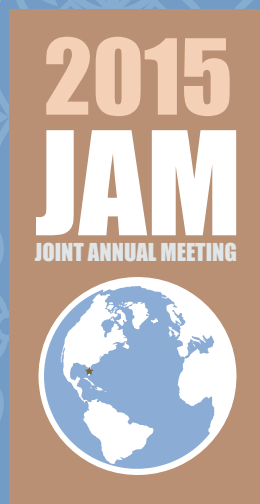




JOINT ANNUAL MEETING



CONFERENCE INFORMATION AND SCIENTIFIC PROGRAM



ADSA®—ASAS
July 12–16 • Orlando, Florida

www.jtmtg.org/2015



King Techina

COATING FOR MORE

A Microencapsulation Technology Specialist

COATING FOR MORE



Visit Us at
Booth 513 & 515

Contact us at
info@king-techina.com



Intelligent
Microcapsule
智能微囊™

2015 Joint Annual Meeting Table of Contents

| | |
|--|-----|
| Welcome Letter | 1 |
| General Meeting Information | 2 |
| Presentation Information | 4 |
| Transportation and Orlando Sightseeing Options | 5 |
| Special Events | 6 |
| Award Donors | 9 |
| Exhibit Schedule and Floor Plan | 11 |
| Guide to Exhibitors | 12 |
| Exhibit Directory | 13 |
| Corporate Sponsorship | 20 |
| Orlando Area and Resort Maps | 21 |
| Meeting Sponsors | 26 |
| Schedule of Events | 29 |
| ADSA SAD Schedule of Events | 34 |
| ADSA Dairy Foods Division Schedule of Events | 36 |
| JAM 2015 Program Committees | 37 |
| Scientific Program Table of Contents | 41 |
| Scientific Sessions | 49 |
| Author Index | 263 |

<http://www.jtmtg.org/2015>

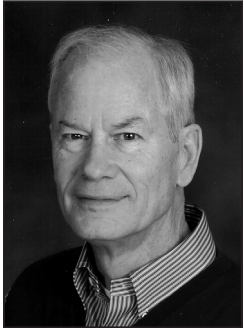
Important Message

In the event that protestors interrupt the meetings, please ignore them. Their goal is to attract attention and any attention you give them will only help their cause. Convention staff have a plan in place to handle these situations, and they depend on our cooperation. If members of the media approach you for an interview about the disturbance, please politely decline and direct them to the convention's media room, where spokespersons will be available.

Thank you for your cooperation.

Welcome to JAM 2015!

On behalf of the American Dairy Science Association® and the American Society of Animal Science, we welcome you to JAM 2015 at the Rosen Shingle Creek Resort in Orlando. This year's meeting begins on Sunday, July 12, and runs through Thursday, July 16. The 2015 Interbull Annual Meeting will take place July 9 through 12 at the Rosen Shingle Creek Resort. Many opportunities exist for networking and socializing with old and new friends. Join us on Sunday night for the opening session and keynote address by Michele Payn-Knoper, author of *No More Food Fights!* Payn-Knoper is a passionate advocate for the global



Al Kertz
ADSA President



Debra Aaron
ASAS President

agri-food system and is principal of Cause Matters Corp., a company designed to "build connections around the food plate." The opening session will be followed by a reception for all attendees. In addition to the Interbull meeting, other pre-meeting events include the Triennial Reproduction Symposium sponsored by Bayer Animal Health and the Jim Lauderdale Appreciation Club; a teaching workshop: "Changing the animal science teaching and learning paradigm—An interactive workshop on how to use case study teaching to foster critical thinking and classroom discussion"; the National ASAS Academic Quadrathlon; and the Late-Breaking Original Research session.

More than 2,500 abstracts and 41 symposia are scheduled that cross species, disciplines, and societal topics of importance in food production and companion animals. On Sunday, we are holding two Breeding and Genetics symposia that are joint sessions with Interbull: "Milk spectral data—Cost-effective information to improve expensive and limited traits in dairy cattle breeding" (morning) and "Use of genomics to improve limited and novel phenotypes in animal breeding" (afternoon). All JAM attendees are welcome to attend those symposia at no additional cost. The Bioethics symposium on Monday will address the effects of science, government, and the public in directing the future of animal agriculture. The ADSA Foundation symposium addresses the present and future demand for employees with a PhD, and the Teaching/Undergraduate and Graduate Education Symposium is "Teaching graduate students to teach and be successful at teaching." The Forages and Pastures symposium tackles climate change, the EAAP Genetics symposium focuses on breeding for environmental sustainability, and the ADSA Southern Section symposium addresses ways to maximize forage quality in the southeastern United States. The Cell Biology symposium will cover regulation of growth through amino acid sensing. Several symposia will address topics in basic and applied nutrition for ruminants and nonruminants. Two companion animal symposia will discuss bioenergetics of pet food and comparative nutrition. The Beef Cattle Nutrition symposium will focus in feeding Holstein steers, and the Beef Species symposium addresses consumer demand for beef. The ADSA Multidisciplinary and International Leadership Keynote (MILK) Symposium is titled "Global dairy perspective—Production, processing, people, politics, and priorities" and various other dairy food symposia discuss dairy ingredient innovations. Organizers will again conduct the Mixed Models workshop on Wednesday and Thursday.

JAM attendees are encouraged to take full advantage of these great opportunities to share ideas across species and societies, visit with each other in person, and make new acquaintances.

ASAS is sponsoring or working with sponsors to host two very special events at the 2015 JAM. On Tuesday, join us as we work together to reduce hunger. Participants will pack 100,000 balanced meals for distribution by Hunger Fights to a food desert in northern Florida. Ensuring a safe and adequate food supply is a cause dear to ASAS and we are proud to partner with a number of sponsors and Hunger Fights to make this program a reality. On Wednesday, join ASAS as we combine our love of science and love of animals to enjoy a night at SeaWorld.

We are grateful to the many people involved in making this meeting a success, starting with our sponsors. Their support is essential to the quality program that makes JAM unlike any other meeting. A list of sponsors of this year's meeting is available in this program book. Please take time to thank them during the meeting. The program committee has worked long and hard to organize an excellent program. Our thanks to the overall program committee of Geoff Dahl (chair), Mark McGuire, Connie Larson, Shawn Archibeque, and Filippo Miglior for their efforts in bringing forth this outstanding scientific program. We also thank the many others who contributed to this huge undertaking, including the staffs of FASS, ADSA, and ASAS.

Finally, thank you, the attendees, for participating in JAM 2015 and making it a grand success!

Al Kertz
ADSA President

Debra Aaron
ASAS President

General Meeting Information

Location

The meeting will be held at the Rosen Shingle Creek Resort in Orlando, Florida. All meeting space, exhibits, and most official JAM social events are conveniently located under one roof. All of the attractions that Orlando offers are within a few minutes of the Rosen Shingle Creek Resort.

Schedule of Events

The 2015 ADSA-ASAS JAM will be held July 12–16 (Sunday through Thursday). The opening session will be held on Sunday evening, July 12; scientific sessions will begin Monday morning, July 13, and run through noon on Thursday, July 16. Several pre-conference events are scheduled for Sunday, including the Triennial Reproduction Symposium and Teaching Workshop; please check the scientific program starting on page 41.

Opening Session

This year's opening session, on Sunday evening, will feature a presentation by Michele Payn-Knoper, author of *No More Food Fights!* Michele is principal of Cause Matters Corp. and a passionate advocate for the global agrifood system. Michele has worked with farmers in more than 25 countries and raised over \$5 million in sponsorships for the National FFA Foundation. She founded the weekly Twitter conversation AgChat, which has involved more than 15,000 participants since April 2009. Payn-Knoper resides with her daughter on a small farm in central Indiana, where they enjoy Registered Holsteins, MSU Spartans, and cooking. After the opening session, please join us for food, drinks, and camaraderie at the reception.

Program Format for 2015

| | |
|--|---------------------|
| Poster sessions (Monday–Wednesday) | 7:30 am – 9:30 am |
| Morning scientific sessions (Monday, Tuesday) | 9:30 am – 12:30 pm |
| Morning scientific sessions (Wednesday) | 10:30 am – 12:30 pm |
| Morning scientific sessions (Thursday) | 8:30 am – 11:30 am |
| Lunch break | 12:30 pm – 2:00 pm |
| Afternoon scientific sessions (Monday–Wednesday) | 2:00 pm – 5:00 pm |

Meeting rooms will be equipped for electronic presentations and preloaded sessions. In addition to free Wi-Fi in public areas, a cyber café will be available in the exhibit hall for attendees to use while at the meeting.

Registration Hours

Registration for Interbull will be at the Transportation Lobby registration desk; registration for JAM will be in the Gatlin Foyer. Registration hours for the meeting, including special symposia and other events, will be as follows:

Interbull:

| | |
|-----------------------------|-------------------|
| Wednesday, July 8 | 3:00 pm – 5:00 pm |
| Thursday, July 9 | 7:30 am – 5:00 pm |
| Friday, July 10 | 7:30 am – 5:00 pm |

JAM:

| | |
|------------------------------|-------------------|
| Saturday, July 11 | 3:00 pm – 5:00 pm |
| Sunday, July 12 | 7:00 am – 7:00 pm |
| Monday, July 13 | 6:30 am – 5:15 pm |
| Tuesday, July 14 | 7:00 am – 5:15 pm |
| Wednesday, July 15 | 7:00 am – 5:15 pm |
| Thursday, July 16 | 8:00 am – 1:00 pm |

Important Phone Numbers

- Rosen Shingle Creek Resort (toll-free) (866) 996-9939
- Westgate Lakes Resort (877) 502-7058
- Wyndham Orlando Resort (407) 351-2420
- Avanti Resort (407) 313-0100

Speaker Ready Room

The Speaker Ready Room is located in Gatlin A-2 of the Rosen Shingle Creek Convention Center. This room will be available for speakers from 7:00 am to 5:00 pm on each day of the meeting.

Media Room

A media room (Suwannee 21) will be available throughout the meeting to provide a space for media representatives to work. Meeting press releases will be available there. Complimentary registration is available for members of the media. For more information, please contact adsa@adsa.org.

Media Check-In

Please check in at the Registration Desk in the Gatlin Foyer of the Rosen Shingle Creek Convention Center.

JAM Hospitality Lounge

The JAM hospitality lounge will be located in Suwannee 18 in the Convention Center. This lounge will offer attendees an area to relax, network, and catch up with friends.

ASAS Hospitality Suite

The ASAS hospitality suite will be located in Suwannee 20 in the Convention Center. Join your colleagues in the ASAS hospitality suite to relax and catch up. While you are there, take advantage of the mobile charging station and the ASAS Foundation Coffee Club. Registration for the Coffee Club is open year round. Sign up now at <https://www.asas.org/membership-services/foundation/call-for-donations/coffee-club>.

Business Center

The business center is located on the lower level of the Rosen Shingle Creek Convention Center, near the JAM Registration Desk. Use of the business center is at your own expense.

Presentation Information

Oral and Invited Speakers: Onsite Upload Information

Oral sessions will begin at 9:30 am on Monday and Tuesday, 10:30 am on Wednesday, and 8:30 am on Thursday.

Onsite Upload Information

Onsite upload: Onsite presentation upload will be available; files can be delivered to the Preload Room (Gatlin A-1) at the convention center (Saturday: 3:00 to 5:00 pm; Sunday to Wednesday: 7:00 am to 5:00 pm; Thursday: 7:00 am to noon). **Presentations must be uploaded by 5:00 pm on the day before your scheduled presentation. Files will not be accepted via e-mail. No presentations will be loaded while the session is in progress or between presentations.**

Poster Presentations

We have dedicated a two-hour block each morning to poster presentations. The “open poster” sessions will be from 7:30 to 9:30 am Monday, Tuesday, and Wednesday in the Gatlin Ballroom. Coffee and pastries will be served in the hall from 8:00 to 9:00 am on all three days.

Each poster will be available for public viewing for the entire day, with the presenting authors in attendance during the open posters time (7:30–9:30 am). All posters must be mounted on the board 30 minutes before the beginning of the day’s session (**poster sessions begin at 7:30 am so posters must be mounted on boards by 7:00 am**) and must list the abstract number and corresponding day. The exhibit hall will open at 6:30 am on Monday through Wednesday. **Posters must be removed after 5:00 pm each day.** Any posters remaining after 5:30 pm each day will be removed by the convention center staff and discarded.

Each poster board area is **48 inches high and 96 inches wide**. Use of this space is determined by the presenter, with the following exceptions: the top of the poster space must include the abstract number with corresponding letter of the day it is being presented, title, authors, and affiliations. The lettering for this section should be at least 1 inch high.

Locating the Correct Poster Board

Each poster board number corresponds to the abstract number as noted in the program. For Monday posters an “M”; Tuesday posters a “T”; and for Wednesday posters a “W” precedes the board number.

Poster in my Pocket: JAM Poster App

New this year is the JAM poster app, *Poster in my Pocket*. JAM attendees can download the app, scan the QR code on participating posters, and within seconds have a crisp, clear replica of the poster on their mobile device. Posters can be favorited, forwarded to colleagues, and saved for offline reading until 60 days after the meeting ends. The app also allows attendees to connect with poster presenters via e-mail.

Camera, Video Camera, and Cell Phone Policy

Use of cameras, video cameras, and phones (for calls or audio/video recording) is prohibited during oral and poster presentations to minimize disruption and unauthorized dissemination of data. Anyone found in violation of this policy will be asked to leave the session. Smartphones or tablets may be used in the poster area to access the JAM poster app via QR code.

ARPAS Continuing Education Units

The 2015 Joint Annual Meeting has been approved for up to 21 continuing education units (CEUs) for the American Registry of Professional Animal Scientists (ARPAS) certification requirements. Check the schedule of events for times and location of the ARPAS exams.

Continuing Education Credits for Veterinarians (RACE credits)

Many of the symposia at the 2015 Joint Annual Meeting will be approved for RACE credits. We are in the process of having specific symposia approved. Symposia approved for RACE credits will be posted online at <http://www.jtmtg.org/2015>. Information regarding RACE can be found at www.aavsb.org.

Job Resource Center and Interview Room

The ADSA-ASAS Job Resource Center is located in the exhibit hall. Job announcements and CVs will be organized into the following categories for posting: Animal Behavior and Well-Being; Animal Health; Animal Breeding; Companion Animals; Extension; Food Safety; Food Science; Forages and Pastures; Genetics; Growth and Development; International Animal Agriculture; Lactation; Meat Science and Muscle Biology; Nonruminant Nutrition; Pharmacology and Toxicology; Physiology and Endocrinology; Production and Management; Ruminant Nutrition; and Teaching. An interview room (Gatlin A-4) is available for company representatives to interview candidates during JAM. Reservations are required, so please visit <http://www.jtmtg.org/2015/interviews.asp> for more information and to book a time.

Free Wi-Fi and Cyber Café

Free Wi-Fi is available in all meeting areas and the exhibit hall. Located in the exhibit hall, the cyber café is available to all meeting attendees. The cyber café will also have a computer with a printer for limited printing during the meeting.

Mobile MyProgram—An Easier Way to Plan Your Schedule

The MyProgram planner is now mobile! Mobile MyProgram provides JAM attendees with convenient access to the conference schedule via most mobile devices. With Mobile MyProgram, the JAM program is more convenient than ever. Mobile MyProgram includes a personal scheduler for symposia, sessions, and events you wish to attend, and you can access and share abstracts for all presentations, read invited speaker bios, find exhibitors, and more, making it easier than ever to plan your meeting while on the go. Visit m.JtMtg.org today!

Transportation in Orlando

Orlando International Airport serves more than 35 scheduled airlines, providing nonstop service from more than 100 US domestic and international cities. Once in Orlando, you can choose from a large selection of rental vehicles, taxis, limousines, and public transportation. Travel by car is also convenient, with a number of major highways flowing into Central Florida and throughout the rest of the state. JAM attendees who choose to drive to the meeting will enjoy free overnight self-parking; a discounted parking rate of \$5/day is available for JAM attendees not staying at the Rosen Shingle Creek. Attendees traveling around International Drive can board the I-Ride Trolley, a hop-on, hop-off service route exclusive to the International Drive Resort area. Orlando's public transportation system, LYNX, is a great way to get around town.

The Rosen Shingle Creek Resort is approximately 11 miles from Orlando International Airport (MCO). The one-way taxi fare from the airport to the resort is approximately \$45.00. Start networking by sharing a cab with other JAM attendees to save expense; just print out this sign: http://www.jtmtg.org/2015/2015_JAM_Taxi_Sharing.pdf and display it near the taxi stand at the airport. There are also many shuttle services available to choose from; SuperShuttle is one of the most popular (<http://www.supershuttle.com>).

Orlando Sightseeing Options

With 7 of the world's top 20 theme parks in 1 destination, not to mention nearly 100 other attractions, Orlando certainly knows how to entertain. If rollercoasters aren't your thing, consider 18 holes of golf on one of Orlando's 176 courses. Orlando was recently named the North American Golf Destination of the Year by the International Association of Golf Tour Operators. Play 18 holes on courses designed by golf legends, including Palmer, Watson, Nicklaus, and Norman. Orlando is also a true culinary hot-spot with award-winning restaurants and celebrity chefs catering to visitors from across the globe. An extensive list of fine-dining establishments, casual cafés, and chic wine bars meets just about any taste or budget. Visit the CVB (<http://www.visitorlando.com>) for many more ideas on what to do for fun in Orlando!

Check the Orlando area map on page 21 for attractions close to the Rosen Shingle Creek Resort.

Special Events

Coffee and pastries will be served in the exhibit hall on Monday, Tuesday, and Wednesday from 8:00 to 9:00 am. Please make time to talk with our exhibitors while you are enjoying complimentary coffee and pastries!

ASAS Undergraduate Academic Quadrathlon Sunday and Monday Times and Locations Below

ASAS is excited to offer our four undergraduate regional championship teams the chance to compete for the National Academic Quadrathlon (AQ) title. The AQ has been an integral part of ASAS history and we are excited to use it as a platform to integrate more undergraduate involvement at our meetings. The competition will be hosted at the University of Florida.

Sunday, July 12: Practicum and written exam (University of Florida)

Monday, July 13: Oral reports and quiz bowl, including finals (University of Florida). Video presentations by each team to take place during ASAS Awards Program in the evening (at the Rosen Shingle Creek).

ASAS Hospitality Suite Sunday 12:00 – 5:00 pm Monday – Wednesday, 8:00 am – 5:00 pm Suwannee 20

Join your colleagues in the ASAS Hospitality Suite to relax and catch up. While you are there, take advantage of the mobile charging station and the ASAS Foundation Coffee Club. Registration for the Coffee Club is open year round. Sign up now at <https://www.asas.org/membership-services/foundation/call-for-donations/coffee-club>.

ADSA Undergraduate and Graduate Student Event: Animal Rescue and Rehabilitation Laboratory, SeaWorld Orlando Saturday, July 11 11:30 am – 5:00 pm Meet in Transportation Lobby

Departing from the transportation lobby of the Rosen Shingle Creek, we will be shuttled by motor coach to nearby SeaWorld Orlando. Students will participate in a one-hour course taught by a SeaWorld instructor. The course will give an insider's look at SeaWorld's efforts to help preserve and protect endangered and threatened species through its rescue, rehabilitation, and release program. The remainder of the afternoon is free for you to explore the many shows, rides, and exhibitions offered at SeaWorld. This event is offered to both undergraduate and graduate students.

ADSA Undergraduate Student Mixer: Pizza and Pool Party Saturday, July 11 7:00 pm Lap Pool, Rosen Shingle Creek Resort

Gather with friends old and new for a fun night filled with good music, good food, and good friends, all poolside on a balmy Florida night—it doesn't get any better than this! Ticket price includes soft drinks and pizza. Don't miss this perennial meeting highlight!

ADSA SAD Student Midday Mixer Sunday, July 12 12:00 – 1:00 pm Butler

Join your fellow dairy clubs for a fun hour of getting reacquainted and making new friends, and get to know your 2015–2016 Student

Affiliate Division (SAD) Officer candidates. Ticket price includes lunch. Note: Registration is limited to ADSA undergraduate student members and advisors.

ADSA Graduate Student Division Workshop: Making Science Sexy: Communicating Your Relevance Sunday, July 12 2:00 – 4:00 pm Conway

Join us for an exciting interactive workshop with the 2015 JAM keynote speaker, Michele Payn-Knoper. One of the greatest challenges the scientific community faces currently is how to demonstrate the importance of their research to gain the trust of the general public. Attend to learn how to "sell" science and influence the non-science world. A \$10 registration fee is required, and space is limited, so sign up early! Attendees will receive a copy of Michele Payn-Knoper's book titled "No More Food Fights!"

ADSA Graduate Student Division Business Meeting and Open Forum Sunday, July 12 4:30 – 5:15 pm Wekiwa 5

In addition to meeting the incoming GSD officer team, be sure to attend this meeting to voice your ideas and opinions about ADSA GSD activities. Join us for a new, more interactive style of business meeting and great conversations with your fellow dairy science graduate students.

ADSA SAD Student Dairy Quiz Bowl Final Round Sunday, July 12 5:30 – 6:00 pm St. John's 22/23

University teams from across North America will compete in the ADSA-SAD Dairy Quiz Bowl. The event gives schools an opportunity to demonstrate their knowledge about dairy production, processing, and ADSA history. The Student Affiliate Division (SAD) invites you to join them for the excitement of the final round of competition as the top two schools go head to head for the title of 2015 Dairy Quiz Bowl Winning Team.

Opening Session and Reception Sunday, July 12 7:00 – 8:00 pm; 8:00 – 10:00 pm Panzacola G/H (opening session) and Gatlin Foyer (reception)

Come help us kick off the 2015 Joint Annual Meeting at the opening session. Then, wind down the evening by joining us after the opening session for food and drinks and some long-awaited socializing time with colleagues and friends.

ADSA Undergraduate Student Poster and Oral Competitions Monday, July 13 Gatlin Ballroom (posters) and meeting rooms (orals)

Please support our undergraduate students by planning time to visit the undergraduate posters and oral presentations on Monday. See scientific program for complete details.

Graduate Student Professional Development Lunch: Your résumé may get you in the door but your APCs will separate you!**Monday, July 13**
12:30 – 2:00 pm
Sandlake

All graduate students are invited to listen to Mike Moseley, a Dale Carnegie Instructor for 25 years, speak about career development. Students will learn how their Attitude, Aptitude, Passion, Persistence, and Communication skills will separate them beyond their résumés. A \$10 registration fee is required and a box lunch is included.

ASAS Undergraduate Lunch and Learn**Monday, July 13**
12:30 – 2:00 pm
Suwannee 16

This interactive discussion will focus on preparing for a future in animal science with specific emphasis on navigating career choices in a challenging economic and societal environment.

ASAS President's Picks Posters**Monday, July 13**
6:00 – 9:00 pm
Sebastian J Foyer

We will display 10 to 20 posters beginning 30 minutes before the ASAS awards. The posters will represent science that the current ASAS president finds innovative! Take a moment to walk through the posters and see what Dr. Aaron thinks is new and exciting at JAM this year.

ADSA Undergraduate Student Mixer: Downtown Disney and House of Blues**Monday, July 13**
6:30 – 11:00 pm
Meet in Transportation Lobby

Choose from the wide array of world-class restaurants, dazzling entertainment and unique shops that line the waterfront in the Downtown Disney area. Shop in the world's largest Disney store, dine amid life-size prehistoric creatures, bowl a game at the 30-lane alley and more. This fun-filled district includes Downtown Disney West Side, Downtown Disney Marketplace and Pleasure Island. At 8:30 pm, students can keep the Disney Magic going by meeting at the legendary House of Blues. Shuttle service will be provided between the Rosen Shingle Creek and Downtown Disney.

ASAS Awards Program**Monday, July 13**
7:15 – 8:45 pm
Sebastian J

All meeting participants, families, and friends are welcome to attend the ASAS Awards Program. Please join us at this special event to recognize and congratulate the 2015 ASAS National Award Winners. The 2015 Awards Celebration follows immediately after the awards ceremony. ASAS Academic Quadrathlon finals will take place at the University of Florida on Monday morning. There will be a special video presentation by each AQ team about their school and themselves during the Awards Program.

ASAS Awards Celebration, Big Scoop Ice Cream Competition, and Battle of the Brats Competition**Monday, July 13**
8:45 – 10:30 pm
Sebastian J Foyer

Come and join ASAS after our awards ceremony to celebrate and congratulate all of the 2015 ASAS National Award winners. ASAS and sponsors welcome you to this exciting reception. We will have food, cash bars, and designated areas where you can meet with award winners and colleagues. New this year is the Battle of the Brats

Competition. Back by popular demand, the Big Scoop Competition will be held during the awards celebration with the winner being presented a trophy at the business meeting on Wednesday morning.

ASAS Graduate Student Mixer: Splitsville at Downtown Disney**Monday, July 13**
9:30 pm
Meet in Transportation Lobby

Join your fellow graduate students from ASAS at a mixer for all to enjoy at Splitsville at Downtown Disney. This event will provide an opportunity to catch up with old friends and make new ones. Don't miss it! Preregistration is highly recommended.

ASAS Undergraduate Poster Contest**Tuesday, July 14**
7:30 – 9:30 am
Gatlin Ballroom

Join us for the 2015 national undergraduate research poster competition. Please come out to support our undergraduate presenters.

ADSA SAD Student Career Symposium**Tuesday, July 14**
9:30 – 11:00 am
Sandlake

This highly interactive event will give students the opportunity to meet with industry professionals representing various facets of the animal agriculture industry. They will learn about careers in the industry, get useful tips on planning for their careers, and much more. Students are encouraged to dress professionally (business casual or better) and bring several copies of their resumes. Students should also plan time to visit industry reps in the exhibit hall for information about internships and job opportunities.

Companion Event 1: Winter Park Cultural Tour**Tuesday, July 14**
10:00 am – 2:00 pm
Meet in Transportation Lobby

Downtown Winter Park's charm is magnified in its details: hidden gardens and side streets that are home to unique stores, a farmer's market that attracts both locals and visitors alike each Saturday morning, and festive parades that make the seasons. The Scenic Boat Tour cruises through three of the city's lakes and border the area's most prestigious homes. The relaxing, narrated, one-hour, 12-mile cruise through the lakes and canals is really the only way to see the true beauty of Winter Park. Lunch is included at Chez Vincent, which is located in the recently renovated artsy Hannibal Square of Winter Park and it's one of "the" places to dine in the Winter Park and Orlando areas. Preregistration for this event is required. Register early—capacity is limited!

ADSA SAD Student Awards Luncheon**Tuesday, July 14**
11:45 am – 2:00 pm
Butler

Plan to attend this year's SAD awards luncheon. The afternoon will be capped with presentation of student awards and announcement of new SAD officers. Both students and professionals are encouraged to attend. This is a wonderful chance to get to know the next generation of the dairy industry.

ASAS Graduate Student Lunch and Learn**Tuesday, July 14**
12:30 – 2:00 pm
Sandlake

This interactive discussion will focus on future career options and opportunities after graduation.

ASAS Foundation Heritage Luncheon

Tuesday, July 14

12:30 – 2:00 pm

Conway

Each year, the Foundation Heritage Lunch honors notable animal scientists for their achievements. Please join us at this Foundation fundraiser to honor pioneers of animal science.

ASAS JAS Editorial and Open Forum Luncheon

Tuesday, July 14

12:30 – 2:00 pm

St. John's 26/27

Section editors are invited to the *Journal of Animal Science* Open Forum Luncheon to discuss the current status of the journal and future development opportunities.

ADSA Student Three-Minute Thesis Challenge

Tuesday, July 14

3:00 – 4:30 pm

Wekiwa 5

Plan to take part in the new "Three-Minute Thesis" competition open to all ADSA student members! This event will test the competitors' abilities to concisely convey their research in a way that is understandable to all. Entry will be limited to those students selected by a panel of judges based upon strength of CV and a 100-word abstract describing the presentation. Five graduate students and five undergraduate students will be invited to participate in this inaugural event and will compete for cash prizes to be awarded to the first- and second-place graduate and undergraduate students, as determined by a panel of judges. Please join us to make this event a success and to see these students present their research in a fun and challenging way.

Hunger Fight Food Packing Event, sponsored by ASAS and AMSA

Tuesday, July 14

4:30 – 7:00 pm

Panzacola G-2

Animal scientists work toward feeding the future every day—here is a chance to give back even more. ASAS has partnered with Hunger Fight in 2015! Attendees are invited to help pack nutritional meals for the Florida-based Hunger Fight organization as well as make a monetary donation to help pay for the meal packages. These nutritional meals are distributed to individuals and families in Florida. With the help of great partners, Hunger Fight is able to supply four meals for a dollar. We need approximately 350 people to pack 100,000 meals. Come be part of the solution as we work to combat world hunger. Learn more about this event, sign up, or make a monetary donation at <https://www.asas.org/meetings/hungerfightevent>.

ADSA Awards Program

Tuesday, July 14

7:00 – 8:00 pm

Sebastian J

All meeting participants, families, and friends are welcome to attend the 2015 ADSA awards program. Please join us at this special event to recognize and congratulate the 2015 award winners.

JAM Ice Cream Social, sponsored by ADSA

Tuesday, July 14

8:15 – 9:30 pm

Gatlin Foyer

All meeting participants, families, friends, and award donors are invited to join us for the always-popular ice cream social.

ADSA Graduate Student Division Mixer

Tuesday, July 14

9:00 pm – 12:00 am

Howl at the Moon, 8815 International Drive, Orlando

Enjoy a fun and entertaining night with your fellow ADSA graduate students. Howl at the Moon features dueling pianos playing the most popular hits from today and the past. Free drink ticket AND free admission for the first 100 at the door! After the first 100, there is a \$5 admission fee. Howl at the Moon is located just a short cab ride away from the conference location and close to other restaurants and venues. Join your colleagues from around the world for a fun-filled night of entertainment!

Companion Event 2: Kennedy Space Center and Lunch with an Astronaut

Wednesday, July 15

8:30 am – 2:00 pm

Meet in Transportation Lobby

Worlds apart from Orlando's theme parks, but just a short drive away, Kennedy Space Center is NASA's launch headquarters. Each year, millions of visitors make the trek to this hub of technology and discovery where many of mankind's greatest accomplishments take place. Tour NASA's launch and landing facilities, experience live shows and jaw-dropping encounters with massive rockets as well as have the opportunity to meet a real member of NASA's Astronaut Corps. View 10-story-high rockets from all eras of space exploration in the Rocket Garden, walk through a full-size Space Shuttle mock-up, enjoy IMAX Theater space films on gigantic five-story screens and see an actual Gemini program capsule on display. Shopping and food concessions are also available here for your enjoyment. Guests will take a break from self-exploring the facility and have a one-of-a-kind experience for lunch. While guests enjoy their meal, they will be introduced to a real astronaut who will give a presentation and participate in a question and answer session. Guests will also have the opportunity to take pictures with the astronaut. Preregistration for this event is required. Register early—capacity is limited!

Global Networking Reception

Wednesday, July 15

4:30 – 6:00 pm

Butler

All meeting participants, families, and friends are welcome to attend the closing reception on Wednesday evening. Again this year, attendees will have the opportunity to indicate their home affiliation on a world map; check the exhibit hall for the poster board before the reception.

SeaWorld Reception and Park Access

Wednesday, July 15

6:00 – 10:00 pm (busing at 5:45 pm and 10:00 pm)

Meet in Transportation Lobby

Join fellow attendees for an evening at SeaWorld. The evening will start with a reception with light hors d'oeuvres and drinks with special appearances by park animals as well as costumed characters for children and adults alike from 6:00 to 7:00 pm. Following the reception, you will have access to the SeaWorld park until 10:00 pm, including show and ride access. Busing will be provided between the Rosen Shingle Creek and Sea World. More details including sign-up information can be found online at www.asas.org/JAM_Events. Note, you must register on the ASAS site for this event!

2015 ADSA Award Donors

ABS Global Inc.
Alltech Biotechnology Center
American Dairy Science Association
American Dairy Science Association
Foundation
American Feed Industry Association
Cargill Animal Nutrition
Dairy Research Institute

DuPont Nutrition and Health
Elanco Animal Health
Elsevier
Hoard's Dairyman
International Dairy Foods Association
Kraft Foods
Lallemand Animal Nutrition
Leprino Foods

National Milk Producers Federation
Novus International
Nutrition Professionals Inc.
Purina Animal Nutrition
West Agro Inc.
Zoetis

2015 ASAS Award Donors

ABS Global Inc.
Agri-King
American Feed Industry Association
American Society of Animal Science
American Society of Animal Science
Foundation
BASF
Bouffault Award Fund
Center for Regulatory Services Inc.

Casida Award Fund
Corbin Award Fund
Cenzone Technology
Cromwell Appreciation Club
DSM Nutritional Products Inc.
EAAP
Elanco Animal Health
Fontenot Appreciation Club
Journal of Animal Science

Land O'Lakes
Merial Ltd.
Morrison Award Fund
Omega Protein Corp.
Pond Appreciation Club
The Iams Company
Tucker Appreciation Club
Zinpro Corp.
Zoetis



5th International Symposium

Managing Animal Mortalities, Products, Byproducts
& Associated Health Risks: Connecting Research,
Regulations & Responses

September 28 - October 1, 2015
Lancaster, Pennsylvania

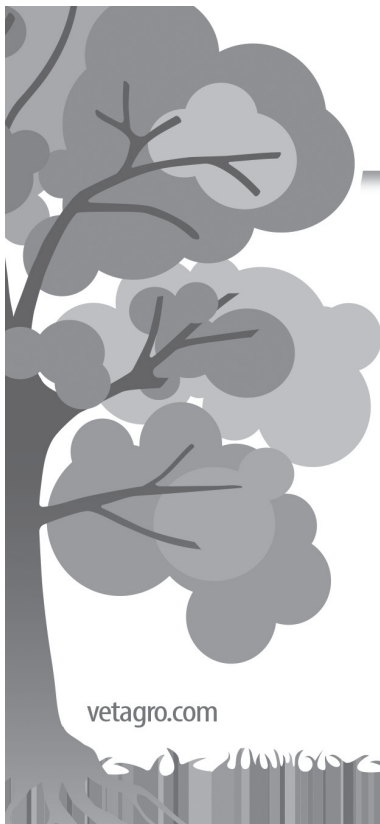
animalmortmgmt.org



**INSTITUTE FOR
INFECTIOUS ANIMAL DISEASES**

In collaboration with world-wide academia, industry and government partners.

This event was made possible with funding from the Department of
Homeland Security, Science & Technology Directorate.



Our
**MICROENCAPSULATION
YOUR SOLUTION**
since 1982.

vetagro.com

AviPlus[®] Timet[®] MecoVit[®]



Exhibit Schedule

Sunday, July 12

Set Up Exhibits 10:00 am – 6:00 pm

Monday, July 13

Exhibits Open 8:00 am – 5:00 pm

Tuesday, July 14

Exhibits Open 8:00 am – 5:00 pm

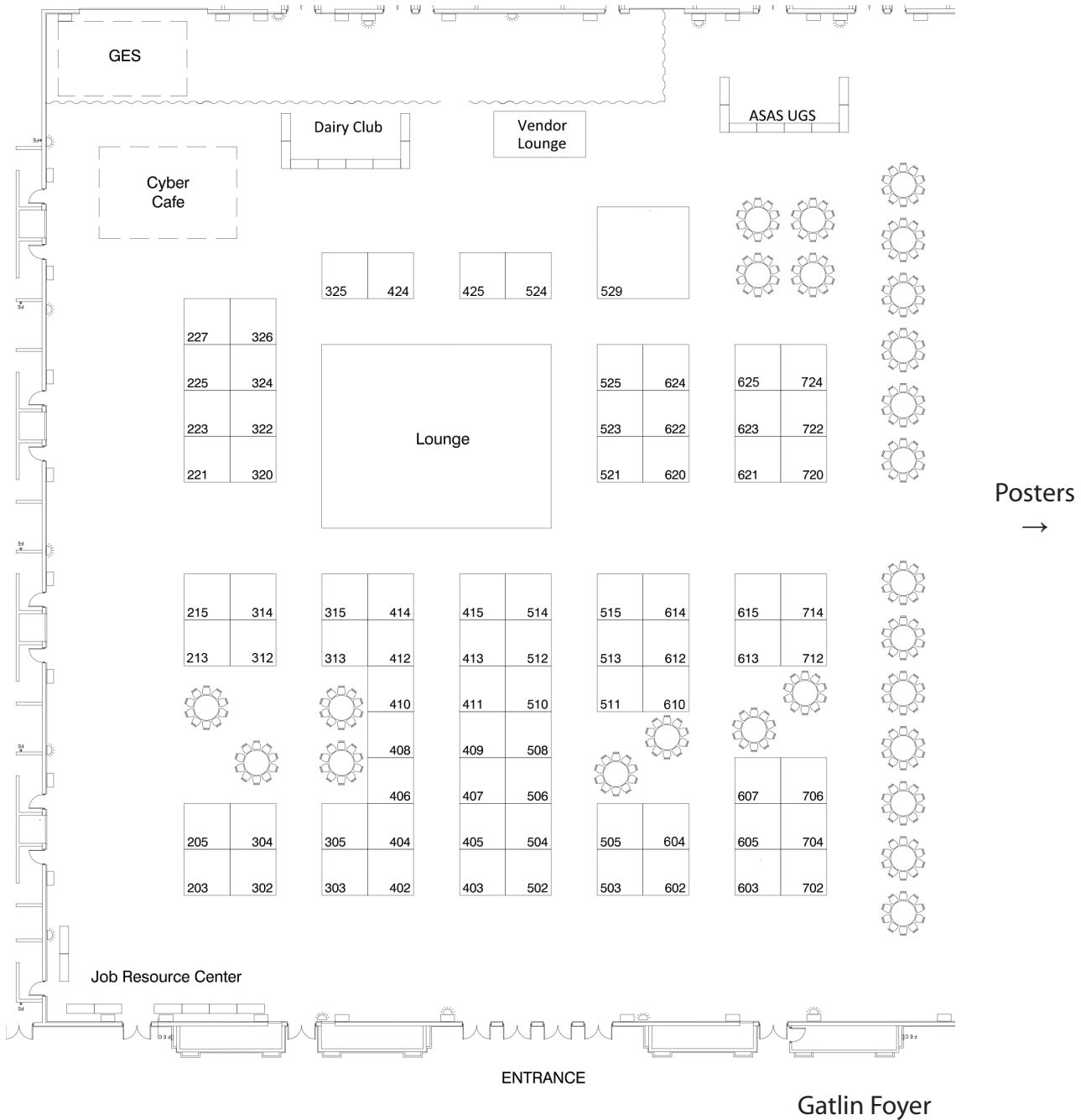
Wednesday, July 15

Exhibits Open 8:00 am – 2:00 pm

Dismantle Exhibits 2:00 pm – 5:00 pm

Coffee and pastries will be served from 8:00 to 9:00 am on Monday, Tuesday, and Wednesday.

Exhibit Floor Plan



Guide to Exhibitors/Booth Numbers

| | | | |
|--|--------------------|---|--------------------|
| AAALAC | 413 | Diamond V | 303, 305, 402, 404 |
| Adifo NV | 524 | DVM Systems LLC | 322 |
| Adisseo | 620, 622 | EAAP | 624 |
| ADM Animal Nutrition | 320 | E. I. Medical Imaging | 325 |
| Ag Processing Inc. | 724 | Elsevier | 409 |
| Agri-King Inc. | 302 | Enovative Technologies | 610 |
| American Dairy Science Association (ADSA) ... | 405 | Evonik Corp. | 324, 326 |
| American Registry of Professional Animal Scientists (ARPAS) | 607 | FASS | 510 |
| American Society of Animal Science (ASAS) | 529 | FDA/Office of Foods/Center for Veterinary Medicine | 512 |
| Ankom Technology | 424 | Feedstuffs | 523 |
| Arm & Hammer Animal Nutrition | 621, 623, 720, 722 | Gasmet Technologies Inc. | 604 |
| Balchem | 504, 506 | GrowSafe Systems | 712 |
| Bar Diamond Inc. | 614 | Kemin Industries | 615, 714 |
| Biomin USA Inc. | 514 | King Techina Group | 513, 515 |
| BioZyme Inc. | 613 | Laboratories Phodé | 702 |
| Bruker Optics Inc. | 521 | Lallemand Animal Nutrition | 315, 414 |
| Bruno Rimini Corp. | 221 | Micronutrients | 603, 605 |
| CABI Bookshop | 410, 412 | National Animal Nutrition Program | 411 |
| Cambridge University Press | 313 | Novus International | 314 |
| Central Life Sciences | 415 | PetAg Inc. | 602 |
| Chr. Hansen | 505 | Phileo Lesaffre Animal Care | 213, 312 |
| C-Lock Inc. | 625 | Poultry Protein and Fat Council | 503 |
| Cobb-Vantress Inc. | 304 | Sable Systems International Inc. | 407 |
| Cumberland Valley Analytical Services | 704, 706 | SmartStock LLC | 215 |
| Dairy One Forage Laboratory | 425 | SoyBest | 403, 502 |
| Dairy Records Management Systems | 406, 408 | UMG Trading LLC | 525 |
| Dascor Inc. | 612 | Unity Scientific Inc. | 511 |
| | | University of Florida | 508 |
| | | West Central (SoyPLUS, SoyChlor) | 203, 205 |

**A special thank you to our 2015
Joint Annual Meeting Exhibitors!**

Exhibit Directory

AAALAC
5283 Corporate Dr Ste 203
Frederick, MD 21703-2879
<http://www.aaalac.org>
Booth(s): 413

AAALAC International offers accreditation and education services for agricultural animal research programs. Earning accreditation demonstrates dedication to responsible animal care. It also assures research partners, funding sources, and the public of a commitment to quality research and good science. More than 900 institutions in 40 countries have earned AAALAC accreditation.

Adifo NV
Industrielaan 11b
9990 Maldegem
Belgium
<http://www.adifo.com>
Booth(s): 524

World market leader Adifo develops and services a unique range of feed industry-specific software tools for least-cost feed formulation, quality data management, ration calculation, cloud services and ERP. Six hundred customers in over 60 countries apply Adifo's software to optimize their resources, to achieve optimal animal performance, to service their clients, to be more efficient and to be more profitable. Continuous input from users, more than 40 years of experience and state-of-the-art technology guarantee innovative products that make a difference.

Adisseo
4400 N Point Pkwy Ste 275
Alpharetta, GA 30022-2429
<http://www.adisseo.biz/>
Booth(s): 620, 622

At Adisseo, we are nutritionists with a long tradition of applying our expertise to nutritional additives. We are dedicated to serving the animal production industry by helping premixers, feed manufacturers and integrators to improve their performance and to become more competitive.

ADM Animal Nutrition
1000 N 30th St
Quincy, IL 62301-3400
<http://www.adm.com/specialtyingredients>
Booth(s): 320

ADM Animal Nutrition is a leading manufacturing, nutrition and marketing company, which offers a wide range of innovative products for the animal nutrition market. Known as a global leader in amino acids, ADM Animal Nutrition also offers consistent, high-quality feed products, supplements, premixes, custom ingredient blends and specialty feed ingredients designed to provide leading-edge solutions, enabling our customers to meet and optimize animal health and nutrition goals.

Ag Processing Inc.
12700 West Dodge Road
Omaha, NE 68154
<http://www.amino-plus.com>
Booth(s): 724

AminoPlus is the number one volume bypass protein soybean meal dairy supplement in the United States. The patented AminoPlus process utilizes soybean meal to provide high amino acid quality, rumen bypass and intestinal digestibility without the addition of chemicals or non-soybean components.

Agri-King Inc.
PO Box 208
Fulton, IL 61252-0208
<http://www.agriking.com>
Booth(s): 302

Agri-King is a technology driven, global leader in livestock nutrition and forage treatment, focused on improving producer profitability. Agri-King's main purpose is to improve our clients herd health through highly fortified and properly balanced diets while increasing their bottom line.

American Dairy Science Association (ADSA)
1800 S Oak St Ste 100
Champaign, IL 61820-6974
<http://www.adsa.org/>
Booth(s): 405

Established in 1906, ADSA is an international organization of educators, scientists, industry, and government representatives who are committed to advancing the dairy industry. All are keenly aware of the vital role the dairy sciences play in fulfilling the economic, nutritive, and health requirements of the world's population. Together, ADSA members have discovered new methods and technologies that have revolutionized the dairy industry. Please visit www.adsa.org for more information.

American Registry of Professional Animal Scientists (ARPAS)
1800 S Oak St Ste 100
Champaign, IL 61820-6974
<http://www.arpas.org>
Booth(s): 607

The American Registry of Professional Animal Scientists, ARPAS, is an organization that provides certification of animal scientists through examination, continuing education, and commitment to a code of ethics. Continual improvement of individual members is catalyzed through publications (including *The Professional Animal Scientist* journal) and by providing information on educational opportunities.

American Society of Animal Science
PO Box 7410
Champaign, IL 61826-7410
<http://www.asas.org>
Booth(s): 529

Established in 1908, ASAS is a professional organization for animal scientists designed to help members provide effective leadership through research, extension, teaching, and service for the dynamic and rapidly changing livestock, companion animal, exotic animal, and food industries. Visit the ASAS booth for more information on *Journal of Animal Science* (www.journalofanimalscience.org), *Animal Frontiers* (www.animalfrontiers.org), *Natural Sciences Education*, AnimalSmart.org, ASAS Foundation, ASAS Membership, ASAS Sections, and ASAS Public Policy. Also, be sure to visit the ASAS Hospitality Suite to catch up with colleagues and relax. While you are there, take advantage of the mobile charging station and the ASAS Foundation Coffee Club. Registration for the Coffee Club is open year round. Sign up now at asas.org/membership-services/foundation/asas-coffee-club.

Ankom Technology
2052 O'Neil Rd
Macedon, NY 14502-8953
<http://www.ankom.com>
Booth(s): 424

Ankom Technology is best known for the development of filter bag technology for automating fiber and fat analysis in foods and feeds. Ankom has products supporting in vitro digestibility, in vitro gas production, and in situ digestibility. Ankom products are in use in over 90 countries around the world.

Arm & Hammer Animal Nutrition
905 S Carolina Ave
Mason City, IA 50401-5813
<http://www.vi-cor.com>
Booth(s): 621, 623, 720, 722

A dairy cow's lifecycle is a journey with many unexpected stops and starts along the way. Arm & Hammer Animal Nutrition is committed to helping producers navigate through these challenging times with the right resources and the right solutions at the right time. Arm & Hammer Animal Nutrition has acquired Vi-COR, a world-class manufacturer of fermented yeast-based feed ingredients and refined functional carbohydrates (RFC). That means Celmanax and the rest of Vi-COR's product portfolio is now part of the Arm & Hammer Animal Nutrition family, further strengthening its position as the brand that stands for "Animals First. Productivity Always." Visit www.armandhammeranimalnutrition.com to learn more.

Balchem
PO Box 600
52 Sunrise Park
New Hampton, NY 10958-0600
<http://www.balchem.com>
Booth(s): 504, 506

Balchem's Animal Nutrition and Health Division brings the benefits of patented proprietary micro-encapsulation and chelated trace

mineral technology to the livestock, poultry, and companion animal industries. Encapsulation and chelation technologies offer "protection nutrition" to sensitive compounds. Hence, these compounds become bioavailable when and where they offer the most benefit to the animal. Our products include ReaShure, NiaShure, AminoShure-L, NitroShure, KeyShure, VitaShure, and choline chloride.

Bar Diamond Inc.
PO Box 60
Parma, ID 83660-0060
<http://bardiamond.com>
Booth(s): 614

Bar Diamond Inc. provides the world with rumen cannulae and accessories. Our cannulae are used in cattle, goats, sheep, water buffalo, bison, deer, reindeer, llama, musk oxen, and a camel! Visit our booth and see our newest photos from around the world.

Biomin USA Inc.
1846 Lockhill Selma Rd Ste 101
San Antonio, TX 78213-1551
<http://www.biomin.net>
Booth(s): 514

We care for healthy animal nutrition—Naturally ahead. We at Biomin are dedicated to developing innovative and sustainable solutions that ensure our customers' success through healthy and safe animal nutrition. The application of science and expertise is based on first understanding and appreciating our customers' needs and concerns. This principle enables us to deliver solutions that support animal health, optimize performance and production efficiency.

Biozyme Inc.
6010 Stockyards Expy
Saint Joseph, MO 64504-2802
<http://www.amaferm.com>
Booth(s): 613

BioZyme Inc. serves the agriculture industry as an innovator in the fields of animal nutrition and microbiology. In the business for more than 50 years, the company offers a complete line of high density, highly available vitamin, mineral, trace mineral and protein supplements for animals plus Amaferm—a digestive enhancer that increases feed utilization, enhances health, increases energy, milk and gain. With headquarters in St. Joseph, Missouri, the company reaches a global market with customers throughout the United States and Canada, South America, Europe, Asia and the Middle East. Visit Amaferm.com for information on the benefits of including Amaferm.

Bruker Optics Inc.
19 Fortune Dr
Billerica, MA 01821-3923
<http://www.bruker.com>
Booth(s): 521

Save costs and improve quality by upgrading to the next generation of NIR analyzers. From control of feed ingredients to precise testing of proximates, these analyzers have also been used

to monitor blending processes and optimize mill operation. They feature the lowest cost of ownership with a 10-year warranty on the permanently aligned RockSolid Interferometer, eliminating time-consuming instrument standardization protocols. Samples can be measured in seconds without sample preparation.

Bruno Rimini Corp.
401 N. Michigan Avenue
Chicago, IL 60601
<http://silostop.com>
Booth(s): 221

Bruno Rimini makes Silostop oxygen barrier film. Protect the value of your feed—keep oxygen out and nutrients in.

CABI Bookshop
22883 Quicksilver Dr
Sterling, VA 20166-2019
<http://www.styluspub.com>
Booth(s): 410, 412

CABI is a not-for-profit international organization that improves people's lives by providing information and applying scientific expertise to solve problems in agriculture and the environment. Partner CSIRO Publishing operates as an independent science and technology publisher, covering a wide range of scientific disciplines, including agriculture, the plant and animal sciences, and environmental management. Distributed in North America by Stylus Publishing.

Cambridge University Press
32 Avenue of the Americas
New York, NY 10013
<http://www.cambridge.org>
Booth(s): 313

Cambridge University Press publishes high-quality journals and books across the spectrum of agriculture and animal science. Highlights include *animal: The International Journal of Animal Bioscience*, published on behalf of The Animal Consortium, and *British Journal of Nutrition*, published on behalf of The Nutrition Society.

Central Life Sciences
1501 E Woodfield Rd
Suite 200 West
Schaumburg, IL 60173-6052
<http://www.centralflycontrol.com>
Booth(s): 415

ClariFly Larvicide is a feed supplement that prevents adult house flies, stable flies, face flies, and horn flies from developing in and emerging from the manure of treated cattle. Unlike conventional insecticides that attack the nervous system of insects, ClariFly works by interrupting the fly's life cycle, rather than through direct toxicity. When mixed into cattle feed, ClariFly passes through the digestive system and into the manure. With only very small concentrations, ClariFly is able to disrupt the normal molting process of the fly larvae. ClariFly even controls organophosphate and pyrethroid resistant flies.

Chr. Hansen
99015 W Maple St
Milwaukee, WI 53214
<http://www.chr-hansen.com/animalhealth>
Booth(s): 505

Rooted in science, grounded in agriculture. Since 1874, Chr. Hansen has the largest collection of microbial strains for probiotics and silage inoculants in the world. We can help you boost profitability, while meeting all regulatory requirements for safety. Products include Probios, SiloSolve, BioPlus, and GalliPro.

C-Lock Inc.
2525 W Main St Ste 211
Rapid City, SD 57702-2439
<http://c-lockinc.com/>
Booth(s): 625

GreenFeed is a low-cost (patented) system to measure CH₄ and CO₂ emissions from ruminants remotely in a nonintrusive way. CH₄ and CO₂ data collected several times daily provides valuable feedback on the performance of individual animals and can aid in maintaining animal health and in maximizing feed efficiency.

Cobb-Vantress Inc.
4703 Hwy 412 E
PO Box 1030
Siloam Springs, AR 72761-8906
<http://www.cobb-vantress.com>
Booth(s): 304

Cobb-Vantress is a global company using innovative research and technology to make protein available, healthy and affordable worldwide.

Cumberland Valley Analytical Services
14515 Industry Dr
Hagerstown, MD 21742-2410
<http://www.foragelab.com>
Booth(s): 704, 706

Cumberland Valley Analytical Services is a full-service forage and feed testing laboratory specializing in chemistry analysis.

Dairy One Forage Lab
730 Warren Rd
Ithaca, NY 14850-1242
www.dairyone.com
Booth(s): 425

Dairy One exists to help farms succeed. We do this by measuring components on the farm, from cow and crop production, to feed, soil and water analysis. Measuring the right things provides the critical information necessary to make informed decisions. We measure it so you can manage it.

Dairy Records Management Systems

313 Chapanoke Rd Ste 100

Raleigh, NC 27603-3435

<http://www.drms.org>

Booth(s): 406, 408

Dairy Records Management Systems provides innovative dairy information products and services for producers, DHIA staff, consultants and other dairy industry professionals. Comprehensive processed reports include Heifer Genomics Guide, Transition Cow Management, and MUN Profile. Leading-edge software and web tools include PCDART, PocketDairy Android, Herd Detective, DairyMetrics, WebReports, and Reports On-Demand.

Dascor Inc.

PO Box 462885

Escondido, CA 92046-2885

<http://www.dascor.com/>

Booth(s): 612

Dascor Inc. manufactures a series of autonomous data loggers for ruminal research measurements of temperature, pH, ORP, NH_4^+ , and pressure for use in cannulated cattle, and as boluses for use in sheep and goats.

Diamond V

2525 60th Ave SW

Cedar Rapids, IA 52404

<http://www.diamondv.com/>

Booth(s): 303, 305, 402, 404

Diamond V, headquartered in Cedar Rapids, Iowa, is the world's leading supplier of microbial fermentation products used to optimize digestive function and nutrition key to animal and aqua health, productivity, efficiency and profitability. A commitment to innovation, technology and quality has earned Diamond V a global reputation of trust and reliability within the animal feed industry. Diamond V's brands—including Diamond V Original XPC, XP or YC, DiaMune Se, SelenoSource and DV Aqua—are research-proven and engineered to deliver results.

DVM Systems LLC

3115 35th Ave

Greeley, CO 80634-9415

<http://www.dvmsystems.com>

Booth(s): 322

DVM Systems LLC is a company based in Greeley, Colorado, that develops and markets animal health temperature monitoring products internationally to dairy and beef farms, and research organizations providing customers with industry leading reproduction, early illness identification, calving alerts software and tamper proof identification. DVM's unique dairy cow wireless RFID temperature monitoring system and TempTrack software provides real-time animal health data integrating information directly from most major dairy herd management software.

EAAP

Via G. Tomassetti, 3 A/1

00161 Rome, Italy

<http://www.eaap.org>

Booth(s): 624

EAAP annually organizes the largest animal science meeting in Europe. This meeting is the perfect venue to create a network with qualified animal scientists. Over one thousand scientists have attended the EAAP annual meetings in the past years. EAAP produces the journal "Animal", one of the highest ranked animal science magazines. EAAP has many other services and activities for its members: publishing scientific books, organizing specific and regional workshops and scientific meetings, coordinating international research projects, and defending positions of animal science and livestock industry at international level. EAAP is a federation of national members with the national members being the backbone of EAAP. To increase the quantity and quality of services to the animal science community, EAAP established the individual membership structure. Everyone is invited to become members of EAAP and benefit from belonging to the EAAP community.

E. I. Medical Imaging

110 12th Street SW

Unit 102

Loveland, CO 80537

<http://www.eimedical.com>

Booth(s): 325

E.I. Medical Imaging is a world leader and the only US manufacturer of portable ultrasound solutions specifically engineered for veterinary use. For the past 30 years, the company's core values have remained intact: putting the customer first and delivering solid, effective ultrasound solutions. EIMI provides Ibox portable ultrasound systems.

Elsevier

1600 John F Kennedy Blvd Ste 1800

Philadelphia, PA 19103-2398

<http://www.us.elsevierhealth.com/?sgCountry=US>

Booth(s): 409

Elsevier is a world-leading multiple media publisher of science, technology, and health information products and services. We are proud to publish the *Journal of Dairy Science*® (JDS), the official journal of the American Dairy Science Association. Please visit the Elsevier booth in the exhibit hall with any questions you might have about accessing the *Journal of Dairy Science* online and to browse our other titles in animal science.

Enovative Technologies

11935 Worcester Hwy

Bishopville, MD 21813

<http://magicpulsemassage.com/>

Booth(s): 610

Ingenuity for a Better Life—Enovative Technologies designs products that help improve people's lives. Our brands focus on enhancing comfort, well-being, and convenience for our consumers.

Evonik Corporation
1701 Barrett Lakes Blvd NW Ste 340
Kennesaw, GA 30144-4509
<http://www.evonik.com>
Booth(s): 324, 326

Evonik Industries is a global leader in the feed additives market. With seven production sites in five countries, we are the only company to produce and market all four of the important amino acids for modern animal nutrition: MetAMINO (DL-methionine), Biolys (L-lysine), ThreAMINO (L-threonine) and TrypAMINO (L-tryptophan). The continued growth of Mepron, our rumen-protected DL-methionine, further complements Evonik's "one source" strategy. Through the 2015 construction of an additional Mepron production site in the US, we are very well positioned to meet the growing needs of dairy producers locally and globally.

FASS
1800 S Oak St, Ste 100
Champaign, IL 61820-6974
<http://www.fass.org>
Booth(s): 510

FASS was formed to support the common agricultural interests and streamline administrative expenses of our clients while preserving their traditions and values. We specialize in providing a wide array of management services to small and medium-sized, not-for-profit associations.

FDA/Office of Foods (OF)/Center for Veterinary Medicine (CVM)
7519 Standish Pl
Rockville, MD 20855-2792
<http://www.fda.gov/animalveterinary>
Booth(s): 512

Center for Veterinary Medicine (CVM) -- A Consumer Protection Organization. At CVM, a component of the U.S Food and Drug Administration, we ensure that animal drugs, food additives, animal devices, and medicated feeds are safe and effective. We ensure that food (for example: milk, meat, and eggs) from treated animals is safe for us to eat. And, we protect public and animal health by approving safe and effective products; monitoring marketed products for safety and effectiveness; conducting research; educating the public; and enforcing the applicable sections of the Federal Food, Drug, and Cosmetic Act, the law under which we operate.

Feedstuffs
12400 Whitewater Dr Ste 160
Minnetonka, MN 55343-4158
<http://www.feedstuffs.com/>
Booth(s): 523

Feedstuffs is the leading news and information source for animal agriculture. Every week, we keep our subscribers informed on the important issues affecting the business of producing food for the world.

Gasmet Technologies Inc.
956A, The Queensway
Toronto, ON M8Z 1P5, Canada
<http://gasmet.com>
Booth(s): 604

Gasmet's rugged FTIR multi-gas analyzers provide exceptional analytical precision for researchers measuring soil gas fluxes in the field. The DX-series portable FTIR Gas Analyzers are lightweight and compact for easy field transport and our Calcmeter Software provides an easy-to-use interface for researchers to view multiple gases in near real-time.

GrowSafe Systems
273216 Range Road 23, RR1 Site 1 Box 29
Airdrie, AB T4B2A3, Canada
<http://www.growsafe.com>
Booth(s): 712

GrowSafe's advanced data acquisition and analytics platform automatically measures feed, water, weight, behavioral and situational data continuously from a plurality of sensors. We are seeking synergistic research collaborations to build new large scale data computational models to improve feed efficiency, profitability and sustainability in beef cattle, dairy and sheep industries.

Kemin Industries
2100 Maury St
Des Moines, IA 50317-1100
<http://www.kemin.com>
Booth(s): 615, 714

Kemin offers a range of feed ingredients to help you raise healthy animals that produce safe food for consumers. It is through this focus on animal nutrition and health that Kemin offers Total Nutrition, a comprehensive program providing safe, healthy and efficient solutions. Our Total Nutrition solutions can help you feed the world.

King Techina Group
8 Yinxing Road
Ren He Jie Dao, Yuhang District
Hangzhou, Zhejiang 311107, China
Booth(s): 513, 515

With offices and distributors over 40 countries, King Techina plays a leadership role in microencapsulation technology to improve feed efficiency, animal performance and environmental sustainability for more than 15 years. Based on extensive R&D, King Techina has developed groundbreaking technology--Intelligent Microcapsule (IM) technology. To ensure that our customer receive high-quality products and professional services, we manufacture all of our products only in plants that are certified by ISO9001, GMP+ and FAMI-QS, and provide worldwide technical supports to satisfy customers' need. Through continual innovation, King Techina aims to invent and promote sustainable solutions for human and animal health.

Laboratoires Phodé
Z. I Albipole
81150 Terssac
France
<http://www.phode.com>
Booth(s): 702

Located in France and founded in 1997 by Dr. Daniel Eclache, Laboratoires Phodé, designs unique sensory and functional ingredients for the feed market. Phodé Sciences, Research and Innovation center of Laboratoires Phodé, aims to understand the effects of olfactive molecules and vegetable extracts on the brain and offering efficient solutions for the behavior and the Better-being targeting livestock performances. Original technologies, protected by international patents, come from the knowledge and know-how of Phodé research. Their efficiency is validated at field level, especially through quality partnerships with academic and industrial players in nutrition and environment sectors worldwide.

Lallemand Animal Nutrition
6120 W Douglas Ave
Milwaukee, WI 53218-1548
<http://www.lallemandanimalnutrition.com/>
Booth(s): 315, 414

Lallemand Animal Nutrition is dedicated to the development, production and marketing of yeast and bacteria for agricultural applications. Lallemand is the only major supplier of yeast and bacteria that is a primary producer of both. Core products are lyophilized bacteria for direct fed microbials (DFMs) and forage inoculants, probiotic active dry yeasts, and inactive yeast mineral supplements. Lallemand's products are based on proprietary strains of yeast and bacteria and are developed through collaborations with leading research institutions around the world. Lallemand's innovative product portfolio is marketed through commercial partnerships with leading companies and backed with local technical and marketing support.

Micronutrients
1550 Research Way
Indianapolis, IN 46231-3350
<http://www.micro.net>
Booth(s): 603, 605

Micronutrients, based in Indianapolis, is dedicated to the development, production and marketing of trace minerals for livestock and companion animals. Current development has led to the creation of a new class of trace minerals, hydroxy trace minerals. Use of the first mineral - IntelliBond C (Micronutrients TBCC—tribasic copper chloride) has grown consistently for the past 15 years and is soon to be followed by zinc and manganese. Hydroxy trace minerals have been proven in over 70 research studies to deliver improved essential nutrient stability in feeds while significantly increasing the availability of the mineral to the animal.

National Animal Nutrition Program
Department of Animal and Food Sciences
University of Kentucky
907 W. P. Garrigus Bldg.
Lexington, KY 40546-0001
<http://www.nanp-nrsp-9.org>
Booth(s): 411

The National Animal Nutrition Program (NANP) serves as a forum to identify high-priority animal nutrition issues and provide an integrated and systemic approach to sharing, collecting, assembling, synthesizing, and disseminating science-based information, educational tools, and enabling technologies on animal nutrition that facilitate high-priority research among agricultural species, with emphasis on beef cattle, dairy cattle, swine, and poultry. The NANP is a research-support activity funded as a National Research Support Project with Hatch funds appropriated by the USDA's National Institute of Food and Agriculture, and administered by the Experiment Station Committee on Organization and Policy and the State Agricultural Experiment Stations.

Novus International
20 Research Park Dr
Saint Charles, MO 63304-5633
<http://www.novusint.com>
Booth(s): 314

Novus is headquartered in St. Louis, Missouri, serves customers in more than 90 countries. An industry leader in animal nutrition and health, Novus's products include Agrado Plus feed ingredient, Alimet and MFP feed supplements, Activate nutritional feed acid, Mintrex and MAAC organic trace minerals, Santoquin feed preservative, and other ingredients.

PetAg Inc.
255 Keyes Ave
Hampshire, IL 60140-9449
<http://www.petag.com>
Booth(s): 602

Bospro is an *Aspergillus* mycelium product for ruminants that has demonstrated remarkable effects on increasing rumen function. Fermacto is an *Aspergillus* mycelium product for monogastrics that has demonstrated in poultry increased maturity levels of the gastrointestinal tract of the immature bird. Please stop by our booth #602 for data and samples.

Phileo Lesaffre Animal Care
7475 W Main St
Milwaukee, WI 53214-1552
<http://www.phileo-lesaffre.com>
Booth(s): 213, 312

Lesaffre, the world's largest and oldest manufacturer of yeast products, features live yeast, MOS products, selenium yeast, and enzymes.

Poultry Protein and Fat Council
1530 Cooledge Rd
Tucker, GA 30084-7303
http://www.uspoultry.org/ppfc_index.cfm
Booth(s): 503

The Poultry Protein and Fat Council solicits and sponsors research that would develop new and increased utilization of poultry byproduct meal, feather meal, blood meal, and poultry fat by demonstrating their efficacy in poultry, aquaculture, livestock, and companion animal rations.

Sable Systems International Inc.
6000 S. Eastern Ave. Bldg 1
Las Vegas, NV 89119
<http://www.sablesys.com>
Booth(s): 407

Sable Systems is the world's most trusted provider of tools and expertise for research in animal metabolism and behavioral sciences. Whether your focus is on livestock nutrition and diet or methane and CO₂ emission studies, Sable's precise, reliable, high-resolution systems measure MR, RQ, temperature, and water vapor. Our systems are designed to reduce external disturbance for your animal and to maximize your ease of setup and operation in the lab or a field environment.

SmartStock LLC
PO Box 337
Pawnee, OK 74058-0337
<http://www.smartstock-usa.com>
Booth(s): 215

Animal health monitoring. Electronic bolus that monitors temperature remotely. Early infection detection; estrus detection, and parturition detection.

SoyBest
PO Box 157
West Point, NE 68788-0157
<http://www.soybest.com>
Booth(s): 403, 502

SoyBest High Bypass Soybean Meal with Gums is bypass protein for dairy cows. Manufactured by the mechanical process, it contains no chemical solvents and is all-natural. Soy Best includes fresh soy gums with lecithin and phosphatidyl-choline. Research shows these nutrients behave like rumen-protected fat, resulting in even more bypass protein with excellent intestinal digestibility. Now nutritionists and dairy producers can choose between two Soy Best formulations: Original Soy Best with fresh soy gums and now Soy Best PEARL—the only high-bypass soybean meal available with rumen-protected lysine fortification.

UMG Trading LLC
75 A, Parizhskoy Communy Street
Druzhkovka, Donetsk Region 84205, Ukraine
<http://www.umgukraine.com>
Booth(s): 525

UMG Holding was established in 2006 by SCM Company (System Capital Management), the largest industrial-financial group in

Ukraine. There are 3 clay mining companies in the holding: VESCO, Druzhkovskoe Rudoupravleniye, and Ogneupornerud. Today, UMG is one of the largest clay mining companies in the world according to production volume—3 million tonnes per year and total balance of about 300 million tonnes. Eleven open mines extract more than 100 types of clay. UMG is a young company still in development. In addition to confirmed plans to optimize production activity and development of existing deposits, the company is looking for new segments and considering the possibility of organizing production and trading of other types of raw materials. One such new activity is production of the feed additive EcoMix, which is used in farming.

Unity Scientific Inc.
117 Old State Rd
Brookfield, CT 06804-2535
<http://www.unityscientific.com>
Booth(s): 511

Unity Scientific is a global leader in the design and manufacture of near infrared (NIR) instrumentation that serves a wide variety of applications in the animal science industry. Unity Scientific offers forage, feed and dairy analyzers that come pre-calibrated and provide quality results in 30 seconds.

University of Florida
2015 S 16th Ave PO Box 100136
Gainesville, FL 32610-0001
<http://animal.ifas.ufl.edu/>
Booth(s): 508

The University of Florida Department of Animal Sciences offers MS (thesis and non-thesis) and PhD programs. Each program provides advanced training beyond the baccalaureate degree. Upon completion, students will be able to conduct research, teach, and carry out extension activities in animal agriculture across the major animal species: beef, dairy, poultry, swine, and equine. Areas of specialization include basic to applied aspects of meat processing, muscle biology, immunology, food safety, nutrition, reproductive physiology, microbiology, genetics, breeding and animal behavior. More details are available at <http://animal.ifas.ufl.edu/students/graduate/index.shtml>.

West Central: SoyPLUS, SoyChlor
406 First Street
PO Box 68
Ralston, IA 51459
<http://www.west-central.com>
Booth(s): 203, 205

SoyPLUS is the industry leader, consistently delivering dairy bypass protein, unbeatable protein quality and intestinal digestibility. SoyPLUS contains research proven higher energy and rumen inert fat. SoyChlor has proven itself in effectively balancing DCAD in herd health. SoyChlor's key ingredient is hydrochloric acid, the most palatable source of chloride available.

2015 Corporate Sponsorship

ADSA Corporate Sustaining Members

Ag Processing Inc.
Arm & Hammer Animal Nutrition
BioZyme Incorporated
Darling International Research
Diamond V
DuPont Pioneer
Elanco Animal Health
GEA Farm Technologies
Global Agri-Trade Corp.
Grande Cheese Company
Kent Nutrition Group

Kraft Foods
Lallemand Animal Nutrition
Masters Choice
Papillon Agricultural Co.
Quali Tech Inc.
Renaissance Nutrition Inc.
West Central: SoyPlus/SoyChlor
Varied Industries Corporation
Zinpro
Zoetis Animal Health
Zook Nutrition & Management Inc.

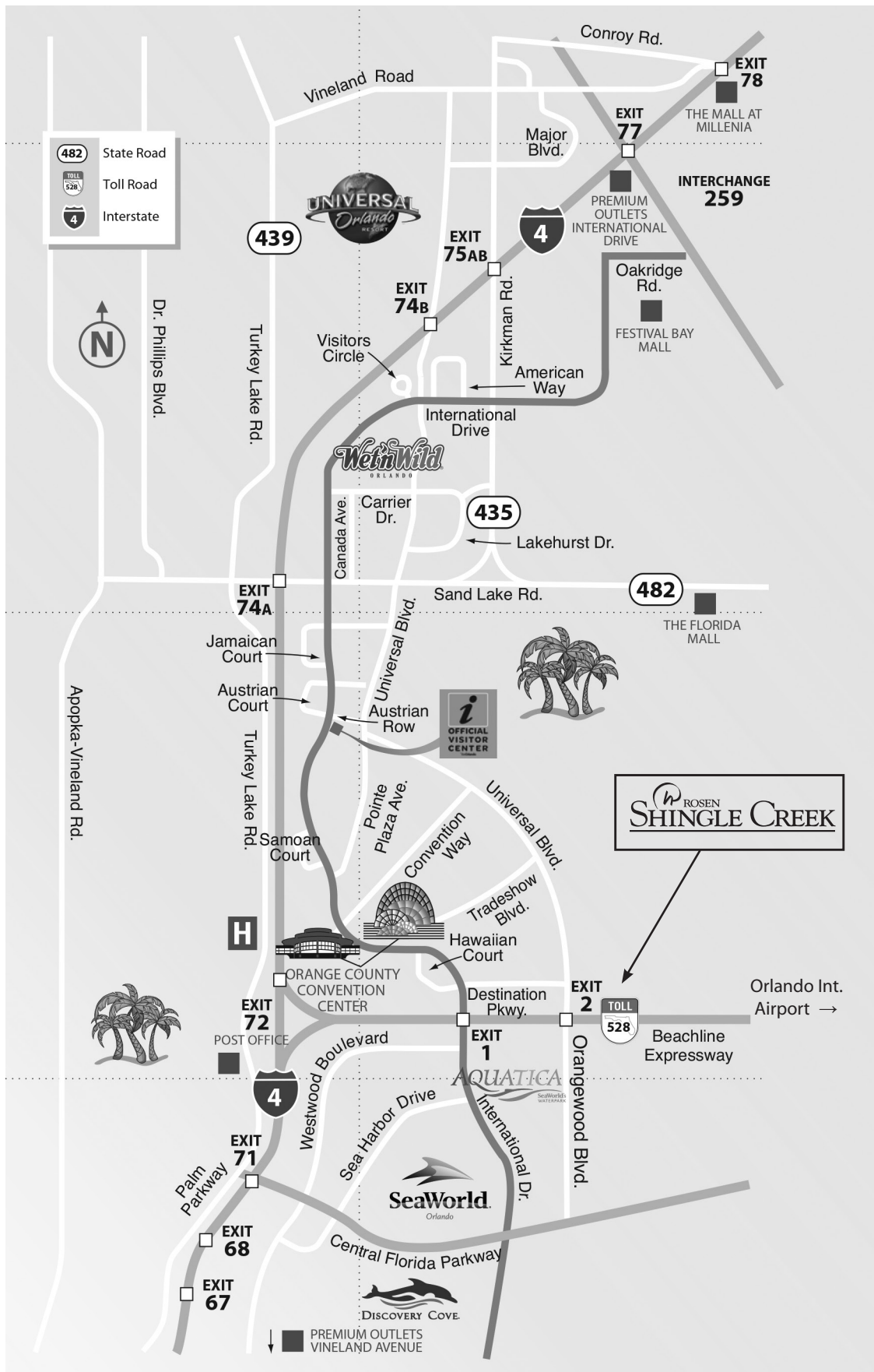
ASAS Corporate Sustaining Members

Adisseo
Ajinomoto Heartland Inc.
Akey
APC Inc.
Archer Daniels Midland Co.
BioZyme Inc.
Darling International Inc.
Diamond V
DuPont Pioneer
Elanco Animal Health
Global Pig Farms Inc.
International Ingredient Corporation
International Nutrition
Jefo Nutrition
Kemin Industries

Kent Nutrition Group
Lallemand Animal Nutrition
Micronutrients
MIN-AD Inc.
Nutraferma Inc.
Novus International Inc
PCS Sales (USA) Inc.
PIC North America
QualiTech Inc.
Ralco Nutrition Inc.
Trouw Nutrition USA
Varied Industries Corporation
Zinpro Corporation
Zoetis

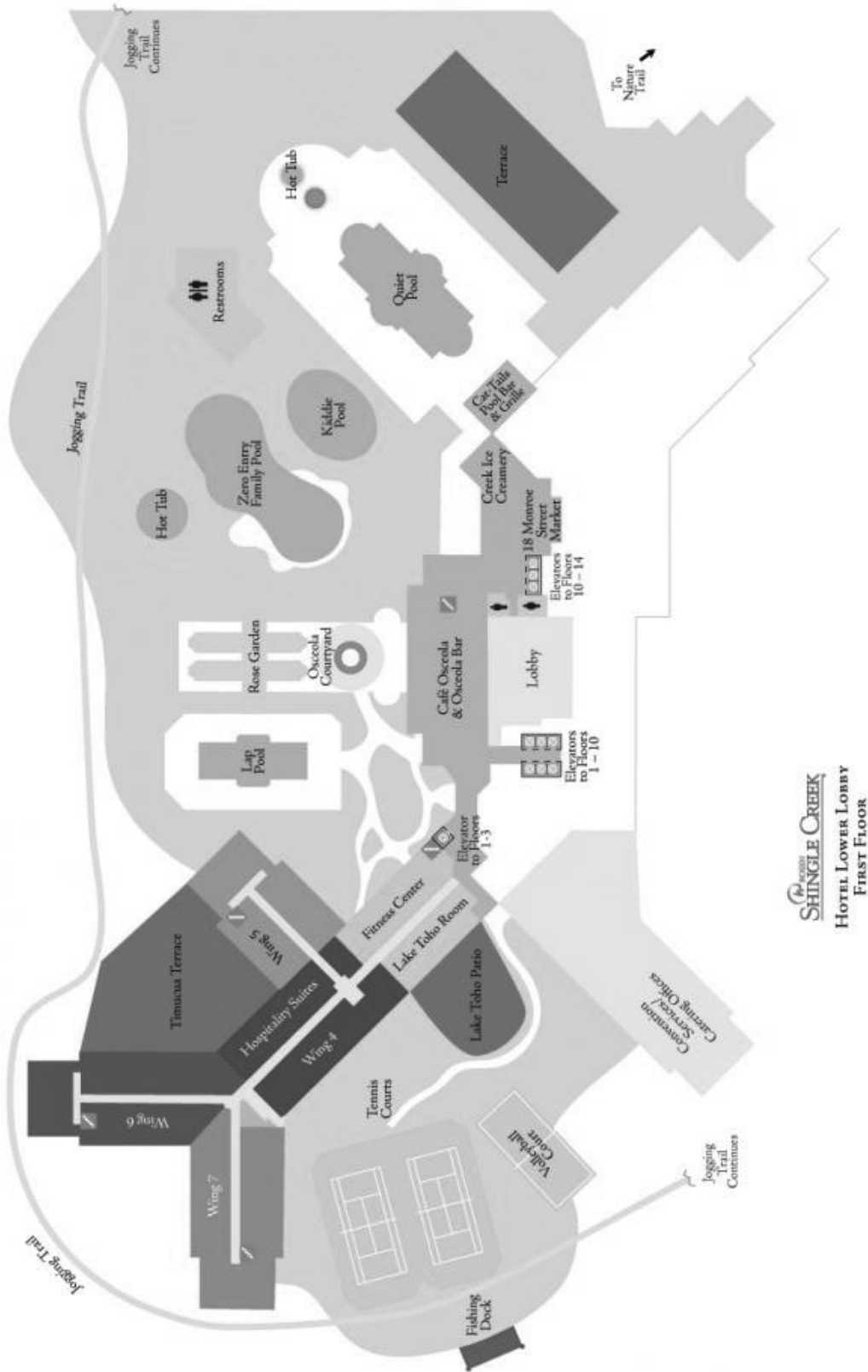
Thank you for your support!

Orlando International Drive area



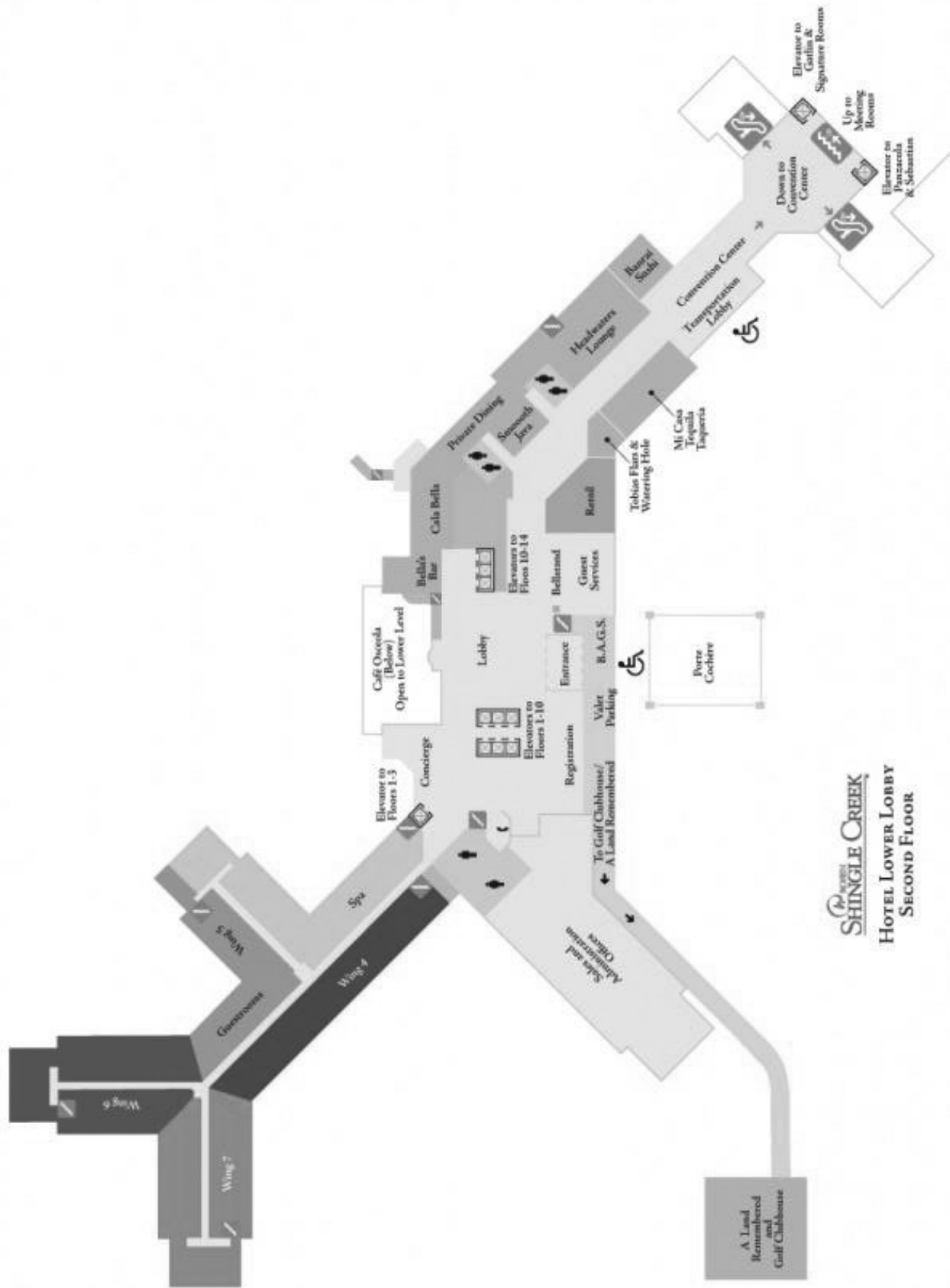
Maps

Rosen Shingle Creek Resort Level 1



ROSEN
SHINGLE CREEK
HOTEL LOWER LOBBY
FIRST FLOOR

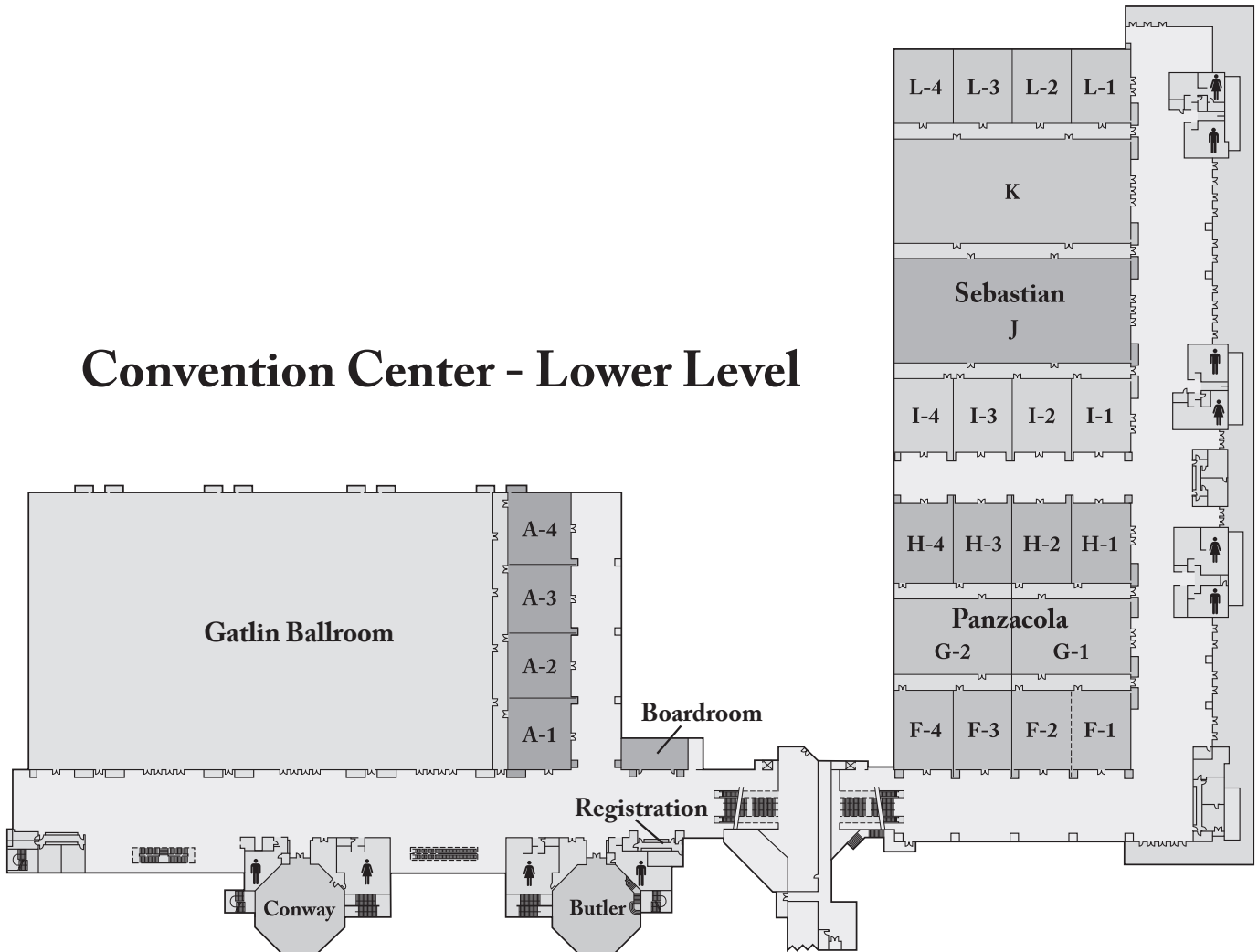
Rosen Shingle Creek Resort Level 2



Maps

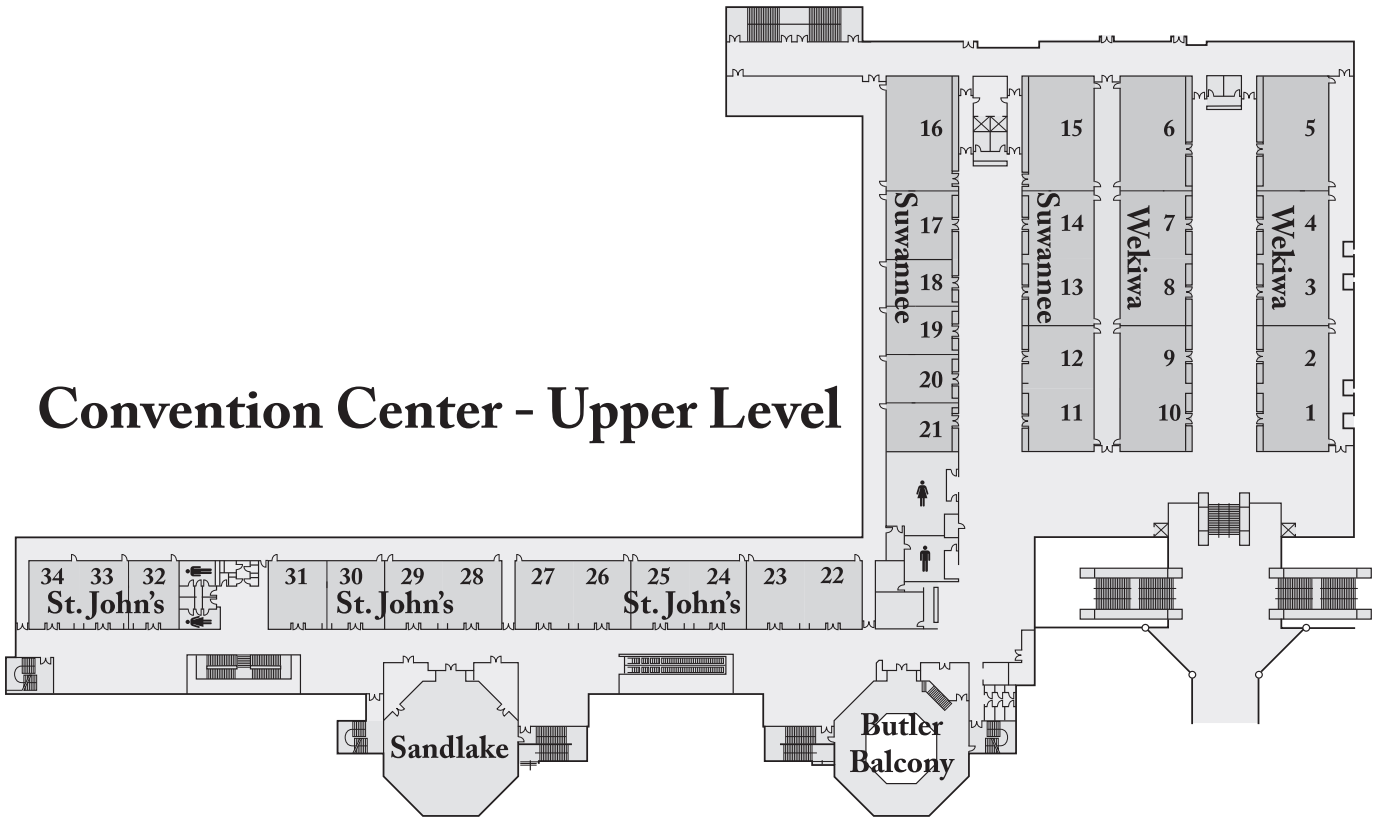
Rosen Shingle Creek Convention Center

Convention Center - Lower Level



Rosen Shingle Creek Convention Center

Convention Center - Upper Level



Maps

Thank you to the 2015 Joint Annual Meeting Sponsors!

Platinum Level

Elanco Animal Health

Gold Level

American Dairy Science Association
American Society of Animal Science Foundation
Dairy Research Institute/Innovation Center
for US Dairy

Diamond V
European Association of Animal Production (EAAP)
Merck Animal Health
Pancosma

Silver Level

DuPont (Danisco Animal Nutrition)

Bronze Level

Adiseo
Agropur Cooperative
Ajinomoto Heartland
American Association of Mycobacterial Diseases
(AAMD)
APC Inc.
Archer Daniels Midland

Bayer Animal Health
Biomin USA
Council on Dairy Cattle Breeding (CDCB)
Kemin Animal Nutrition and Health
King Techina Group
Novus International
USDA-National Institute of Food and Agriculture

Donors

Arm and Hammer Animal Nutrition (Vi-Cor)
BASF
Bruker Optics
Chr. Hansen
GrowSafe Systems Ltd.

Jefo Nutrition
Phibro Animal Health Corp.
Vetagro Inc.
West Central: SoyPLUS/SoyChlor

Contributors

JBS United
Qualitech

Virtus Nutrition
Zoetis

A SPECIAL THANK YOU TO OUR INTERBULL SPONSORS

Council on Dairy Cattle Breeding (CDCB)
Illumina Inc.

World Wide Sires

A SPECIAL THANK YOU TO OUR ASAS EVENT SPONSORS

Alltech
American Meat Science Association
American Sheep Industry
ASAS Foundation
ASAS Past Presidents' Club
Colorado State University
Elanco Animal Health
Hunger Fight
Iowa State University
Mississippi State University
National Block and Bridle
National Cattleman's Beef Association
National Pork Board
North Dakota State University

Purdue University
South Dakota State University
University of Connecticut
University of Florida
University of Idaho
University of Kentucky
University of Missouri–Columbia
University of Nebraska
Utah State University
Virginia Tech
Washington State University
Zoetis

A SPECIAL THANK YOU TO OUR ADSA EVENT SPONSORS

ADSA Graduate Student Division
Bar Diamond
Lallemand

NOTES

Schedule of Events

Scheduling and locations are subject to change without notice. All Interbull and JAM events take place at the Rosen Shingle Creek Resort unless otherwise noted. Please refer to the onsite newsletter for late schedule and room changes.

Interbull Schedule of Events

Wednesday, July 8

3:00 pm – 5:00 pm Registration open Transportation Lobby

Thursday, July 9

7:30 am – 5:00 pm Registration open Transportation Lobby
 8:00 am – 12:00 pm Technical Committee Meeting Suwannee 11
 1:00 pm – 4:30 pm Steering Committee Meeting Suwannee 11
 4:30 pm – 6:30 pm Business Meeting Wekiwa 3/4/5

Friday, July 10

7:30 am – 5:00 pm Registration open Transportation Lobby
 8:30 am – 10:00 am Open Meeting — Session 1 Wekiwa 3/4/5
 10:30 am – 12:00 pm Open Meeting — Session 2 Wekiwa 3/4/5
 1:30 pm – 3:30 pm Open Meeting — Session 3 Wekiwa 3/4/5
 4:00 pm – 6:00 pm Open Meeting — Session 4 Wekiwa 3/4/5
 8:00 pm – 11:00 pm Interbull Dinner Conway

Saturday, July 11

8:30 am – 10:00 am Open Meeting — Session 5 Wekiwa 3/4/5
 10:30 am – 12:00 pm Open Meeting — Session 6 Wekiwa 3/4/5
 1:00 pm – 3:00 pm Business Meeting Wekiwa 3/4/5
 3:00 pm – 4:30 pm Technical Committee Meeting Boardroom
 4:30 pm – 7:00 pm Steering Committee Meeting Boardroom

Sunday, July 12

9:00 am – 12:00 pm Joint Interbull/JAM Session Sebastian I-1/2/3
 2:00 pm – 5:00 pm Joint Interbull/JAM Session Sebastian I-1/2/3

JAM Schedule of Events

Saturday, July 11

7:00 am – 8:00 am ASAS New Board Orientation Boardroom
 7:30 am – 5:00 pm ADSA Board of Directors Meeting Wekiwa 1/2
 9:30 am – 5:00 pm ASAS Board of Directors Meeting Suwannee 20/21
 11:30 am – 5:00 pm ADSA Student Tour: SeaWorld Meet in Transportation Lobby
 3:00 pm – 5:00 pm Registration open Gatlin Foyer
 3:00 pm – 5:00 pm Preload Room open Gatlin A-1
 3:00 pm – 5:00 pm Speaker Ready Room open Gatlin A-2
 6:00 pm ARPAS Executive Committee Dinner Café Osceola, Rosen Shingle Creek
 7:00 pm ADSA Undergraduate Student Mixer Lap Pool, Rosen Shingle Creek
 7:30 pm ASAS Board and Academic Quadrathlon Picnic University of Florida

Sunday, July 12

All day ASAS Undergraduate Academic Quadrathlon University of Florida
 7:00 am – 7:00 pm Registration open Gatlin Foyer
 7:00 am – 5:00 pm Preload Room open Gatlin A-1
 7:00 am – 5:00 pm Speaker Ready Room open Gatlin A-2

| | | |
|---------------------|---|-------------------|
| 7:30 am – 10:00 am | ADSA New Board Orientation | Boardroom |
| 7:30 am – 5:00 pm | Teaching Workshop | Suwannee 13/14 |
| 8:00 am – 5:00 pm | ARPAS Governing Council Meeting | Suwannee 17 |
| 8:00 am – 5:00 pm | Triennial Reproduction Symposium | Gatlin A-3 |
| 8:00 am – 5:00 pm | Media Room open | Suwannee 21 |
| 8:30 am – 12:00 pm | ASAS Board of Directors Meeting | Wekiwa 3/4 |
| 9:00 am – 12:00 pm | Joint Interbull/JAM Session | Sebastian I-1/2/3 |
| 10:00 am – 11:00 am | ADSA SAD Officers and Advisors Meeting | St. John's 24/25 |
| 10:00 am – 6:00 pm | Exhibit setup (exhibitors and student dairy clubs) | Gatlin Ballroom |
| 11:00 am – 12:00 pm | ADSA SAD Quiz Bowl Officials Meeting | St. John's 24/25 |
| 11:30 am – 12:00 pm | ADSA SAD Quiz Bowl Seating Test | Butler |
| 12:00 pm – 1:00 pm | ADSA SAD Midday Mixer | Butler |
| 12:00 pm – 5:00 pm | JAM Hospitality Lounge open | Suwannee 18 |
| 12:00 pm – 5:00 pm | ASAS Hospitality Suite open | Suwannee 20 |
| 12:00 pm – 5:00 pm | ADSA JDS Editors/JMC Lunch and Meeting | Suwannee 16 |
| 1:00 pm – 3:00 pm | ASAS Foundation Board of Trustees Meeting | Wekiwa 3/4 |
| 1:00 pm – 5:00 pm | ADSA SAD Student Quiz Bowl Seating/Preliminary Rounds | St. John's 22/23 |
| 2:00 pm – 3:00 pm | ADSA Production Division Council Meeting | Suwannee 15 |
| 2:00 pm – 3:30 pm | ADSA Foundation Board of Trustees Meeting | Boardroom |
| 2:00 pm – 4:00 pm | ADSA GSD Workshop: Making Science Sexy: Communicating Your Relevance | Conway |
| 2:00 pm – 5:00 pm | Joint Interbull/JAM Session | Sebastian I-1/2/3 |
| 3:00 pm – 4:00 pm | ADSA Production Division Nominating Committee | Suwannee 15 |
| 3:00 pm – 5:00 pm | Late-Breaking Original Research Session | Panzacola F-1/2 |
| 4:30 pm – 5:15 pm | ADSA GSD Business Meeting and Open Forum | Wekiwa 5 |
| 5:00 pm – 6:00 pm | ADSA Dairy Foods Division Council Meeting | Suwannee 15 |
| 5:00 pm – 6:30 pm | 2016 Program Committee Meeting | Wekiwa 3/4 |
| 5:30 pm – 6:00 pm | ADSA SAD Student Quiz Bowl Final Round | St. John's 22/23 |
| 7:00 pm – 8:00 pm | JAM Opening Session | Panzacola G/H |
| 8:00 pm – 10:00 pm | JAM Opening Reception | Gatlin Foyer |

Monday, July 13

| | | |
|---------------------|---|-----------------------------------|
| Morning only | ASAS Undergraduate Academic Quadrathlon | University of Florida |
| 6:15 am – 7:00 am | ADSA SAD Student Posters setup | Gatlin Ballroom |
| 6:30 am – 8:00 am | ADSA Production Division Extension Breakfast | St. John's 30 |
| 6:30 am – 5:15 pm | Registration open | Gatlin Foyer |
| 7:00 am – 5:00 pm | Preload Room open | Gatlin A-1 |
| 7:00 am – 5:00 pm | Speaker Ready Room open | Gatlin A-2 |
| 7:15 am – 8:30 am | Turn in yearbooks, scrapbooks, and annual reports | SAD Booth, Gatlin Ballroom |
| 7:30 am – 9:30 am | ADSA SAD Student Poster Presentations | Gatlin Ballroom |
| 7:30 am – 9:30 am | Poster presentations | Gatlin Ballroom |
| 8:00 am – 9:00 am | Coffee and pastries in exhibit hall | Gatlin Ballroom |
| 8:00 am – 9:00 am | S-PAC Interest Group | Suwannee 17 |
| 8:00 am – 5:00 pm | Commercial exhibits open | Gatlin Ballroom |
| 8:00 am – 5:00 pm | Job Resource Center open | Gatlin Ballroom |
| 8:00 am – 5:00 pm | Media Room open | Suwannee 21 |
| 8:00 am – 5:00 pm | Interview Room open | Gatlin A-4 |
| 8:00 am – 5:00 pm | JAM Hospitality Lounge open | Suwannee 18 |
| 8:00 am – 5:00 pm | ASAS Hospitality Suite open | Suwannee 20 |
| 8:30 am – 9:30 am | ADSA SAD Judging of yearbooks, scrapbooks, annual reports | SAD Booth, Gatlin Ballroom |
| 8:30 am – 9:30 am | ADSA SAD Interviews for Outstanding Student and Advisor Awards | St. John's 24/25 |
| 8:30 am – 9:45 am | ADSA SAD Activities Symposium | St. John's 26/27 |
| 9:30 am – 5:00 pm | Scientific Sessions | See Scientific Program on page 41 |
| 9:45 am – 10:45 am | ADSA SAD Student Business Meeting | St. John's 22/23 |
| 10:30 am – 12:30 pm | ARPAS Exam | Suwannee 19 |
| 11:00 am – 4:00 pm | ADSA SAD Undergraduate Student Oral Presentations | St. John's 22/23; 26/27 |

| | | |
|--------------------|--|---|
| 12:30 pm – 2:00 pm | ASAS Undergraduate Lunch and Learn | Suwannee 16 |
| 12:30 pm – 2:00 pm | ASAS Past Presidents' Luncheon | Conway |
| 12:30 pm – 2:00 pm | Graduate Student Professional Development Lunch | Sandlake |
| 12:30 pm – 2:00 pm | ADSA Past Presidents' Luncheon | Butler |
| 12:30 pm – 2:00 pm | ACAS Annual Meeting | Wekiwa 5 |
| 12:30 pm – 2:00 pm | ASAS National and Sectional Graduate Directors Meeting | Suwannee 17 |
| 2:00 pm – 4:00 pm | ARPAS Exam | Suwannee 19 |
| 2:00 pm – 5:30 pm | Southern Branch ADSA Symposium and Business Meeting | Wekiwa 1/2 |
| 5:00 pm – 7:00 pm | Informal Calf Gathering | Butler |
| 5:15 pm – 6:45 pm | ASAS Award Winners' Dinner | Sandlake |
| 6:00 pm – 9:00 pm | ASAS President's Picks Posters | Sebastian J Foyer |
| 6:30 pm – 11:00 pm | ADSA Undergraduate Student Mixer | Downtown Disney/House of Blues; meet in Transportation Lobby |
| 7:15 pm – 8:45 pm | ASAS Awards Program | Sebastian J |
| 8:30 pm – 11:00 pm | Iowa State Alumni and Friends Reception | Sebastian L-2 |
| 8:30 pm – 11:00 pm | Purdue University Reception | Sebastian L-3 |
| 8:45 pm – 10:30 pm | ASAS Awards Celebration, Big Scoop Ice Cream Competition, and Battle of the Brats Competition | Sebastian J Foyer |
| 9:30 pm | ASAS Graduate Student Mixer | Splitsville at Downtown Disney; meet in Transportation Lobby |

Tuesday, July 14

| | | |
|---------------------|--|-----------------------------------|
| 6:30 am – 8:00 am | University of Illinois Breakfast | Suwannee 16 |
| 6:30 am – 8:00 am | Kentucky Breakfast | St. John's 25 |
| 6:30 am – 8:00 am | JDS Editorial Board Breakfast/Meeting | St. John's 26/27 |
| 6:30 am – 8:00 am | ADSA DF Division Milk Proteins and Enzyme Committee Breakfast | Boardroom |
| 7:00 am – 5:00 pm | Preload Room open | Gatlin A-1 |
| 7:00 am – 5:00 pm | Speaker Ready Room open | Gatlin A-2 |
| 7:00 am – 5:15 pm | Registration open | Gatlin Foyer |
| 7:30 am – 9:30 am | ASAS Undergraduate Poster Competition | Gatlin Ballroom |
| 7:30 am – 9:30 am | Poster presentations | Gatlin Ballroom |
| 8:00 am – 9:00 am | Coffee and pastries in exhibit hall | Gatlin Ballroom |
| 8:00 am – 9:00 am | Mycobacterial Diseases of Animals Interest Group | Suwannee 15 |
| 8:00 am – 5:00 pm | Commercial exhibits open | Gatlin Ballroom |
| 8:00 am – 5:00 pm | Job Resource Center open | Gatlin Ballroom |
| 8:00 am – 5:00 pm | Media Room open | Suwannee 21 |
| 8:00 am – 5:00 pm | Interview Room open | Gatlin A-4 |
| 8:00 am – 5:00 pm | JAM Hospitality Lounge open | Suwannee 18 |
| 8:00 am – 5:00 pm | ASAS Hospitality Suite open | Suwannee 20 |
| 8:30 am – 9:30 am | ADSA SAD Student Business Meeting/ Election of Officers | St. John's 22/23 |
| 9:30 am – 11:00 am | ADSA SAD Student Career Symposium | Sandlake |
| 9:30 am – 12:30 pm | ARPAS Symposium | Panzacola G-1 |
| 9:30 am – 5:00 pm | Scientific Sessions | See Scientific Program on page 41 |
| 10:00 am – 11:00 am | Discover Conference Steering Committee Meeting | Boardroom |
| 10:00 am – 2:00 pm | Companion Tour 1 – Winter Park Cultural Tour | Meet in Transportation Lobby |
| 10:30 am – 12:00 pm | ASAS Investment Committee Meeting | Suwannee 17 |
| 11:30 am – 12:30 pm | ADSA Production Division Business Meeting | Wekiwa 5 |
| 11:30 am – 12:30 pm | ADSA Dairy Foods Division Business Meeting | Wekiwa 6 |
| 11:45 am – 2:00 pm | ADSA SAD Student Awards Luncheon | Butler |
| 12:30 pm – 2:00 pm | ASAS Graduate Student Lunch and Learn | Sandlake |
| 12:30 pm – 2:00 pm | ASAS Foundation Heritage Luncheon | Conway |
| 12:30 pm – 2:00 pm | ASAS JAS Editorial Meeting and Open Forum Lunch | St. John's 26/27 |
| 12:30 pm – 2:00 pm | ARPAS Business Meeting | Suwannee 15 |
| 12:30 pm – 2:00 pm | ADSA DF Division Program Planning Lunch | Boardroom |
| 2:00 pm – 3:00 pm | ADSA SAD Student Award and Club Photos | Butler |
| 2:00 pm – 4:00 pm | ARPAS Exam | Suwannee 19 |

| | |
|--------------------|---|
| 2:00 pm – 5:00 pm | ADSA SAD Student Exhibits SAD Booth, Gatlin Ballroom (Pick up yearbooks and scrapbooks by 5:00 pm) |
| 2:30 pm – 3:30 pm | ADSA Undergraduate Student Committee Meeting. St. John's 24/25 (Old and New Officers and Advisors) |
| 3:00 pm – 4:30 pm | ADSA Student Three-Minute Thesis Challenge. Wekiwa 5 |
| 4:30 pm – 7:00 pm | ASAS Hunger Fight Food Packing Event Panzicola G-2 |
| 5:00 pm – 6:30 pm | ADSA Award Donor Dinner Sebastian L-1 |
| 7:00 pm – 8:00 pm | ADSA Awards Program Sebastian J |
| 8:15 pm – 9:30 pm | JAM Ice Cream Social, sponsored by ADSA Gatlin Foyer |
| 9:00 pm – 12:00 am | ADSA Graduate Student Division Mixer Howl at the Moon; meet in Transportation Lobby |

Wednesday, July 15

| | |
|---------------------|--|
| 7:00 am – 9:15 am | ASAS Sectional Leadership Meeting. Suwannee 15 |
| 7:00 am – 5:15 pm | Registration open Gatlin Foyer |
| 7:00 am – 5:00 pm | Preload Room open Gatlin A-1 |
| 7:00 am – 5:00 pm | Speaker Ready Room open Gatlin A-2 |
| 7:30 am – 9:30 am | Poster presentations. Gatlin Ballroom |
| 8:00 am – 9:00 am | Coffee and pastries in exhibit hall Gatlin Ballroom |
| 8:00 am – 9:00 am | ADSA Spokesperson Update. St. John's 24 |
| 8:00 am – 2:00 pm | Commercial Exhibits open Gatlin Ballroom |
| 8:00 am – 5:00 pm | Job Resource Center open Gatlin Ballroom |
| 8:00 am – 5:00 pm | Mixed Models Workshop Gatlin A-3 |
| 8:00 am – 5:00 pm | Media Room open. Suwannee 21 |
| 8:00 am – 5:00 pm | Interview Room open Gatlin A-4 |
| 8:00 am – 5:00 pm | JAM Hospitality Lounge open. Suwannee 18 |
| 8:00 am – 5:00 pm | ASAS Hospitality Suite open Suwannee 20 |
| 8:30 am – 2:00 pm | Companion Tour 2 – Kennedy Space Center Meet in Transportation Lobby |
| 9:30 am – 10:30 am | ADSA Business Meeting Wekiwa 1/2 |
| 9:30 am – 10:30 am | ASAS Business Meeting. Sebastian I-2 |
| 10:30 am – 12:30 pm | ARPAS Exam. Suwannee 19 |
| 10:30 am – 5:00 pm | Scientific Sessions See Scientific Program on page 41 |
| 11:30 am – 2:00 pm | ADSA-ASAS Northeast Branch/Section Business Meeting, Reception, and Awards Wekiwa 1/2 |
| 12:30 pm – 2:30 pm | ADSA Board of Directors Meeting Suwannee 16 |
| 2:00 pm – 4:00 pm | ARPAS Exam. Suwannee 19 |
| 2:00 pm – 5:00 pm | ADSA-ASAS Northeast Branch/Section Symposium. Wekiwa 1/2 |
| 2:00 pm – 5:00 pm | Commercial Exhibits Dismantle Gatlin Ballroom |
| 4:30 pm – 6:00 pm | Global Networking Reception (all attendees and guests are welcome) Butler |
| 5:00 pm – 7:00 pm | ASAS Foundation George C. Fahey Appreciation (Companion Animal Reception). Suwannee 15 |
| 6:00 pm – 10:00 pm | ASAS SeaWorld Reception and Park Access. Meet in Transportation Lobby at 5:45 pm |

Thursday, July 16

| | |
|--------------------|---|
| 8:00 am – 10:00 am | ASAS Board of Directors Meeting Suwannee 15 |
| 8:00 am – 11:30 am | Preload Room open Gatlin A-1 |
| 8:00 am – 11:30 am | Speaker Ready Room open Gatlin A-2 |
| 8:00 am – 12:00 pm | Media Room Suwannee 21 |
| 8:00 am – 12:00 pm | Mixed Models Workshop Gatlin A-3 |
| 8:00 am – 1:00 pm | Registration open Gatlin Foyer |
| 8:30 am – 11:30 am | Scientific Sessions See Scientific Program on page 41 |
| 1:00 pm – 5:00 pm | ADSA/DMI Media Training for Issues Spokespersons Suwannee 16 (invitation only) |
| 2:00 pm – 4:00 pm | <i>Animal Frontiers</i> Editorial Board Meeting Suwannee 15 |

ANNUAL REVIEWS ✨ SPARK A CONNECTION

Annual Review of Animal Biosciences

animal.annualreviews.org • Volume 3 • February 2015

Co-Editors: **Harris A. Lewin**, *University of California, Davis* and **R. Michael Roberts**, *University of Missouri*

The *Annual Review of Animal Biosciences*, in publication since 2013, places a particular emphasis on biotechnology, genetics, genomics, and breeding, as well as veterinary medicine, especially veterinary pathobiology, infectious diseases and vaccine development, and conservation and zoo biology. This journal is intended for scientists focused on domesticated and wild animal species, veterinarians, conservation biologists, and geneticists.

Access this and all Annual Reviews journals via your institution at www.annualreviews.org.

TABLE OF CONTENTS:

- *If a Bull Were a Cow, How Much Milk Would He Give?*
Morris Soller
- *One Hundred Years of Statistical Developments in Animal Breeding*, Daniel Gianola, Guilherme J.M. Rosa
- *The Genome 10K Project: A Way Forward*, Klaus-Peter Koepfli, Benedict Paten, the Genome 10K Community of Scientists, Stephen J. O'Brien
- *Conservation Genetics and Genomics of Amphibians and Reptiles*, H. Bradley Shaffer, Müge Gidiş, Evan McCartney-Melstad, Kevin M. Neal, Hilton M. Oyamaguchi, Marisa Tellez, Erin M. Toffelmier
- *Elephant Natural History: A Genomic Perspective*, Alfred L. Roca, Yasuko Ishida, Adam L. Brandt, Neal R. Benjamin, Kai Zhao, Nicholas J. Georgiadis
- *Development, Regeneration, and Evolution of Feathers*, Chih-Feng Chen, John Foley, Pin-Chi Tang, Ang Li, Ting Xin Jiang, Ping Wu, Randall B. Wideltz, Cheng Ming Chuong
- *The Genetics of Skeletal Muscle Disorders in Horses*, James R. Mickelson, Stephanie J. Valberg
- *Unraveling the Swine Genome: Implications for Human Health*, Lawrence B. Schook, Tiago V. Collares, Kwame A. Darfour-Oduro, Arun Kumar De, Laurie A. Rund, Kyle M. Schachtschneider, Fabiana K. Seixas
- *The Domestic Piglet: An Important Model for Investigating the Neurodevelopmental Consequences of Early Life Insults*, Matthew S. Conrad, Rodney W. Johnson
- *A New Medical Research Model: Ethically and Responsibly Advancing Health for Humans and Animals*, Patricia N. Olson, Robin R. Ganzert
- *Animal Models of Aging Research: Implications for Human Aging and Age-Related Diseases*, Sarah J. Mitchell, Morten Scheibye-Knudsen, Dan L. Longo, Rafael de Cabo
- *Chronic Wasting Disease of Cervids: Current Knowledge and Future Perspectives*, Nicholas J. Haley, Edward A. Hoover
- *Comparative Immunology of Allergic Responses*, Laurel J. Gershwin
- *Environmental Role in Influenza Virus Outbreaks*, Harini Sooryanarain, Subbiah Elankuma
- *Strategies for Design and Application of Enteric Viral Vaccines*, Kuldeep S. Chattha, James A. Roth, Linda J. Saif
- *Understanding the Basis of Parasite Strain-Restricted Immunity to Theileria parva*, W. Ivan Morrison, Timothy Connelley, Johanneke D. Hemmink, Niall D. MacHugh
- *The Impact of the Milk Glycobiome on the Neonate Gut Microbiota*, Alline R. Pacheco, Daniela Barile, Mark A. Underwood, David A. Mills
- *The Early Impact of Genomics and Metagenomics on Ruminant Microbiology*, Stuart E. Denman, Christopher S. McSweeney
- *Lessons from Reproductive Technology Research*, George E. Seidel, Jr.
- *Uterine Responses to the Preattachment Embryo in Domestic Ungulates: Recognition of Pregnancy and Preparation for Implantation*, Stefan Bauersachs, Eckhard Wolf
- *Thermal Biology of Domestic Animals*, Robert J. Collier, Kifle G. Gebremedhin
- *Comparative Dendritic Cell Biology of Veterinary Mammals*, Artur Summerfield, Gael Auray, Meret Ricklin
- *Genetically Engineered Livestock: Ethical Use for Food and Medical Models*, Lydia C. Garas, James D. Murray, Elizabeth A. Maga



ANNUAL REVIEWS | Connect With Our Experts

T: 650.493.4400/800.523.8635 (US/CAN) | service@annualreviews.org

ADSA-Student Affiliate Division Program

SAD Special Events

Saturday, July 11

ADSA Undergraduate and Graduate Student Event: Animal Rescue and Rehabilitation Laboratory, SeaWorld Orlando

11:30 am – 5:00 pm

Meet in Transportation Lobby

Departing from the lobby of the hotel, we will be shuttled by motor coach to nearby SeaWorld Orlando. Students will participate in a one-hour course taught by a SeaWorld instructor. The course will give an insider's look at SeaWorld's efforts to help preserve and protect endangered and threatened species through its rescue, rehabilitation, and release program. The remainder of the afternoon is free for you to explore the many shows, rides, and exhibitions offered at SeaWorld. This event is offered to both undergraduate and graduate students.

ADSA Undergraduate Student Mixer: Pizza and Pool Party

7:00 pm

Lap Pool, Rosen Shingle Creek Resort

Gather with friends old and new for a fun night filled with good music, good food, and good friends, all poolside on a balmy Florida night—it doesn't get any better than this! Ticket price includes soft drinks and pizza. Don't miss this perennial meeting highlight!

Sunday, July 12

ADSA SAD Student Midday Mixer

12:00 – 1:00 pm

Butler

Join your fellow dairy clubs for a fun hour of getting reacquainted and making new friends, and get to know your 2015–2016 Student Affiliate Division (SAD) Officer candidates. Ticket price includes lunch. Note: Registration is limited to ADSA undergraduate student members and advisors.

ADSA SAD Student Dairy Quiz Bowl Final Round

5:30 – 6:00 pm

St. John's 22/23

University teams from across North America will compete in the ADSA-SAD Dairy Quiz Bowl. The event gives schools an opportunity to demonstrate their knowledge about dairy production, processing, and ADSA history. The SAD invites you to join them for the excitement of the final round of competition as the top two schools go head to head for the title of 2015 Dairy Quiz Bowl Winning Team.

Opening Session and Reception

7:00 – 8:00 pm; 8:00 – 10:00 pm

Panzacola G/H and Gatlin Foyer

Come help us kick off the 2015 Joint Annual Meeting at the opening session. Then, wind down the evening by joining us after the opening session for food and drinks, and some long-awaited socializing time with colleagues and friends.

Monday, July 13

ADSA Undergraduate Student Poster and Oral Competitions Gatlin Ballroom (posters) and meeting rooms (orals)

Please support our undergraduate students by planning time to visit the undergraduate posters and oral presentations on Monday. See scientific program for complete details.

ADSA Undergraduate Student Mixer

6:30 – 11:00 pm

Downtown Disney and House of Blues

Meet in Transportation Lobby

Choose from the wide array of world-class restaurants, dazzling entertainment and unique shops that line the waterfront in the Downtown Disney area. Shop in the world's largest Disney store, dine amid life-size prehistoric creatures, bowl a game at the 30-lane alley and more. This fun-filled district includes Downtown Disney West Side, Downtown Disney Marketplace and Pleasure Island. At 8:30 pm, students can keep the Disney Magic going by meeting at the legendary House of Blues. Shuttle service will be provided between the Rosen Shingle Creek and Downtown Disney.

Tuesday, July 14

ADSA SAD Student Career Symposium

9:30 – 11:00 am

Sandlake

This highly interactive event will give students the opportunity to meet with industry professionals representing various facets of the animal agriculture industry. They will learn about careers in the industry, get useful tips on planning for their careers, and much more. Students are encouraged to dress professionally (business casual or better) and bring several copies of their résumés. Students should also plan time to visit industry representatives in the exhibit hall for information about internships and job opportunities.

ADSA SAD Student Awards Luncheon

11:45 am – 2:00 pm

Butler

Plan to attend this year's SAD awards luncheon. The afternoon will be capped with presentation of student awards and announcement of new SAD officers. Both students and professionals are encouraged to attend. This is a wonderful chance to get to know the next generation of the dairy industry.

ADSA Student Three-Minute Thesis Challenge

3:00 – 4:30 pm

Wekiwa 5

Plan to take part in the new "Three-Minute Thesis" competition open to all ADSA student members! This event will test the competitors' abilities to concisely convey their research in a way that is understandable to all. Entry will be limited to those students selected by a panel of judges based upon strength of CV and a 100-word abstract describing the presentation. Five graduate students and five undergraduate students will be invited to participate in this inaugural event and will compete for cash prizes to be awarded to the first- and second-place graduate and undergraduate students, as determined by a panel of judges. Please join us to make this event a success and to see these students present their research in a fun and challenging way.

SAD Schedule of Events

Consult the meeting website (<http://www.adsa.org/sad.asp>) for the latest program information. Please refer to the onsite newsletter for late schedule and room changes.

Saturday, July 11

| | |
|--------------------|--|
| 11:30 am – 5:00 pm | ADSA Student Tour: Animal Rescue and Rehabilitation Laboratory. SeaWorld Orlando; meet in Transportation Lobby |
| 3:00 pm – 5:00 pm | Registration Open Gatlin Foyer |
| 7:00 pm | ADSA Undergraduate Student Mixer Lap Pool, Rosen Shingle Creek |

Sunday, July 12

| | |
|---------------------|---|
| 7:00 am – 7:00 pm | Registration open Gatlin Foyer |
| 10:00 am – 11:00 am | SAD Officers and Advisors Meeting St. John's 24/25 |
| 11:00 am – 12:00 pm | Dairy Quiz Bowl Officials Meeting St. John's 24/25 |
| 11:30 am – 12:00 pm | Dairy Quiz Bowl Seating Test Butler |
| 12:00 pm – 1:00 pm | SAD Midday Mixer Butler |
| 1:00 pm – 5:00 pm | Dairy Quiz Bowl Preliminary Rounds St. John's 22/23 |
| 5:30 pm – 6:00 pm | Dairy Quiz Bowl Final Round St. John's 22/23 |
| 7:00 pm – 8:00 pm | JAM Opening Session Panzacola G/H |
| 8:00 pm – 10:00 pm | JAM Opening Reception Gatlin Foyer |

Monday, July 13

| | |
|--------------------|---|
| 6:15 am – 7:00 am | Hanging of SAD Posters Gatlin Ballroom |
| 7:15 am – 8:30 am | Turn in yearbooks, scrapbooks, and annual reports SAD Booth, Gatlin Ballroom |
| 7:30 am – 9:15 am | SAD Undergraduate Poster Presentations Gatlin Ballroom |
| 8:00 am – 5:00 pm | Commercial Exhibits Open Gatlin Ballroom |
| 8:30 am – 9:30 am | SAD Judging of Yearbooks, Scrapbooks, and Annual Reports SAD Booth, Gatlin Ballroom |
| 8:30 am – 9:30 am | SAD Interviews for Outstanding Student and Advisor Awards St. John's 24/25 |
| 8:30 am – 9:45 am | SAD Activities Symposium St. John's 26/27 |
| 9:30 am – 5:00 pm | Scientific Sessions See Scientific Program on page 41 |
| 9:45 am – 10:45 am | SAD Business Meeting St. John's 22/23 |
| 11:00 am – 4:00 pm | SAD Undergraduate Oral Presentations St. John's 22/23; 26/27 |
| 5:00 pm – 5:30 pm | Removal of SAD Posters Gatlin Ballroom |
| 6:30 pm – 11:00 pm | ADSA Undergraduate Student Mixer Downtown Disney/House of Blues; meet in Transportation Lobby |

Tuesday, July 14

| | |
|--------------------|--|
| 7:30 am – 9:30 am | Poster Presentations Gatlin Ballroom |
| 8:00 am – 5:00 pm | Commercial Exhibits Gatlin Ballroom |
| 8:30 am – 9:30 am | SAD Business Meeting/Election of Officers St. John's 22/23 |
| 9:30 am – 11:00 am | SAD Career Symposium Sandlake |
| 11:45 am – 2:00 pm | SAD Awards Luncheon Butler |
| 2:00 pm – 3:00 pm | SAD Award and Club Photos Butler |
| 2:00 pm – 5:00 pm | Pick up Yearbooks and Scrapbooks SAD Booth, Gatlin Ballroom |
| 2:30 pm – 3:30 pm | SAD Committee Meeting St. John's 24/25 (old and new officers and advisors) |
| 3:00 pm – 4:30 pm | ADSA Student Three-Minute Thesis Challenge Wekiwa 5 |
| 3:00 pm – 5:00 pm | Scientific Sessions See Scientific Program on page 41 |
| 7:00 pm – 8:00 pm | ADSA Awards Ceremony Sebastian J |
| 8:15 pm – 9:30 pm | JAM Ice Cream Social, sponsored by ADSA Gatlin Foyer |

ADSA Dairy Foods Division Schedule of Events

Scheduling and locations are subject to change without notice. All JAM events take place at the Rosen Shingle Creek Resort unless otherwise noted. Please refer to the onsite newsletter for late schedule and room changes.

Sunday, July 12

5:00 pm – 6:00 pm ADSA Dairy Foods (DF) Division Council Meeting Suwannee 15

Monday, July 13

7:30 am – 9:30 am Dairy Foods Posters Gatlin Ballroom
 7:30 am – 9:30 am Graduate Student Competition:
 ADSA Dairy Foods Division Poster Competition Gatlin Ballroom
 9:30 am – 12:30 pm Graduate Student Competition:
 ADSA Dairy Foods Oral Competition Wekiwa 7/8
 2:00 pm – 5:00 pm ADSA Multidisciplinary and International Leadership Keynote (MILK)
 Symposium: Global dairy perspective—Production, processing, people,
 politics, and priorities Panzacola H-1

Tuesday, July 14

6:30 am – 8:00 am ADSA DF Division Milk Proteins and Enzyme Committee Breakfast Boardroom
 7:30 am – 9:30 am Dairy Foods Posters Gatlin Ballroom
 9:30 am – 12:30 pm Dairy Foods: Microbiology Wekiwa 7/8
 9:30 am – 12:30 pm Milk Protein and Enzymes Symposium: High milk protein foods—
 Challenges and opportunities in structures and digestion Suwannee 13/14
 11:30 am – 12:30 pm ADSA DF Division Business Meeting Wekiwa 6
 12:30 pm – 2:00 pm ADSA DF Division Program Planning Lunch Boardroom
 2:00 pm – 5:00 pm Dairy Foods Symposium: Recent developments in manufacturing and
 applications of lactose and lactose derivatives. Suwannee 13/14
 2:00 pm – 5:00 pm Dairy Foods: Cheese and chemistry Wekiwa 7/8

Wednesday, July 15

7:30 am – 9:30 am Dairy Foods Posters Gatlin Ballroom
 10:30 am – 12:30 pm Dairy Foods Symposium: Advances in bacterial exopolysaccharides—
 From production to applications in dairy foods and health. Suwannee 13/14
 10:30 am – 12:30 pm Dairy Foods: Processing and chemistry Wekiwa 7/8
 2:00 pm – 5:00 pm Milk Protein and Enzymes Suwannee 11/12
 2:00 pm – 5:00 pm Dairy Foods Symposium: Processing and ingredient innovations
 to grow fluid milk sales Suwannee 13/14

Thank you to the JAM 2015 Program Committees

Overall Program Committee

Geoff Dahl
Mark McGuire
Connie Larson
Shawn Archibeque

Animal Behavior and Well-Being

Amy Stanton
Brianna Gaskill
Heather Dann
Temple L. Grandin
Marshall Streeter
Kathryn Proudfoot

Animal Health

Charlie Elrod
Jeff Carroll
Tom Overton
Troy J. Wistuba
Marnie Mellencamp
Michael Ballou

Beef Species

Patrick Gunn
Judson T. Vasconcelos
David L. Fernandez
Allison M. Meyer

Bioethics

Maurice Eastridge
Jim Knight
Leorges Moraes Fonseca
David Buchanan

Breeding and Genetics

Alan Fahey
John Cole
Ignacy Misztal
Jennifer M. Bormann
Hasan Khatib
Filippo Miglior

Companion Animals

Susanna E. Kitts-Morgan
Brittany M. Vester Boler
Katie Kerr
Kelly Swanson
Greg Aldrich

Comparative Physiology of Lower Gut

Joanne Knapp
Yanhong Liu
Angel Aguilar
Emma Wall
James Matthews
Chris Reynolds

Contemporary and Emerging Issues

Jim Pettigrew
Kayanush (Kai) Aryana
Tamilee Nennich
John A. Paterson
James P. S. Neel
Eric Vanzant
Luis C. Solorzano

Dairy Foods

Kerry Kaylegian
Stephanie Clark
Stephenie Drake
Milena Corredig
Paul Kindstedt
Trish Dawson
Annie Bienvenue

Extension Education

Victor Cabrera
Lawton Stewart
Julie A. Walker
Joseph Dalton
Karl W. Harborth
Donna Amaral-Phillips

Food Safety

Thomas Powell
Sanjeev Anand
Lisa Holden
Todd R. Callaway
Clint Krehbiel
Frost M. Steele

Forages and Pastures

Brad Heins
Jeffrey Lehmkuhler
Kathy J. Soder
Vivek Fellner
Jong-Su Eun
Karla H. Jenkins

Growth and Development

David Carlson
Helga Sauerwein
Gary J. Hausman
James Matthews
Harald Hammon
Jay Daniel

Horse

Thomas A. Hoagland
Josie A. Coverdale
Fernada Camargo

International Animal Agriculture

Hugo Arelovich
Filippo Miglior
Michel Wattiaux
Amey L. Adams
Andrea Rosati
Normand R. St-Pierre
Fernando Valdes

Lactation Biology

Rupert Bruckmaier
Tom McFadden
Monique Rijnkels
Ben Corl
Juan J. Looor
Chantal Farmer
Laura Hernandez

Meat Science and Muscle Biology

Ty B. Schmidt
Deborah L. VanOverbeke
Bryon Wiegand

Milk Protein and Enzymes

Rafael Jimenez-Flores
Milena Corredig
Don McMahon
Lloyd Metzger
Yves Pouliot
Rodrigo Roesch
Hasmukh Patel
Dave Everett
Phoebe Qi
Trish Dawson

Nonruminant Nutrition

Joshua A. Jendza
Zach Rambo

Physiology and Endocrinology

Jose Santos
Brian Keith Whitlock
Lance Baumgard
Graham Cliff Lamb
Alex Souza
Kim Vonnahme

Production, Management, and the Environment

Scott Radcliffe
Trevor DeVries
Al Rotz
N. Andy Cole
Don Ely
Phil Cardoso

Ruminant Nutrition

Robbi Pritchard
Mary Beth Hall
Jong-Su Eun
Jon P. Schoonmaker
Donald A. Llewellyn
Jenny Jennings
Timothy Hackmann

Small Ruminant

Uma Karki
Pauline Y. Aad
Reid Redden
Steve Hart
Niki Whitley

Swine

Hans H. Stein
Mike D. Tokach
Yuzhi Li
Ron Bates

Teaching/Undergraduate and Graduate Education

Mark Hanigan
Jay Daniel
Amin Ahmadzadeh
Peter K. Camfield
Jodi Sterle
Antonio Faciola

**ADSA Multidisciplinary and International
Keynote (MILK) Symposium**

Leo Timms
Barry Bradford
Kerry Kaylegian
Susan Duncan

ADSA Southern Section Symposium

Shannon Davidson

ADSA Production Division Symposium

Barry Bradford

ADSA-ASAS Northeast Section Symposium

Ken Griswold

Beef Cattle Nutrition Symposium

Steve Zinn
Richard Zinn
Nathan M. Long
Shanna L. Ivey
David Lalman

ARPAS Symposium

Robert Wettemann
Jack Garrett Jr.
Mike Galyean

Cell Biology Symposium

Teresa Davis
Ruqian Zhao

ADSA Graduate Student Symposium

Curtis Park
Kasey Klein

ASAS Graduate Student Symposium

W. Brandon Smith

ASAS Undergraduate Poster Competition

Billy Flowers

Graduate Student Competition: ADSA Dairy Foods Oral

David McCoy
Randy Brandsma
Hasmukh Patel

Graduate Student Competition: ADSA Dairy Foods Poster

Elizabeth Ng
Chenchaiah Marella
Shantanu Agarwal

Graduate Student Competition: ADSA Production Oral (MS/PhD)

Eric Reid
Tera Montgomery
Gerd Bobe
Phil Cardoso
Luis Mendonca
Kelly Perfield

Graduate Student Competition: ADSA Production Poster (MS/PhD)

Jeff Firkins
Corwin Nelson
Sheila Andrew
Kasey Moyes
Liz Karcher
Paul Fricke

Graduate Student Competition: ADSA-ASAS Northeast Section Oral Competition

Kristen Govoni

Graduate Student Competition: ADSA Southern Section Oral Competition

Shannon Davidson

Graduate Student Competition: ASAS Companion Animals Oral

Susanna E. Kitts-Morgan

Mycobacterial Diseases (Johne's/TB)

Ken Olson

Preconference Teaching Workshop

Michel Wattiaux
David Buchanan
Larry Miller
Molly Kelley
Ken Esbenshade
Larry Berger

ADSA Foundation PhD Symposium

Mike Socha

Mixed Models Workshop

Nora Bello
Ken Koehler
Kevin McCarter

NOTES

Scientific Program Table of Contents

All session rooms shown in the scientific program are in the Rosen Shingle Creek Convention Center, and all poster sessions will be held in the Gatlin Ballroom. Scheduling and locations are subject to change without notice, so please check the onsite newsletter each morning for changes.

Sunday, July 12

WORKSHOPS AND SYMPOSIA

| | Abstracts | Page |
|---|-----------|------|
| Teaching Workshop | | |
| Changing the animal science teaching and learning paradigm—An interactive workshop on how to use case study teaching to foster critical thinking and classroom discussion | | 49 |
| Triennial Reproduction Symposium | | |
| Developmental programming of fertility..... | 1–9 | 49 |
| Breeding and Genetics Symposium: Joint Interbull/JAM Session | | |
| Milk spectral data—Cost-effective information to improve expensive and limited traits in dairy cattle breeding..... | 10–14 | 50 |
| Breeding and Genetics Symposium: Joint Interbull/JAM Session | | |
| Use of genomics to improve limited and novel phenotypes in animal breeding..... | 15–19 | 51 |

Monday, July 13

POSTER PRESENTATIONS

| | | |
|--|-----------|----|
| ADSA-SAD (Student Affiliate Division) Undergraduate Competition | | |
| ADSA-SAD Undergraduate Student Poster Competition..... | M1–M16 | 52 |
| Animal Behavior and Well-Being I..... | M17–M36 | 53 |
| Animal Health | | |
| Beef Cattle..... | M37–M48 | 54 |
| Animal Health | | |
| Immunology | M49–M62 | 55 |
| Bioethics..... | M63–M66 | 57 |
| Breeding and Genetics | | |
| Application and methods in animal breeding—Swine, poultry, and other species | M67–M85 | 57 |
| Breeding and Genetics | | |
| Molecular genetics | M86–M100 | 58 |
| Dairy Foods | | |
| Chemistry..... | M101–M109 | 60 |
| Forages and Pastures | | |
| Silages and forages in dairy production systems..... | M110–M128 | 60 |
| Graduate Student Competition | | |
| ADSA Production Division Graduate Student Poster Competition, MS | M129–M141 | 62 |
| Lactation Biology I..... | M142–M156 | 63 |
| Meat Science and Muscle Biology | M157–M165 | 64 |
| Nonruminant Nutrition | | |
| Amino acids..... | M166–M177 | 65 |

| | Abstracts | Page |
|--|-----------|------|
| Nonruminant Nutrition | | |
| Enzymes and minerals..... | M178–M197 | 66 |
| Nonruminant Nutrition | | |
| General I | M198–M208 | 68 |
| Physiology and Endocrinology | | |
| Effects of nutrition and metabolism on ruminant reproduction..... | M209–M229 | 69 |
| Physiology and Endocrinology | | |
| Estrous synchronization and detection of estrus in cattle | M230–M250 | 71 |
| Production, Management, and the Environment I..... | M251–M309 | 72 |
| Ruminant Nutrition | | |
| Beef I | M310–M338 | 77 |
| Ruminant Nutrition | | |
| Dairy I..... | M339–M415 | 79 |
| Ruminant Nutrition | | |
| General I | M416–M451 | 85 |
| Small Ruminant I | M452–M488 | 88 |
| Swine Species..... | M489–M518 | 90 |
| <i>SYMPOSIA AND ORAL SESSIONS</i> | | |
| Animal Health | | |
| Reproductive health and acute immune responses | 20–31 | 94 |
| Bioethics Symposium | | |
| Effects of science, government, and the public in directing the future of animal agriculture | 32–37 | 95 |
| Breeding and Genetics Symposium | | |
| Relevance of modeling in the genomics era..... | 38–42 | 95 |
| Comparative Gut Physiology and Nonruminant Nutrition Symposium | | |
| The gut–brain axis—Sensing and signaling | 43–54 | 96 |
| Extension Education Symposium | | |
| Extension and industry outreach for tomorrow’s producers..... | 55–60 | 97 |
| Forages and Pastures | | |
| Forages for livestock systems | 61–69 | 98 |
| Graduate Student Competition | | |
| ADSA Dairy Foods Graduate Student Oral Competition | 70–79 | 98 |
| Graduate Student Competition | | |
| ADSA Production Division Graduate Student Oral Competition, MS..... | 80–92 | 99 |
| Graduate Student Competition | | |
| ADSA Southern Section Graduate Student Oral Competition | 93–94 | 100 |
| Lactation Biology Symposium | | |
| Mammary gland biology revisited..... | 95–101 | 101 |
| Meat Science and Muscle Biology | 102–112 | 101 |
| Nonruminant Nutrition | | |
| Enzymes and processing..... | 113–123 | 102 |
| Physiology and Endocrinology | | |
| Reproduction and estrous synchronization..... | 124–135 | 103 |
| Production, Management, and the Environment I..... | 136–148 | 104 |
| Ruminant Nutrition | | |
| Dairy calves | 149–160 | 106 |

| | Abstracts | Page |
|--|-----------|------|
| Ruminant Nutrition | | |
| Dairy rumen fermentation | 161–172 | 107 |
| Small Ruminant | | |
| Nutrition | 173–184 | 108 |
| Swine Species | 185–195 | 109 |
| ADSA-SAD (Student Affiliate Division) Undergraduate Competition | | |
| Dairy Foods | 196–201 | 110 |
| ADSA Foundation PhD Symposium | | |
| Meeting the present and future demand for employees with a PhD | 202–209 | 111 |
| ADSA Multidisciplinary and International Leadership Keynote (MILK) Symposium | | |
| Global dairy perspective—Production, processing, people, politics, and priorities | 210–214 | 111 |
| ADSA Southern Section Symposium | | |
| Maximizing forage quality in the Southeast | 215–219 | 112 |
| ADSA-SAD (Student Affiliate Division) Undergraduate Competition | | |
| Dairy Production | 220–226 | 112 |
| ADSA-SAD (Student Affiliate Division) Undergraduate Competition | | |
| Original Research | 227–232 | 113 |
| Animal Behavior and Well-Being Symposium | | |
| Novel and multidisciplinary approaches to animal welfare | 233–236 | 113 |
| Animal Health | | |
| Swine health and transition cows | 237–248 | 114 |
| Animal Health Symposium | | |
| Understanding and reducing the impact of various stressors on immune responses and health of cattle | 249–253 | 115 |
| Bovine tuberculosis (TB) and paratuberculosis (Johne's disease) Symposium | | |
| What we know and what we need to know | 254–258 | 115 |
| Breeding and Genetics: EAAP Genetics Symposium | | |
| Breeding for environmental sustainability | 259–262 | 116 |
| Forages and Pastures | | |
| Grasses and silages | 263–273 | 116 |
| Graduate Student Competition | | |
| ADSA Production Division Graduate Student Oral Competition, PhD | 274–287 | 117 |
| Graduate Student Competition | | |
| ADSA-ASAS Northeast Section Graduate Student Oral Competition | 288–294 | 119 |
| Lactation Biology I | 295–301 | 119 |
| Nonruminant Nutrition | | |
| Amino acids and minerals | 302–310 | 120 |
| Physiology and Endocrinology | | |
| Nutrition, reproduction, and metabolism | 311–322 | 121 |
| Physiology and Endocrinology Symposium | | |
| Progesterone as an endocrine regulator of fertility in cattle | 323–329 | 122 |
| Ruminant Nutrition | | |
| General | 330–341 | 123 |
| Ruminant Nutrition Symposium | | |
| Time required for diet adaptation and minimization of carry-over effect in ruminants: Evidence-based decisions | 342–348 | 124 |

Tuesday, July 14

POSTER PRESENTATIONS

| | Abstracts | Page |
|---|-----------------------|------|
| Animal Health | | |
| Lactating cows | T1–T55 | 125 |
| ASAS Undergraduate Student Poster Competition..... | T56–T76 | 129 |
| Breeding and Genetics | | |
| Application and methodology in animal breeding—Beef | T77–T85 | 131 |
| Breeding and Genetics | | |
| Applications and methodology in animal breeding—Dairy | T86–T106 | 132 |
| Dairy Foods | | |
| Dairy products..... | T107–T130 | 133 |
| Dairy Foods | | |
| Microbiology..... | T131–T147 | 135 |
| Extension Education | T148–T157 | 136 |
| Food Safety | T158–T175 | 137 |
| Forages and Pastures | | |
| Silages and forages in beef and sheep production systems | T176–T190 | 139 |
| Graduate Student Competition | | |
| ADSA Dairy Foods Graduate Student Poster Competition | T191–T197 | 140 |
| Graduate Student Competition | | |
| ADSA Production Division Graduate Student Poster Competition, PhD | T198–T222 | 140 |
| Growth and Development I | T223–T232 | 142 |
| Horse Species | T233–T247 | 143 |
| International Animal Agriculture | T248–T262 | 144 |
| Lactation Biology II..... | T263–T279 | 145 |
| Nonruminant Nutrition | | |
| General II | T280–T291 | 147 |
| Nonruminant Nutrition | | |
| Sows and piglets | T292–T303 | 148 |
| Physiology and Endocrinology | | |
| Environment, metabolism, and physiological processes..... | T304–T315 | 149 |
| Physiology and Endocrinology | | |
| Reproductive tissues, gametes, and embryo development..... | T316–T329 | 150 |
| Production, Management, and the Environment II..... | T330–T350 | 151 |
| Ruminant Nutrition | | |
| Beef II | T351–T379 | 153 |
| Ruminant Nutrition | | |
| Dairy II | T380–T457 | 155 |
| Ruminant Nutrition | | |
| General II | T205, T458–T493 | 161 |
| Small Ruminant II..... | T494–T530 | 164 |
| Teaching/Undergraduate and Graduate Education..... | T531–T537 | 167 |

SYMPOSIA AND ORAL SESSIONS

| | Abstracts | Page |
|---|--------------|------|
| ADSA Production Division Symposium | | |
| Production efficiency of the dairy cow | 349–353 | 169 |
| Animal Health | | |
| Transition cow health | 354–365 | 169 |
| ARPAS Symposium | | |
| Reproductive efficiency of beef cows—Current status and new technologies..... | 366–369 | 170 |
| Beef Species Symposium | | |
| Keeping beef in the center of the plate—Meeting consumer demand in a period of reduced cattle numbers and increased prices | 370–372 | 171 |
| Breeding and Genetics | | |
| Application and methods—Dairy I..... | 373–384 | 171 |
| Cell Biology Symposium | | |
| Regulation of growth through amino acid sensing | 385–388 | 172 |
| Companion Animals | | |
| Nutrition and behavior..... | 389–399 | 173 |
| Dairy Foods | | |
| Microbiology..... | 400–405 | 174 |
| Extension Education | 406–411 | 174 |
| Food Safety | 412–415 | 175 |
| Forages and Pastures Symposium | | |
| Implications of climate change on the resiliency of forage and pasture production systems | 416–418, 876 | 175 |
| Growth and Development I | 419–425 | 176 |
| Horse Species Symposium | | |
| Exercise physiology of the horse | 426–429 | 176 |
| Lactation Biology II..... | 430–436 | 177 |
| Milk Protein and Enzymes Symposium | | |
| High milk protein foods—Challenges and opportunities in structures and digestion..... | 437–441 | 177 |
| Physiology and Endocrinology | | |
| Reproduction in cattle..... | 442–453 | 178 |
| Ruminant Nutrition | | |
| Amino acids and metabolism..... | 454–465 | 179 |
| Ruminant Nutrition | | |
| Dairy..... | 466–477 | 180 |
| Teaching/Undergraduate and Graduate Education..... | 478–487 | 181 |
| ADSA Production Division Symposium | | |
| The rumen and beyond—Nutritional physiology of the modern dairy cow | 488–492 | 182 |
| Animal Behavior and Well-Being I..... | 493–503 | 182 |
| Animal Health | | |
| Beef cattle health, lameness, and mastitis..... | 504–515 | 184 |
| Beef Cattle Nutrition Symposium | | |
| Feeding Holstein steers..... | 516–521 | 185 |
| Breeding and Genetics | | |
| Feed efficiency and methods | 522–533 | 185 |

| | Abstracts | Page |
|--|-----------|------|
| Breeding and Genetics | | |
| Genomic methods..... | 534–545 | 187 |
| Companion Animal Symposium | | |
| Bioenergetics of pet food..... | 546–550 | 188 |
| Contemporary and Emerging Issues and International Animal Agriculture Symposium | | |
| Ahead to 2050—Global livestock production challenges: Current status, future needs, production obstacles..... | 551–555 | 188 |
| Dairy Foods | | |
| Cheese and chemistry..... | 556–565 | 189 |
| Dairy Foods Symposium | | |
| Recent developments in manufacturing and applications of lactose and lactose derivatives..... | 566–570 | 190 |
| Nonruminant Nutrition | | |
| Feed ingredients..... | 571–581 | 190 |
| Physiology and Endocrinology | | |
| Gametes and stress..... | 582–590 | 191 |
| Production, Management, and the Environment II..... | 591–602 | 192 |
| Ruminant Nutrition | | |
| Manipulating rumen function..... | 603–614 | 193 |
| Ruminant Nutrition | | |
| Protein metabolism..... | 615–626 | 194 |
| Small Ruminant | | |
| General..... | 627–637 | 195 |
| Teaching/Undergraduate and Graduate Education Symposium | | |
| Teaching graduate students to teach and be successful at teaching..... | 638–642 | 196 |

Wednesday, July 15

POSTER PRESENTATIONS

| | | |
|--|-----------|-----|
| Animal Behavior and Well-Being II..... | W1–W18 | 197 |
| Animal Health | | |
| Dairy calves and heifers..... | W19–W39 | 198 |
| Animal Health | | |
| Monogastric health..... | W40–W48 | 200 |
| Beef Species..... | W49–W65 | 201 |
| Breeding and Genetics | | |
| Genomic methods and application—Beef..... | W66–W78 | 202 |
| Breeding and Genetics | | |
| Genomic methods and application—Dairy..... | W79–W94 | 203 |
| Companion Animals | | |
| Nutrition..... | W95–W105 | 204 |
| Comparative Gut Physiology..... | W106–W124 | 205 |
| Dairy Foods | | |
| Cheese..... | W125–W141 | 207 |
| Dairy Foods | | |
| Processing..... | W142–W157 | 208 |

| | Abstracts | Page |
|---|-----------------|------|
| Forages and Pastures | | |
| General forages and forage systems..... | W158–W211 | 209 |
| Growth and Development II | W212–W224 | 214 |
| Nonruminant Nutrition | | |
| Energy and fiber | W225–W237 | 214 |
| Physiology and Endocrinology | | |
| Male reproduction, deer and poultry..... | W238–W244 | 216 |
| Physiology and Endocrinology | | |
| Metabolism, health, and physiological processes | W245–W262 | 216 |
| Production, Management, and the Environment III | W263–W288 | 218 |
| Ruminant Nutrition | | |
| Beef III..... | W289–W317 | 220 |
| Ruminant Nutrition | | |
| Dairy III | W318–W393 | 222 |
| Ruminant Nutrition | | |
| General III | W394–W465 | 228 |
| Ruminant Nutrition | | |
| Other ruminants..... | W466–W472 | 234 |
| Small Ruminant III..... | W473–W508 | 235 |

WORKSHOPS, SYMPOSIA, AND ORAL SESSIONS

| | | |
|--|---------------|-----|
| Mixed Models Workshop..... | | 238 |
| ADSA Foundation Scholar Lecture: Dairy Foods..... | | 238 |
| ADSA Foundation Scholar Lecture: Production | | 238 |
| ASAS Early Career Award Presentations | 874–875 | 238 |
| ASAS Graduate Student Symposium | | |
| Networking to achieve interdisciplinary research | 643–645 | 238 |
| Breeding and Genetics | | |
| Beef and meat species..... | 646–653 | 239 |
| Dairy Foods | | |
| Processing and chemistry..... | 654–660 | 240 |
| Dairy Foods Symposium | | |
| Advances in bacterial exopolysaccharides—From production to applications in dairy foods and health | 661–664 | 240 |
| Growth and Development Symposium | | |
| The mitochondrion—A powerhouse for the cell or a key to animal productivity? | 665–670 | 241 |
| Horse Species Symposium | | |
| Recent advances in the microbiome and physiology of the hind-gut of the horse and dog | 671–674 | 241 |
| Physiology and Endocrinology | | |
| Estrous synchronization and metabolism..... | 675–682 | 242 |
| Production, Management, and the Environment III | 683–689 | 243 |
| Production, Management, and the Environment IV..... | 690–697 | 243 |
| Ruminant Nutrition | | |
| Lactation responses | 698–705 | 244 |
| Ruminant Nutrition | | |
| Mineral nutrition | 706–713 | 245 |

| | Abstracts | Page |
|---|-----------|------|
| Small Ruminant Symposium | | |
| Genetic improvement in small ruminants for the future..... | 714–717 | 246 |
| ADSA-ASAS Northeast Section Symposium | | |
| Bridging the gap between animal protein production and consumers, current and future | 718–720 | 246 |
| Animal Behavior and Well-Being II..... | 721–730 | 247 |
| Animal Health Symposium | | |
| Maintaining animal health in organic dairy herds..... | 731–735 | 247 |
| Beef Species I..... | 736–747 | 248 |
| Breeding and Genetics | | |
| Application and methods—Dairy II..... | 748–759 | 249 |
| Breeding and Genetics | | |
| Poultry and swine | 760–771 | 250 |
| Companion Animal Symposium | | |
| Comparative nutrition—Protein and energy across species | 772–776 | 251 |
| Dairy Foods Symposium | | |
| Processing and ingredient innovations to grow fluid milk sales | 777–781 | 252 |
| Milk Protein and Enzymes..... | 782–786 | 252 |
| Nonruminant Nutrition | | |
| Immune support | 787–798 | 253 |
| Physiology and Endocrinology Symposium | | |
| Insulin revisited..... | 799–805 | 254 |
| Production, Management, and the Environment V | 806–817 | 254 |
| Production, Management, and the Environment Symposium | | |
| Environmental footprint of livestock production—Greenhouse gas emissions and climate change..... | 818–822 | 255 |
| Ruminant Nutrition | | |
| Modifying rumen microbial populations | 823–834 | 256 |

Thursday, July 16

WORKSHOP

| | |
|----------------------------|-----|
| Mixed Models Workshop..... | 258 |
|----------------------------|-----|

ORAL SESSIONS

| | | |
|---|---------|-----|
| Nonruminant Nutrition | | |
| Fiber | 835–838 | 258 |
| Production, Management, and the Environment VI..... | 839–849 | 258 |
| Ruminant Nutrition | | |
| Dairy rumen metabolism | 850–861 | 260 |
| Ruminant Nutrition | | |
| Feedlot nutrition | 862–873 | 261 |

Sunday, July 12

WORKSHOP

Teaching Workshop: Changing the animal science teaching and learning paradigm—An interactive workshop on how to use case study teaching to foster critical thinking and classroom discussion

Sponsors: **USDA-National Institute of Food and Agriculture and Virtus Nutrition**
Suwannee 13/14
7:30 AM to 5:00 PM

The purpose of the case study workshop is to engage participants in different types of case study methods of instruction, demonstrate how to teach with case studies, and how to write cases and teaching notes so that others individuals can use them. During this highly interactive workshop, participants will experience case study teaching from the student's viewpoint, and discuss how this teaching method can contribute to critical thinking and effective classroom discussions. In breakout sessions, participants will write their own cases or modify existing cases relevant to specific disciplines within the animal sciences undergraduate program (e.g., nutrition, genetics, management, physiology). This daylong workshop will be facilitated by Dr. Clyde (Kipp) Herreid, who is the founding director of the National Center for Case Study Teaching in Science (<http://science-cases.lib.buffalo.edu/cs/>) and distinguished teaching professor of the State University of New York. Kipp has published over 150 articles and five books in the fields of ecology, behavior, and physiology of animals and written extensively in the field of science education.

Instructor: **Clyde (Kipp) Herreid**

SYMPOSIA AND ORAL SESSIONS

Triennial Reproduction Symposium

Developmental programming of fertility

Chair: **Kimberly Vonnahme, North Dakota State University**

Sponsors: **ASAS Foundation Jim Lauderdale Appreciation Club and Bayer Animal Health**
Gatlin A-3

- | | | |
|----------|---|--|
| 8:00 AM | 1 | The importance of understanding the impacts of developmental programming on fertility: An overview. Lawrence Reynolds*, <i>North Dakota State University, Fargo, ND.</i> |
| 8:30 AM | 2 | Beef heifer development systems and lifetime productivity. Andrew J. Roberts* ¹ , Rick N. Funston ² , Elaine E. Grings ³ , and Mark K. Petersen ¹ , ¹ <i>USDA-ARS, Fort Keogh LARRL, Miles City, MT</i> , ² <i>University of Nebraska West Central Research and Extension Center, North Platte, NE</i> , ³ <i>Department of Animal Science, South Dakota State University, Brookings, SD.</i> |
| 9:20 AM | 3 | Effects of nutrition on reproductive development in bulls. Leonardo F. C. Brito*, <i>ABS Global Inc., DeForest, WI.</i> |
| 9:40 AM | 4 | Nutritional programming of puberty in heifers. Gary L. Williams* ^{1,2} , Rodolfo C. Cardoso ^{1,2} , Bruna R. C. Alves ² , and Marcel Amstalden ² , ¹ <i>Texas A&M AgriLife Research, Beeville, TX</i> , ² <i>Texas A&M University, College Station, TX.</i> |
| 10:30 AM | | Break |
| 10:50 AM | 5 | Future reproduction in gilts and boars is affected prenatally by sow management and early in life by management conditions to which the developing swine are exposed. Mark J. Estienne*, <i>Virginia Tech, Blacksburg, VA.</i> |
| 11:10 AM | 6 | Our stolen figures: Using the process of sexual differentiation to think about endocrine-disrupting compounds and their effects on energy balance. Jill E. Schneider*, <i>Lehigh University, Bethlehem, PA.</i> |

| | | |
|----------|---|--|
| 12:00 PM | | L. E. Casida Award Presentation |
| 12:30 PM | | Lunch |
| 2:00 PM | 7 | Environmentally induced epigenetic transgenerational inheritance of disease: Ancestral ghosts in your genome. Michael K. Skinner*, <i>Center for Reproductive Biology, School of Biological Sciences, Washington State University, Pullman, WA.</i> |
| 2:50 PM | 8 | Environmental effects on programming of reproductive behavior. Frederick vom Saal*, <i>University of Missouri-Columbia, Columbia, MO.</i> |
| 3:40 PM | | Break |
| 4:00 PM | 9 | Potential effects of real life exposure to environmental contaminants on reproductive health. Neil P. Evans* ¹ , Michelle Bellingham ¹ , Corinne Cotinot ² , Stewart M. Rhind ³ , Richard Sharpe ⁴ , and Paul A. Fowler ⁵ , ¹ <i>College Medical Veterinary and Life Sciences, Institute of Biodiversity Animal Health & Comparative Medicine, University of Glasgow, Glasgow, UK</i> , ² <i>INRA, Jouy en Josas, France</i> , ³ <i>James Hutton Institute, Aberdeen, UK</i> , ⁴ <i>Queens Medical Research Institute, MRC Centre for Reproductive Health, University of Edinburgh, Edinburgh, UK</i> , ⁵ <i>Institute of Medical Sciences, Division of Applied Medicine, University of Aberdeen, Aberdeen, UK.</i> |
| 4:50 PM | | Summary Lawrence Reynolds. |

Breeding and Genetics Symposium: Joint Interbull/JAM Session
Milk spectral data—Cost-effective information to improve expensive and limited traits in dairy cattle breeding
Chairs: **John B. Cole, Animal Improvement and Genomics Laboratory, ARS-USDA,**
and Filippo Miglior, University of Guelph
Sebastian I-1/2/3

| | | |
|----------|----|--|
| 9:00 AM | 10 | Capitalizing on fine milk composition for breeding and management of dairy cows. Nicolas Gengler* ¹ , H el ene Soyeurt ¹ , Fr ed eric Dehareng ² , Catherine Bastin ¹ , Fr ed eric Colinet ¹ , Hedi Hammami ¹ , and Pierre Dardenne ² , ¹ <i>University of Li ege-GxABT, Gembloux, Belgium</i> , ² <i>Walloon Agricultural Research Center, Gembloux, Belgium.</i> |
| 9:30 AM | 11 | Applications of milk spectroscopy data to select for feed efficiency and reduced methane emissions in dairy breeding programs. Sinead McParland* ¹ and Frederic Dehareng ² , ¹ <i>Animal and Grassland Research & Innovation Centre, Teagasc Moorepark, Fermoy, Co. Cork, Ireland</i> , ² <i>Walloon Agricultural Research Centre, Gembloux, Belgium.</i> |
| 10:00 AM | 12 | Using milk spectroscopy phenotypes in genetic selection programs to improve the nutraceutical value of milk in dairy cows. Henk Bovenhuis*, <i>Animal Breeding and Genomics Centre, Wageningen University, Wageningen, the Netherlands.</i> |
| 10:30 AM | 13 | Do milk spectroscopy phenotypes have a role to play in dairy fertility and health breeding programs? Catherine Bastin* ¹ , L eonard Th eron ² , Aur elie Lain e ¹ , and Nicolas Gengler ¹ , ¹ <i>University of Li ege, Gembloux Agro-Bio Tech, Animal Science Unit, Gembloux, Belgium</i> , ² <i>Faculty of Veterinary Medicine, Clinical Department of Production Animals, University of Li ege, Li ege, Belgium.</i> |
| 11:00 AM | 14 | Implementation of mid-infrared calculated tools to select for novel traits in dairy cattle breeding. Eileen Wall* ¹ , Stephanie Smith ¹ , Sinead McParland ² , Vicky Hicks ³ , and Mike Coffey ¹ , ¹ <i>Scotland's Rural College, Edinburgh, UK</i> , ² <i>Teagasc, Cork, Ireland</i> , ³ <i>National Milk Records, Chippenham, UK.</i> |
| 11:30 AM | | Panel Discussion |

Breeding and Genetics Symposium: Joint Interbull/JAM Session
Use of genomics to improve limited and novel phenotypes in animal breeding
 Chairs: **Alan G. Fahey, University College Dublin, and Hasan Khatib, University of Wisconsin**
 Sponsor: **Council on Dairy Cattle Breeding (CDCB)**
Sebastian I-1/2/3

| | | |
|---------|----|---|
| 2:00 PM | 15 | The effect of genomic technologies in the selection of novel phenotypes in dairy crossbreeding programs. Richard J. Spelman*, Mathew D. Littlejohn, Ric G. Sherlock, and Steve Davis, <i>Livestock Improvement Corporation, Hamilton, New Zealand.</i> |
| 2:30 PM | 16 | Using genomic technologies to improve broiler health and production. Rachel J. Hawken*, <i>Cobb-Vantress, Siloam Springs, AR.</i> |
| 3:00 PM | 17 | Application of genomic technologies to improve feed efficiency traits in swine. Kent A. Gray*, <i>Smithfield Premium Genetics, Rose Hill, NC.</i> |
| 3:30 PM | 18 | The role of genomics in the development of novel phenotype-based products in the beef industry. Matthew A. Cleveland*, <i>Genus plc, DeForest, WI.</i> |
| 4:00 PM | 19 | Using genomics to enhance selection of novel traits in North American dairy cattle. Jacques P. Chesnais* ¹ , Mehdi Sargolzaei ^{1,3} , Filippo Miglior ^{2,3} , and Jennie E. Pryce ⁴ , ¹ <i>The Semex Alliance, Guelph, Ontario, Canada</i> , ² <i>Canadian Dairy Network, Guelph, Ontario, Canada</i> , ³ <i>CGIL, University of Guelph, Guelph, Ontario, Canada</i> , ⁴ <i>Department of Economic Development, Jobs, Transport and Resources, Bundoora, Victoria, Australia.</i> |
| 4:30 PM | | Panel Discussion |

OTHER EVENTS

Late-Breaking Original Research Session

**Panzacola F-1/2
3:00 to 5:00 PM**

**Opening Session
Panzacola G/H
7:00 to 8:00 PM**

This year's opening session will feature a presentation by Michele Payn-Knoper, author of *No More Food Fights!* Michele is principal of Cause Matters Corp. and a passionate advocate for the global agrifood system. Michele has worked with farmers in more than 25 countries and raised over \$5 million in sponsorships for the National FFA Foundation. She founded the weekly Twitter conversation AgChat, which has involved more than 15,000 participants since April 2009. Payn-Knoper resides with her daughter on a small farm in central Indiana, where they enjoy Registered Holsteins, MSU Spartans, and cooking. After the opening session, please join us for food, drinks, and camaraderie at the reception.

**Opening Reception
Gatlin Foyer
8:00 to 10:00 PM**

Monday, July 13

POSTER PRESENTATIONS

ADSA-SAD (Student Affiliate Division) Undergraduate Competition

ADSA-SAD Undergraduate Student Poster Competition

Chair: Jeffrey Bewley, University of Kentucky

- M1 **An analysis of cow cooling methods in lactating Jersey cows, while simultaneously assessing the accuracy of infrared thermography in characterizing heat stress.**
Amy P. McBirney*¹, Stan L. Henderson¹, and Luis A. Rodriguez², ¹California Polytechnic State University, San Luis Obispo, CA, ²Innovative Liquids LLC, El Dorado Hills, CA.
- M2 **Comparison of dry matter measurements between a hand-held near infrared unit and 48 hour-60°C oven drying with corn silage and alfalfa silage.**
Derek M. Donnelly*, Robb W. Bender, and David K. Combs, *University of Wisconsin-Madison, Madison, WI.*
- M3 **Evaluation of pH test strips for accuracy in determining pH of cow urine.**
Colleen N. Curtiss*¹, Kayleigh G. Gratz¹, David P. Chamberlin¹, Timothy F. Brown², and Elizabeth L. Karcher¹, ¹Michigan State University, East Lansing, MI, ²West Central, Ralston, IA.
- M4 **Rumen epithelial gene expression in response to oral NaHCO₃ treatment in Holstein bull calves.**
Emily R. Meese*¹, Taylor T. Yohe^{1,2}, Hannah L. M. Tucker^{1,2}, and Kristy M. Daniels^{1,2}, ¹The Ohio State University, OARDC, Wooster, OH, ²Virginia Tech, Blacksburg, VA.
- M5 **Effect of overstocking at the feed bunk on indicators of cow temperament.**
Danielle N. Coleman*, Maurice L. Eastridge, Jessica A. Pempek, and Kathryn L. Proudfoot, *The Ohio State University, Columbus, OH.*
- M6 **Relationship between cow lying behavior and freestall barn design.**
Jennifer Callanan* and Amber L. Adams-Progar, *Washington State University, Pullman, WA.*
- M7 **Effect of carbon dioxide on oxidative stability of raw milk.**
Jayendra Kumar Amamcharla and Jia Xin Tang*, *Kansas State University, Manhattan, KS.*
- M8 **Hepatic patatin-like phospholipase domain-containing protein 3 protein is regulated during the transition to lactation period in dairy cows.**
Ryan S. Pralle*, Rafael C. Oliveira, Tawny L. Chandler, Sandra J. Bertics, and Heather M. White, *University of Wisconsin-Madison, Madison, WI.*
- M9 **Effect of management practices and housing type on somatic cell counts in Kentucky dairy farms.**
Mickayla A. Myers*, Amanda E. Stone, and Jeffrey M. Bewley, *University of Kentucky, Lexington, KY.*
- M10 **Effect of milking procedures and mastitis detection methods on somatic cell counts for Kentucky dairy herds.**
Kerri A. Bochantin*, Amanda E. Stone, and Jeffrey M. Bewley, *University of Kentucky, Lexington, KY.*
- M11 **Effect of a probiotic on dairy calf diarrhea and growth rate.**
Alexis C. Thompson*, Donna M. Amaral-Phillips, and Jeffrey M. Bewley, *University of Kentucky, Lexington, KY.*
- M12 **Genomic testing of female Holsteins: A resource for selection and improvement.**
Kimberly M. Davenport*, Joshua J. Peak, and Brenda M. Murdoch, *University of Idaho, Moscow, ID.*
- M13 **Effects of rubber coverings for slatted floor facilities on cattle performance and cleanliness.**
Derrick S. Smith*, Bryant R. Chapman, Colleen N. Curtiss, Monica J. Atkin, Steven R. Rust, and Dan L. Grooms, *Michigan State University, East Lansing, MI.*
- M14 **Expression of aryl hydrocarbon receptor in the endometrium of dairy heifers during early pregnancy and the estrous cycle.**
Michelle C. Hartzell*, Troy L. Ott, Manasi M. Kamat, and Sreelakshmi Vasudevan, *Pennsylvania State University, State College, PA.*

- M15 **Absence of milk residues after using a hydrogen peroxide pre-dip.**
Jamie E. Leistner*, Joey D. Clark, and Jeffrey M. Bewley, *University of Kentucky, Lexington, KY.*
- M16 **Effects of adding a pasteurized milk balancer on dairy calf growth and performance.**
Lydia H. Hoene*¹, B. Houin², and Tamilee Nennich^{1,3}, ¹*Purdue University, West Lafayette, IN*, ²*Homestead Dairy, Plymouth, IN*, ³*Famo Feeds, Freeport, MN.*

Animal Behavior and Well-Being I

- M17 **Associations between feed push-up frequency, lying and feeding behavior, and milk composition of dairy cows.**
Emily K. Miller-Cushon*¹ and Trevor J. DeVries², ¹*Department of Animal Sciences, University of Florida, Gainesville, FL*, ²*Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada.*
- M18 **Effect of timing of feed delivery on feeding behavior and productivity of dairy cows.**
Meagan T. M. King*, Robin E. Crossley, and Trevor J. DeVries, *Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada.*
- M19 **Relationships between dry matter intake, rumination time, lying behavior, and milk yield in lactating cows.**
Dafu Shao*, Fengxia Wang, YaJing Wang, Shengli Li, and Zhijun Cao, *State Key Laboratory of Animal Nutrition, College of Animal Science and Technology, China Agricultural University, Beijing, China.*
- M20 **Association between lying behavior and subclinical ketosis in transition dairy cows.**
Emily I. Kaufman*¹, Stephen J. LeBlanc², Brian W. McBride¹, Todd F. Duffield², and Trevor J. DeVries¹, ¹*Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada*, ²*Department of Population Medicine, University of Guelph, Guelph, ON, Canada.*
- M21 **Metritic heifers search for a safe place.**
Julia C. Lomb¹, Julie M. Huzzey², Heather W. Neave*¹, Daniel M. Weary¹, Bianca Costa¹, and Marina A. G. von Keyserlingk¹, ¹*University of British Columbia, Vancouver, BC, Canada*, ²*California Polytechnic State University, San Luis Obispo, CA.*
- M22 **Feeding and social behaviors change prior to metritis diagnosis in transition dairy cows.**
Heather W. Neave*, Julia C. Lomb, Julie M. Huzzey, Daniel M. Weary, and Marina A. G. von Keyserlingk, *University of British Columbia, Vancouver, BC, Canada.*
- M23 **LPS injection in pregnant ewes and the number of lambs born affect maternal behavior and the time to first suckling.**
Cristiane G. Titto*¹, Fábio L. Henrique¹, Evaldo A. L. Titto¹, Adroaldo J. Zanella², Henrique B. Hooper¹, Lina F. P. Rodriguez¹, Ana Luisa S. Longo¹, Thays M. C. Leme-dos Santos¹, Raquel F. Calviello¹, Jessica C. Veronezi¹, and Alfredo M. F. Pereira³, ¹*Faculdade de Zootecnia e Engenharia de Alimentos, Universidade de São Paulo, Pirassununga, São Paulo, Brazil*, ²*Faculdade de Medicina Veterinária e Zootecnia, Universidade de São Paulo, Pirassununga, São Paulo, Brazil*, ³*Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora, Évora, Alentejo, Portugal.*
- M24 **Effect of increasing levels of babassu flour starch on feeding behavior of feedlot lambs.**
Michelle de Oliveira Maia Parente¹, Osman José de Aguiar Gerude Neto¹, Paull Andrews Carvalho Santos¹, Henrique Nunes Parente¹, Miguel Arcanjo Moreira Filho¹, Ruan Mourão da Silva Gomes*¹, Itamara Gomes França¹, Arnaud Azevedo Alves², and Valdi Lima Júnior³, ¹*Universidade Federal do Maranhão, Chapadinha, Maranhão, Brazil*, ²*Universidade Federal do Piauí, Teresina, Piauí, Brazil*, ³*Universidade Federal do Rio Grande do Norte, Natal, Rio Grande do Norte, Brazil.*
- M25 **Residual feed intake selection: Effect on gilt behavior in response to a lipopolysaccharide challenge.**
Samaneh Azarpajouh*¹, Jessica Colpoys¹, Anoosh Rakhshandeh^{1,2}, Jack Dekkers¹, Caitlyn Abell³, Nicholas Gabler¹, and Anna Johnson¹, ¹*Department of Animal Science, Iowa State University, Ames, IA*, ²*Department of Animal and Food Sciences, Texas Tech University, Lubbock, TX*, ³*DNA Genetics, Columbus, NE.*
- M26 **Effects of light programs and tryptophan supplementation on stress indicator parameters and growth of weaned piglets.**
Lívea Maria Gomes*¹, Gabriela de Mello Miassi¹, Luan Sousa Santos², Marcos Livio Panhoza Tse¹, and Dirlei Antonio Berto¹, ¹*Faculdade de Medicina Veterinária e Zootecnia – FMVZ/UNESP, Botucatu, SP, Brazil*, ²*Faculdade de Ciências Agrárias e Veterinárias – FCAV/UNESP, Jaboticabal, SP, Brazil.*

- M27 **The effects of ethyl alcohol as a tool for pain management in neonatal pigs during castration.**
Justin L. Lyles*¹, Scott D. Carter¹, John N. Gilliam², Keith L. Bailey², Johann F. Coetzee³, and Michelle S. Calvo-Lorenzo¹, ¹*Oklahoma State University, Stillwater, OK*, ²*Oklahoma State University College of Veterinary Medicine, Stillwater, OK*, ³*Iowa State University College of Veterinary Medicine, Ames, IA*.
- M28 **Effect of surgical and band castration on indicators of chronic pain in 0-, 2-, and 4-month-old beef calves.**
Sonia Marti¹, Daniela Melendez*^{2,1}, Eugene D. Janzen², Ed Pajor², Diego Moya^{1,2}, and Karen S. Schwartzkopf-Genswein¹, ¹*Agriculture and Agri-Food Canada, Lethbridge, AB, Canada*, ²*University of Calgary, Faculty of Veterinary Medicine, Calgary, AB, Canada*.
- M29 **Characteristics of agonistic behavior of commercially housed pigs after mixing.**
Shin-Jae Rhim*¹, Hyun-Su Hwang¹, Seung-Hun Son¹, Hojeong Kang¹, and Joon-Ki Hong², ¹*Chung-Ang University, Ansong, Gyeonggi, South Korea*, ²*National Institute of Animal Science, Cheonan, Chungnam, South Korea*.
- M30 **Determining feeder space requirement for growing-finishing pigs.**
Yuzhi Li*¹, Kimberly McDonalds², and Harold Gonyou², ¹*West Central Research and Outreach Center, University of Minnesota, Morris, MN*, ²*Prairie Swine Center Inc., Saskatoon, SK, Canada*.
- M31 **Effects of different number of animals relative to a single feeding space on performance and behavior in Holstein bulls fed high-concentrate diets.**
Maria Devant*¹, Alex Bach^{2,1}, and Marçal Verdú¹, ¹*IRTA-Ruminant Production, Animal Nutrition, Management, and Welfare Research Group, Caldes Montbui, Spain*, ²*ICREA, Barcelona, Spain*.
- M32 **Effects of stocking density and source of forage fiber on short-term behavioral and lactational responses of Holstein dairy cows.**
Mackenzie A. Campbell*^{1,2}, Kurt W. Cotanch¹, Catherine S. Ballard¹, Heather M. Dann¹, Dave M. Barbano³, Alyssa M. Couse¹, and Richard J. Grant¹, ¹*William H. Miner Agricultural Research Institute, Chazy, NY*, ²*The University of Vermont, Department of Animal Science, Burlington, VT*, ³*Cornell University, Ithaca, NY*.
- M33 **Effect of temperament on feedlot performance and carcass traits in purebred and crossbred Nellore cattle.**
Aline C. Sant'Anna*¹, Fernanda M. Benez², Janaina S. Braga², Arquimedes J. R. Pellechia², and Mateus J. R. Paranhos da Costa¹, ¹*São Paulo State University, Department of Animal Science, Faculty of Agricultural and Veterinarian Sciences, Jaboticabal, São Paulo, Brazil*, ²*São Paulo State University, Post Graduate Program in Animal Science, Faculty of Agricultural and Veterinarian Sciences, Jaboticabal, São Paulo, Brazil*.
- M34 **Agitated temperament related to worse carcass quality in feedlot cattle.**
Désirée Ribeiro Soares*¹, Karen S. Schwartzkopf-Genswein², Joslaine N. Dos Santos Gonçalves Cyrillo³, and Mateus J. Rodrigues Paranhos da Costa¹, ¹*Faculdade de Ciências Agrárias e Veterinárias, UNESP, Jaboticabal, São Paulo, Brazil*, ²*Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, Alberta, Canada*, ³*Centro APTA Bovinos de Corte, Instituto de Zootecnia, IZ, Sertãozinho, São Paulo, Brazil*.
- M35 **Effects of handling before and during processing on behavior and ADG of feedlot steers.**
Ruth H. Woiwode*¹, Temple Grandin¹, Brett Kirch¹, and John Paterson², ¹*Colorado State University, Fort Collins, CO*, ²*National Cattlemen's Beef Association, Centennial, CO*.
- M36 **Temperament of beef cattle receiving supplementation on grazing system: daily gain, ultrasound measures, and intake behavior.**
C. L. Francisco*, A. M. Castilhos, D. C. M. Silva, F. M. Silva, and A. M. Jorge, *Universidade Estadual Paulista-FMVZ, Botucatu, SP, Brazil*.

Animal Health Beef cattle

- M37 **Functional capacities of blood neutrophils are influenced by both acute and chronic dexamethasone stress models in beef steers.**
Michael A. Ballou*¹, Jeff A. Carroll², Nicole C. Burdick Sanchez², Nathan D. May³, Shelby L. Roberts³, Heather D. Hughes³, Paul R. Broadway², Kate P. Sharon^{1,2}, and John T. Richeson³, ¹*Department of Animal and Food Sciences, Texas Tech University, Lubbock, TX*, ²*USDA-ARS, Lubbock, TX*, ³*Department of Agricultural Sciences, West Texas A&M University, Canyon, TX*.

- M38 **Transcriptome profiling of the endometrium of healthy beef cows postpartum.**
Robmay Garcia*, Dianelys Gonzalez-Pena, and Sandra L. Rodriguez-Zas, *University of Illinois at Urbana-Champaign, Urbana, IL.*
- M39 **Cardiac damage assessment in beef cattle receiving different dosages of monensin in finishing diets as measured by Creatine-Kinase Myocardic kit.**
Ariel O. Miranda*¹, Oscar Frances², Hernan Romero Harry¹, and Anibal J. Pordomingo¹, ¹INTA, Anguil, La Pampa, Argentina, ²Fac. Cs. Vet. Gral Pico, Gral Pico, La Pampa, Argentina.
- M40 **Estimating glucose requirements of an activated immune system in Holstein steers.**
Sara K. Stoakes*, Erin A. Nolan, David J. Valko, Mohannad Abuajamieh, Maria V. Sanz Fernandez, and Lance H. Baumgard, *Iowa State University, Ames, IA.*
- M41 **A comparison of rumen bacterial communities in bloated and non-bloated cattle grazing alfalfa.**
Elnaz Azad*¹, Robert Forster², Surya Acharya², Tim McAllister², and Ehsan Khafipour¹, ¹Department of Animal Science, University of Manitoba, Winnipeg, Manitoba, ²Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, Alberta, Canada.
- M42 **Efficacy of dosing toltrazuril 5% as a coccidiostatic for cattle.**
Rafahel C. Souza¹, Rogério C. Souza¹, Renato O. Santos¹, Sérgio V. G. Ribeiro¹, Andre B. D. Pereira*³, Thiago M. Soares², and Maria I. V. Melo¹, ¹Pontifícia Universidade Católica de Minas Gerais, Betim, MG, Brazil, ²Ourofino Agronegocios, Cravinhos, SP, Brazil, ³University of New Hampshire, Durham, NH.
- M43 **In vitro evaluation of the antimicrobial activity of plant extracts from *Ruta graveolens* and *Annona muricata*.**
Yadileiny Portilla¹, María Dolores Carro², Grethel Milián¹, Conrado Camacho¹, Aymara Valdivia¹, Alexey Díaz^{3,4}, Cristina Saro³, Iván Mateos³, and María José Ranilla*^{3,4}, ¹Center for Biotechnological Studies, University of Matanzas, Matanzas, Cuba, ²Agriculture Production Department. Technical University of Madrid, Madrid, Spain, ³Animal Production Department. University of León, León, Spain, ⁴IGM (CSIC-ULE). Finca Marzanas s/n, Grulleros, León, Spa.
- M44 **OmniGen-AF affects expression of immune-related genes in whole blood of healthy Angus heifers.**
S. A. Armstrong*^{1,2}, D. J. McLean¹, T. H. Schell^{1,2}, G. Bobe², and M. Bionaz², ¹Phibro Animal Health, Corvallis, OR, ²Department of Animal and Rangeland Sciences, Oregon State University, Corvallis, OR.
- M45 **Influence of hydrolysable tannin extract on nematode egg count in feces of receiving beef cattle.**
Melissa B. Corona¹, Eva X. Murillo¹, Billy J. Cervantes², Nohemi Castro¹, Javier A. Romo¹, Soila M. Gaxiola¹, and Rubén Barajas*¹, ¹FMVZ-Universidad Autónoma de Sinaloa, Culiacán, Sinaloa, México, ²Ganadera Los Migueles, S.A. de C.V, Culiacán, Sinaloa, México.
- M46 **Effects of bambermycin or monensin on health and performance of receiving cattle.**
William Galyen*¹, Tom Hess², Don Hubbell², Shane Gadberry³, Elizabeth Kegley¹, Matt Cravey⁴, Jeremy Powell¹, Elizabeth Backes¹, Laura Meyers¹, and Paul Beck⁵, ¹University of Arkansas Department of Animal Science, Fayetteville, AR, ²University of Arkansas LFRS, Batesville, AR, ³University of Arkansas Cooperative Extension Service, Little Rock, AR, ⁴Huvepharma, Inc., Amarillo, TX, ⁵University of Arkansas SWREC, Hope, AR.
- M47 **Influence of *Papaveraceae* plant preparation on nematode egg count in feces of receiving bull-calves.**
Rubén Barajas*¹, Melissa B. Corona¹, Eva X. Murillo¹, Billy J. Cervantes², Ingo Rogge³, Nohemi Castro¹, and Luis E. Soto⁴, ¹FMVZ-Universidad Autónoma de Sinaloa, Culiacán, Sinaloa, México, ²Ganadera Los Migueles, S.A. de C.V, Culiacán, Sinaloa, México, ³Phytobiotics Futterzusatzstoffe GmbH, Eltville, Germany, ⁴FA-Universidad Autónoma de Sinaloa, Culiacán, Sinaloa, México.
- M48 **Effect of Safeguard on fecal egg count and performance in received beef calves.**
Antonio Jose Neto*¹, Curt J. Bittner¹, Galen E. Erickson¹, and Brandon L. Nuttelman², ¹Department of Animal Science, University of Nebraska, Lincoln, NE, ²Merck Animal Health, De Soto, KS.

Animal Health Immunology

- M49 **Comparison of antibody response, bacteriological culture and PCR based diagnostic methods in *Brucella ovis* inoculated rams.**
Ariel O. Miranda*¹, Hernán Romero Harry¹, Valeria N. Baldone¹, Marcy Owens², and Scott Pratt², ¹INTA, Anguil, La Pampa, Argentina, ²Clemson University, Clemson, SC.

- M50 **Prevalence of brucellosis in Iraq and control through a vaccination campaign.**
Alaa Khalil Ismaiel*, *Ministry of Agriculture, Veterinary Directorate, Central Veterinary Laboratory, Baghdad, Iraq.*
- M51 **Maternal undernutrition increases acylated ghrelin concentrations in the umbilical artery and vein of the twin ovine fetus.**
Sahng-Wook Hahm*¹, Meghan Field¹, Russell V. Anthony², and Hyungchul Han¹, ¹*Department of Animal Sciences, Colorado State University, Fort Collins, CO*, ²*Department of Biomedical Sciences, Colorado State University, Fort Collins, CO.*
- M52 **Evaluating udder health in dairy goats: An old but still unsolved issue.**
Andrea Bezerra¹, Candice De Leon¹, Magda Fernandes¹, Bryan White², Juan Loor², and Celso Oliveira*^{1,2}, ¹*Federal University of Paraiba (UFPB), Brazil, Areia, PB, Brazil*, ²*The University of Illinois at Urbana-Champaign, Urbana, IL.*
- M53 **Effect of FMD vaccine on seminal traits of HF bulls.**
Mohua Das Gupta*¹, Shivaji Hanmantrao Sontakke¹, Gunjan Rathi¹, Vinod Haribhau Shende¹, Mohammed Mushtaque¹, Samir Kumar Dash¹, Suresh B. Gokhale¹, Arun P. Phatak², Hemant Dasharath Kadam¹, Narayan Laxman Phadke¹, and Jayant Ramachandra Khadse¹, ¹*BAIF Development Research Foundation, Central Research Station, Uruli Kanchan, Pune, Maharashtra, India*, ²*601 Curran Drive, Waterford, CA.*
- M54 **Development of an effective oral animal vaccine using M cell targeting strategy.**
Sangkee Kang*^{1,2}, Yoonseok Lee², Jinduck Bok², Chongsu Cho³, and Yunjaie Choi^{2,3}, ¹*Graduate School of International Agricultural Technology, Seoul National University, Pyeongchang, Republic of Korea*, ²*Institute of Green-Bio Science & Technology, Seoul National University, Pyeongchan, Republic of Korea*, ³*Department of Agricultural Biotechnology, Seoul National University, Seoul, Republic of Korea.*
- M55 **Amino acid supplementation and lipopolysaccharide challenge alters bovine blood polymorphonuclear leukocytes response in vitro.**
M. Garcia*¹, T. H. Elsasser², Y. Qu¹, L. Juengst¹, B. J. Bequette¹, and K. M. Moyes¹, ¹*Department of Animal and Avian Sciences, University of Maryland, College Park, MD*, ²*Agricultural Research Service, Animal Biosciences and Biotechnology Laboratory, U.S. Department of Agriculture, Beltsville, MD.*
- M56 **In vitro activity of *Pithecellobium dulce* and *Lysiloma acapulcensis* on exogenous development stages of sheep gastrointestinal strongyles.**
A. Olmedo-Juárez¹, R. Rojo-Rubio*¹, J. Arece-García², C. Marie-Magdeleine³, and JF Vázquez-Armijo¹, ¹*Centro Universitario UAEM Temascaltepec, Universidad Autónoma del Estado de México, Temascaltepec, Estado de México, México*, ²*Estación Experimental de Pastos y Forrajes, España Republicana, Matanzas, Cuba*, ³*Instituto de Investigaciones Agronómicas (INRA), Guadeloupe, France.*
- M57 **Changes in transcriptome of bovine monocytes-derived macrophage challenged with *Mycobacterium bovis*.**
Dianelys Gonzalez-Pena*, Robmay Garcia, Andrew J. Steelman, and Sandra L. Rodriguez-Zas, *University of Illinois at Urbana-Champaign, Urbana, IL.*
- M58 **Phytochemicals in corn distillers grains.**
Adebola Daramola and Byunrok Min*, *University of Maryland Eastern Shore, Princess Anne, MD.*
- M59 **Characterization of the binding potential of pathogenic bacteria to yeast probiotics and paraprobiotics.**
Janet R. Donaldson*¹, Gabe Posadas¹, Jeffery A. Carroll², Paul R. Broadway², Amanda Lawrence¹, and Jimmie Corley³, ¹*Mississippi State University, Mississippi State, MS*, ²*USDA-ARS, Lubbock, TX*, ³*Phileo, Lesaffre Animal Care, Milwaukee, WI.*
- M60 **Effects of polybrene and puromycin on equine infectious anemia virus replication.**
Dustin A. Therrien, Rebecca D. Parr, and Sarah C. Canterbury*, *Stephen F. Austin State University, Nacogdoches, TX.*
- M61 **Co-aggregation ability of cell wall components of *Saccharomyces cerevisiae* to pathogenic bacteria.**
Marlén Rodríguez¹, Ana Julia Rondón¹, Yadileiny Portilla¹, Ramón Bocourt², María José Ranilla*^{3,5}, María Dolores Carro⁴, Alexey Díaz^{3,5}, and Grethel Milián¹, ¹*Center for Biotechnological Studies, University of Matanzas, Matanzas, Cuba*, ²*Institute of Animal Science, Mayabeque, San José de las Lajas, Cuba*, ³*Animal Production Department, University of León, León, Spain*, ⁴*Agriculture Production Department, Technical University of Madrid, Madrid, Spain*, ⁵*SIGM (CSIC-ULE), Finca Marzanas s/n, Grulleros, León, Spain.*
- M62 **In vitro efficacy of chitosan against *Cryptosporidium parvum* and validation on infected goat kids.**
Karim Adjou¹, Jean-Philippe Marden*², Eric Auclair², Christian Mage³, and Isabelle Vallée¹, ¹*UMR BIPAR Anses-ENVA, Maisons-Alfort, France*, ²*Phileo Lesaffre Animal Care, Marcq en Baroeul, France*, ³*Mage Consultant, Estivaux, France.*

Bioethics

- M63 **US consumer perceptions of and willingness to pay for “local” pork chops and chicken breasts.**
Elizabeth Byrd*, Nicole Widmar, and Michael Wilcox, *Purdue University, W. Lafayette, IN.*
- M64 **US consumer awareness of animal diseases and animal health requirements: Are we meeting the demands of the US public?**
Elizabeth Byrd*, Nicole Widmar, and John Lee, *Purdue University, W. Lafayette, IN.*
- M65 **Consumers know food, but they don’t know ag (how does that work?).**
Ann Cummins*, Nicole Widmar, Candace Croney, and Joan Fulton, *Purdue University, W. Lafayette, IN.*
- M66 **Ergonomic assessment of the milking routine in large dairy operations of the US Southwest.**
Jose A. Garcia Buitrago*¹, Gerrit R. Hagevoort¹, David Gimeno², and David I. Douphrate², ¹*New Mexico State University, Clovis, NM*, ²*University of Texas, San Antonio, TX.*

Breeding and Genetics

Application and methods in animal breeding—Swine, poultry, and other species

- M67 **Accuracy of estimated breeding values for males and females with genomic information on males, females, or both: A broiler chicken example.**
Daniela A. L. Lourenco*¹, Breno O. Fragomeni¹, Shogo Tsuruta¹, Ignacio Aguilar², Birgit Zumbach³, Rachel J. Hawken³, Andres Legarra⁴, and Ignacy Misztal¹, ¹*University of Georgia, Athens, GA*, ²*INIA, Las Brujas, Uruguay*, ³*Cobb-Vantress Inc., Siloam Springs, AR*, ⁴*INRA, Castanet-Tolosan, France.*
- M68 **Genetic parameters for length of productive life and lifetime production traits of purebred Landrace and Yorkshire sows in northern Thailand.**
Udomsak Noppibool*^{1,2}, Skorn Koonawootrittriron¹, Mauricio A. Elzo², and Thanathip Suwanasopee¹, ¹*Kasetsart University, Chatuchak, Bangkok, Thailand*, ²*University of Florida, Gainesville, FL.*
- M69 **A study on *PIT1* gene polymorphism and its association with growth traits in pigs.**
S. Mohana Devi*¹, V. Balachandar², and I. H. Kim¹, ¹*Department of Animal Resource & Science, Dankook University, Cheonan, Chungnam, South Korea*, ²*Department of Human Genetics and Molecular Biology, Bharathiar University, Coimbatore, Tamil Nadu, India.*
- M70 **Recombination rates in layer chickens.**
Zi-Qing Weng*¹, Anna Wolc^{1,2}, Rohan L. Fernando¹, Jack C. M. Dekkers¹, Jesus Arango², Petek Settar², Janet E. Fulton², Neil P. O’Sullivan², and Dorian J. Garrick¹, ¹*Department of Animal Science, Iowa State University, Ames, IA*, ²*Hy-Line International, Dallas Center, IA.*
- M71 **Genetic selection tool for number born alive and stillbirth piglets in commercial Thai populations.**
Thanathip Suwanasopee*¹, Skorn Koonawootrittriron¹, and Mauricio A. Elzo², ¹*Department of Animal Science, Faculty of Agriculture, Kasetsart University, Bangkok, Thailand*, ²*Department of Animal Sciences, University of Florida, Gainesville, FL.*
- M72 **Genomic correlation between piglet preweaning mortality and individual birth weight using a bivariate threshold-linear maternal effect model.**
Shogo Tsuruta*¹, Ching-Yi Chen², William O. Herring², and Ignacy Misztal¹, ¹*University of Georgia, Athens, GA*, ²*PIC North America, Hendersonville, TN.*
- M73 **Genetic parameters of lifetime characteristics of preweaning production traits of landrace sows raised under tropical conditions.**
Teerapong Jaichansukkit¹, Thanathip Suwanasopee*¹, Skorn Koonawootrittriron¹, and Mauricio A. Elzo², ¹*Kasetsart University, Bangkok, Thailand*, ²*University of Florida, Gainesville, FL.*
- M74 **General and specific combining abilities for reproductive and growth performance of three color variants of Nigerian indigenous turkeys.**
Matthew A. Adeleke*¹, Rasheed O. Ojo¹, Sunday O. Peters², and Michael O. Ozoje¹, ¹*Department of Animal Breeding and Genetics, Federal University of Agriculture, Abeokuta, Ogun State, Nigeria*, ²*Department of Animal Science, Berry College, Mount Berry, GA.*

- M75 **Association with disease resistance markers and economic traits in Korean native chickens.**
Boyeong Park*, Anh Duc Truong, Jihye Ban, and Yeong Ho Hong, *Chung-Ang University, Anseong, Gyeonggi, Korea.*
- M76 **Breeding implications of heteroskedastic whole-genome prediction of genetic merit.**
Zhining Ou*¹, Robert J. Tempelman², Juan P. Steibel², Catherine W. Ernst², Ronald O. Bates², and Nora M. Bello¹, ¹*Kansas State University, Manhattan, KS*, ²*Michigan State University, East Lansing, MI.*
- M77 **Co-association gene networks for meat quality and carcass traits in pigs and validating by transcription factors.**
Darlene A. S. Duarte*, Fabyano F. Silva, Renata Veroneze, Lucas L. Verardo, Ivan Carvalho Filho, Simone E. F. Guimarães, and Paulo S. Lopes, *Universidade Federal de Viçosa, Viçosa, MG, Brazil.*
- M78 **An improved approach for swine SNP genotyping using Genotyping-by-Sequencing.**
Cheng Tan*¹, Jiangli Ren¹, Zhuolin Huang¹, Yiqiang Zhao¹, Yang Da², and Xiaoxiang Hu¹, ¹*State Key Laboratory for Agrobiotechnology, China Agricultural University, Beijing, China*, ²*Department of Animal Science, University of Minnesota, Saint Paul, MN.*
- M80 **Growth curve analyses of three turkey genotypes in the hot humid tropics using a Bayesian mixed model approach.**
Michael O. Ozoje*¹, Sunday O. Peters², Kyle C. Caires², and Kadir Kizilkaya³, ¹*Federal University of Agriculture, Abeokuta, Ogun State, Nigeria*, ²*Berry College, Mount Berry, GA*, ³*Adnan Menderes University, Aydin, Turkey.*
- M81 **Inferring the causal effect of number of lambs born on milk yield in dairy sheep using propensity score methods.**
Vera C. Ferreira*, Bruno D. Valente, David L. Thomas, and Guilherme J. M. Rosa, *University of Wisconsin-Madison, Madison, WI.*
- M82 **Comparative whole-genome analysis of CpG islands in camelid and selected mammalian genomes.**
Arsalan Barazandeh^{1,2}, Mohammadreza Mohammadabadi², Ikhide G. Imumorin³, Sunday O. Peters*⁴, Bolaji N. Thomas⁵, Mostafa Ghaderi-Zefrehei⁶, and Hossein Nezamabadi-Pour¹, ¹*Shahid Bahonar University of Kerman, Keerman, Iran*, ²*Jiroft University, Jiroft, Iran*, ³*Cornell University, Ithaca, NY*, ⁴*Berry College, Rome, GA*, ⁵*Rochester Institute of Technology, Rochester, NY*, ⁶*University of Yasousj, Yasousj, Iran.*
- M83 **Genome-wide association study of mandibular inferior in multiple breeds of sheep.**
Michelle R. Mousel*¹, Stephen N. White^{1,2}, J. Bret Taylor³, and Donald P. Knowles^{1,2}, ¹*USDA-ARS, Animal Disease Research Unit, Pullman, WA*, ²*Department of Veterinary Microbiology and Pathology, Pullman, WA*, ³*USDA-ARS, Range Sheep Production Efficiency Research Unit, Dubois, ID.*
- M84 **Integration of haplotype analysis of functional genomic information with single SNP analysis improved accuracy of genomic prediction.**
Cheng Tan*^{1,2}, Dzianis Prakapenka¹, Chunkao Wang¹, Li Ma³, John R. Garbe⁴, Xiaoxiang Hu², and Yang Da¹, ¹*Department of Animal Science, University of Minnesota, Saint Paul, Minnesota*, ²*State Key Laboratory of Agrobiotechnology, China Agricultural University, Beijing, China*, ³*Department of Animal and Avian Sciences, University of Maryland, College Park, MD*, ⁴*Minnesota Supercomputer Institute, University of Minnesota, Minneapolis, MN.*
- M85 **Preliminary study of *DMRT3* variation and association with performance gait for American Saddlebred horses.**
Inaê C. Regatieri*¹, John E. Eberth², Fred Sarver³, and Ernest Bailey², ¹*Faculdade de Ciências Agrárias e Veterinárias, UNESP – Univ Estadual Paulista, Jaboticabal, São Paulo, Brazil*, ²*Department of Veterinary Science, University of Kentucky, Lexington, KY*, ³*Cornerstone Farm, Carlisle, KY.*

Breeding and Genetics

Molecular genetics

- M86 **Heat storage and HSP expression of Holstein females—An in vivo study.**
Ana C. A. P. M. Geraldo^{1,2}, Thays M. C. Leme¹, Reissa A. Vilela¹, Cristiane G. Titto¹, Evaldo A. L. Titto*¹, Paulo Infante³, Fernando J. Moreira da Silva⁴, and Alfredo M. F. Pereira², ¹*Animal Science and Food Engineering Faculty, University of São Paulo, Pirassununga, São Paulo, Brazil*, ²*Institute of Mediterranean Agricultural and Environmental Sciences, University of Évora, Évora, Portugal*, ³*Mathematics Department, University of Évora, Évora, Portugal*, ⁴*Department of Agrarian Sciences, University of Azores, Angra do Heroísmo, Azores, Portugal.*

- M87 **Gene and pathway analysis of metabolic traits in dairy cows.**
Ngoc-Thuy Ha^{1,2}, Josef J. Gross^{*1}, Jens Tetens³, Martin Schlather⁴, Rupert M. Bruckmaier¹, and Henner Simianer², ¹*Veterinary Physiology, Vetsuisse Faculty University of Bern, Bern, Switzerland*, ²*Animal Breeding and Genetics Group, Department of Animal Sciences, Georg-August-University Goettingen, Goettingen, Germany*, ³*Institute of Animal Breeding and Husbandry, Christian-Albrechts-University Kiel, Kiel, Germany*, ⁴*Chair of Mathematical Statistics, University of Mannheim, Mannheim, Germany*.
- M88 **A novel intronic SNP marker candidate associated with fatty acids profile in Korean cattle (Hanwoo).**
Yoonseok Lee^{*1}, Dongyep Oh³, Jaejung Ha³, Jinduk Bok¹, Sangkee Kang^{1,2}, YunJaie Choi^{1,2}, and Myunggi Baik^{1,2}, ¹*Institute of Green Bio Science & Technology, Seoul National University, Pyeongchang-gun, Gangwon-do, South Korea*, ²*Department of Agricultural Biotechnology, Seoul National University, Gwanak-gu, Seoul, South Korea*, ³*Gyeongsangbuk-do Livestock Research Institute, Yeongju, Gyeongsangbuk-do, South Korea*.
- M89 **A QTL on BTA16 is associated with *Mycobacterium avium* ssp. *paratuberculosis* (Map) tissue infection.**
Jennifer N. Kiser^{*} and Holly L. Neibergs, *Washington State University, Pullman, WA*.
- M90 **Effect of the STAT5A BstEII polymorphism on reproductive parameters of Holstein dairy cows.**
Pedro A. S. Silveira¹, Walter R. Butler², Carlos C. Barros¹, Marcio N. Corrêa¹, and Augusto Schneider^{*1}, ¹*Federal University of Pelotas, Pelotas, RS, Brazil*, ²*Cornell University, Ithaca, NY*.
- M91 **Differentially expressed genes for beef fatty acid profile in Nelore cattle.**
Mariana P. Berton^{*1}, Marcos V. A. Lemos¹, Hermenegildo L. J. Chiaia¹, Fabieli L. B. Feitosa¹, Carolyn Aboujaoude¹, Larissa F. S. Fonseca¹, Bianca F. Olivieri¹, Daniela F. R. J. Gimenez¹, Bruno L. Utembergue², Lucia G. de Albuquerque¹, Aline S. M. Cesar², Angélica S. C. Pereira², and Fernando Baldi¹, ¹*State University of Sao Paulo, Jaboticabal, Sao Paulo, Brazil*, ²*University of Sao Paulo, Pirassununga, Sao Paulo, Brazil*.
- M92 **Polymorphisms in the promoter of interleukin-12 β 2 and interleukin-23 receptor genes influence milk production traits in Chinese Holstein cows.**
Yongjiang Mao^{*}, Xiaorui Zhu, Shiyu Xin, Huiming Zhang, and Zhangping Yang, *College of Animal Science and Technology, Yangzhou University, Yangzhou, Jiansu, China*.
- M93 **Evolution of mutational variance associated with age and sex of the parent for weaning weight in C57BL/6J mice.**
Mayela Castillo¹, Juan F. Medrano², and Joaquim Casellas^{*1}, ¹*Universitat Autònoma de Barcelona, Bellaterra, Spain*, ²*University of California, Davis, CA*.
- M94 **A molecular evaluation of bovine respiratory disease and carcass traits in feedlot steers.**
Samantha Miller¹, Ryon Walker³, Timothy Page^{1,2}, and Matthew Garcia^{*1,2}, ¹*Louisiana State University, Baton Rouge, LA*, ²*Louisiana State AgCenter, Baton Rouge, LA*, ³*Louisiana State AgCenter Hill Farm, Homer, LA*.
- M95 **Association of a polymorphism in the paraoxonase 1 (PON1) gene with reproductive performance, health and production of Holstein cows.**
Pedro A. S. Silveira¹, Walter R. Butler², Carlos C. Barros¹, Marcio N. Corrêa¹, and Augusto Schneider^{*1}, ¹*Federal University of Pelotas, Pelotas, RS, Brazil*, ²*Cornell University, Ithaca, NY*.
- M96 **Effect of POU1F1 gene polymorphism and dairy traits in Holstein cattle from Antioquia, Colombia.**
Jose V. Isaza^{*}, Albeiro Lopez-Herrera, and Jose J. Echeverri, *Universidad Nacional de Colombia Sede Medellin, Medellin, Antioquia, Colombia*.
- M97 **Identification of genes and networks for the response to thermal stress.**
Hoyoung Chung^{*}, *National Institute of Animal Science, Suwon, KY, Korea*.
- M98 **Transcriptome analysis of muscular tissue in Nelore cattle divergently ranked for meat tenderness.**
Larissa Fernanda Simielli Fonseca^{*1}, Daniele Fernanda Jovino Gimenez¹, Fernando Baldi¹, Jesus Aparecido Ferro², Rafael Espigolan¹, and Lucia Galvão Albuquerque¹, ¹*Departamento de Zootecnia, Faculdade de Ciências Agrárias e Veterinárias, UNESP, Jaboticabal, SP, Brazil*, ²*Departamento de Tecnologia, Faculdade de Ciências Agrárias e Veterinárias, UNESP, Jaboticabal, SP, Brazil*.
- M99 **Environmental risk assessment by genetically engineered mice as transgenic animal model.**
Dailu Guan¹, Qian Yu¹, Erhu Zhao¹, Yong Wang², and Yongju Zhao^{*1}, ¹*College of Animal Science and Technology, Southwest University; Chongqing Key Laboratory of Forage & Herbivore; Chongqing Engineering Research Center for Herbivores Resource Protection and Utilization, Beibei, Chongqing, China*, ²*Department of Laboratory Animal Science, College of Basic Medicine, Third Military Medical University, Sapingba, Chongqing, China*.

- M100 **Associations between HEL5, AFZ1, ILSTS002, BMS3004, IDVGA-51, LHR, and FSHR alleles on reproductive evaluation of bulls.**
Gabriel R. Pereira*¹, Silvio R. O. Menegassi¹, Paulo R. Aguiar², Katiana S. Pereira², Celso Koetz³, Flavio G. Lopes³, Vanerlei M. Roso⁴, Vanessa Peripolli¹, Fernanda G. Moojen¹, and Julio O. J. Barcellos¹, ¹*Federal University of Rio Grande do Sul - UFRGS, Porto Alegre, RS, Brazil*, ²*Lutheran University of Brazil - ULBRA, Canoas, RS, Brazil*, ³*University of Northern Paraná - UNOPAR, Arapongas, PR, Brazil*, ⁴*GenSys Association, Porto Alegre, RS, Brazil*.

Dairy Foods Chemistry

- M101 **Inhibition of lipid oxidation in fish oil-in-water emulsions by the combination of bovine and caprine caseins with phospholipids.**
Adela Mora-Gutierrez*, Rahmat Attaie, Sela Woldesenbet, and Jeneanne Kirven, *Prairie View A&M University, Prairie View, TX*.
- M102 **Obtaining of casein fractions by preparative ion-exchange chromatography on weak anion-exchangers.**
Andrij Iukalo¹, Orysa Tsisaryk*², and Volodymyr Yukalo¹, ¹*Ternopil Ivan Pulu National Technical University, Ternopil, Ukraine*, ²*Lviv National University of Veterinary Medicine and Biotechnology, Lviv, Ukraine*.
- M103 **Size distribution of casein micelles in raw skim milk from individual cows as studied using cryo-TEM.**
Maneesha S. Mohan* and Federico M. Harte, *Food Science Department, Pennsylvania State University, University Park, PA*.
- M104 **Effect of casein micelle dissociation and casein modification on plasmin-induced hydrolysis.**
Hemang Bhatt^{1,2}, Aurelie Cucheval¹, Christina Coker¹, Hasmukh Patel*³, Alistair Carr², and Rod Bennett², ¹*Fonterra Research and Development Centre, Palmerston North, New Zealand*, ²*Institute of Food, Nutrition and Human Health, Massey University, Palmerston North, New Zealand*, ³*Dairy Science Department, South Dakota State University, Brookings, SD*.
- M105 **The role of lactose and whey proteins in plasmin resistance of heat-treated milk.**
Hemang Bhatt^{1,2}, Aurelie Cucheval¹, Christina Coker¹, Hasmukh Patel*³, Alistair Carr², and Rod Bennett², ¹*Fonterra Research and Development Centre, Palmerston North, New Zealand*, ²*Institute of Food, Nutrition and Human Health, Massey University, Palmerston North, New Zealand*, ³*Dairy Science Department, South Dakota State University, Brookings, SD*.
- M106 **Oxidative stability of an Iranian ghee (butter fat) versus soybean oil during storage at different temperatures.**
Mahshid Azizi*¹, Maryam Enteshari², and Mohammadreza Dolatkhanjad³, ¹*Islamic Azad University of Birjand, Chemical Engineering and Food Industries Department, Tehran, Iran*, ²*Department of Food Science and Technology, Shahid Beheshti University of Medical Sciences, Tehran, Iran*, ³*Islamic Azad University of Ayatollah Amoli, Food Industries and Scientific Engineering Department, Tehran, Iran*.
- M107 **Effect of hydrodynamic cavitation on acid gelation properties of skim milk.**
Harsh Dahiya*¹, Hasmukh A. Patel¹, and Thom Huppertz^{1,2}, ¹*South Dakota State University, Brookings, SD*, ²*NIZO Food Research, Ede, the Netherlands*.
- M108 **Molar mass of a crude extract of *Streptococcus thermophilus* St-143 exopolysaccharide during fermentation of milk.**
Som N. Khanal*¹ and John A. Lucey^{1,2}, ¹*Food Science Department, University of Wisconsin-Madison, Madison, WI*, ²*Wisconsin Center of Dairy Research-Madison, Madison, WI*.
- M109 **Formation of hydroxymethylfurfural and other caramelization products during extrusion of lactose blends.**
Catrin E. Tyl, Elizabeth M. Reid, and Tonya C. Schoenfuss*, *University of Minnesota, St. Paul, MN*.

Forages and Pastures Silages and forages in dairy production systems

- M110 **Cool season grass-legume mixtures in north-central Florida.**
Erick R. S. Santos*¹, José C. B. Dubeux¹, Lynn E. Sollenberger², Marta M. Kohmann², Stephanie Pope², Hiran M. S. Silva¹, and Ana C. C. Melo¹, ¹*University of Florida-North Florida Research and Education Center (NFREC), Marianna, FL*, ²*University of Florida - Agronomy Department, Gainesville, FL*.

- M111 **Length of ensiling effects on fermentation characteristics, DM recovery and aerobic stability of corn Shredlage.**
Luis C. Solórzano*¹, Luis L. Solórzano², and Abner A. Rodríguez¹, ¹Universidad de Puerto Rico, Mayagüez, PR, ²Lankin, Fitchburg, WI.
- M112 **Fermentation of frozen whole-plant corn silage after defrosting.**
Luiz F. Ferraretto*¹, Gilson S. Dias Junior^{1,2}, John P. Goeser^{1,3}, and Randy D. Shaver¹, ¹University of Wisconsin, Madison, WI, ²Universidade Federal de Lavras, Lavras, MG, Brazil, ³Rock River Laboratory Inc., Watertown, WI.
- M113 **Length of ensiling effects on starch characteristics of corn Shredlage.**
Luis C. Solórzano*¹, Luis L. Solórzano², Beatriz A. Quintana¹, and Abner A. Rodríguez¹, ¹Universidad de Puerto Rico, Mayagüez, PR, ²Lankin, Fitchburg, WI.
- M114 **Relationship between corn silage processing score and kernel fraction geometric mean particle size in whole-plant corn silage.**
Gilson S. Dias Junior^{1,2}, Luiz F. Ferraretto*¹, Gustavo G. S. Salvati¹, Lucas C. de Resende^{1,2}, Pat C. Hoffman¹, and Randy D. Shaver¹, ¹University of Wisconsin, Madison, WI, ²Universidade Federal de Lavras, Lavras, MG, Brazil.
- M115 **The effects of different silo plastics on the fermentation, aerobic stability, and dry matter recovery of corn silage.**
Michelle Windle*, *Vita Plus, Madison, WI.*
- M116 **Length of ensiling effects on nutritional characteristics and in vitro NDF digestibility of corn Shredlage.**
Luis C. Solórzano*¹, Luis L. Solórzano², and Abner A. Rodríguez¹, ¹Universidad de Puerto Rico, Mayagüez, PR, ²Lankin, Fitchburg, WI.
- M117 **Ensiling practices of corn on California dairies.**
Jennifer M. Heguy*¹ and Noelia Silva-del-Rio², ¹University of California, Ag & Natural Resources, Modesto, CA, ²University of California, VMTRC, Tulare, CA.
- M118 **Investigation into the accuracy of a commercially available activity meter for measuring grazing duration.**
Emer Kennedy*, James Moloney, Donagh P. Berry, Michelle Liddane, and Frank Buckley, *Teagasc, Animal & Grassland Research and Innovation Centre, Moorepark, Fermoy, Co. Cork, Ireland.*
- M119 **Forage quality of two different pasture systems incorporating warm and cool season forages for grazing organic dairy cattle.**
Kathryn E. Ruh*^{1,2}, Bradley J. Heins^{1,2}, and Jim C. Paulson³, ¹West Central Research and Outreach Center, Morris, MN, ²University of Minnesota, St. Paul, MN, ³University of Minnesota Extension, Rochester, MN.
- M120 **Effect of starchy or fibrous carbohydrate supplementation of an herbage diet on ruminal fermentation and methane output in continuous culture.**
Kathy J. Soder*¹, Aimee N. Hafla¹, Andre F. Brito², Melissa D. Rubano¹, and Curtis J. Dell¹, ¹USDA-ARS, Pasture Systems and Watershed Management Research Unit, University Park, PA, ²University of New Hampshire, Durham, NH.
- M121 **Heifer growth performance from fall-oat pastures.**
Wayne K. Coblenz*¹, Geoff E. Brink², Nancy M. Esser³, Jason S. Cavadini³, and Patrick C. Hoffman⁴, ¹US Dairy Forage Research Center, Marshfield, WI, ²US Dairy Forage Research Center, Madison, WI, ³University of Wisconsin, Marshfield, WI, ⁴University of Wisconsin, Madison, WI.
- M122 **Fertilization of fall-grown oat with dairy slurry or urea.**
Wayne Coblenz*¹, William Jokela¹, and Jason Cavadini², ¹US Dairy Forage Research Center, Marshfield, WI, ²University of Wisconsin, Marshfield, WI.
- M123 **Effect of different ruminal incubation orders on in situ degradability of maize silage and alfalfa haylage in lactating dairy cows.**
Shuangzhao Dong*, Yang Zou, Yun Du, Yajing Wang, Shengli Li, and Zhijun Cao, *State Key Laboratory of Animal Nutrition, College of Animal Science and Technology, China Agricultural University, Beijing, China.*
- M124 **Productive performance and morphological composition of two genotypes of *Brachiaria* grazed by dairy calves in Mexico's Central Highlands.**
Francisca Avilés Nova*¹, Sandra A. Vencez González¹, Octavio A. Castelán Ortega², José M. Castro Salas³, and Luis M. Ríos García¹, ¹Centro Universitario UAEM-Temascaltepec, Temascaltepec, Estado de México, México, ²Facultad de Medicina Veterinaria y Zootecnia de la UAEM, Toluca, Estado de México, México, ³Unidad Académica de Ciencias Agropecuarias y Ambientales. Universidad Autónoma de Guerrero, Iguala de la Independencia, Estado de Guerrero, México.

- M125 **Effect of processing methods on in situ degradability of maize silage and alfalfa haylage in lactating dairy cows.**
Yang Zou*, Shuangzhao Dong, Yun Du, Yajing Wang, Shengli Li, and Zhijun Cao, *State Key Laboratory of Animal Nutrition, College of Animal Science and Technology, China Agricultural University, Beijing, China.*
- M126 **Effectiveness of plastic underlays with or without oxygen barrier properties in maintaining corn silage quality.**
Peter H. Robinson*¹, Nadia Swanepoel¹, and Jim Ralles², ¹*Department of Animal Science, University of California, Davis, CA,* ²*ARI, Belmont, CA.*
- M127 **Defining and measuring losses (shrink) from well-managed corn silage silos, and identifying stages in silo life where losses occur.**
Peter H. Robinson*¹, Nadia Swanepoel¹, Jennifer Heguy², and Deanne Meyer¹, ¹*Department of Animal Science, University of California, Davis, CA,* ²*UCCE Stanislaus, San Joaquin & Merced Counties, University of California, Davis, CA.*
- M128 **Effects of sealing time post-filling and sealing material on fermentation, nutritional quality, and organic matter loss of whole-plant corn ensiled in a drive-over pile.**
Katie Nutcher¹, Estela Uriarte², Keith K. Bolsen*², Ron Kuber³, and Connie Kuber³, ¹*California Polytechnic State University, San Luis Obispo, CA,* ²*Kansas State University, Manhattan, KS,* ³*Connor Agriscience, Clovis, CA.*

Graduate Student Competition
ADSA Production Division Graduate Student Poster Competition, MS
Chair: Jeffrey Firkins, The Ohio State University

- M129 **Transcriptome profiling of pituitary gland from pre- and post-pubertal beef heifers.**
Robmay Garcia*, Dianelys Gonzalez-Pena, Bruce R. Southey, and Sandra L. Rodriguez-Zas, *University of Illinois at Urbana Champaign, Urbana, IL.*
- M130 **Prepartum supplementation of niacin increases colostral immunoglobulin G content in dairy cows.**
Kayla M. Aragona*, Colleen E. Chapman, André B.D. Pereira, and Peter S. Erickson, *University of New Hampshire, Durham, NH.*
- M131 **Innate immune cells may be involved in bovine mammary development.**
Kirsten L. Beaudry*¹, Cathy L. Parsons¹, Adam J. Geiger¹, Steven E. Ellis², and R. Michael Akers¹, ¹*Department of Dairy Science, Virginia Polytechnic Institute and State University, Blacksburg, VA,* ²*Department of Animal and Veterinary Sciences, Clemson University, Clemson, SC.*
- M132 **An evaluation of precision dairy farming technologies monitoring rumination, feeding, and lying behaviors.**
Matthew R. Borchers*, I-Ching Tsai, Barbara A. Wadsworth, and Jeffrey M. Bewley, *University of Kentucky, Lexington, KY.*
- M133 **The effect of estrus expression on target genes in the endometrium, conceptus and corpus luteum of cows.**
Saeideh Davoodi*¹, Reinaldo F. Cooke², Arthur C. C. Fernandes¹, Bruno I. Cappellozza², Jose L. M. Vasconcelos³, and Ronaldo L. A. Cerri¹, ¹*Faculty of Land and Food Systems, University of British Columbia, Vancouver, BC, Canada,* ²*Eastern Oregon Agricultural Research Center, Oregon State University, Burns, OR,* ³*Faculdade de Medicina Veterinária e Zootecnia, UNESP – Botucatu, SP, Brazil.*
- M134 **Accuracy and intensity of heat detection with activity monitoring systems for lactating dairy cows.**
Craig LeRoy* and Stephen LeBlanc, *Department of Population Medicine, University of Guelph, Guelph, ON.*
- M135 **Extruded flaxseed products improve the fatty acid profile of bovine milk.**
Janna Moats*^{1,2}, Timothy Mutsvangwa², and David Christensen², ¹*O&T Farms Ltd, Regina, SK, Canada,* ²*University of Saskatchewan, Saskatoon, SK, Canada.*
- M136 **Prebiotic supplementation influences feed intake, body weight gain, and adaptive immunity in Holstein heifer calves during commingling.**
Caleigh E. Payne*, Luis G. D. Mendonça, Sonia J. Moisés, Sophia C. Trombetta, Lucas D. S. Rocha, Suzy Q. Fowler, Juan C. Gordienko, and Lindsey E. Hulbert, *Kansas State University, Manhattan, KS.*
- M137 **Supplementation of conjugated linoleic acid during the transition to lactation period increased milk production in a commercial dairy.**
Tawny L. Chandler*¹, Robert T. Fugate¹, Arnulf H. A. Troescher³, Joshua A. Jendza², and Heather M. White¹, ¹*University of Wisconsin-Madison, Madison, WI,* ²*BASF Corporation, Florham Park, NJ,* ³*BASF Corporation, Langerhagen, Germany.*

- M138 **Effects of plane of nutrition on glucose tolerance test kinetics pre- and postweaning in Holstein calves fed twice daily.**
Jayden A. R. MacPherson^{*1}, Harma Berendss², Leonel Leal², Javier Martin-Tereso², and Michael A. Steele¹, ¹University of Alberta, Edmonton, Alberta, Canada, ²Nutreco, Boxmeer, The Netherlands.
- M139 **Metabolic characteristics of protein, nutrient supply and feed milk value of the newly developed AAFC yellow and brown carinata lines for dairy cattle in comparison with commercial canola seeds.**
Yajing Ban^{*}, David A. Christensen, John J. McKinnon, and Peiqiang Yu, *Department of Animal and Poultry Science, College of Agricultural and Bioresources, University of Saskatchewan.*
- M140 **Responses of neonatal goats (kids) to different concentrations of carbon dioxide gas.**
Isabelle C. Withrock^{*}, Paul J. Plummer, Timothy A. Shepherd, Anna Johnson, Hongwei Xin, Johann F. Coetzee, and Suzanne T. Millman, *Iowa State University, Ames, IA.*
- M141 **Analyzing udder efficiency of Brown Swiss cattle using data envelopment analysis.**
Keith D. Gibson^{*} and Chad D. Dechow, *The Pennsylvania State University, State College, PA.*

Lactation Biology I

- M142 **Distribution and analysis of milk fat globule and crescent in Murrah buffalo and crossbred cow.**
Ratan K. Choudhary^{*}, Harmanjot Kaur, Shanti Choudhary, and Ramneek Verma, *School of Animal Biotechnology, Guru Angad Dev Veterinary and Animal Science University, Ludhiana, Punjab, India.*
- M143 **Fatty acid synthase (FASN) gene polymorphism and early lactation milk fat composition in Xinong Saanen goats.**
Abiel B. Haile^{*}, Zhang Wei, Wang Wei, Yang Dikun, Yi Yongqing, and Luo Jun, *Northwest A&F University, Yangling, Shaanxi, China.*
- M144 **Pattern of immunoglobulin A in milk from gorillas throughout lactation.**
M. Garcia^{*1}, M. L. Power², and K. M. Moyes¹, ¹Department of Animal and Avian Sciences, University of Maryland, College Park, MD, ²Smithsonian Conservation Biology Institute, Washington, DC.
- M145 **Peroxisome proliferator-activated receptor gamma (PPAR γ) agonist does not stimulate mammary lipogenic gene expression or overcome the effect of *trans*-10,*cis*-12 conjugated linoleic acid (CLA) in lactating ewes.**
Eveline C. Sandri¹, Elvis Ticiani¹, Monica Urrio¹, Maurício Camera¹, Ana P. Povaluk¹, Kevin J. Harvatine², and Dimas E. Oliveira^{*1}, ¹Santa Catarina State University/CAV, Lages, Santa Catarina, Brazil, ²Penn State University, State College, PA.
- M146 **Effect of *trans*-10,*cis*-12 CLA on the expression of genes involved in milk fat synthesis in ovine mammary gland tissue cultured in vitro.**
Monica Urrio, Ana P. Povaluk, Humberto T. Borges, June A. Favaretto, Maurício Camera, and Dimas E. Oliveira^{*}, *Santa Catarina State University/CAV, Lages, Santa Catarina, Brazil.*
- M147 **Gene expression of transcription factors and genes involved in milk fat depression in lactating ewes of different body weights fed the same dose of CLA *trans*-10,*cis*-12.**
Monica Urrio, Eveline C. Sandri, Ana P. Povaluk, Elvis Ticiani, Camila Renneberg, Maurício Camera, June A. Favaretto, and Dimas E. Oliveira^{*}, *Santa Catarina State University/CAV, Lages, Santa Catarina, Brazil.*
- M148 **Expression of acetyl-CoA carboxylase alpha (ACC α) transcripts from different promoters in mammary and adipose tissue from lactating ewes at different stages of lactation.**
Grégory J. Cardoso¹, Elvis Ticiani¹, Monica Urrio¹, Ana P. Povaluk¹, Maurício Camera¹, Rogério Ferreira², Kevin J. Harvatine³, and Dimas E. Oliveira^{*1}, ¹Santa Catarina State University/CAV, Lages, Santa Catarina, Brazil, ²Santa Catarina State University/CEO, Chapecó, Santa Catarina, Brazil, ³Penn State University, State College, PA.
- M149 **Effects of sodium salicylate on early lactation milk production parameters.**
Caroline M. Ylioja^{*}, Abigail J. Carpenter, Laman K. Mamedova, and Barry J. Bradford, *Department of Animal Sciences and Industry, Kansas State University, Manhattan, KS.*
- M150 **Effect of Leu and His on casein protein synthesis via mTOR signaling pathway in bovine mammary epithelial cells.**
Haina Gao^{1,2}, Han Hu^{1,3}, Nan Zheng^{1,3}, and Jiaqi Wang^{*1,3}, ¹Ministry of Agriculture-Milk Risk Assessment Laboratory, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ²College of Animal Science and Technology, Gansu Agricultural University, Lanzhou, Gansu, China, ³State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China.

- M151 **MicroRNA miR-200b regulates lactation and cell proliferation by concurrently targeting *Dnmt3a* and *Dnmt3b* in bovine mammary epithelial cells.**
Yanjie Bian, Chunmei Wang, Na Zhang*, Yingjun Cui, and Qingzhang Li, *Key Laboratory of Dairy Science, Ministry of Education, Northeast Agricultural University, Harbin, P.R. China.*
- M152 **MicroRNAs miR-181a and miR-194 can regulate the biosynthesis of milk fat and protein by targeting ACSL1 and STAT5a.**
S. Lian^{1,2}, X. M. Nan^{2,3}, D. P. Bu^{*2,4}, F. Wang², and J. R. Guo¹, ¹College of Animal Science and Veterinary Medicine, Heilongjiang Bayi Agricultural University, Daqing, Heilongjiang, China, ²State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ³Synergetic Innovation Center of Food Safety and Nutrition, Harbin, China, ⁴CAAS-ICRAF Joint Lab on Agroforestry and Sustainable Animal Husbandry, Beijing, China.
- M153 **Establishment of a mammary epithelial cell line from a Chinese Holstein dairy cow and effects of different concentrations of insulin-like growth factor-I on expression of genes related to milk synthesis.**
T. Qin¹, H. Y. Wang¹, D. P. Bu², and H. B. Zhu^{*1}, ¹Embryo Biotechnology and Reproduction Laboratory, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ²State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China.
- M154 **Influence of heat stress and amino acid supplementation on microRNA expression in bovine mammary epithelial cells.**
M. Duque^{*1}, A. A. K. Salama², and J. J. Loo³, ¹Grupo de Investigación Biogénesis and GRICA, Facultad de Ciencias Agrarias, Universidad de Antioquia, Medellín, Colombia, ²Grup de Recerca en Remugants (G2R), Departament de Ciència Animal i dels Aliments, Universitat Autònoma de Barcelona, Bellaterra, Spain, ³Department of Animal Sciences, University of Illinois, Urbana, IL.
- M155 **Characterization of prolactin and adrenergic and serotonergic receptors in bovine apocrine sweat glands.**
Courtney A. Burger, Jayne L. Collier, and Robert J. Collier*, *University of Arizona, Tucson, AZ.*
- M156 **RNA-sequencing analysis of milk somatic cells in heat-stressed dairy goats.**
A. A. K. Salama^{*1}, B. Badaoui², S. Hamzaoui¹, and G. Caja¹, ¹Grup de Recerca en Remugants (G2R), Departament de Ciència Animal i dels Aliments, Universitat Autònoma de Barcelona, Bellaterra, Spain, ²Integrative Biology Group, Parco Tecnologico Padano - CERSA, Lodi, Italy.

Meat Science and Muscle Biology

- M157 **Molecular background of differential expression of THRSF in bovine longissimus muscle.**
Lisa Schering*, Elke Albrecht, Yinuo Liu, Christa Kühn, Klaus Wimmers, and Steffen Maak, *FBN Dummerstorf, Dummerstorf, Germany.*
- M158 **Effects of feeding different sources of vegetable oils on meat quality traits of Nellore steers.**
Fabiane de Souza Costa^{*1}, Anderson Roberto Cabral¹, Marília Aparecida Izepe da Silva¹, Beatriz de Conti Fiorese¹, Danielle Leal Matarim¹, Saulo da Luz e Silva¹, and Angélica Simone Cravo Pereira², ¹University of Sao Paulo/Faculty of Animal Science and Food Engineering, Pirassununga, Sao Paulo, Brazil, ²University of Sao Paulo/School of Veterinary Medicine and Animal Science, Pirassununga, Sao Paulo, Brazil.
- M159 **Effects of beta agonist and immunocastration on fatty acid profile of cattle.**
Madeline Rezende Mazon*, Saulo da Luz Silva, Daniel Silva Antonelo, Keni Nubiato, Juan Fernando Morales Gomez, Roberta Ferreira Carvalho, and Paulo Roberto Leme, *University of São Paulo, Pirassununga, São Paulo, Brazil.*
- M160 **Growth and serial real-time ultrasound measurements for backfat and loin muscle area in three breeds of swine.**
L. L. Lo* and C. C. Tsai, *Chinese Culture University, Taipei, Taiwan.*
- M161 **Effects of gender status on beef quality from crossbred Angus x Nellore cattle.**
Lenise F. Mueller^{*1}, Júlio C. C. Balieiro¹, Adrielle M. Ferrinho¹, Joyce J. M. Furlan¹, Laura R. R. Mantilla³, Fernando S. Baldi², and Angélica S. C. Pereira¹, ¹University of Sao Paulo, Pirassununga, Sao Paulo, Brazil, ²Sao Paulo State University, Jaboticabal, Sao Paulo, Brazil, ³University Cooperative of Colombia, Medellín, Colombia.
- M162 **Influence of aging on intramuscular color variations in beef semimembranosus.**
Mahesh Narayanan Nair*, Shuting Li, Ryan Chaplin, Gregg Rentfrow, and Surendranath P. Suman, *University of Kentucky, Lexington, KY.*

- M163 **Effect of oil source and storage time on burger sensorial traits from Nellore cattle.**
Anderson R. Cabral*¹, Fabiane de Souza Costa¹, Maria E. Groto¹, Saulo da Luz e Silva¹, and Angélica S. Cravo Pereira², ¹University of Sao Paulo/FZEA, Pirassununga, SP, Brazil, ²University of Sao Paulo/FMVZ, Sao Paulo, SP, Brazil.
- M164 **Association of SNPs in the *THRSP* gene with morphological and biochemical traits of longissimus muscle in F₂ offspring of a Charolais x Holstein cross.**
Elke Albrecht*, Lisa Schering, Dirk Dannenberger, Gerd Nuernberg, Christa Kuehn, and Steffen Maak, *Leibniz Institute for Farm Animal Biology, Dummerstorf, Germany.*
- M165 **Meat quality of M. Longissimus dorsi of lambs fed with sunflower cake.**
Anny Graycy Vasconcelos de Oliveira Lima, Ronaldo Lopes de Oliveira*, Thadeu Mariniello Silva, Patrícia Gonçalves Cirqueira, and Marcondes Dias de Freitas Neto, *Federal University of Bahia, Salvador, Bahia, Brazil.*

Nonruminant Nutrition Amino acids

- M166 **Effects of arginine supplementation during early gestation (d 1 to 30) on litter size and plasma metabolites in gilts and sows.**
Jie Li¹, Huan Xia¹, Wei Yao¹, Tingting Wang¹, Jiliang Li², Xiangshu Piao¹, Phil Thacker³, Guoyao Wu⁴, and Fenglai Wang*¹, ¹State Key Laboratory of Animal Nutrition, Ministry of Agriculture Feed Industry Centre, China Agricultural University, Beijing, China, ²Tianjin National Breeding Pig Farm, Tianjin, China, ³Department of Animal Science, University of Saskatchewan, Saskatoon, SK, Canada, ⁴Department of Animal Science, Texas A&M University, College Station, TX.
- M167 **Limiting dietary lysine increased plasma concentration of total cholesterol in finishing pigs.**
Naresh Regmi*, Taiji Wang, Mark A. Crenshaw, Brian J. Rude, and Shengfa F. Liao, *Department of Animal and Dairy Sciences, Mississippi State University, Mississippi State, MS.*
- M168 **The effect of dietary protein and amino acid concentration on certain production parameters of growing ostrich chicks (*Struthio camelus*).**
Tertius S. Brand*^{1,2}, Pieter D. Carstens², and Louw C. Hoffman², ¹Directorate for Animal Sciences, Department of Agriculture, Western Cape Government, Elsenburg, South Africa, ²Department of Agricultural Sciences, Stellenbosch University, Stellenbosch, South Africa.
- M169 **Oral supplementation of tryptophan and pyridoxine to nursing piglets on performance and behavior after weaning.**
L. Bonagurio¹, P. C. Pozza*¹, T. J. Pasquetti², L. M. Diaz-Huepa¹, L. D. Castilha¹, L. A. C. Esteves¹, A. N. T. R. Monteiro¹, V. P. Ricardo¹, and N. Galoro¹, ¹Universidade Estadual de Maringá, Maringá, Paraná, Brazil, ²Universidade Estadual do Oeste do Paraná, Mchal Candido Rondon, Paraná, Brazil.
- M170 **Methionine + cysteine and its ratios for barrows from 15 to 30 kg.**
C. F. Muniz, P. C. Pozza*, A. C. Furlan, C. A. L. Oliveira, F. Sato, L. D. Castilha, L. A. C. Esteves, C. P. Sangali, and M. R. Fachinello, *Universidade Estadual de Maringá, Maringá, Paraná, Brazil.*
- M171 **Bioavailability of L-methionine relative to DL-methionine in weaned pigs.**
John K. Htoo*¹ and Georg Dusel², ¹Evonik Industries AG, Hanau-Wolfgang, Germany, ²University of Applied Sciences Bingen, Bingen am Rhein, Germany.
- M172 **Bioavailability of L-lysine sulfate compared with L-lysine·HCl to optimize performance of 12- to 25-kg pigs.**
J. P. Oliveira*¹, J. K. Htoo², L. F. T. Albino¹, M. I. Hannas¹, R. J. B. Rodrigueiro³, N. A. A. Barbosa³, and H. S. Rostagno¹, ¹Federal University of Viçosa, Viçosa, Minas Gerais, Brazil, ²Evonik Industries AG, Hanau-Wolfgang, Germany, ³Evonik Industries do Brasil, São Paulo, Brazil.
- M173 **Pig's biochemical plasmatic variables response to methionine ingestion in a phase-feeding program or an individual daily feeding program.**
Aline Remus*^{1,4}, Dani Perondi¹, Jaqueline P. Gobi¹, Ines Andretta², Luciano Hauschild¹, Marie-Pierre L. Montminy³, and Candido Pomar⁴, ¹FCAV-UNESP, Jaboticabal, SP, Brazil, ²UFRGS, Porto Alegre, RS, Brazil, ³Université Laval, Quebec, QC, Canada, ⁴AAFC, QC, Canada.

- M174 **Effects of dietary supplementation of branched-chain amino acids on growth performance, nitrogen balance, and whole-body protein turnover in piglets.**
Liufeng Zheng, Hongkui Wei*, Chuanshang Chen, Quanhang Xiang, and Jian Peng, *Department of Animal Nutrition and Feed Science, College of Animal Science and Technology, Huazhong Agricultural University, Wuhan, Hubei, China.*
- M175 **Standardized ileal digestibility of amino acids in single cell protein and tuna fish meal fed to growing pigs.**
A. R. Son* and B. G. Kim, *Konkuk University, Seoul, Republic of Korea.*
- M176 **Apparent and standardized ileal digestibility of amino acids in soybean meal and canola meal in finished pigs.**
Juan Edrei Sanchez*¹, Ignacio Arturo Dominguez¹, Ernesto Morales¹, Jose Luis Yañez², and Miguel Cervantes³, ¹*Universidad Autonoma del Estado de Mexico, Toluca, Estado de Mexico, Mexico*, ²*Universidad Autonoma de Tlaxcala, Tlaxcala, Tlaxcala, Mexico*, ³*Universidad Autonoma de Baja California, Mexicali, Baja California, Mexico.*
- M177 **Nutritional value of soybean products for growing pigs.**
Tofuko A. Woyengo*^{1,2}, Jorge Yañez^{1,3}, and Ruurd T. Zijlstra¹, ¹*University of Alberta, Edmonton, AB, Canada*, ²*South Dakota State University, Brookings, SD*, ³*Universidad Autónoma de Tlaxcala, Tlaxcala, México.*

Nonruminant Nutrition Enzymes and minerals

Sponsor: **DuPont**

- M178 **Porcine in vitro degradation and fermentation characteristics of regular and low-fat corn distillers dried grains with soluble without or with carbohydrase.**
Tofuko A. Woyengo*^{1,2}, Natasha Miceli¹, and Ruurd T. Zijlstra¹, ¹*University of Alberta, Edmonton, AB, Canada*, ²*South Dakota State University, Brookings, SD.*
- M179 **Nutrient digestibility of sorghum, with or without exogenous enzymes, for young broiler chickens.**
C. Gallardo, J. C. Dadalt*, J. C. C. Balieiro, and M. A. Trindade Neto, *University of São Paulo, Pirassununga, SP, Brazil.*
- M180 **Performance of commercial market hogs supplemented with a new generation *Buttiauxella* phytase.**
Janet C. Remus*¹, Yueming Dersjant-Li², Peter Plumstead³, and Ajay Awati², ¹*Danisco Animal Nutrition/DuPont Industrial Bioscience, St. Louis, MO*, ²*Danisco Animal Nutrition/DuPont Industrial Bioscience, Marlborough, Wiltshire, UK*, ³*University of Pretoria, Pretoria, South Africa.*
- M181 **Ileal amino acid digestibility in high protein sunflower meal and pea protein isolate fed to growing pigs with or without multi-carbohydrase supplementation.**
J. C. Dadalt*¹, D. E. Velayudhan¹, M. A. Trindade Neto², and C. M. Nyachoti¹, ¹*University of Manitoba, Winnipeg, MB, Canada*, ²*University of São Paulo, São Paulo, SP, Brazil.*
- M182 **Ileal amino acid digestibility in rice polished and broken fed to weaned pigs with or without multi-carbohydrase and phytase supplementation.**
J. C. Dadalt*¹, G. V. Polycarpo¹, C. Gallardo¹, T. W. Almeida¹, J. C. S. M. Souza¹, F. E. L. Budiño², and M. A. Trindade Neto¹, ¹*University of São Paulo, São Paulo, SP, Brazil*, ²*Institute of Animal Science, Nova Odessa, SP, Brazil.*
- M183 **Ileal amino acid digestibility in micronized full fat soybean fed to weaned pigs with or without multi-carbohydrase and phytase supplementation.**
J. C. Dadalt*¹, C. Gallardo¹, T. W. Almeida¹, P. A. P. Ribeiro¹, G. V. Polycarpo¹, G. Galvão¹, B. A. Malheiros¹, F. E. L. Budiño², and M. A. Trindade Neto¹, ¹*University of São Paulo, São Paulo, SP, Brazil*, ²*Institute of Animal Science, Nova Odessa, SP, Brazil.*
- M184 **Nutrient digestibility of rice bran, with or without exogenous enzymes, for young broiler chickens.**
C. Gallardo, J. C. Dadalt*, J. C. C. Balieiro, and M. A. Trindade Neto, *University of São Paulo, Pirassununga, SP, Brazil.*
- M185 **Effects of phosphorus source and content on bone mineralization and performance of broiler chickens.**
Roseline Kahindi*¹, Phil Thacker², and Martin Nyachoti¹, ¹*University of Manitoba, Winnipeg, MB, Canada*, ²*University of Saskatchewan, Saskatoon, SK, Canada.*

- M186 **A comparison of total, apparent total-tract digestible, and standardized total-tract digestible phosphorus on excretion and digestibility of phosphorus in pigs.**
W. B. Kwon*¹, S. K. Park², and B. G. Kim¹, ¹*Konkuk University, Seoul, Republic of Korea*, ²*Sejong University, Seoul, Republic of Korea*.
- M187 **Standardized total-tract digestibility of phosphorus in various inorganic phosphates fed to growing pigs.**
W. B. Kwon* and B. G. Kim, *Konkuk University, Seoul, Republic of Korea*.
- M188 **Effect of phosphorus and calcium depletion-repletion sequences on femoral mechanical properties in growing pigs.**
Enrique Gonzalo*^{1,2}, Thomas D. Crenshaw¹, Marie-Pierre Letourneau-Montminy², and Candido Pomar³, ¹*University of Wisconsin, Animal Sciences Department, Madison, WI*, ²*Laval University, Animal Sciences Department, Quebec, QC, Canada*, ³*Agriculture and Agri-food Canada, Sherbrooke, QC, Canada*.
- M189 **Effects of dietary calcium concentrations on growth performance, litter quality, and tibia characteristics in starter broiler chickens.**
Jong Hyuk Kim*¹, Byung Bo Lee¹, Moon Chan Kim¹, Jae Sang Um², and Dong Yong Kil¹, ¹*Chung-Ang University, Anseong-si, Gyeonggi-do, Republic of Korea*, ²*Nonghyup Feed, Gangdong-gu, Seoul, Republic of Korea*.
- M190 **Effects of dietary calcium concentrations on growth performance, litter quality, and tibia characteristics in growing broiler chickens.**
Jong Hyuk Kim¹, Byung Bo Lee*¹, Moon Chan Kim¹, Jae Sang Um², and Dong Yong Kil¹, ¹*Chung-Ang University, Anseong-si, Gyeonggi-do, Republic of Korea*, ²*Nonghyup Feed, Gangdong-gu, Seoul, Republic of Korea*.
- M191 **Determination of additivity of apparent and standardized total-tract digestibility of phosphorus in mixed diet fed to growing pigs.**
W. B. Kwon*¹, S. K. Park², and B. G. Kim¹, ¹*Konkuk University, Seoul, Republic of Korea*, ²*Sejong University, Seoul, Republic of Korea*.
- M192 **Effect of dietary calcium and phosphorus concentration on apparent ileal and total-tract digestibility of calcium and phosphorus of pigs.**
Fengrui Zhang*¹, Darryl Ragland², and Layi Adeola¹, ¹*Department of Animal Science, Purdue University, West Lafayette, IN*, ²*Department of Veterinary Clinical Sciences, Purdue University, West Lafayette, IN*.
- M193 **Influence of calcium source and fat level on broiler performance and nutrient utilization.**
O. El-Husseiny¹ and M. A. Michael*^{1,2}, ¹*Department of Animal Sciences, Cairo University, Egypt*, ²*Affor. and Environment, Ministry of Agriculture, Egypt*.
- M194 **Dietary nitrogen level affects ileal phosphorus digestion in growing pigs.**
Pengcheng Xue*¹, Darryl Ragland², Kolapo Ajuwon¹, and Olayiwola Adeola¹, ¹*Departments of Animal Sciences, Purdue University, West Lafayette, IN*, ²*Departments of Veterinary Clinical Sciences, West Lafayette, IN*.
- M195 **Could a reduction of crude protein content avoid the use of ZnO and antibiotics in pig diets without affecting their subsequent performance?**
Sergi López-Vergé, Laia Blavi*, David Solà-Oriol, José Francisco Pérez, and Josep Gasa, *Animal Nutrition and Welfare Service, Department of Animal and Food Sciences, Universitat Autònoma de Barcelona, Bellaterra, Spain*.
- M196 **Comparing zinc status, growth, and mortality in piglets fed with or without therapeutic doses of Zn oxide.**
Laia Blavi*, Sergi López-Vergé, David Solà-Oriol, and José Francisco Pérez, *Animal Nutrition and Welfare Service, Department of Animal and Food Sciences, Universitat Autònoma de Barcelona, Bellaterra, Spain*.
- M197 **Prediction equation to estimate digestible energy content of crude glycerin for swine based on chemical composition.**
Ciro A. Ordoñez-Gomez*¹, German Afanador-Tellez², and Claudia Ariza-Nieto³, ¹*Universidad Francisco de Paula Santander-Ocaña, Ocaña, Colombia*, ²*Universidad Nacional de Colombia, Bogota, Colombia*, ³*Corpoica, Mosquera, Colombia*.

Nonruminant Nutrition General I

- M198 **Effect of dietary gamma-aminobutyric acid on egg production, egg quality, blood profiles, cecal microbial populations and excreta gas emission in layers.**
J. H. Park*¹, B. Balasubramanian¹, S. Kathannan¹, J. H. Cho², and I. H. Kim¹, ¹*Department of Animal Resource & Science, Dankook University, Cheonan, Chungnam, South Korea*, ²*Department of Animal Science, Chungbuk National University, Cheongju, Chungbuk, South Korea*.
- M199 **Egg production, egg quality, blood profiles, cecal microflora, and excreta noxious gas emission in layer hens fed with fenugreek (*Trigonella foenum-graecum* L.) seed powder.**
J. H. Park*¹, P. Y. Zhao¹, H. L. Li¹, J. H. Cho², and I. H. Kim¹, ¹*Department of Animal Resource & Science, Dankook University, Cheonan, Choongnam, South Korea*, ²*Department of Animal Science, Chungbuk National University, Cheongju, Chungbuk, South Korea*.
- M200 **Effect of astaxanthin produced by *Phaffia rhodozyma* on growth performance, meat quality, and fecal noxious gas emission in broilers.**
M. M. Hossain*, M. Begum, H. Y. Shin, J. S. Jeong, M. Mohammadi, and I. H. Kim, *Department of Animal Resource & Science, Dankook University, Cheonan, Chungnam, South Korea*.
- M201 **Effect of protected organic acid blends on growth performance, nutrient digestibility and fecal micro flora in growing pigs.**
Y. H. Liu*¹, J. K. Kim¹, P. Y. Zhao¹, K. Y. Lee², and I. H. Kim¹, ¹*Department of Animal Resource & Science, Dankook University, Cheonan, Chungnam, South Korea*, ²*Morningbio Co., LTD, Cheonan, Chungnam, South Korea*.
- M202 **Effect of phytogenics on egg production, egg quality, excreta microbiota, noxious gas emission and nutrient digestibility in laying hens fed with different density diets.**
A. Hosseindoust*, H. L. Li, P. Y. Zhao, J. S. Jeong, and I. H. Kim, *Department of Animal Resource & Science, Dankook University, Cheonan, Chungnam, South Korea*.
- M203 **Effects of gel based phytogenic feed supplement on growth performance, nutrient digestibility, blood characteristics, and intestinal morphology in weanling pigs.**
P. Y. Zhao*¹, H. M. Yun¹, H. L. Li¹, J. D. Hancock², and I. H. Kim¹, ¹*Department of Animal Resource & Science, Dankook University, Cheonan, Chungnam, South Korea*, ²*Department of Animal Science & Industry, Kansas State University, Manhattan, KS*.
- M204 **Effect of medium chain fatty acids and probiotic (*Enterococcus faecium*) supplementation on the growth performance, nutrient digestibility, fecal score, fecal microflora, and fecal noxious gas emission in weanling pigs.**
P. Y. Zhao*, B. Balasubramanian, M. Begum, M. Mohammadi, and I. H. Kim, *Department of Animal Resource & Science, Dankook University, Cheonan, Chungnam, South Korea*.
- M205 **Effect of dietary protected organic acids on growth performance, nutrient digestibility, blood profiles, microflora, and gas emission in weanling pigs.**
P. Y. Zhao*¹, M. Mohammadi¹, K. Y. Lee², M. Begum¹, and I. H. Kim¹, ¹*Department of Animal Resource & Science, Dankook University, Cheonan, Chungnam, South Korea*, ²*Morningbio Co. Ltd, Cheonan, Chungnam, South Korea*.
- M206 **Effects of dietary fiber and benzoic acid on growth performance, nutrient digestibility, reduction of harmful gases, and lipid profiles in growing pigs.**
H. Y. Shin*¹, T. S. Li¹, J. Y. Cheong², C. M. Nyachoti³, and I. H. Kim¹, ¹*Department of Animal Resource & Science, Dankook University, Cheonan, Choongnam, South Korea*, ²*Daehan Feed Co. Ltd, Incheon, South Korea*, ³*Department of Animal Science, University of Manitoba, Winnipeg, Manitoba, Canada*.
- M207 **Ileal digestibility of nutrients and amino acids in conventional hulled (44% CP) and dehulled (48% CP) soybean meal treated with β -mannanase for growing pigs.**
S. Shanmugam*¹, J. K. Kim¹, H. M. Yun¹, J. H. Cho², and I. H. Kim¹, ¹*Department of Animal Resource & Science, Dankook University, Cheonan, Chungnam, South Korea*, ²*Department of Animal Science, Chungbuk National University, Cheongju, Chungbuk, South Korea*.
- M208 **Effect of flavor and sweetener on growth performance, nutrient digestibility, blood profile, and diarrhea score in weaning pigs.**
Y. Lei*¹, P. Y. Zhao¹, H. L. Li¹, C. M. Nyachoti², and I. H. Kim¹, ¹*Department of Animal Resource & Science, Dankook University, Cheonan, Chungnam, South Korea*, ²*Department of Animal Science, University of Manitoba, Winnipeg, Manitoba, Canada*.

Physiology and Endocrinology

Effects of nutrition and metabolism on ruminant reproduction

- M209 **Consistency of metabolic responses to nutrient deficiencies in early and mid-lactation of dairy cows.**
Josef J. Gross* and Rupert M. Bruckmaier, *Veterinary Physiology, Vetsuisse Faculty University of Bern, Bern, Switzerland.*
- M210 **Relationship of dietary and serum phosphorus during the transition period to fertility measures.**
Ellen R. Jordan¹, Kevin J. Lager^{1,2}, J. Armando Garcia Buitrago^{*3}, Don R. Toppliff⁴, and Pablo J. Pinedo⁵, ¹Texas A&M AgriLife Extension, Dallas, TX, ²West Texas A&M University, Canyon, TX, ³New Mexico State University, Clovis, NM, ⁴Angelo State University, San Angelo, TX, ⁵Texas A&M AgriLife Research, Amarillo, TX.
- M211 **Reproductive performance of lactating dairy cows with an extended duration of the postpartum voluntary waiting period and injectable trace mineral supplementation.**
Matias L. Stangaferro^{*1}, Robert Wijma¹, Magdalena Masello¹, Rodrigo C. Bicalho², Mark J. Thomas³, and Julio O. Giordano¹, ¹Department of Animal Science, Cornell University, Ithaca, NY, ²Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, NY, ³Dairy Health and Management Services, Lowville, NY.
- M212 **Resumption of ovarian cycle postpartum in dairy cows is affected by metabolic load in herbage-based feeding systems.**
Josef J. Gross^{*1}, Chiho Kawashima², Frigga Dohme-Meier³, Akio Miyamoto², and Rupert M. Bruckmaier¹, ¹Veterinary Physiology, Vetsuisse Faculty, Bern, Switzerland, ²Obihiro University of Agriculture & Veterinary Medicine, Obihiro, Japan, ³Agroscope Institute for Livestock Sciences ILS, Posieux, Switzerland.
- M213 **Blood β -hydroxybutyrate (BHBA) concentrations during the first two weeks after calving affect pregnancy establishment in postpartum dairy cows.**
Monica O. Caldeira^{*1}, Matthew C. Lucy¹, Ricardo O. Rodrigues¹, and Scott E. Pooch², ¹Division of Animal Sciences, University of Missouri, Columbia, MO, ²College of Veterinary Medicine, University of Missouri, Columbia, MO.
- M214 **Effects of prepartum diets supplemented with oilseeds on reproductive performance in dairy cows.**
R. Salehi^{*1}, M. G. Colazo², M. Oba¹, and D. J. Ambrose^{1,2}, ¹University of Alberta, Edmonton, Alberta, Canada, ²Alberta Agriculture and Rural Development, Edmonton, Alberta, Canada.
- M215 **Distribution of fatty acids in reproductive tissues of cows fed flax-, canola-, or sunflower seed-based rations.**
Patricia A. Dutra^{1,2}, Mohanathas Gobikrushanth^{*2}, Reza Salehi², Marcos G. Colazo³, and Divakar J. Ambrose^{2,3}, ¹Departamento de Zootecnia, Universidade Federal da Bahia, Salvador, Bahia, Brazil, ²Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, Alberta, Canada, ³Livestock Research Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta, Canada.
- M216 **Fatty acid profile in follicular fluid and serum of dairy cows fed diets supplemented with rolled canola, sunflower or flax seed.**
Patricia A. Dutra^{1,2}, Mohanathas Gobikrushanth^{*2}, Reza Salehi², Marcos G. Colazo³, and Divakar J. Ambrose^{3,2}, ¹Departamento de Zootecnia, Universidade Federal da Bahia, Salvador, Bahia, Brazil, ²Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, Alberta, Canada, ³Livestock Research Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta, Canada.
- M217 **Effects of rumen-protected methionine and choline supplementation on gene expression of follicular cells of the first postpartum dominant follicle.**
Diego A. Velasco Acosta^{*1,2}, Ines M. Rivelli², Cassandra Skenandore², Daniel Luchini³, Marcio Corrêa¹, and Felipe Cardoso², ¹Universidade Federal de Pelotas, Pelotas, Rio Grande do Sul, Brazil, ²University of Illinois, Urbana, IL, ³Adisseo NA, Alpharetta, GA.
- M218 **Effect of yeast culture plus enzymatically hydrolyzed yeast supplementation starting prepartum on acute phase protein profiles and reproductive performance in dairy cows.**
Vanessa Oliveira Freitas¹, Claudia Faccio Demarco¹, Tatiele Mumbach¹, Eduardo Gulate Xavier², Raquel Fraga Silva Raimondo³, Fernanda Medeiros Gonçalves¹, Francisco Augusto Burkert Del Pino¹, Viviane Rohrig Rabassa¹, Sangita Jalukar⁴, Marcio Nunes Corrêa¹, and Cassio Cassal Brauner^{*1}, ¹Universidade Federal de Pelotas, NUPEEC, Pelotas, RS, Brazil, ²Granjas 4 Irmãos S/A, Rio Grande, RS, Brazil, ³Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil, ⁴Arm & Hammer Animal Nutrition, Princeton, NJ.
- M219 **Nutritional level of the recipient ewe, but not of the donor, determines the embryo fate when good quality embryos are transferred.**
Victoria de Brun^{*1}, Ana Meikle¹, Fernando Forcada², Inmaculada Palacín², Cecilia Sosa³, and José Alfonso Abecia², ¹Laboratorio de Técnicas Nucleares, Montevideo, Uruguay, ²Departamento de Producción Animal y Ciencia de los Alimentos, Zaragoza, Spain, ³Departamento de Anatomía Patológica, Medicina Legal y Forense y Toxicología, Zaragoza, Spain.

- M220 **Evaluation of the hypothalamic kisspeptin system during the attainment of puberty in gilts.**
Eric S. Jolitz*¹, Waljit S. Dhillon², and Jeffrey A. Clapper¹, ¹South Dakota State University, Brookings, SD, ²Imperial College, London, UK.
- M221 **Ovine maternal nutrient restriction from mid to late gestation induces steroid metabolizing enzyme activity in maternal and fetal reproductive and liver tissues.**
Megan P. T. Coleson*¹, Christa L. Gilfeather¹, Kimberly A. Vonnahme², and Caleb O. Lemley¹, ¹Department of Animal and Dairy Sciences, Mississippi State University, Mississippi State, MS, ²Department of Animal Sciences, North Dakota State University, Fargo, ND.
- M222 **Effects of maternal nutrient restriction on bovine placentome and miRNA expression during mid-gestation.**
Regina K. Taylor*, Kayla S. Mangrum, Christopher T. LeMaster, Scott L. Pratt, and Nathan M. Long, Clemson University, Clemson, South Carolina.
- M223 **Maternal overnutrition/obesity (MO) in the ewe has multigenerational metabolic programming effects on adult granddaughters (F₂).**
Megan A. Walton*, John F. Odhiambo, Peter W. Nathanielsz, and Stephen P. Ford, Department of Animal Science, University of Wyoming, Laramie, WY.
- M224 **Effect of prepartum dam supplementation, creep-feeding and post-weaning diet on age at puberty in Nelore heifers.**
Marcos V. C. Ferraz Junior*¹, Delci D. Nepomuceno^{2,1}, Marcos V. Biehl², Alexandre V. Pires^{2,1}, Marcelo H. Santos¹, Renan G. Silva¹, Vinicius N. Gouvea¹, Jose R. S. Goncalves³, Thiago S. Andrade¹, and Michael L. Day⁴, ¹University of São Paulo, Pirassununga, São Paulo, Brazil, ²University of São Paulo, Piracicaba, São Paulo, Brazil, ³Experimental Station Hildegard Georgina Von Pritzelwitz, Londrina, Paraná, Brazil, ⁴The Ohio State University, Columbus, OH.
- M225 **Effect of prepartum dam supplementation and creep-feeding on age at puberty in Nelore heifers.**
Elizangela M. Moreira¹, Alexandre V. Pires^{2,1}, Delci D. Nepomuceno², Marcos V. C. Ferraz Junior*¹, Jose A. Faleiro Neto¹, Marcos V. Biehl², Jose R. S. Goncalves³, Renan G. Silva¹, Marcelo H. Santos¹, Vinicius N. Gouvea¹, and Michael L. Day⁴, ¹University of São Paulo, Pirassununga, São Paulo, Brazil, ²University of São Paulo, Piracicaba, São Paulo, Brazil, ³Experimental Station Hildegard Georgina Von Pritzelwitz, Londrina, Paraná, Brazil, ⁴The Ohio State University, Columbus, OH.
- M226 **Effect of energy supplementation on plasmatic concentration of leptin in pre-pubertal beef heifers.**
Maria Carolina V. Miguel*¹, Siobhan W. Walsh², Henri F. Costa¹, Juliana S. Souza¹, Rafael S. Cipriano¹, David Giraldo-Arana¹, Marcos Antônio Maioli¹, Devani M. Pinheiro¹, Alexander C. Evans², and Guilherme P. Nogueira¹, ¹São Paulo State University, Araçatuba, SP, Brazil, ²University College Dublin, Dublin, Ireland.
- M227 **Form of selenium in free-choice mineral mixes affects ovarian production of progesterone but not estradiol in cycling beef cows.**
Phillip J. Bridges*¹, Katheryn L. Cerny¹, Michelle Rhoads², Leslie H. Anderson¹, Walter R. Burris¹, and James C. Matthews¹, ¹University of Kentucky, Lexington, KY, ²Virginia Polytechnic Institute and State University, Blacksburg, VA.
- M228 **Relationship between plasma amino acid profile and ovarian function around the time of ovulation in beef cows.**
Taylor C. Geppert*¹, Allison M. Meyer², George A. Perry³, and Patrick J. Gunn¹, ¹Department of Animal Science, Iowa State University, Ames, IA, ²Division of Animal Sciences, University of Missouri, Columbia, MO, ³Department of Animal Sciences, South Dakota State University, Brookings, SD.
- M229 **Association between circulating blood or plasma urea nitrogen concentrations and reproductive efficiency in beef heifers and cows.**
Patrick J. Gunn*¹, Allie L. Lundberg¹, Robert A. Cushman², Harvey C. Freetly², Olivia L. Amundson³, Julie A. Walker³, and George A. Perry³, ¹Department of Animal Science, Iowa State University, Ames, IA, ²USDA, ARS, US Meat Animal Research Center, Clay Center, NE, ³Department of Animal Sciences, South Dakota State University, Brookings, SD.

Physiology and Endocrinology

Estrous synchronization and detection of estrus in cattle

- M230 **Efficacy of PGF_{2α} doses to induce luteolysis on day 5, 7, or 9 of estrus cycle in nonlactating Nelore cows.**
Marcos V. Biehl^{*1}, Alexandre V. Pires^{1,2}, Marcos V. C. Ferraz Junior², Jose R. S. Gonçalves³, Anibal B. Nascimento¹, Marcelo H. Santos², Vinicius N. Gouvea², Alexandre A. Miszura², Leandro H. Cruppe⁴, and Michael L. Day⁴, ¹University of São Paulo, Piracicaba, São Paulo, Brazil, ²University of São Paulo, Pirassununga, São Paulo, Brazil, ³Experimental Station Hildegard Georgina Von Pritzelwitz, Londrina, Paraná, Brazil, ⁴The Ohio State University, Columbus, OH.
- M231 **Addition of gonadotropin-releasing-hormone treatment at the beginning and/or at the end of an estradiol-based protocol for timed artificial insemination in Nelore (*Bos indicus*) cows.**
Carla Cristian Campos^{*}, Estevão Vieira de Rezende, Mayara Oliveira, Renata de Freitas Ferreira Mohallem, and Ricarda Maria dos Santos, *Federal University of Uberlândia, Uberlândia, Minas Gerais, Brazil.*
- M232 **Using estrus-detection patches to optimally time artificial insemination improved pregnancy rates in suckled beef cows in a timed AI program.**
Scott L. Hill^{*1}, David M. Grieger¹, K. C. Olson¹, John R. Jaeger¹, Jason K. Ahola², Mariah C. Fischer², Teresa L. Steckler³, G. Allen Bridges⁴, Jamie A. Larson⁵, Carl R. Dahlen⁶, Sarah R. Underdahl⁶, George A. Perry⁷, William D. Whittier⁸, John F. Currin⁸, Jeffrey S. Stevenson¹, ¹Kansas State University, Manhattan, KS, ²Colorado State University, Fort Collins, CO, ³University of Illinois, Dixon Springs, IL, ⁴University of Minnesota, Grand Rapids, MN, ⁵Mississippi State University, Mississippi State, MS, ⁶North Dakota State University, Fargo, ND, ⁷South Dakota State University, Brookings, SD, ⁸Virginia Tech, Blacksburg, VA.
- M233 **Treatment of primiparous lactating dairy cows with GnRH before first insemination during summer heat stress.**
Benjamin E. Voelz^{*}, Lucas Rocha, Filipe Scortegagna, Jeffrey S. Stevenson, and Luís G. D. Mendonça, *Department of Animal Sciences and Industry, Kansas State University, Manhattan, KS.*
- M234 **Treatment of multiparous lactating dairy cows with GnRH before first insemination during summer heat stress.**
Benjamin E. Voelz^{*}, Lucas Rocha, Filipe Scortegagna, Jeffrey S. Stevenson, and Luís G. D. Mendonça, *Department of Animal Sciences and Industry, Kansas State University, Manhattan, KS.*
- M235 **Presynchronization strategy using prostaglandin F_{2α} and GnRH to improve fertility in a resynchronization program based on detection of estrus.**
Lucas S. Rocha, Jeffrey S. Stevenson, and Luís G. D. Mendonça^{*}, *Department of Animal Sciences and Industry, Kansas State University, Manhattan, KS.*
- M236 **Progesterone concentration at each treatment during an Ovsynch protocol affects fertility to timed AI in lactating Holstein cows.**
P. D. Carvalho^{*}, A. H. Souza, M. C. Wiltbank, and P. M. Fricke, *Department of Dairy Science, University of Wisconsin-Madison, Madison, WI.*
- M237 **Timed AI improves reproductive performance and reduces cost per pregnancy in dairy heifers.**
Thiago V. Silva¹, Fabio S. Lima², William W. Thatcher¹, and Jose E. P. Santos^{*1}, ¹University of Florida, Gainesville, FL, ²University of Illinois, Urbana, IL.
- M238 **Addition of a second dose of prostaglandin F_{2α} to a fixed-time AI protocol improves fertility of anestrous dairy cows.**
Francisco R. Lopes^{*}, Marcos H. C. Pereira, Anderson K. Munhoz, and José L. M. Vasconcelos, *Sao Paulo State University, Botucatu, SP, Brazil.*
- M239 **Effect of a second treatment with prostaglandin F_{2α} during the Ovsynch protocol on pregnancy to the timed AI.**
Fenella Cochrane^{*1}, Giovanni M. Baez², Cheryl R. Trayford¹, Robert T. Joseph¹, and Milo C. Wiltbank², ¹Parnell Corporate Services US Inc., Overland Park, KS, ²University of Wisconsin-Madison, Madison, WI.
- M240 **Efficacy of different fixed-time AI protocols using GnRH, estradiol, and progesterone in lactating dairy cows.**
Leonardo F. Melo^{*1,2}, Pedro Leopoldo Monteiro¹, Jessica N. Drum¹, Ricardo S. Surjus¹, Milo C. Wiltbank², and Roberto Sartori¹, ¹University of São Paulo, Piracicaba, São Paulo, Brazil, ²University of Wisconsin-Madison, Madison, WI.
- M241 **The use of a modified 5-day CIDR-Cosynch protocol for resynchronization in lactating dairy cows.**
J. A. Spencer^{*1}, K. G. Carnahan¹, B. Shafii¹, C. Claypool¹, J. C. Dalton², and A. Ahmadzadeh¹, ¹University of Idaho, Moscow, ID, ²University of Idaho, Caldwell, ID.
- M242 **Assessment of an application for mobile devices developed to evaluate the AI procedure.**
Santiago Bas^{*} and Gustavo M. Schuenemann, *Department of Veterinary Preventive Medicine, College of Veterinary Medicine, The Ohio State University, Columbus, OH.*

- M243 **Estradiol and GnRH on ovulation induction in crossbred cows estrus synchronized.**
Fabrício Albani Oliveira, Jurandy Mauro Penitente Filho, Erly Luisana Triana Carrascal, Carlos Thiago Oliveira, Adriana Moreira Zolini, Italo Augusto da Costa Soares, and Ciro Alexandre Alves Torres*, *Federal University of Viçosa, Viçosa, MG, Brazil.*
- M244 **Effect of estrous synchronization program, season, body condition score and ovarian status on pregnancy rate to fixed-time AI in beef cows.**
Federico Randi*^{1,2}, Mervyn Parr², Peter Doolan², Michael G. Diskin², Alessio Valenza³, Pedro Rodriguez³, Pat Lonergan¹, and David A. Kenny², ¹*University College Dublin, Dublin, Ireland*, ²*AGRIC Teagasc Grange, Dunsany, Meath, Ireland*, ³*CEVA Sante Animale, Libourne, France.*
- M245 **Body weight loss of cows early postpartum is associated with negative effects on estrous expression.**
Tracy A. Burnett*, Muhammad A. Khan, Marina A. G. von Keyserlingk, and Ronaldo L. A. Cerri, *University of British Columbia, Vancouver, BC, Canada.*
- M246 **Automated detection of estrus using multiple commercial precision dairy farming technologies in synchronized dairy cows.**
L. M. Mayo*, W. J. Silvia, G. Heersche, I. C. Tsai, B. A. Wadsworth, A. E. Stone, and J. M. Bewley, *Department of Animal and Food Sciences, University of Kentucky, Lexington, KY.*
- M247 **Using the Draminski Estrous Detector in the dry cow to measure electrical resistance of vaginal mucus as it relates to animal factors pre- and postcalving.**
Caitlin L. Widener*, William M. Graves, and Jillian F. Bohlen, *University of Georgia, Athens, GA.*
- M248 **Estrus lying behavior of Holstein cows: Risk factors for estrus expression, ovulation risk and pregnancy per AI.**
Bruna F. Silper*¹, Augusto M. L. Madureira², Liam B. Polsky¹, Eraldo L. Drago Filho², José L. M. Vasconcelos², and Ronaldo L. A. Cerri¹, ¹*Faculty of Land and Food Systems, University of British Columbia, Vancouver, BC, Canada*, ²*Faculdade de Medicina Veterinária e Zootecnia, UNESP, Botucatu, SP, Brazil.*
- M249 **Characterization of ovarian function in nonpregnant previously inseminated lactating dairy cows.**
Robert Wijma*, Matias L. Stangaferro, and Julio O. Giordano, *Department of Animal Science, Cornell University, Ithaca, NY.*
- M250 **The effects of ovulatory status of the dominant follicle and spatial relationship of the corpus luteum on diameter and average growth rate of that dominant follicle.**
Ashleigh M. Muth-Spurlock*, Garrett F. Cline, Caleb O. Lemley, and Jamie E. Larson, *Mississippi State University, Mississippi State, MS.*

Production, Management, and the Environment I

- M251 **Canadian dairy producers' transition to automatic milking systems: preliminary results of a national survey.**
Christina Tse*¹, Trevor DeVries², Elsa Vasseur³, Herman Barkema¹, and Ed Pajor¹, ¹*Department of Production Animal Health, University of Calgary, Calgary, AB, Canada*, ²*Department of Animal and Poultry Science, University of Guelph, Kemptville, ON, Canada*, ³*Organic Dairy Research Centre, University of Guelph, Alfred, ON, Canada.*
- M252 **A stochastic dairy farm model to evaluate the effect of changes in technical or economic factors on performance and benefits.**
Sergio Calsamiglia*¹, Susana Astiz², Lorena Castillejos¹, Carlos Lopez de Toro¹, and Joaquim Baucells³, ¹*Universitat Autònoma de Barcelona, Bellaterra, Spain*, ²*INIA, Madrid, Spain*, ³*Centre Veterinari Tona, Tona, Spain.*
- M253 **Changes in temperature-humidity index and number of hot days related to heat stress of dairy cattle in Thailand.**
Thirarat Sae-tiao¹, Skorn Koonawootrittriron*¹, Thanathip Suwanasopee¹, and Mauricio A. Elzo², ¹*Kasetsart University, Bangkok, Thailand*, ²*University of Florida, Gainesville, FL.*
- M254 **Checks and balances: Evaluating reliability of dairy nutrient management data to better protect groundwater resources.**
Christine Miller* and Deanne Meyer, *University of California, Davis, Davis, CA.*
- M255 **Reproductive performance of North American dairies by geographic region.**
Cristian F. Vergara*^{1,2}, Flavio Bitencourt¹, Lydia M. Johnson¹, Diego Vallejo¹, and Hernando Lopez¹, ¹*ABS Global Inc., DeForest, WI*, ²*ABS Chile Ltda, Santiago, Chile.*

- M256 **Lactation stage alters the rumen protozoal communities in three breeds of primiparous dairy cattle.**
L. M. Cersosimo*¹, M. Bainbridge¹, A.-D. G. Wright², and J. Kraft¹, ¹University of Vermont, Burlington, VT, ²University of Arizona, Tucson, AZ.
- M257 **Quality of hatching eggs from different broiler breeder ages.**
Vanessa Michalsky Barbosa*¹, Bruno Delphino Medrado^{1,2}, Isabela Cláudia Barbosa Santos¹, Larissa Kiana Santos Azevedo Martins¹, Taís Pinheiro Borges Silva¹, Tayana Nery Franca¹, Silvania Belo Dourado¹, Juliana Cantos Faveri¹, and Lia Muniz Barretto Fernandes³, ¹Department of Animal Science, Faculty of Veterinary Medicine and Animal Science, Federal University of Bahia, Salvador, Bahia, Brazil, ²Federal Institute of Education, Science and Technology—Santa Inês Campus, Santa Inês, Bahia, Brazil, ³Department of Animal Production, Faculty of Veterinary Medicine and Animal Science, Federal University of Bahia, Salvador, Bahia, Brazil.
- M258 **Effects of turning duration during incubation and broiler breeder age on hatchability, chick organs, and poultry performance.**
Vanessa Michalsky Barbosa*¹, Bruno Delphino Medrado^{1,2}, Mariana André Pompeu³, Júlia Sampaio Rodrigues Rocha³, Edgard Onoda Luiz Caldas³, Genilson Bezerra Carvalho⁴, Leonardo José Camargos Lara³, and Nelson Carneiro Baião³, ¹Department of Animal Science, Faculty of Veterinary Medicine and Animal Science, Federal University of Bahia, Salvador, Bahia, Brazil, ²Federal Institute of Education, Science and Technology—Santa Inês Campus, Santa Inês, Bahia, Brazil, ³Department of Animal Science, Veterinary School, Federal University of Minas Gerais, Belo Horizonte, Minas Gerais, Brazil, ⁴Department of Animal Science, Veterinary Medicine and Animal Science School, Federal University of Goiás, Goiânia, Goiás, Brazil.
- M259 **Health, milk yield and quality for Parmigiano Reggiano cheese evaluated in cows fed OmniGen-AF from dry-off to 150 days in milk.**
Ludovica M. E. Mammi*, Mattia Fustini, Elena Bonfante, Alberto Palmonari, Giorgia Canestrari, and Andrea Formigoni, Department of Veterinary Medical Sciences, University of Bologna, Ozzano Emilia, Italy.
- M260 **Body weight gain of dairy heifers fed diets with *Origanum vulgare* or *Camellia sinensis* extracts.**
Vivian Fischer*¹, Giovanni Jacob Kolling¹, Débora Strider¹, Dejeni Maira Panazzolo¹, Carolina da Silva dos Santos¹, Alexandre Mossate Gabbi¹, Mateus Wanderer¹, Andress Sopelsa¹, and Renata Wolf Sune Martins da Silva², ¹Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil, ²Empresa Brasileira de Pesquisa Agropecuária, Bagé, RS, Brazil.
- M261 **Effect of cow BCS during gestation on performance variables of the offspring.**
Rodrigo Marques*, Reinaldo Cooke, Murilo Rodrigues, Bruno Cappellozza, and David Bohnert, Oregon State University-EOARC, Burns, OR.
- M262 **A comparison of two evaporative cooling systems on a commercial dairy farm in Saudi Arabia.**
Xavier A. Ortiz*¹, John F. Smith¹, Fernando Villar¹, Laun W. Hall¹, Jamison D. Allen², Andrew Odde³, Adnan al-Haddad³, Peter Lyle⁴, and Robert Collier¹, ¹The University of Arizona, Tucson, AZ, ²Northwest Missouri State University, Maryville, MO, ³Al Safi Dairy Company, Al-Kharj, Kingdom of Saudi Arabia, ⁴Schaefer Ventilation Equipment, Sauk Rapids, MN.
- M263 **Association between changes in body condition score and back fat thickness during the transition period with fertility and health events in Holstein cows.**
P. D. Carvalho* and P. M. Fricke, Department of Dairy Science, University of Wisconsin-Madison, Madison, WI.
- M264 **Effect of an automated teat preparation system on teat skin bacterial counts.**
Cecilia Baumberger* and Pamela L. Ruegg, University of Wisconsin, Madison, WI.
- M265 **Effect of timing of insemination of lactating Jersey cows with sex-sorted semen on probability of pregnancy.**
Gabriel D. Bombardelli¹, Henrique F. Soares¹, and Ricardo C. Chebel*^{1,2}, ¹University of Minnesota, St Paul, MN, ²University of Florida, Gainesville, FL.
- M266 **Determining the effect of transporting dairy cattle after calving on production and reproduction performance.**
Danilo Domingues Millen*¹, Joaquim Baucells², and Sergio Calsamiglia³, ¹Sao Paulo State University, Dracena, Sao Paulo, Brazil, ²Centre Veterinari Tona, Tona, Spain, ³Animal Nutrition and Welfare Service, Universitat Autònoma de Barcelona, Bellaterra, Spain.
- M267 **Antibiotic resistance of *Escherichia coli* isolated from gastrointestinal tracts of dairy calves fed waste milk or milk replacer.**
Georgina Maynou¹, Anna Arís¹, Alex Bach*^{1,2}, Francesc Fàbregas¹, Alba Ferré¹, and Marta Terré¹, ¹Institut de Recerca i Tecnologia Agroalimentàries, Caldes de Montbui, Spain, ²Institució Catalana de Recerca i Estudis Avançats, Barcelona, Spain.
- M268 **Effect of feeding calves waste milk on antibiotic resistance patterns of fecal *Escherichia coli*.**
Georgina Maynou¹, David Ziegler*³, Hugh Chester-Jones³, Alex Bach*^{2,1}, and Marta Terré¹, ¹Institut de Recerca i Tecnologia Agroalimentàries, Caldes de Montbui, Spain, ²Southern Research and Outreach Center, Waseca, MN, United States, ³Institució Catalana de Recerca i Estudis Avançats, Barcelona, Spain.

- M269 **Fatty acid profile of bulk milk samples in commercial dairy herds in Quebec, Canada.**
Melissa Duplessis*, Debora E. Santschi, Rene Lacroix, and Daniel M. Lefebvre, *Valacta, Ste-Anne-de-Bellevue, QC, Canada.*
- M270 **Determination of β -hydroxybutyrate concentration in hand-stripped milk samples taken at different times relative to milking.**
Melissa Duplessis*, Debora E. Santschi, Jean Durocher, and Daniel M. Lefebvre, *Valacta, Ste-Anne-de-Bellevue, QC, Canada.*
- M271 **Prevalence of *Salmonella* and *Campylobacter* from composite fecal samples on US dairy operations.**
Charles P. Fossler¹, Jason E. Lombard*¹, Paula J. Fedorka-Cray^{2,3}, Jodie R. Plumblee², Christine A. Koprak¹, and R. Camilla Kristensen¹, ¹USDA:APHIS:VS: Center for Epidemiology and Animal Health, Fort Collins, CO, ²USDA:ARS:Bacterial Epidemiology and Antimicrobial Resistance Research Unit, Athens, GA, ³North Carolina State University, Raleigh, NC.
- M272 **Off-site dairy heifer rearing in the United States.**
Jason E. Lombard*¹, Ashley E. Adams^{1,2}, Charles P. Fossler¹, Natalie J. Urie^{1,2}, Chelsey B. Shivley^{1,2}, and Christine A. Koprak¹, ¹USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO, ²Colorado State University, Fort Collins, CO.
- M273 **Management practices that may affect dairy heifer welfare on US dairy operations.**
Ashley E. Adams*^{1,2}, Jason E. Lombard², Chelsey S. Shivley^{1,2}, Natalie J. Urie^{1,2}, Ivette N. Roman-Muniz¹, Charles P. Fossler², and Christine A. Koprak², ¹Colorado State University, Fort Collins, CO, ²USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO.
- M274 **Management practices that may affect dairy cow welfare on US dairy operations.**
Ashley E. Adams*^{1,2}, Jason E. Lombard², Ivette N. Roman-Muniz¹, Charles P. Fossler², and Christine A. Koprak², ¹Colorado State University, Fort Collins, CO, ²USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO.
- M275 **Evaluation of colostrum management, feeding management, and weaning practices on US dairy operations.**
Chelsey B. Shivley*^{1,2}, Jason E. Lombard², Ashley E. Adams^{1,2}, Natalie J. Urie^{1,2}, Charles P. Fossler², and Christine A. Koprak², ¹Colorado State University, Fort Collins, CO, ²USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO.
- M276 **Locomotion scoring dairy cows: A comparison among three different locomotion scoring on intra- and interrater reliability.**
Ashley E. Adams*^{1,2}, Jason E. Lombard², and Ivette N. Roman-Muniz¹, ¹Colorado State University, Fort Collins, CO, ²USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO.
- M277 **Association between changes in body condition score, NEFA, and BHBA concentrations during the transition period on fertility of Holstein cows.**
R. V. Barletta*^{1,2}, P. D. Carvalho¹, M. Madureira³, T. A. Del Vale², E. R. Madureira³, A. S. Netto², G. M. Baez¹, P. M. Fricke¹, and M. C. Wiltbank¹, ¹Department of Dairy Science, University of Wisconsin-Madison, Madison, WI, ²Department of Nutrition and Animal Production, School of Veterinary Medicine and Animal Sciences, University of São Paulo, São Paulo, Brazil, ³Department of Animal Reproduction, School of Veterinary Medicine and Animal Sciences, University of São Paulo, São Paulo, Brazil.
- M278 **Compost bedded pack on bacterial counts and milk composition in lactating dairy cows.**
Lorena Castillejos, María Rodríguez, Adriana Siurana, and Sergio Calsamiglia*, *Animal Nutrition and Welfare Service, Department of Animal and Food Science, Universitat Autònoma de Barcelona, Bellaterra, Spain.*
- M279 **Economic impact of nutritional grouping in dairy herds.**
Afshin S. Kalantari*, Louis E. Armentano, Randy D. Shaver, and Victor E. Cabrera, *University of Wisconsin-Madison, Madison, WI.*
- M280 **Influence of calving weight on milk yield of dairy Gyr cows.**
Manuela Pires Monteiro Gama*¹, Gabriela Geraldi Mendonça², Anibal Eugênio Vercesi Filho³, André Rabelo⁴, Lenira El Faro Zadra³, and Cláudia Cristina Paro Paz^{1,3}, ¹Departamento de Genética, FMRP-USP, Ribeirão Preto, SP, Brazil, ²Instituto de Zootecnia (IZ/APTA/SAA), Nova Odessa, SP, Brazil, ³Centro APTA Bovinos de Corte, Instituto de Zootecnia (IZ), Sertãozinho, SP, Brazil, ⁴ABCIL – Associação Brasileira de Criadores de Gir Leiteiro, Uberaba, MG, Brazil.
- M281 **Effects of dietary forage and protein levels on the concentration and total load of *Escherichia coli* and *Listeria monocytogenes* in feces of dairy cows.**
M. Niu*¹, S. Biswas², J. A. D. R.N. Appuhamy¹, P. K. Pandey², A. Leytem³, R. Dungan³, and E. Kebreab¹, ¹Department of Animal Science, University of California, Davis, Davis, CA, ²Department of Population Health and Reproduction, University of California, Davis, Davis, CA, ³USDA-ARS, Northwest Irrigation and Soils Research Lab, Kimberly, ID.
- M282 **Urinary disposition kinetics and fecal excretion of two intramammary antibiotic preparations in dairy cows.**
Partha Pratim Ray*, Katharine F. Knowlton, Chao Shang, and Kang Xia, *Virginia Polytechnic Institute and State University, Blacksburg, VA.*

- M283 **Performance and health of Holstein calves fed different amounts of milk supply with or without a symbiotic complex.**
Marcos Inácio Marcondes¹, Juana Chagas^{*1,2}, Roberto D. Sainz³, Thiago Pereira¹, and Evando Filgueiras⁴, ¹Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil, ²Universidade Federal Rural de Pernambuco, Recife, Pernambuco, Brazil, ³University of California, Davis, CA, ⁴Bioformula Leite, Goiânia, Goiás, Brazil.
- M284 **Impact of feeding betaine-containing molasses to transition dairy cows during late summer.**
Ana Paula A. Monteiro^{*1}, John K. Bernard¹, Stephen Emanuele², Randy Davis², Charles R. Staples³, Jundi Liu¹, Geoffrey E. Dahl³, and Sha Tao¹, ¹University of Georgia, Tifton, GA, ²Quality Liquid Feeds, Dodgeville, WI, ³University of Florida, Gainesville, FL.
- M285 **Growth and behavior of group-fed dairy calves fed once or twice daily in an organic production system.**
Myrrh-Anna J. Kienitz^{*1}, Bradley J. Heins¹, and Hugh Chester-Jones², ¹University of Minnesota, West Central Research and Outreach Center, Morris, MN, ²University of Minnesota, Southern Research and Outreach Center, Waseca, MN.
- M286 **The sex ratio of female to male calves may be affected by number of services to achieve conception and lactation number of the lactating dairy cow.**
Andy Mendes^{*1}, Michael R. Murphy², Peter S. Erickson³, and David P. Casper¹, ¹South Dakota State University, Brookings, SD, ²University of Illinois, Champaign Urbana, IL, ³University of New Hampshire, Durham, NH.
- M287 **Margin over concentrates as a performance indicator for the dairy farms.**
Aadi Remmik^{*}, Estonian University of Life Sciences, Tartu, Estonia.
- M288 **Factors affecting the success of an embryo transfer program in dairy cattle.**
Priscila Ferraz^{*3}, Clay Burnley⁴, John Karanja⁵, Achilles Vieira-Neto¹, Jose Eduardo P. Santos¹, and Klibs N. Galvão², ¹Department of Animal Sciences, University of Florida, Gainesville, FL, ²Department of Large Animal Clinical Sciences, University of Florida, Gainesville, FL, ³Escola de Medicina Veterinária, Universidade Federal da Bahia, Salvador, Bahia, Brazil, ⁴Southern Embryo, Athens, GA, ⁵North Florida Holsteins, Bell, FL.
- M289 **High cow ration recipe: Preparation and feeding times.**
Yolanda Trillo^{*1}, Sonia Rodriguez¹, Alfonso Lago², and Noelia Silva-del-Rio¹, ¹UC Davis School of Veterinary Medicine, VMTRC, Tulare, CA, ²DairyExperts, Tulare, CA.
- M290 **Using first test milk yield and previous lactation data to assess herd transition cow management in Brazilian dairy farms.**
J. K. Poncheki¹, J. A. Horst², A. A. Valloto², and R. Almeida^{*1}, ¹Universidade Federal do Paraná, Curitiba, PR, Brazil, ²Associação Paranaense de Criadores de Bovinos da Raça Holandesa, Curitiba, PR, Brazil.
- M291 **Differences in rumination time, lying time, and rectal temperature between cows with and without metritis, ketosis, and subclinical hypocalcemia.**
I. C. Tsai^{*}, L. M. Mayo, A. E. Stone, B. A. Wadsworth, and J. M. Bewley, University of Kentucky, Lexington, KY.
- M292 **Bacterial and dry matter content of bedding substrates utilized on Canadian dairy farms.**
Ivelisse Robles^{*1}, David F. Kelton², Herman W. Barkema³, Greg P. Keefe⁴, Jean-Philippe Roy⁵, Marina A. G. von Keyserlingk⁶, and Trevor J. DeVries¹, ¹Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada, ²Department of Population Medicine, University of Guelph, Guelph, ON, Canada, ³Faculty of Veterinary Medicine, University of Calgary, Calgary, AB, Canada, ⁴Atlantic Veterinary College, University of Prince Edward Island, Charlottetown, PEI, Canada, ⁵Faculté de Médecine Vétérinaire, Université de Montréal, Montréal, QC, Canada, ⁶Animal Welfare Program, University of British Columbia, Vancouver, BC, Canada.
- M293 **Risk factors affecting expression of estrus measured by activity monitors in lactating dairy cows.**
Augusto M. L. Madureira^{*1,2}, Bruna F. Silper², Liam B. Polsky², Eraldo L. Drago Filho¹, Sergio Soriano³, Alex F. Sica³, José L. M. Vasconcelos¹, and Ronaldo L. A. Cerri², ¹Sao Paulo State University, Botucatu, SP, Brazil, ²University of British Columbia, Vancouver, BC, Canada, ³Colorado Dairies, Araras, SP, Brazil.
- M294 **Description of close-up cow recipes in California dairies.**
Sonia Rodriguez^{*1}, Yolanda Trillo¹, Alfonso Lago², and Noelia Silva-del-Rio¹, ¹UC Davis School of Veterinary Medicine, VMTRC, Tulare, CA, ²DairyExperts, Tulare, CA.
- M295 **Agritourism: Demographics and views of customers—In-depth look at Fair Oaks Farms.**
Ann Cummins^{*}, Nicole Widmar, Candace Croney, and Joan Fulton, Purdue University, W. Lafayette, IN.
- M296 **Management practices on Virginia dairy farms utilizing automated calf feeders.**
Alyssa M. Dietrich^{*} and Robert E. James, Virginia Polytechnic Institute and State University, Blacksburg, VA.

- M297 **Calculation method alters the ratio of milk true protein production to milk urea nitrogen production in late-lactation cows fed four levels of dietary crude protein.**
Margaret A. Quaassdorff* and Michel A. Wattiaux, *University of Wisconsin-Madison, Madison, WI.*
- M298 **Seasonality distributions of number of breedings and conception rate of Florida dairy farms.**
Fernanda Ferreira*^{1,2} and Albert De Vries¹, ¹*University of Florida, Gainesville, FL*, ²*Embrapa Gado de Leite, Juiz de Fora, MG, Brazil.*
- M299 **An evaluation of automated milking systems in the Midwest United States.**
Marcia I. Endres¹ and Jim A. Salfer*², ¹*University of Minnesota, St. Paul, MN*, ²*University of Minnesota Extension, St. Cloud, MN.*
- M300 **Factors affecting vaginal temperature in high-producing lactating Holstein cows.**
Eraldo L. Drago Filho*¹, Augusto M. L. Madureira¹, Liam B. Polsky², Sergio Soriano³, Alex F. Sica³, Jose L. M. Vasconcelos¹, and Ronaldo L. A. Cerri², ¹*Sao Paulo State University, Botucatu, SP, Brazil*, ²*University of British Columbia, Vancouver, BC, Canada*, ³*Colorado Dairies, Araras, SP, Brazil.*
- M301 **Prepartum activity is associated with increased plasma NEFA and body weight loss in postpartum dairy cows.**
Yu Zang*, Ida Holásková, and Joseph W. McFadden, *West Virginia University, Morgantown, WV.*
- M302 **Adding antioxidants to ram sperm improves sperm binding capability after cryopreservation.**
Jonathan M. S. Costa¹, Wildelfrancis L. Souza¹, Elenice A. Moraes*¹, and James K. Graham², ¹*Federal University of San Francisco Valley, Petrolina, PE, Brazil*, ²*Colorado State University, Fort Collins, CO.*
- M303 **Distribution of detected estrus following 14-day CIDR and prostaglandin F_{2α} treatment as a pre-synchronization strategy in dairy heifers.**
Courtney K. Claypool*¹, Jennifer A. Spencer¹, Saulo Menegatti Zoca³, Bahman Shafii¹, William J. Price¹, Amin Ahmadzadeh¹, Neil R. Rimbey², and Joseph C. Dalton², ¹*University of Idaho, Moscow, ID*, ²*University of Idaho, Caldwell, ID*, ³*UNESP, Botucatu, Sao Paulo, Brazil.*
- M304 **Feeding time variation on California dairies.**
Yolanda Trillo*¹, Sonia Rodriguez¹, Alfonso Lago², and Noelia Silva-del-Rio¹, ¹*UC Davis School of Veterinary Medicine, VMTRC, Tulare, CA*, ²*DairyExperts, Tulare, CA.*
- M305 **Association among body condition score change, milk yield, and reproductive performance of Holstein cows.**
Ricardo C. Chebel*¹, Pablo J. Pinedo², Jose E. P. Santos¹, Gustavo Schuenemann³, Guilherme J. M. Rosa⁴, Robert Gilbert⁵, Rodrigo C. Bicalho⁵, Klibs N. Galvao¹, Christopher Seabury⁶, John Fetrow⁷, William W. Thatcher¹, and Sandra L. Rodriguez-Zas⁸, ¹*University of Florida, Gainesville, FL*, ²*Texas A&M Agrilife Research, Amarillo, TX*, ³*Ohio State University, Columbus, OH*, ⁴*University of Wisconsin, Madison, WI*, ⁵*Cornell University, Ithaca, NY*, ⁶*Texas A&M University, College Station, TX*, ⁷*University of Minnesota, St Paul, MN*, ⁸*University of Illinois at Urbana-Champaign, Urbana, IL.*
- M306 **Animal and dietary factors associated with daily rumination time during the periparturient period.**
Daniela N. Liboreiro*¹, Luiz Ferraretto², Randy Shaver², and Ricardo C. Chebel^{1,3}, ¹*University of Minnesota, St Paul, MN*, ²*University of Wisconsin, Madison, WI*, ³*University of Florida, Gainesville, FL.*
- M307 **Deviation from the formulated target weight for ingredients loaded into the high cow ration on California dairies.**
Yolanda Trillo*¹, Alfonso Lago², and Noelia Silva-del-Rio¹, ¹*UC Davis School of Veterinary Medicine, VMTRC, Tulare, CA*, ²*DairyExperts, Tulare, CA.*
- M308 **Feeding frequency of the high cow ration recipe on California dairies.**
Yolanda Trillo*¹, Alfonso Lago², and Noelia Silva-del-Rio¹, ¹*UC Davis School of Veterinary Medicine, VMTRC, Tulare, CA*, ²*DairyExperts, Tulare, CA.*
- M309 **The effects of milk production class on serum haptoglobin concentrations in mid-lactation Holstein cows with and without clinical mastitis.**
G. Taasoli*¹, F. Kafizadeh¹, D. Ghadimi², and M. A. Ballou³, ¹*Department of Animal Science, Razi University, Kermanshah, Iran*, ²*Institute of Physiology and Biochemistry, MRI, Karlsruhe, Germany*, ³*Department of Animal and Food Sciences, Texas Tech University, Lubbock, TX.*

Ruminant Nutrition Beef I

- M310 **Effect of narasin in mineral mix to Nellore heifers fed with high forage.**
Renan G. Silva*¹, Marcos V. C. Ferraz Junior¹, Vinicius N. Gouvea¹, Daniel M. Polizel¹, Marcelo H. Santos¹, Alexandre A. Miszura¹, Thiago S. Andrade¹, Mariana F. Westphalen², Marcos V. Biehl², and Alexandre V. Pires^{2,1}, ¹University of São Paulo, Pirassununga, São Paulo, Brazil, ²University of São Paulo, Piracicaba, São Paulo, Brazil.
- M311 **Ruminal microbiology of Nellore steers fed different sources of forage in diets with crude glycerin in feedlot.**
Telma T. Berchielli*, Andressa F. Ribeiro, Yury G. Salcedo, Antonio Jose Neto, Luis G. Rossi, Monaliza O. Santana, Ana Laura E. G. F. Carvalho, Erick E. Dallantonia, and Juliana D. Messana, Sao Paulo State University, Jaboticabal, Sao Paulo, Brazil.
- M312 **Performance of young Nellore bulls during the dry season with two supplements.**
Marcella de Toledo Piza Roth*¹, Matheus Henrique Moretti², Flavio Dutra de Resende^{3,4}, Rodolfo Maciel Fernandes¹, Ana Paula de Toledo Piza Roth², and Gustavo Rezende Siqueira^{3,4}, ¹UNIFEB, Barretos, São Paulo, Brazil, ²Agroceres Multimix, Rio Claro, São Paulo, Brazil, ³Agência Paulista de Tecnologia dos Agronegócios, Colina, São Paulo, Brazil, ⁴UNESP, Jaboticabal, São Paulo, Brazil.
- M313 **Transcriptional profiles of adipose tissue from finishing beef steers fed diets supplemented with *Aspergillus oryzae*.**
Kristen M. Brennan*, Daniel E. Graunard, Allison C. Smith, Tatijana M. Fisher, and Leya F. Spangler, Alltech Inc., Center for Animal Nutrigenomics and Applied Animal Nutrition, Nicholasville, KY.
- M314 **Earlage: Yield, harvest timing, composition, and in situ digestibility.**
L. Brown, S. Soderlund, and F. N. Owens*, DuPont Pioneer, Johnston, IA.
- M315 **Effect of prenatal trace mineral source on neonatal and growing calf mineral status.**
Deborah M. Price*¹, Alex F. Swain¹, Joseph M. Guevera², Carley R. Trcalek², Meaghan M. O'Neil¹, Max Irsik², Owen Rae², Matthew J. Hersom¹, and Joel V. Yelich¹, ¹Department of Animal Sciences, University of Florida, Gainesville, FL, ²College of Veterinary Medicine, University of Florida, Gainesville, FL.
- M316 **Effects of feeding a complete pelleted feed consisting of treated corn stover and distillers byproducts on total tract digestion and performance of growing cattle.**
Jana L. Harding*, Curt J. Bittner, Dirk B. Burken, Galen E. Erickson, and James C. MacDonald, University of Nebraska Lincoln, Lincoln, NE.
- M317 **Additives in supplements to fed Nellore young bulls in pasture.**
Erick Escobar Dallantonia¹, Josiane Fonseca Lage*², Elias San Vito¹, Gabriela Moraes Delamagna¹, Patricia Baldi Garrido¹, Lutti Maneck Dellevatti¹, Ricardo de Andrade Reis¹, Marco Antonio Alvares Balsalobre², and Telma Teresinha Berchielli¹, ¹Universidade Estadual Paulista Julio de Mesquita Filho, Jaboticabal, São Paulo, Brazil, ²Trouw Nutrition Brazil, Mirassol, São Paulo, Brazil.
- M318 **Relationship between infrared thermography and heat production in young bulls.**
Mario L. Chizzotti², Rafael A. Gomes*^{1,3}, Karina C. Busato¹, Marcio M. Ladeira¹, Matheus C. Galvão¹, Priscilla D. Teixeira¹, Aline C. Rodrigues¹, Antonio Henrique Ribeiro Junior¹, and Maria Helena Oliveira¹, ¹Universidade Federal de Lavras, Lavras, MG, Brazil, ²Universidade Federal de Viçosa, Viçosa, MG, Brazil, ³Washington State University, Pullman, WA.
- M319 **Intake, digestibility and rumen fermentation in beef cattle fed warm-season legume (*Stylosanthes* 'Campo Gande') silage with two dietary protein levels.**
Leandro D. Silva, Odilon G. Pereira*, Thiago C. Silva, Sebastião C. Valadares Filho, and Karina G. Ribeiro, Universidade Federal de Viçosa, Viçosa, MG, Brazil.
- M320 **Performance of Nellore bulls supplemented with energy sources associated crude glycerin on finishing phase.**
Antonio Jose Neto*, Luis Gustavo Rossi, Erick Escobar Dallantonia, Monaliza de Oliveira Santana, and Telma Teresinha Berchielli, Department of Animal Science, São Paulo State University, UNESP, Jaboticabal, SP, Brazil.
- M321 **Ruminal health of feedlot beef cattle fed with crude glycerin during adaptation period or finishing time.**
Josimari Regina Paschoaloto*, Jane Maria Bertocco Ezequiel, Marco Tulio Costa Almeida,IVALDO Monsignati, Vanessa Barbosa Carvalho, Henrique Leal Perez, Antonio Carlos Homem Junior, Henrique Boselli Bussioli, Rhaony Gonçalves Leite, Anibal Garcia Camargo Junior, and Gustavo Leite Vieira, São Paulo State University, UNESP/FCAV, Jaboticabal, São Paulo, Brazil.

- M322 **Feeding behavior of feedlot beef cattle fed with high level of crude glycerin with crude glycerin during adaptation period or finishing time.**
Josimari Regina Paschoaloto*, Jane Maria Bertocco Ezequiel, Marco Tulio Costa Almeida, Bruno Henrique Ferreira Araujo, Vanessa Barbosa Carvalho, Henrique Leal Perez,IVALDO Monsignati, Henrique Boselli Bussioli, Rhaony Gonçalves Leite, Anibal Garcia Camargo Junior, and Gustavo Leite Vieira, *São Paulo State University-UNESP/FCAV, Jaboticabal, São Paulo, Brazil.*
- M323 **Supplementary levels of *Macleaya cordata* plant extract Sangrovit-RS on feedlot performance and carcass traits of finishing bullocks.**
Rubén Barajas*¹, Billy J. Cervantes², Ingo Rogge³, Alejandro Plascencia-Jorquera⁴, Alejandro Camacho¹, and Marco A. Osuna¹, ¹FMVZ-Universidad Autónoma de Sinaloa, Culiacán, Sinaloa, México, ²Ganadera Los Migueles, S.A. de C.V, Culiacán, Sinaloa, México, ³Phytobiotics Futterzusatzstoffe GmbH, Eltville, Germany, ⁴FMVZ-Universidad de Baja California, Mexicali, Baja California, México.
- M324 **Energy requirements of Nellore and Angus young bulls.**
Rafael A. Gomes*^{1,3}, Mario L. Chizzotti², Karina C. Busato¹, Jose Rodolfo R. Carvalho¹, Marcio M. Ladeira¹, Matheus C. Galvão¹, Maria Helena Oliveira¹, Aline C. Rodrigues¹, and Priscilla D. Teixeira¹, ¹Universidade Federal de Lavras, Lavras, MG, Brazil, ²Universidade Federal de Viçosa, Viçosa, MG, Brazil, ³Washington State University, Pullman, WA.
- M325 **Influence of particle size of sugar cane and concentrate level on intake and digestibility of nutrients, and rumen fermentation in crossbred steers.**
T. C. da Silva*, O. G. Pereira, D. R. da Costa, R. M. Martins, M. C. N. Agarussi, L. D. da Silva, K. G. Ribeiro, and S. C. Valadares Filho, *Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.*
- M326 **Supplementation with a DHA-rich microalgae alters muscle gene expression profiles in finishing beef heifers.**
Kristen M. Brennan*¹, Daniel E. Graugnard¹, Allison C. Smith¹, James S. Drouillard², and Kate A. Jacques¹, ¹Alltech Inc., Center for Animal Nutrigenomics and Applied Animal Nutrition, Nicholasville, KY, ²Kansas State University, Manhattan, KS.
- M327 **Influence of a tannins extract preparation supplementation level on the feedlot performance of feedlot bullocks.**
Rubén Barajas*¹, Billy J. Cervantes², Juan A. Vázquez², Alejandro Camacho¹, and Javier A. Romo¹, ¹FMVZ-Universidad Autónoma de Sinaloa, Culiacán, Sinaloa, México, ²Ganadera Los Migueles, S.A. de C.V, Culiacán, Sinaloa, México.
- M328 **Effect of monensin withdrawal on intake and digestion in *Bos indicus* and *Bos taurus* steers consuming bermudagrass hay.**
Natasha L. Bell*^{1,2}, Todd R. Callaway³, Robin C. Anderson³, Marcia O. Franco⁴, and Tryon A. Wickersham¹, ¹Texas A&M University, College Station, TX, ²Texas A&M University-Kingsville, Kingsville, TX, ³Southern Plains Agricultural Research Center, Agricultural Research Service, USDA, College Station, TX, ⁴Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.
- M329 **The influence of pellet size and a pellet binder on rumen fermentation and total tract digestibility in beef heifer.**
Katie M. Wood*¹, Faustin Joy¹, John Smillie¹, Rodrigo Kanafany Guzmán¹, Gillian Gratton¹, Tom A. Scott¹, Herbert (Bart) A. Lardner^{2,1}, and Gregory B. Penner¹, ¹Dept of Animal and Poultry Science, University of Saskatchewan, Saskatoon, Saskatchewan, Canada, ²Western Beef Development Center, Lanigan, Saskatchewan, Canada.
- M330 **Effect of monensin concentration on rumen pH, short-chain fatty acid absorption, total-tract digestibility, and barrier function in beef heifers.**
Katie M. Wood*¹, Ana C. J. Pinto², Danilo D. Millen², Rodrigo Kanafany Guzmán¹, and Gregory B. Penner¹, ¹Dept. of Animal and Poultry Science, University of Saskatchewan, Saskatoon, Saskatchewan, Canada, ²São Paulo State University(UNESP), Dracena, São Paulo, Brazil.
- M331 **Effects of essential oils and exogenous enzymes on in vitro rumen fermentation kinetics.**
Camila Delveaux Araujo Batalha¹, Lucas Jado Chagas¹, João Ricardo Rebouças Dórea*², Tiago Sabella Acedo², Luis Fernando Tamassia², Cristina Simões Cortinhas², and Flávio Augusto Portela Santos¹, ¹University of São Paulo, Piracicaba, SP, Brazil, ²DSM Produtos Nutricionais Brasil SA, São Paulo, SP, Brazil.
- M332 **Effects of essential oils and exogenous enzymes for finishing Nellore cattle in feedlot during the adaptation period.**
Murillo Alves Porto Meschiatti¹, Diandra Leziér¹, João Ricardo Rebouças Dórea², Tiago Sabella Acedo*², Luis Fernando Tamassia², Cristina Simões Cortinhas², and Flávio Augusto Portela Santos¹, ¹University of São Paulo, Piracicaba, SP, Brazil, ²DSM Produtos Nutricionais Brasil SA, São Paulo, SP, Brazil.
- M333 **Shifts in rumen microbiota in response to inoculation with *Propionibacterium acidipropionici* strain P169.**
Elnaz Azad*¹, Nelmy Narvaez², Hooman Derakhshani¹, Awfa Y. Alazze^{2,3}, Yuxi Wang², Tim A. McAllister^{2,1}, and Ehsan Khafipour¹, ¹Department of Animal Science, University of Manitoba, Winnipeg, MB, Canada, ²Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, AB, Canada, ³Department of Clinical Nutrition, College of Applied Medical Sciences, University of Hail, Hail, Saudi Arabia.

- M334 **A comparative assessment of dried distillers grain, ionophore, bambermycin, saponin, and condensed tannin for methane emission abatement in beef cattle.**
M. A. Fonseca*¹, L. O. Tedeschi¹, T. R. Callaway², and W. L. Crossland¹, ¹Texas A & M University, College Station, TX, ²USDA-ARS, College Station, TX.
- M335 **Effect of dietary supplementation of β -mannanase in Hanwoo growing heifers.**
Jakyem Seo¹, Jeongsoo Park*¹, Junsung Lee¹, Jae-Hwan Lee², Jung-Jin Lee², Dong Keun Kam³, and Seongwon Seo¹, ¹Department of Animal Biosystem Sciences, Chungnam National University, Daejeon, Republic of Korea, ²CTC Bio Inc., Seoul, Republic of Korea, ³Cargill Agri Purina Inc., Seongnam, Republic of Korea.
- M337 **Calculating residual feed intake using high-frequency partial body weights.**
Ann Kenny*¹, David Benfield², Camiel Huisma², and Kevin Garossino², ¹University of Missouri, Columbia, MO, ²GrowSafe Systems Ltd, Airdrie, AB, Canada.
- M338 **Effect of different supplementation strategies on grazing and ingestive behavior in cattle finished on pasture.**
Guilherme Felipe Berti¹, Rodolfo Maciel Fernandes², Matheus Henrique Moretti², Mauricia Brandao Silva³, Paloma Helena Gonçalves¹, Michele Aparecida Prado Alves¹, Flávio Dutra Resende^{4,2}, and Gustavo Rezende Siqueira*^{4,2}, ¹Centro Universitario de Barretos, Barretos, Sao Paulo, Brazil, ²Universidade Estadual Paulista, Jaboticabal, Sao Paulo, Brazil, ³Universidade Estadual Paulista, Botucatu, Sao Paulo, Brazil, ⁴Agencia Paulista de Tecnologia dos Agronegocios, Colina, Sao Paulo, Brazil.

Ruminant Nutrition Dairy I

- M339 **The effect of decreasing dietary cation-anion difference in the prepartum diet on urine pH and plasma minerals in multiparous Holstein cows.**
B. M. Sweeney*¹, C. M. Ryan¹, T. Stokol², K. Zanzalari³, D. Kirk³, and T. R. Overton¹, ¹Department of Animal Science, Cornell University, Ithaca, NY, ²Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, NY, ³Prince Agri Products Inc., Quincy, IL.
- M340 **Canola meal in dairy cow diets with varying concentration of starch sources.**
Nadeesha K. Jayasinghe¹, Kenneth F. Kalscheur*², Jill L. Anderson¹, and David P. Casper¹, ¹Dairy Science Department, South Dakota State University, Brookings, SD, ²US Dairy Forage Research Center, USDA-ARS, Madison, WI.
- M341 **Dietary grape marc supplementation alters the milk protein and fatty acid profile produced by pasture-based dairy cattle.**
Reuben Harland¹, Aysha Morrow¹, Roland Harrison¹, Jana Kraft², and Sabrina L. Greenwood*^{1,2}, ¹Lincoln University, Lincoln, New Zealand, ²The University of Vermont, Burlington, VT.
- M342 **Integrating nutrient and hormonal effects on mTOR phosphorylation in the mammary cell.**
Juan J. Castro Marquez* and Mark D. Hanigan, Virginia Tech, Blacksburg, VA.
- M343 **Prediction of daily energy status in early and mid lactation using milk and body traits.**
Päivi Mäntysaari*¹, Tuomo Kokkonen², Martin Lidauer¹, and Esa A. Mäntysaari¹, ¹Natural Resources Institute Finland, Green technology, Jokioinen, Finland, ²Department of Agricultural Sciences, University of Helsinki, Helsinki, Finland.
- M344 **Performance of dairy calves receiving probiotic containing *Bacillus subtilis* and *Bacillus licheniformis*.**
Thais M. Torrezan¹, Jackeline T. Silva¹, Nathalia B. Rocha¹, Evangelina Miqueo¹, Fernanda L. M. Silva¹, Samyra Baldassin¹, and Carla M. M. Bittar*^{1,2}, ¹University of Sao Paulo, ESALQ, Piracicaba, Sao Paulo, Brazil, ²CNPq, Brasilia, DF, Brazil.
- M345 **Growth performance in Crossbred (Holstein x Gyr) calves differing in phenotypic residual feed intake on pre-weaned period.**
Juliana Mergh Leão*¹, Fernanda Samarini Machado², Mariana Magalhães Campos², Juliana Campos Carneiro³, Paulo Campos Martins¹, Isabela Carvalho Costa⁴, Paulo Sérgio Dornelas Silva⁴, Brenda Karoline Alcântara Faria³, Juliana Aparecida Mello Lima², Rayanne Soalheiro de Souza¹, and Sandra Gesteira Coelho¹, ¹Universidade Federal de Minas Gerais-UFMG, Belo Horizonte, Minas Gerais, Brazil, ²Embrapa Dairy Cattle, Juiz de Fora, Minas Gerais, Brazil, ³Instituto de Ciências Agrárias da UFMG, Montes Claros, Minas Gerais, Brazil, ⁴Instituto Federal de Educação, Ciência e Tecnologia do Sudeste de Minas Gerais-IFSEMG, Rio Pomba, Minas Gerais, Brazil.
- M346 **Dietary grape marc supplementation lowers urinary nitrogen excretion from pasture-based dairy cattle.**
Aysha Morrow¹, Reuben Harland¹, Roland Harrison¹, Jana Kraft², and Sabrina L. Greenwood*^{1,2}, ¹Lincoln University, Lincoln, New Zealand, ²The University of Vermont, Burlington, VT.

- M347 **Energy expenditure and methane emission in dairy heifers using the face-mask method.**
Carlos Alberto Alves Oliveira Filho¹, Fernanda Samarini Machado², Alexandre Lima Ferreira², Luiz Gustavo Ribeiro Pereira^{*2}, Thierry Ribeiro Tomich², Mariana Magalhães Campos², José Augusto Gomes Azevêdo³, Rogério Martins Maurício⁴, Alexandre Vieira Chaves⁵, and Camilla Flávia Portela Gomes Silva⁶, ¹Universidade Estadual do Sudoeste da Bahia, Itapetinga, Bahia, Brazil, ²Embrapa Dairy Cattle, Juiz de Fora, Minas Gerais, Brazil, ³Universidade Estadual de Santa Cruz, Ilhéus, Bahia, Brazil, ⁴Universidade Federal de São João Del Rei, São João Del Rei, Minas Gerais, Brazil, ⁵Faculty of Veterinary Science, Sydney, New South Wales, Australia, ⁶Instituto Federal de Educação, Ciência e Tecnologia Baiano, Santa Inês, Bahia, Brazil.
- M348 **Methane production in dairy cows consuming corn milling co-products.**
K. G. Saathoff^{*1}, C. J. R. Jenkins¹, S. C. Fernando¹, D. Hostetler², and P. J. Kononoff¹, ¹Department of Animal Science, University of Nebraska-Lincoln, Lincoln, NE, ²The School of Veterinary Medicine and Biomedical Sciences, University of Nebraska-Lincoln, Lincoln, NE.
- M349 **Implementing multi-variate statistical process control to detect variability on a commercial dairy farm.**
Robb W. Bender^{*1,2}, James A. Barmore², David E. Cook¹, and David K. Combs¹, ¹University of Wisconsin-Madison, Madison, WI, ²GPS Dairy Consulting LLC, Calmar, IA.
- M350 **Evaluation of apparent starch digestibility in commercial dairy herds.**
R. A. Silva¹, J. H. Carneiro¹, I. Q. Carvalho², J. F. Santos³, R. B. Navarro⁴, P. F. Menegucci⁵, M. Caetano⁶, D. P. D. Lanna⁷, and R. Almeida^{*1}, ¹Universidade Federal do Paraná, Curitiba, PR, Brazil, ²Fundação ABC, Castro, PR, Brazil, ³Castrolanda Cooperativa Agroindustrial, Castro, PR, Brazil, ⁴Capal Cooperativa Agroindustrial, Arapoti, PR, Brazil, ⁵Chr. Hansen, Valinhos, SP, Brazil, ⁶University of Adelaide, Roseworthy, SA, Australia, ⁷ESALQ/USP, Piracicaba, SP, Brazil.
- M351 **Effects of partial replacement of corn and alfalfa silage with tall fescue hay on total-tract digestibility and lactation performance in lactating dairy cows.**
Robb W. Bender^{*}, Fernanda Lopes, David E. Cook, and David K. Combs, *University of Wisconsin-Madison, Madison, WI.*
- M352 **Methyl-donors choline and methionine differentially alter hepatic methyl carbon metabolism.**
Tawny L. Chandler^{*1}, Courtney L. McCourt¹, Sandra J. Bertics¹, Barbara A. Barton², and Heather M. White¹, ¹University of Wisconsin-Madison, Madison, WI, ²Balchem Corporation, New Hampton, NY.
- M353 **The effect of nitrate or live yeast culture on methane mitigation in a continuous culture system.**
Caitlyn M. Massie^{*1}, Benjamin A. Wenner¹, Amanda M. Gehman², Zhongtang Yu¹, Kelly C. Wrighton¹, and Jeffrey L. Firkins¹, ¹The Ohio State University, Columbus, OH, ²Alltech, Nicholasville, KY.
- M354 **Performance, heat production and methane emission in dairy heifers under different nutritional plans.**
Carlos Alberto Alves Oliveira Filho¹, Fernanda Samarini Machado², Alexandre Lima Ferreira², Luiz Gustavo Ribeiro Pereira^{*2}, Thierry Ribeiro Tomich², Mariana Magalhães Campos², José Augusto Gomes Azevêdo³, Rogério Martins Maurício⁴, Alexandre Vieira Chaves⁵, and Camilla Flávia Portela Gomes Silva⁶, ¹Universidade Estadual do Sudoeste da Bahia, Itapetinga, Bahia, Brazil, ²Embrapa Dairy Cattle, Juiz de Fora, Minas Gerais, Brazil, ³Universidade Estadual de Santa Cruz, Ilhéus, Bahia, Brazil, ⁴Universidade Federal de São João Del Rei, São João Del Rei, Minas Gerais, Brazil, ⁵University of Sydney, Sydney, New South Wales, Australia, ⁶Instituto Federal de Educação, Ciência e Tecnologia Baiano, Santa Inês, Bahia, Brazil.
- M355 **Effects of rumen-protected choline and B vitamins during the transition period on serum metabolites and milk composition in periparturient dairy cattle.**
C. M. Melo¹, L. C. Copetti¹, O. F. Stuaní², R. Locatelli-Dittrich¹, and R. Almeida^{*1}, ¹Universidade Federal do Paraná, Curitiba, PR, Brazil, ²Safeeds Nutrição Animal, Toledo, PR, Brazil.
- M356 **Microbial protein synthesis of Jersey heifers supplemented with chitosan or omega-6 fatty acids source.**
Murilo Vendramini¹, Helder Amaral¹, Hayne Araki¹, Marcia Vaz², Dargon Salvia¹, Euclides Oliveira¹, Rafael Goes¹, Marcelo Barros², Bruno Secundino¹, and Jefferson Gandra^{*1}, ¹Faculdade de Ciências Agrárias, Universidade Federal da Grande Dourados, Dourados, MS, Brazil, ²Faculdade de Ciências da Saúde, Universidade Federal da Grande Dourados, Dourados, MS, Brazil.
- M357 **Nutritional value of hemp byproducts as ruminant feeds.**
George N. Gozho^{*} and Jan C. Plaizier, *University of Manitoba, Winnipeg, MB, Canada.*
- M358 **Effect of corn type, particle size, enzymes, and time ensiled on chemical composition of rehydrated corn silage.**
Naina M. Lopes^{*1,2}, Marcos N. Pereira², and Felipe C. Cardoso¹, ¹University of Illinois, Urbana, IL, ²Universidade Federal de Lavras, Lavras, MG, Brazil.

- M359 **Nitrogen balance of Jersey heifers supplemented with chitosan or omega-6 fatty acids source.**
Murilo Vendramini¹, Helder Amaral¹, Maria Gabriela Lobo¹, Marcia Vaz², Natalia Silva¹, Euclides Oliveira¹, Rafael Goes¹, Marcelo Barros², Caio Takiya³, and Jefferson Gandra*¹, ¹Faculdade de Ciências Agrárias, Universidade Federal da Grande Dourados, Dourados, MS, Brazil, ²Faculdade de Ciências da Saúde, Universidade Federal da Grande Dourados, Dourados, MS, Brazil, ³Departamento de Nutrição e Produção Animal, Universidade de São Paulo, Pirassununga, Brazil.
- M360 **Effects of amylase and protease on degradability and gas production of rehydrated corn grain silage.**
Naina M. Lopes*^{1,2}, Marcos N. Pereira², and Felipe C. Cardoso¹, ¹University of Illinois, Urbana, IL, ²Universidade Federal de Lavras, Lavras, MG, Brazil.
- M361 **Stereo microscopy and scanning electron microscopy of manure samples from late lactation dairy cows when fed cobalt-lactate in a high-forage total mixed ration.**
Jon P. Pretz*¹, Jianping Wu², Madam Jao², Bill Holloway³, Del Davis³, and David P. Casper¹, ¹South Dakota State University, Brookings, SD, ²Gansau Agricultural University, Lanzhou, Gansu, China, ³Ralco Inc., Marshall, MN.
- M362 **Plasma metabolites of Jersey heifers supplemented with chitosan or omega-6 fatty acid source.**
Helder Amaral¹, Murilo Vendramini¹, Leticia Parangaba¹, Grazielle Rosa¹, Caio Takiya², Euclides Oliveira¹, Rafael Goes¹, Antonio Machado¹, André Santos¹, and Jefferson Gandra*¹, ¹Faculdade de Ciências Agrárias, Universidade Federal da Grande Dourados, Dourados, MS, Brazil, ²Departamento de Nutrição e Produção Animal, Universidade de São Paulo, Pirassununga, Brazil.
- M363 **Effect of top-dressing rumen-protected methionine in lactating Holstein cows: I. Profile of plasma amino acids, milk yield, and milk composition.**
Mateus Z. Toledo*¹, Giovanni M. Baez¹, Eduardo Trevisol¹, Nelson E. Lobos¹, Alvaro Garcia-Guerra¹, Jerry N. Guenther¹, Daniel Luchini², Randy D. Shaver¹, and Milo C. Wiltbank¹, ¹University of Wisconsin-Madison, Madison, WI, ²Adisseo, Alpharetta, GA.
- M364 **Milk protein and fat production are regulated by histidine and glucose supply in the lactating dairy cow.**
John Doelman*^{1,2}, Michelle Carson¹, John P. Cant², and John A. Metcalf¹, ¹Nutreco Canada Agresearch, Guelph, ON, Canada, ²Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada.
- M365 **Development of an in vitro subacute ruminal acidosis (SARA) model.**
Allan B. Chestnut*¹, Jim M. Aldrich¹, Tammy K. Miller Webster², Wenping Hu¹, Wibe B. Fokkink¹, and Howard G. Bateman¹, ¹Provimi North America, Brookville, OH, ²Rumen Fermentation Profiling Laboratory, West Virginia University, Morgantown, WV.
- M366 **Association of periparturitional nutritional strategy with concentration of postpartum β -hydroxybutyrate in dairy cows.**
Allison B. Lawton*¹, Sabine Mann², Winfield S. Burhans³, Daryl V. Nydam², Christine A. Rossiter-Burhans⁴, Michael Tetreault⁴, and Thomas R. Overton¹, ¹Department of Animal Science, Cornell University, Ithaca, NY, ²Department of Population Medicine and Diagnostic Sciences, College of Veterinary Medicine, Cornell University, Ithaca, NY, ³Dairy-Tech Group, South Albany, VT, ⁴Poulin Grain, Newport, VT.
- M367 **Evaluation of rumen outflow in dairy cows by use of reticular and omasal sampling as an alternative to sampling from abomasal cannula.**
José Esler Freitas*¹, Tiago Dell Vale², Vitor Pereira Bettero², Marjorye Kametani², Pablo Gomes Paiva², Rodrigo Gardinal², Caio Seiti Takiya², Filipe Zanferari², Thiago T. H. A. Vendramini², Elmerson Ferreira Jesus², Gustavo Delfino Calomeni², and Francisco Palma Renno², ¹Department of Animal Science, Federal University of Bahia, Salvador, Bahia, Brazil, ²Department of Nutrition and Animal Production, Faculty of Veterinary Medicine, University of São Paulo, Pirassununga, São Paulo, Brazil.
- M368 **Feed milk value and protein supply to dairy cows of new co-products (carinata meal) from bio-fuel processing in comparison with canola meal.**
Yajing Ban*, David A. Christensen, John J. McKinnon, and Peiqiang Yu, Department of Animal and Poultry Science, College of Agricultural and Bioresources, University of Saskatchewan, Saskatoon, Saskatchewan, Canada.
- M369 **Dairy calves changes in serum total protein and albumin concentration according to time after colostrum intake.**
Nathalia B. Rocha¹, Fernanda L. M. Silva¹, Jackeline T. Silva¹, Carolina C. F. Monteiro², Marília R. Paula¹, and Carla M. M. Bitar*^{1,3}, ¹University of Sao Paulo, ESALQ, Piracicaba, SP, Brazil, ²Universidade Federal de Pernambuco, Recife, PE, Brazil, ³CNPq, Brasília, DF, Brazil.
- M370 **Relationship between rumen methanogens and methane production in crossbred Holstein-Gyr steers.**
Shirley Motta de Souza¹, Daniela Batista Oss², Luiz Gustavo Ribeiro Pereira*¹, Cláudia Braga Pereira Bento², Hilário Cuquetto Mantovani², Marcos Inácio Marcondes², Fernanda Samarini Machado¹, Thierry Ribeiro Tomich¹, Mariana Magalhães Campos¹, Adriana Santana Carmo¹, Ellen de Almeida Moreira¹, Sávio Augusto Toledo Moreira¹, and Pedro Braga Arcuri⁴, ¹Brazilian Agricultural Research Corporation-Embrapa (Dairy Cattle), Juiz de Fora, MG, Brazil, ²Federal University of Viçosa, Viçosa, MG, Brazil, ³Federal University of Minas Gerais, Belo Horizonte, MG, Brazil, ⁴EMBRAPA Liaison Officer for Multilateral, Regional & National Entities in Europe, Rome, Italy.

- M371 **Evaluation of different oral rehydration protocols for dairy calves affected by diarrhea.**
 Evangelina Miqueo¹, Thais M. Torrezan¹, Nathalia B. Rocha¹, Jackeline T. Silva¹, Marília R. Paula¹, Samyra Baldassin¹, and Carla M. M. Bittar^{*1,2}, ¹University of Sao Paulo, ESALQ, Piracicaba, SP, Brazil, ²CNPq, Brasilia, DF, Brazil.
- M372 **Pretreatment with saturated and unsaturated fatty acids regulates [1-¹⁴C] C16:0 metabolism in Madin-Darby bovine kidney cells.**
 Katherine E. Boesche*, Stephanie L. Koser, and Shawn S. Donkin, *Purdue University, West Lafayette, IN.*
- M373 **Ca(OH)₂-treated corn stover as an alternative for haycrop forage or corn silage in diets for lactating dairy cows.**
 Brittany A. Casperson^{*1}, Aimee E. Wert-Lutz², and Shawn S. Donkin¹, ¹Purdue University, West Lafayette, IN, ²ADM Alliance Nutrition, Quincy, IL.
- M374 **Composition of rumen microbiota alters following diet-induced milk fat depression in dairy cows.**
 Elnaz Azad¹, Daniel E. Rico², Hooman Derakhshani^{*1}, Kevin J. Havartine², and Ehsan Khafipour¹, ¹Department of Animal Science, University of Manitoba, Winnipeg, MB, Canada, ²Department of Animal Science, Penn State University, University Park, PA.
- M375 **Effects of *Saccharomyces cerevisiae* fermentation product on rumen fermentation during heat stress.**
 Kristy L. Dorton*, Tracy Werner, Jason Lin, Abigail Souder, Adam M. Brainard, Joan Butler, and Ilkyu Yoon, *Diamond V, Cedar Rapids, IA.*
- M376 **Peroxisome proliferator-activated receptor β/δ regulates glucose uptake in bovine mammary epithelial cells.**
 Jayant Lohakare^{*1,2}, Johan Osorio², and Massimo Bionaz², ¹College of Animal Life Sciences, Kangwon National University, Chuncheon, South Korea, ²Oregon State University, Corvallis, OR.
- M377 **Estimation of biohydrogenation in dairy cows fed unsaturated fatty acids by use of reticular and omasal sampling as an alternative to sampling from abomasal cannula.**
 José Esler Freitas^{*1}, Tiago Dell Vale², Vitor Pereira Bettero², Marjorye Kametani², Pablo Gomes Paiva², Rodrigo Gardinal², Caio Seiti Takiya², Filipe Zanferari², Thiago T. H. A. Vendramini², Elmerson Ferreira Jesus², Gustavo Delfino Calomeni², and Francisco Palma Renno², ¹Department of Animal Science, Federal University of Bahia, Salvador, Bahia, Brazil, ²Department of Nutrition and Animal Production, Faculty of Veterinary Medicine, University of São Paulo, Pirassununga, São Paulo, Brazil.
- M378 **Milk odd- and branched-chain fatty acid profile is affected by lactation stage in dairy cows.**
 Eric Baumann*, P. Yvan Chouinard, Yolaine Lebeuf, and Rachel Gervais, *Université Laval, Quebec, QC, Canada.*
- M379 **Ruminal and production effects of supplementing high and low forage dairy rations with a live yeast culture.**
 Maegan E. Weatherly^{*1}, Amanda M. Gehman², Amanda M. Lisembee², Joey D. Clark¹, Laurel L. Ball², and Jeffrey M. Bewley¹, ¹University of Kentucky, Lexington, KY, ²Alltech Inc., Nicholasville, KY.
- M380 **Effects of milk replacer and multivitamin-mineral supplementation on metabolism and rumen development in heat-stressed dairy calves.**
 Steven J. Blair^{*1}, Cathleen C. Williams¹, Bruce F. Jenny¹, Ashley H. Dolejsiova¹, and Thomas J. Earleywine², ¹Louisiana State University, Baton Rouge, LA, ²Land O'Lakes Animal Milk Products, Shoreview, MN.
- M381 **Validation of a radio frequency system for monitoring feeding behavior and intake of feed and water in young cattle.**
 Baltazar Ruas de Oliveira Júnior¹, Marcelo Neves Ribas², Fernanda Samarini Machado³, Juliana Aparecida Mello Lima¹, Luigi Francis Lima Cavalcanti², Mario Luiz Chizzotti⁴, Rafael Alves de Azevedo^{*1}, and Sandra Gesteira Coelho¹, ¹Federal University of Minas Gerais, Belo Horizonte, MG, Brazil, ²CNPq, RHAE-SEVA Engenharia, Projeto Intergado, Contagem, MG, Brazil, ³EMBRAPA Dairy Cattle, Juiz de Fora, MG, Brazil, ⁴Federal University of Viçosa, Viçosa, MG, Brazil.
- M382 **Evaluation of two techniques used to dislodge bacteria from particles contained in rumen digesta.**
 Jared V. Judy*, Chad J. R. Jenkins, Samodha C. Fernando, and Paul J. Kononoff, *University of Nebraska-Lincoln, Lincoln, NE.*
- M383 **Effect of an exogenous fibrolytic enzyme on the performance of dairy cows consuming a diet with a high proportion of bermudagrass silage.**
 Andres A. Pech Cervantes*, Kathy G. Arriola, Jorge E. Zuniga, Ibukun M. Ogunade, Yun Jiang, Thiago F. Bernardes, Charles R. Staples, and Adegbola T. Adesogan, *Department of Animal Sciences, University of Florida, Gainesville, FL.*
- M384 **Effects of intensive whole-milk feeding in calves on subsequent feeding behavior of dairy heifers.**
 Camila Flávia de Assis Lage¹, Mariana Magalhães Campos², Fernanda Samarini Machado², Paulo Campos Martins¹, Luigi Francis Lima Cavalcanti³, Marcelo Neves Ribas³, Luiz Gustavo Ribeiro Pereira², Thierry Ribeiro Tomich², Rafael Alves de Azevedo^{*1}, and Sandra Gesteira Coelho¹, ¹Federal University of Minas Gerais, Belo Horizonte, MG, Brazil, ²EMBRAPA Dairy Cattle, Coronel Pacheco, Minas GG, Brazil, ³CNPq, RHAE-SEVA Engenharia, Projeto Intergado, Contagem, MG, Brazil.

- M385 **Comparison of the RQUICKI estimate of insulin sensitivity with glucose and insulin tolerance in periparturient dairy cows.**
Sina Saed Samii*, J. Eduardo Rico, Alice T. Mathews, Cassandra L. Orndorff, Amanda N. Davis, and Joseph W. McFadden, *West Virginia University, Morgantown, WV.*
- M386 **Evolving the plasma free AA dose-response technique to determine bioavailability of Met in RP-Met supplements.**
Devan L. Chirgwin*¹, Nancy L. Whitehouse¹, Andre F. Brito¹, Charles G. Schwab², and Brian K. Sloan³, ¹*University of New Hampshire, Durham, NH*, ²*Schwab Consulting, LLC, Boscobel, WI*, ³*Adisseo, Alpharetta, GA.*
- M387 **Effects of intensive whole-milk feeding in calves on subsequent performance and feed efficiency of crossbred dairy heifers.**
Camila Flávia de Assis Lage¹, Mariana Magalhães Campos², Fernanda Samarini Machado², Paulo Campos Martins¹, Luigi Francis Lima Cavalcanti³, Marcelo Neves Ribas³, Luiz Gustavo Ribeiro Pereira², Thierry Ribeiro Tomich², Rafael Alves de Azevedo*¹, and Sandra Gesteira Coelho¹, ¹*Federal University of Minas Gerais, Belo Horizonte, MG, Brazil*, ²*EMBRAPA Dairy Cattle, Coronel Pacheco, MG, Brazil*, ³*CNPq, RHAÉ – SEVA Engenharia, Projeto Intergado, Contagem, MG, Brazil.*
- M388 **Immediate and long-term effects of niacin feeding to fresh dairy cows: 1. Ketosis and fertility.**
J. M. Havlin*¹, P. H. Roberson¹, and J. E. Garrett², ¹*University of California, Davis, Davis, CA*, ²*Qualitech, Chaska, MN.*
- M389 **Effects of supplementation with a rumen-protected lysine product on production in high-producing dairy cows.**
Meagan Cooney*¹ and Izuru Shinzato², ¹*phdR&D, East Troy, WI*, ²*Ajinomoto Heartland, Chicago, IL.*
- M390 **Immediate and long-term effects of niacin feeding to fresh dairy cows. 2. Body condition and milk production.**
J. M. Havlin*¹, P. H. Roberson¹, and J. E. Garrett², ¹*University of California, Davis, Davis, CA*, ²*Qualitech, Chaska, MN.*
- M391 **Lactational performance of cows fed extruded linseed on commercial dairy herds.**
Amélie Beaugerard*^{1,2}, Marie-Pierre Dallaire¹, Rachel Gervais¹, and P. Yvan Chouinard^{1,2}, ¹*Université Laval, Quebec, QC, Canada*, ²*Institute of Nutrition and Functional Foods, Quebec, QC, Canada.*
- M392 **Bacterial communities in the gastrointestinal tract of pre-ruminant dairy calves.**
Janet E. Williams*, William I. Loucks, Elizabeth D. Benda, Nicola F. Beatty, Katelyn M. Steinkamp, Matthew E. Doumit, and Mark A. McGuire, *University of Idaho, Moscow, ID.*
- M393 **Application of tri-axial accelerometers to determine the grazing behavior of dairy cows in a commercial dairy herd.**
Pieter JM Raedts*, Rajneet S. Sohi, Indunil Kulatilleke, and Markandeya Jois, *La Trobe University, Melbourne, Victoria, Australia.*
- M394 **Effect of acetate and *trans*-10,*cis*-12 CLA on milk production in lactating dairy cows.**
Natalie L. Urrutia*, Michel Baldin, Jackie Y. Ying, and Kevin J. Harvatine, *The Pennsylvania State University, University Park, PA.*
- M395 **Exogenous fibrolytic enzyme in dairy cows diets: Milk yield and composition.**
Thiago Henrique da Silva*¹, Caio Seiti Takyia¹, Thiago Henrique Anibale Vendramini¹, Filipe Zanferari¹, Elmeson Ferreira de Jesus², and Francisco Palma Rennó¹, ¹*University of São Paulo, Pirassununga, São Paulo, Brazil*, ²*São Paulo State University, Jaboticabal, São Paulo, Brazil.*
- M396 **Milk urea:allantoin ratio is a useful marker of efficiency of protein utilization in dairy cows.**
Pieter J. M. Raedts*, Devin A. Benheim, Ashlee J. Hammond, Jargal Menghe, and Markandeya Jois, *La Trobe University, Melbourne, Australia.*
- M397 **Use of chloride concentration to identify ration sorting by dairy cattle.**
Heidi Rossow*, *University of California, Davis, Davis, CA.*
- M398 **Pre- and postweaning performance of nursery calves offered texturized calf starters with varying protein levels for 56 days.**
Bruce Ziegler*¹, David Ziegler², Hugh Chester-Jones², Daniel Schimek¹, and Sarah Schuling¹, ¹*Hubbard Feeds, Inc., Mankato, MN*, ²*University of Minnesota Southern Research and Outreach Center, Waseca, MN.*
- M399 **Pre- and postweaning performance and health of dairy calves fed milk replacers vs. pasteurized waste milk.**
David Ziegler*¹, Hugh Chester-Jones¹, David Cook², and Julian Olson², ¹*University of Minnesota Southern Research and Outreach Center, Waseca, MN*, ²*Milk Products, Chilton, WI.*
- M400 **Evaluation of the effects of direct-fed microbials, microbial fermentation products, and digestive enzymes on milk yield and milk components in dairy cattle in the tropics.**
Karen Espino-Mercado, Coral Castillo-Caballero, Jaime Curbelo-Rodríguez, and Guillermo Ortiz-Colón*, *University of Puerto Rico at Mayaguez, Mayaguez, PR, Puerto Rico.*

- M401 **Phosphorous excretion and digestibility in Jersey and Holstein consuming corn milling co-products.**
Gabriel Garcia Gomez*, Alison Foth, and Paul Kononoff, *University of Nebraska-Lincoln, Lincoln, NE.*
- M402 **Variability in diets of lactating dairy herds.**
Maria P. Turiello*¹, Marco Sambataro¹, Agustin Turiello¹, Claudina Vissio¹, and Alejandro Relling^{2,3}, ¹*Universidad Nacional de Rio Cuarto, Facultad de Agronomia y Veterinaria, Cordoba, Argentina,* ²*Universidad Nacional de La Plata, Facultad de Ciencias Veterinarias, Buenos Aires, Argentina,* ³*IGEVET CCT CONICET, Buenos Aires, Argentina.*
- M403 **Mineral blood serum status of Holstein cows during the warm and cold seasons.**
Pedro Meda-Alducin*, Maximino Huerta-Bravo, Gustavo De la Torre-López, Baldomero Alarcón-Zúñiga, and Raymundo Rangel-Santos, *Posgrado en Producción Animal, Departamento de Zootecnia, Universidad Autónoma Chapingo, Texcoco, México.*
- M404 **Effects of rumen-protected methionine or choline supplementation on vaginal discharge and uterine cytology of Holstein cows.**
Cassandra S. Skenandore*¹, Diego A. Velasco Acosta^{1,2}, Zheng Zhou¹, Maria I. Rivelli¹, Marcio N. Corrêa², Daniel Luchini³, and Felipe C. Cardoso¹, ¹*University of Illinois, Urbana, IL,* ²*Federal University of Pelotas, Pelotas, Brazil,* ³*Adisseo S.A.S, Alpharetta, GA.*
- M405 **Milk yield and composition in cows fed calcium salts of polyunsaturated fatty acids of different particle sizes.**
Maxime Leduc*^{1,2}, Rachel Gervais¹, Yolaine Lebeuf^{1,2}, and P. Yvan Chouinard^{1,2}, ¹*Université Laval, Québec, QC, Canada,* ²*Institut de Nutrition and Functional Foods, Québec, QC, Canada.*
- M406 **Using the NRC (2001) model to examine the relationships between predicted supplies of metabolizable Met and Lys and actual yields of milk and milk protein: A subject revisited.**
Nancy L. Whitehouse*¹, Andre F. Brito¹, Charles G. Schwab², and Brian K. Sloan³, ¹*University of New Hampshire, Durham, NH,* ²*Schwab Consulting, LLC, Boscobel, WI,* ³*Adisseo, Alpharetta, GA.*
- M407 **Milk fatty acid profile in cows fed calcium salts of polyunsaturated fatty acids of different particle sizes.**
Maxime Leduc^{1,2}, Rachel Gervais*¹, Yolaine Lebeuf^{1,2}, and P. Yvan Chouinard^{1,2}, ¹*Université Laval, Québec, QC, Canada,* ²*Institut de Nutrition and Functional Foods, Québec, QC, Canada.*
- M408 **The effect of linseed oil supplementation on rumen microbiota composition in lactating dairy cows.**
H. M. Tun*¹, E. Khafipour¹, and C. Benchaar², ¹*Department of Animal Science, University of Manitoba, Winnipeg, MB, Canada,* ²*Agriculture and Agri-Food Canada, Dairy and Swine Research and Development Centre, Sherbrooke, QC, Canada.*
- M409 **The effects of linseed oil supplementation on fecal microbiota in lactating dairy cows.**
H. M. Tun*¹, E. Khafipour¹, and C. Benchaar², ¹*Department of Animal Science, University of Manitoba, Winnipeg, MB, Canada,* ²*Agriculture and Agri-Food Canada, Dairy and Swine Research and Development Centre, Sherbrooke, QC, Canada.*
- M410 **Effects of acetate, and propionate infusion and pH on VFA production.**
Sandip Ghimire*¹, Benjamin A. Wenner², Richard A. Kohn³, Jeffrey L. Firkins², and Mark D. Hanigan¹, ¹*Virginia Polytechnic Institute and State University, Blacksburg, VA,* ²*The Ohio State University, Columbus, OH,* ³*The University of Maryland, College Park, MD.*
- M411 **Effect of linseed meal on animal performance and oxidative stability of omega 3 enriched milk in Holstein dairy cows.**
Daniel E. Rico*, Rachel Gervais, Lauriane Schwebel, Yolaine Lebeuf, and Yvan Chouinard, *Département de Sciences Animales, Université Laval, Québec, QC, Canada.*
- M412 **Effect of potassium carbonate and soybean oil supplementation on lactational performance in early-lactating dairy cows fed a high-concentrate diet.**
A. Rene Alfonso Avila*¹, Edith Charbonneau¹, P. Yvan Chouinard¹, Gaëtan F. Tremblay², and Rachel Gervais¹, ¹*Université Laval, Québec, QC, Canada,* ²*Agriculture and Agri-Food Canada, Québec, QC, Canada.*
- M413 **Ratio between plasma sphingolipids reveals acyl-chain specific changes during the transition from pregnancy to lactation in Holstein cows.**
Sina Saed Samii*, J. Eduardo Rico, Alice T. Mathews, and Joseph W. McFadden, *West Virginia University, Morgantown, WV.*
- M414 **Effects of feeding protected unsaturated fatty acids (Persia Fat) on Insulin resistance parameters of fresh Iranian Holstein dairy cows.**
Hamed Khalilvandi-Behroozyar¹, Mehdi Dehghan-Banadaky*², Mohammad Ghaffarzadeh³, Kamran Rezayazdi², and Essa Dirandeh⁴, ¹*Department of Animal Science, Urmia University, Urmia, West Azerbaijan, Iran,* ²*Department of Animal Science, University of Tehran, Karaj, Alborz, Iran,* ³*Chemistry and Chemical Engineering Research Center of Iran, Tehran, Iran,* ⁴*Department of Animal Science, Sari University of Agriculture and Natural Resources, Sari, Mazandaran, Iran.*

- M415 **A novel method to determine rumen biohydrogenation kinetics of alpha-linolenic acid (18:3 n-3).**
Michel Baldin*¹, Natalie L. Urrutia¹, Daniel E. Rico², Kelsie Baxter¹, Yun Ying¹, and Kevin J. Harvatine¹, ¹*Penn State University, University Park, PA*, ²*Université Laval, Québec, QC, Canada*.

Ruminant Nutrition General I

- M416 **Samples dried with commercial dry matter techniques differ in volatile compound contents.**
Donald Meyer*¹, Lynn Nagengast¹, Dustin Sawyer¹, and John Goeser^{1,2}, ¹*Rock River Laboratory, Watertown, WI*, ²*University of Wisconsin-Madison, Madison, WI*.
- M417 **Comparison of in situ and in vitro methods for predicting in vivo fiber digestion.**
David E. Cook*¹, John P. Goeser^{1,2}, Lynn Nagengast², and David K. Combs¹, ¹*Department of Dairy Science, University of Wisconsin-Madison, Madison, WI*, ²*Rock River Laboratory Inc., Watertown, WI*.
- M418 **Response to iso-alpha acids from *Humulus lupulus* (hops) extract on fermentation by rumen microbes in continuous culture fermenters.**
Isaac J. Salfer*, Samuel W. Fessenden, and Marshall D. Stern, *University of Minnesota, St. Paul, MN*.
- M419 **Sodium salicylate depresses fermentation by ruminal microbes in vitro.**
Abigail J. Carpenter*, Claudio F. Vargas-Rodriguez, Jacob A. B. Jantz, and Barry J. Bradford, *Kansas State University, Manhattan, KS*.
- M420 **Comparison of different four methods for determining in vitro digestibility of annual ryegrass.**
Mariano Alende*^{1,2}, Louisa Bowen¹, Prabha Ranasinghe¹, Gabriela Volpi-Lagrecia^{1,2}, Gustavo Lascano¹, and John Andrae¹, ¹*Clemson University, Clemson, SC*, ²*INTA, Anguil, Argentina*.
- M421 **The effect of dietary inclusion of sugar and type of sugar on ruminal short-chain fatty acid and glucose uptake across the ovine ruminal epithelium.**
Katie M. Wood*¹, Christine L. Rosser¹, Matthew E. Walpole¹, Rodrigo Kanafany Guzmán¹, Beth Mason², Timothy Mutsvangwa¹, and Gregory B. Penner¹, ¹*Dept of Animal and Poultry Science, University of Saskatchewan, Saskatoon, SK, Canada*, ²*Saputo Dairy Products Canada Ltd, Saint-Léonard, QC, Canada*.
- M422 **Evaluation of three rumen-protected lysine sources produced in two different batches using a modified three-step in vitro procedure.**
Haley E. Larson*¹, Izuru Shinzato², Makoto Miura³, Samuel W. Fessenden¹, Isaac J. Salfer¹, and Marshall D. Stern¹, ¹*University of Minnesota, Saint Paul, MN*, ²*Ajinomoto Heartland Inc., Chicago, IL*, ³*Research Institute for Bioscience Products & Fine Chemicals, Ajinomoto Co. Inc., Kawasaki, Japan*.
- M423 **Duodenal infusion of casein but not glutamic acid increases nitrogen retention in cattle provided continuous duodenal infusion of cornstarch.**
Ethan J. Blom*¹, Derek W. Brake¹, and David E. Anderson², ¹*South Dakota State University, Brookings, SD*, ²*University of Tennessee Knoxville, Knoxville, TN*.
- M424 **Rumen fermentation responses to phytogetic medicinal oils.**
Barbara J. M. Lemos*, Flavia M. Souza, Edemilson C. Conceição, Victor R. M. Couto, and Juliano J. R. Fernandes, *Universidade Federal de Goiás, Goiania, Goiás, Brazil*.
- M425 **Effect of thyme (*Thymus vulgaris*) and peppermint (*Mentha piperita*) on digestibility of a finishing diet in lambs.**
H. Khamisabadi^{1,2}, F. Kafizadeh¹, B. Charaien², and G. Taasoli*¹, ¹*Department of Animal Science, Razi University, Kermanshah, Iran*, ²*Research Centre of Agriculture and Natural Resource of Kermanshah, Kermanshah, Iran*.
- M426 **Abomasal infusion of glucose increases intramuscular lipid content and acetate incorporation into fatty acids in subcutaneous adipose tissue relative to ruminal acetate infusion.**
Terronica L. Blackmon*, Tryon A. Wickersham, Jason E. Sawyer, Rhonda K. Miller, and Stephen B. Smith, *Texas A&M University, College Station, TX*.

- M427 **Effects of increased inclusion of algae meal with differing fatty acid profiles on lamb total-tract digestibility.**
Rebecca S. Stokes*, Daniel D. Loy, Megan L. Van Emon, and Stephanie L. Hansen, *Department of Animal Science, Iowa State University, Ames, IA.*
- M428 **Urine pH, serum calcium, and dry matter intake evaluated in Jersey cows fed anionic salts or Animate.**
Tyler J. Schell*¹, Shelby A. Armstrong¹, Derek J. McLean¹, Ken P. Zanzalari¹, James D. Chapman¹, and Lane O. Ely², ¹Phibro Animal Health Corporation, Quincy, IL, ²University of Georgia, Athens, GA.
- M429 **Nonlinear models to describe the transit of particles through the ruminant digestive tract: Evaluation of models and theoretical implications.**
Ricardo Augusto Mendonça Vieira*, Marcelo Cabral da Silva, Tadeu Silva de Oliveira, and Alberto Magno Fernandes, *Universidade Estadual do Norte Fluminense, Campos dos Goytacazes, RJ, Brazil.*
- M430 **Supplementation of grazing cow's diet with corn oil and palm kernel oil: ruminal fermentation, milk production and fatty acids profile.**
Jair Esteban Parales, Martha Lucia Pabón, and Juan Evagenlista Carulla*, *Universidad Nacional de Colombia, Bogotá, Cundinamarca, Colombia.*
- M431 **Effect of rumen-protected carbohydrate supplementation on blood and plasma metabolites in finishing steers during heat stress.**
Juan P. Russi*^{1,3}, Elias Peruzzo¹, Nicolas DiLorenzo², and Alejandro E. Relling¹, ¹Facultad de Cs Veterinarias, UNLP, Buenos Aires, Argentina, ²University of Florida, Marianna, FL, ³RUPCA LLC, Merced, CA.
- M432 **Effect of rumen-protected carbohydrate supplementation on performance, blood and plasma metabolites in growing heifers.**
Juan P. Russi*¹, Elias Peruzzo¹, Nicolas DiLorenzo², and Alejandro E. Relling¹, ¹Facultad de Cs Veterinarias, UNLP, Buenos Aires, Argentina, ²University of Florida, Mariana, FL.
- M433 **Nonlinear parameter estimation in R and SAS: Similarities and discrepancies of both statistical programs based on a case study of digestion kinetics and animal growth curves.**
Ricardo Augusto Mendonça Vieira*¹, Leonardo Siqueira Glória², and Fabyano Fonseca e Silva², ¹Universidade Estadual do Norte Fluminense, Campos dos Goytacazes, RJ, Brazil, ²Universidade Federal de Viçosa, Viçosa, MG, Brazil.
- M434 **Effect of crude glycerin in supplement on rumen microbial profile of Nellore steers consuming low quality pasture during the dry season.**
Elias San Vito*, Pablo Castagnino, Erick E. Dallantonia, Yury T. Granja-Salcedo, Lutti M. Delevatti, and Telma T. Berchielli, *University Estadual Paulista-UNESP, Jaboticabal, São Paulo, Brazil.*
- M435 **Effect of crude glycerin in supplement on rumen microbial profile of Nellore steers grazing tropical grass during the rainy season.**
Telma T. Berchielli*, Elias San Vito, Pablo Castagnino, Yury T. Granja-Salcedo, and Erick E. Dallantonia, *University Estadual Paulista-UNESP, Jaboticabal, São Paulo, Brazil.*
- M436 **Improvement in saccharification yield of mixed rumen enzymes by identification of recalcitrant cell wall constituents using enzyme fingerprinting.**
Ajay Badhan¹, Yuxi Wang*¹, Robert Gruninger¹, Justin Powlowski², Adrian Tsang², and Tim McAllister¹, ¹Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, AB, Canada, ²Centre for Structural and Functional Genomics, Concordia Univ, Montreal, QC, Canada.
- M437 **Effect of dietary protein level and verna hay supplementation on production and efficiency of lactating dairy cows.**
Elmer Edgardo Corea-Guillén¹, J. M. Aguilar-Aguilar¹, N. P. Alas-Avelar¹, E. A. Alas-García¹, J. M. Flores-Tensos¹, and Glen A. Broderick*², ¹Universidad de El Salvador, San Salvador, El Salvador, ²Broderick Nutrition & Research LLC, Madison, WI.
- M438 **In vitro effects of a commercial blend of functional oils on rumen fermentation, methane production, and methanogenic archaea.**
Ahmad Reza Seradj¹, Joan Torrent*², Gabriel de la Fuente¹, and Joaquim Balcells¹, ¹University of Lleida, Lleida, Catalonia, Spain, ²Oligo Basics, Cary, NC.
- M439 **The influence of feeding oscillating dietary crude protein contents on milk production and nitrogen utilization in lactating dairy cows.**
Jolet Köhler* and Timothy Mutsvangwa, *Department of Animal and Poultry Science, University of Saskatchewan, Saskatoon, SK, Canada.*

- M440 **Effect of guanidinoacetic acid on metabolism of cattle.**
Mehrnaz Ardalan*¹, Erick D. Batista^{1,2}, Cheryl K. Armendariz¹, and Evan C. Titgemeyer¹, ¹Department of Animal Sciences and Industry, Kansas State University, Manhattan, KS, ²Departamento de Zootecnia, Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.
- M441 **Canola meals produced in different years have similar contents of rumen-undegraded protein.**
Glen A. Broderick*¹, Stefania Colombini², and Sara Costa², ¹Broderick Nutrition & Research LLC, Madison, WI, ²University of Milan, Milan, Italy.
- M442 **Enteric methane emissions of crossbred heifers fed mixtures of *Pennisetum purpureum* grass and *Leucaena leucocephala*.**
A. T. Piñeiro-Vázquez*¹, J. R. Canul-Solis¹, J. A. Alayón-Gamboa², A. J. Ayala-Burgos¹, F. J. Solorio-Sánchez¹, C. F. Aguilar-Pérez¹, and J. C. Ku-Vera¹, ¹Faculty of Veterinary Medicine and Animal Science, University of Yucatán, Mérida, Yucatán, México, ²The College of the Southern Frontier, Campeche, México.
- M443 **Effect of dietary crude protein content on milk yield and composition in dairy cows fed diets based on rehydrated corn silage and sugar cane silage.**
Marcos André Arcari, Cristian Marlon de Magalhães Rodrigues Martins, Juliano Leonel Gonçalves, Dannylo Oliveira Sousa, Bruna Gomes Alves*, Alessandra Módena Orsi, and Marcos Veiga dos Santos, Universidade de São Paulo, Pirassununga, SP, Brazil.
- M444 **Effects of levels of whole cottonseed and soybean oil on intake and ruminal fermentation in Nellore steers.**
Vinicius N. Gouvea*¹, Marcos V. Biehl², Marcos V. C. Ferraz Junior¹, Jose A. Faleiro Neto¹, Elizangela M. Moreira¹, Marcelo H. Santos¹, Renan G. Silva¹, Mariana F. Westphalen², Alexandre A. Miszura¹, Daniel M. Polizel¹, and Alexandre V. Pires^{2,1}, ¹University of Sao Paulo, Pirassununga, SP, Brazil, ²University of Sao Paulo, Piracicaba, SP, Brazil.
- M445 **Effect of lipid sources with different fatty acid profiles on rumen metabolites of feedlot Nellore steers.**
Juliana Duarte Messana*, Giovanni Fiorentini, Pablo S. Castagnino, Roberta C. Canesin, and Telma T. Berchielli, UNESP - Univ. Estadual Paulista, Jaboticabal, SP, Brazil.
- M446 **The effect of carbohydrate source in a urea-based liquid supplement on ruminal fermentation and methane production of wintering beef cows fed low-quality forage.**
A. C. Conway¹, J. J. Michal¹, J. S. Chang², B. Carter³, M. E. Benson¹, T. Bodine⁴, and K. A. Johnson*¹, ¹Department of Animal Sciences, Pullman, WA, ²Korea National Open University, Seoul, Korea, ³Perfomix Nutrition Systems, Nampa, ID, ⁴Northwest Research & Nutrition, LLC, Yakima, WA.
- M447 **Effect of varying type of forage and feeding times of rumen degradable nitrogen sources on the production, digestibility, feeding behavior and rumen metabolites of lactating dairy cows.**
Mustafa Hajilou*¹, Hamid Reza Mirzaei Alamouti¹, Mehdi Ganjkanlou², Hamid Amanlou¹, and Mehdi Dehghan Banadacki², ¹Department of Animal Science, University of Zanjan, Zanjan, Iran, ²Department of Animal Science, Campus of Agriculture and Natural Resources, University of Tehran, Karaj, Iran.
- M448 **Effects of intravenous infusion of olive oil, safflower oil, and flaxseed oil on milk fatty acid composition in dairy cows.**
C. Bai*, C. J. Ao, Khas-Erdene, P. Gao, Y. Zhang, F. Y. Mi, T. L. Zhang, J. Wen, and Y. K. Zheng, College of Animal Science, Inner Mongolia Agricultural University, Hohhot, Inner Mongolia, P. R. China.
- M449 **Pelleting-induced changes at different conditioning temperatures and times on metabolic characteristics of the proteins and feed milk value of co-products from bio-oil processing.**
Xuewei Huang, Tom Scott, Colleen Christensen, Yajing Ban, Xinxin Li, and Peiqiang Yu*, Department of Animal and Poultry Science, University of Saskatchewan, Saskatoon, SK, Canada.
- M450 **Ruminal fermentation of Nellore steers fed different sources of forage in diets with crude glycerin in feedlot.**
Andressa F. Ribeiro, Antonio Jose Neto*, Luis G. Rossi, Erick. E. Dallantonia, Ana Laura E. G. F. Carvalho, Monaliza. O. Santana, Manuela. B. Abra, Juliana D. Messana, and Telma T. Berchielli, Sao Paulo State University, Jaboticabal, SP, Brazil.
- M451 **Comparison of ruminal microbial diversity and richness in whole rumen content, rumen liquid and solid fractions.**
Shoukun Ji*, Yajing Wang, Zhijun Cao, Gibson Maswayi Alugongo, Haitao Shi, and Shengli Li, State Key Laboratory of Animal Nutrition, China Agricultural University, Beijing, China.

Small Ruminant I

- M452 **Chemical composition and quality of fresh lamb from rationally grazed hair and wool x hair sheep lambs as influenced by soy hull supplementation.**
Beruk B. Lemma^{*1}, Jung Hoon Lee¹, Stephan A. Wildeus², Govind Kannan¹, and Brou Kouakou¹, ¹Fort Valley State University, Fort Valley, GA, ²Virginia State University, Petersburg, VA.
- M453 **Effects of feeding entrapped fish oil in a chemically treated protein matrix on milk composition of lactating goats.**
Jung Hoon Lee^{*1}, Christina R. Alfred¹, Beruk B. Lemma¹, Brou Kouakou¹, and Byung J. Min², ¹Fort Valley State University, Fort Valley, GA, ²Tuskegee University, Tuskegee, AL.
- M454 **Fatty acid composition and α -tocopherol content of blood serum from lactation goats fed entrapped fish oil in a chemically treated protein matrix.**
Christina R. Alfred^{*1}, Jung Hoon Lee¹, Beruk B. Lemma¹, Brou Kouakou¹, and Byung J. Min², ¹Fort Valley State University, Fort Valley, GA, ²Tuskegee University, Tuskegee, AL.
- M455 **Fatty acid composition of different fat depots from meat goats supplemented with tannin-rich pine bark.**
Beruk B. Lemma^{*1}, Jung Hoon Lee¹, Byeng R. Min², Govind Kannan¹, and Brou Kouakou¹, ¹Fort Valley State University, Fort Valley, GA, ²Tuskegee University, Tuskegee, AL.
- M456 **Influence of dietary condensed tannins from pine bark and/or sericea lespedeza on chemical composition and quality of goat meat.**
Travet Witherspoon¹, Jung Hoon Lee^{*2}, Beruk B. Lemma¹, Byeng R. Min³, Govind Kannan², and Brou Kouakou², ¹Thomasville High School, Thomasville, GA, ²Fort Valley State University, Fort Valley, GA, ³Tuskegee University, Tuskegee, AL.
- M457 **Fatty acid composition of different fat depots from meat goats supplemented with either tannin-rich pine bark and sericea lespedeza alone or in combination.**
Christina R. Alfred¹, Jung Hoon Lee^{*1}, Travet Witherspoon², Beruk B. Lemma¹, Byeng R. Min³, Govind Kannan¹, and Brou Kouakou¹, ¹Fort Valley State University, Fort Valley, GA, ²Thomasville High School, Thomasville, GA, ³Tuskegee University, Tuskegee, AL.
- M458 **Influence of reproductive stage and breed on the hemogram of sheep.**
Leilson R. Bezerra^{*1,2}, Jacira N. C. Torreão¹, Carlo A. T. Marques¹, Marcos J. Araujo¹, and Ronaldo L. Oliveira², ¹Federal University of Piauí, Bom Jesus, Piauí, Brazil, ²Federal University of Bahia, Salvador, Bahia, Brazil.
- M459 **Production and chemical composition of milk from goats fed different levels of buriti oil.**
Leilson R. Bezerra^{*1,3}, Jasiel S. Morais^{1,2}, Ronaldo L. Oliveira³, Aderbal M. A. Silva², and Ricardo L. Edvan¹, ¹Federal University of Piauí, Bom Jesus, Piauí, Brazil, ²Federal University of Campina Grande, Patos, Paraíba, Brazil, ³Federal University of Bahia, Salvador, Bahia, Brazil.
- M460 **The effects of administering a fibrolytic probiotic made from moose rumen bacteria to neonatal lambs.**
Suzanne L. Ishaq^{*1}, Christina J. Kim¹, and André-Denis G. Wright², ¹University of Vermont, Burlington, VT, ²University of Arizona, Tucson, AZ.
- M461 **Factors affecting feed efficiency in dairy goats.**
Tadeu Silva de Oliveira^{*1}, Ricardo Augusto Mendonça Vieira¹, Danielle Ferreira Baffa², Aberto Magno Fernandes¹, and José Carlos Pereira², ¹Universidade Estadual do Norte Fluminense-Darcy Ribeiro, Rio de Janeiro, Brazil, ²Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.
- M462 **Variation of masses of body fat and protein and visceral organs of alpine goats in the first eight weeks of lactation.**
Tadeu Silva de Oliveira^{*1}, Ricardo Augusto Mendonça Vieira¹, Marcelo Teixeira Rodrigues², Aberto Magno Fernandes¹, and Danielle Ferreira Baffa², ¹Universidade Estadual do Norte Fluminense-Darcy Ribeiro, Rio de Janeiro, Brazil, ²Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.
- M463 **Meat composition and yield of carcass and non-carcass components in crossbred lambs fed frying soybean oil.**
F. O. Scarpino-van Cleef^{*}, E. H. C. B. van Cleef, M. T. C. Almeida, A. P. D' Aurea, H. L. Perez, and J. M. B. Ezequiel, São Paulo State University, Jaboticabal, São Paulo, Brazil.
- M464 **Milk production, quality, and components measured in lactating dairy goats supplemented with OmniGen-AF.**
Angela D. Rowson^{*1}, Shelby A. Armstrong¹, Lane O. Ely², and Derek J. McLean¹, ¹Phibro Animal Health Corporation, Quincy, IL, ²University of Georgia, Athens, GA.

- M465 **Effect of increasing levels of concentrate on nutrient digestibility and growth performance in lambs.**
Michelle de Oliveira Maia Parente¹, Ruan Mourão Silva Gomes*¹, Wesclley Jesus dos Santos Sodré¹, Henrique Nunes Parente¹, Miguel Arcanjo Moreira Filho¹, Nágila Maria de Carvalho Almeida¹, Rosane Cláudia Rodrigues¹, Jocélio dos Santos Araújo¹, and Daniel Louçana da Costa Araújo², ¹Universidade Federal do Maranhão, Chapadinha, Maranhão, Brazil, ²Universidade Federal do Piauí, Teresina, Piauí, Brazil.
- M466 **Feeding behavior of lambs fed increasing levels of concentrate in the diet.**
Michelle de Oliveira Maia Parente¹, Wesclley Jesus dos Santos Sodré¹, Ruan Mourão da Silva Gomes*¹, Miguel Arcanjo Moreira Filho¹, Grazieli Silva Oliveira¹, Alayne Andrade Cutrim¹, Arnaud Azevêdo Alves², and Viviany Lúcia Fernandes dos Santos³, ¹Universidade Federal do Maranhão, Chapadinha, Maranhão, Brazil, ²Universidade Federal do Piauí, Teresina, Piauí, Brazil, ³Universidade Federal do Rio Grande do Norte, Natal, Rio Grande do Norte, Brazil.
- M467 **Efficacy of Rumatel (morantel tartrate) against gastrointestinal nematode infections in lactating dairy goats.**
Angela D. Rowson*¹, Shelby A. Armstrong¹, Brian P. Schnell², and Lane O. Ely³, ¹Phibro Animal Health Corporation, Quincy, IL, ²University of Wisconsin, Madison, WI, ³University of Georgia, Athens, GA.
- M468 **Determining the critical time to measure fasting heat production of Saanen goats.**
Ana Rebeca Castro Lima*, Kleber Tomás de Resende, Márcia Helena Machado da Rocha Fernandes, Izabelle Auxiliadora Molina de Almeida Teixeira, Thiago Henrique Borghi, José Mauricio dos Santos Neto, and Carolina Isabel Soriano Oporto, *Unesp, Jaboticabal, São Paulo, Brazil.*
- M469 **Calcium and phosphorus accretion rate in Saanen goat kids of different genders.**
José Mauricio dos Santos Neto*, Kléber Tomás de Resende, Márcia Helena Machado da Rocha Fernandes, Izabelle Auxiliadora Molina de Almeida Teixeira, Julian André Castillo Vargas, Ana Rebeca Castro Lima, Fernanda Oliveira de Miranda Figueiredo, Rafael Fernandes Leite, Paula Fernanda Varella dos Santos, and Carolina Isabel Soriano Oporto, *São Paulo State University (Unesp), Jaboticabal, São Paulo, Brazil.*
- M470 **Effects of milk replacer feeding time on growth performance, nutrient digestibility and serum profiles in early-weaned lambs.**
Jian-min Chai, Hai-chao Wang, Qi-yu Diao, Tao Ma, Min-li Qi, Yan Tu, and Nai-feng Zhang*, *Feed Research Institute, Chinese Academy of Agricultural Sciences, Key Laboratory of Feed Biotechnology of the Ministry of Agriculture, Beijing, China.*
- M471 **Seasonal weight loss tolerance biomarkers to in dairy goats: An approach for breed selection.**
Mariana Palma¹, Lorenzo Hernández-Castellano^{2,3}, Noemi Castro², Anastasio Argüello², Juan Capote⁴, Manolis Matzapetakis¹, and Andre M. de Almeida*⁵, ¹Instituto de Tecnologia Química e Biológica António Xavier, Universidade Nova de Lisboa, Oeiras, Portugal, ²Department of Animal Science, Universidad de Las Palmas de Gran Canaria, Arucas, Canary Islands, Spain, ³Veterinary Physiology, Vetsuisse Faculty, University of Bern, Bern, Switzerland, ⁴Instituto Canario de Investigaciones Agrarias, Valle Guerra, Canary Islands, Spain, ⁵Instituto de Biologia Experimental e Tecnológica, Oeiras, Portugal.
- M472 **An NGS-based gene expression profile study in the goat mammary gland: Effect of undernutrition in two breeds with different levels of adaptation to nutritional stress.**
José Parreira^{1,2}, Joana R. Lérias¹, Lorenzo E. Hernández-Castellano^{3,4}, Mariana Palma², Noemi Castro⁴, Anastasio Argüello⁴, Juan Capote⁵, Susana S. Araújo^{1,2}, and André M. de Almeida*¹, ¹Instituto de Biologia Experimental e Tecnológica, Oeiras, Portugal, ²Instituto de Tecnologia Química e Biológica (I.T.Q.B.), Universidade Nova de Lisboa, Oeiras, Portugal, ³Veterinary Physiology, Vetsuisse Faculty, University of Bern, Bern, Switzerland, ⁴Department of Animal Science, Universidad de Las Palmas de Gran Canaria, Arucas, Canary Islands, Spain, ⁵Instituto Canario de Investigaciones Agrarias, Valle Guerra, Canary Islands, Spain.
- M473 **Digestibility of diets containing calcium salts of fatty acids in Saanen goats.**
Bruna Susan de Labio Molina, Claudete Regina Alcalde*, Bruna Hygino, Ludmila Couto Gomes, Caroline Isabela da Silva, Ana Paula Silva Possamai, and Rodrigo de Souza, *Universidade Estadual de Maringá, Maringá, Paraná, Brazil.*
- M474 **Loin characteristics of feedlot lambs fed different sources of non-protein nitrogen and carbohydrate.**
Ricardo D. Kliemann*, Jean C. S. Lourenço, Larissa Goltz, Juliana M. Lima, Dayanna Pastal, Tiago M. Santos, Sergio R. Fernandes, and Américo F. Garcez Neto, *Federal University of Paraná, Palotina, Paraná, Brazil.*
- M475 **Blood metabolites of feedlot lambs fed different sources of non-protein nitrogen and carbohydrate.**
Ricardo D. Kliemann*, Larissa Goltz, Jean C. S. Lourenço, Eduardo M. Nascimento, Dayanna Pastal, Tiago M. Santos, Sergio R. Fernandes, and Américo F. Garcez Neto, *Federal University of Paraná, Palotina, Paraná, Brazil.*
- M476 **Multi-scale straightness index analysis of goat behavior.**
Terry A. Gipson*¹, Kenneth M. Andries², Terry Hutchens², and Myron E. Evans³, ¹American Institute for Goat Research, Langston University, Langston, OK, ²Kentucky State University, Frankfort, KY, ³University of Kentucky Cooperative Extension, Grayson, KY.

- M477 **Effects of high heat load on BW, DMI, rectal temperature, and respiration rate of Katahdin sheep and Boer and Spanish goat wethers.**
Mengistu Urge^{1,2}, Ryszard Puchala¹, Terry A. Gipson¹, Tilahun Sahlu¹, and Arthur L. Goetsch^{*1}, ¹*American Institute for Goat Research, Langston University, Langston, OK*, ²*School of Animal and Range Sciences, Haramaya University, Dire Dawa, Ethiopia*.
- M478 **Effects of mixing different breeds to evaluate electric fence strand additions to barbed wire fence to contain growing meat goat kids.**
Yoko Tsukahara*, Terry A. Gipson, Jerry Hayes, Ryszard Puchala, Tilahun Sahu, and Arthur L. Goetsch, *American Institute for Goat Research, Langston University, Langston, OK*.
- M479 **Diet selection patterns and ingestive behavior of feedlot lambs fed different sources of non-protein nitrogen and carbohydrate.**
Jean C. S. Lourenço*, Ricardo D. Kliemann, Larissa Goltz, Caroline Dell'Agnolo, Dayanna Pastal, Tiago M. Santos, Sergio R. Fernandes, and Américo F. Garcez Neto, *Federal University of Paraná, Palotina, Paraná, Brazil*.
- M480 **Carcass characteristics of feedlot lambs fed different sources of non-protein nitrogen and carbohydrate.**
Jean C. S. Lourenço*, Larissa Goltz, Ricardo D. Kliemann, Douglas Bloedorn, Dayanna Pastal, Tiago M. Santos, Sergio R. Fernandes, and Américo F. Garcez Neto, *Federal University of Paraná, Palotina, Paraná, Brazil*.
- M481 **Weight and cutting yield of feedlot lambs fed different sources of non-protein nitrogen and carbohydrate.**
Larissa Goltz, Jean C. S. Lourenço, Ricardo D. Kliemann, Bruna N. Zuffo, Dayanna Pastal, Tiago M. Santos, Sergio R. Fernandes, and Américo F. Garcez Neto*, *Federal University of Paraná, Palotina, Paraná, Brazil*.
- M482 **Effect of *Acacia mearnsii* tannin extract on intake and digestibility by sheep fed a tropical grass hay plus concentrate.**
S. C. Avila^{*1}, G. V. Kozloski¹, T. Orlandi¹, M. P. Mezzomo¹, and D. L. Harmon², ¹*Universidade Federal de Santa Maria, Santa Maria, Rio Grande do Sul, Brazil*, ²*University of Kentucky, Lexington, KY*.
- M483 **Probiotic supplementation affects resilience to parasites in goats.**
Mulumebet Worku*, Kingsley Ekwemalour, Emmanuel Asiama, Hamid Ismail, and Sara Adjei-Fremah, *North Carolina A&T State University, Greensboro, NC*.
- M484 **Determination of the grazing activity energy cost in Boer goat wethers using a portable indirect calorimetry method.**
Marie E. Brassard^{1,2}, Ryszard Puchala^{*1}, Tilahun Sahu¹, and Arthur L. Goetsch¹, ¹*American Institute for Goat Research, Langston University, Langston, OK*, ²*Université Laval, Québec, QC, Canada*.
- M485 **Effects of two heart rate-based methods of estimating the grazing activity energy cost of Boer goat wethers.**
Marie E. Brassard^{1,2}, Ryszard Puchala^{*1}, Terry A. Gipson¹, Tilahun Sahu¹, and Arthur L. Goetsch¹, ¹*American Institute for Goat Research, Langston University, Langston, OK*, ²*Université Laval, Québec, QC, Canada*.
- M486 **The effects of variation in birth weight of littermates on lamb performance.**
Jennifer L. Juengel^{*1}, George H. Davis¹, Roger Wheeler², and Peter D. Johnstone¹, ¹*AgResearch, Invermay Agricultural Centre, Mosgiel, New Zealand*, ²*AgResearch, Woodlands Research Station, Invercargill, New Zealand*.
- M487 **Effect of different rearing systems on growth, nutrient utilization and serum indices of early weaned Hu twin lambs.**
Hai-chao Wang, Jian-min Chai, Yan Tu, Nai-feng Zhang, Tao Ma, Bo Wang, and Qi-yu Diao*, *Feed Research Institute of Chinese Academy of Agricultural Sciences, Key Laboratory of Feed Biotechnology of the Ministry of Agriculture, Beijing, China*.
- M488 **Preliminary results of the feedlot performance of South African Boer goats.**
Tertius S. Brand^{*1,2}, Daniel A. van der Merwe², Louw C. Hoffman², and Emiliano Raffrenato², ¹*Directorate: Animal Sciences, Department of Agriculture, Western Cape Government, Elsenburg, South Africa*, ²*Department of Animal Sciences, Stellenbosch University, Stellenbosch, South Africa*.

Swine Species

- M489 **Long-term effects of dietary calcium montmorillonite on swine productivity in a conventional farm in Japan.**
Fang Chi^{*1}, Munetaka Oi², Tomohiro Furuichi², San Ching¹, and LeAnn Johnston¹, ¹*Amlan International, Chicago, IL*, ²*Toyoura Veterinary Clinic, Kanagawa, Japan*.

- M490 **Effect of dietary micronutrient on the transcriptome of boar semen.**
Dianelys Gonzalez-Pena*, Robmay Garcia, Robert V. Knox, and Sandra L. Rodriguez-Zas, *University of Illinois at Urbana-Champaign, Urbana, IL.*
- M491 **Effects of supplementing high-fiber diets with a multicarbohydrase enzyme on net portal flux of essential amino acids and urea-nitrogen in growing pigs.**
Atta K. Agyekum*¹, Elijah Kiarie^{2,1}, and Charles M. Nyachoti¹, ¹*Department of Animal Science, University of Manitoba, Winnipeg, MB, Canada*, ²*DuPont Industrial Biosciences, Marlborough, Wiltshire, UK.*
- M492 **Lifetime reproductive performance of South African Mukota sows following bio-stimulation protocols.**
Dennis O. Umesobi* and Matthew C. Achilonu, *Central University of Technology, Free State, Bloemfontein, South Africa.*
- M493 **Improved piglets performance with protected sodium heptanoate.**
M. Puyalto*¹, P. Honrubia¹, M. I. Gracia², and J. J. Mallo¹, ¹*Norel S.A, Spain*, ²*IMASDE Agroalimentaria S.L, Spain.*
- M494 **Effects of dietary supplementation organic medicinal charcoal (Olga Black) on aflatoxin adsorption capacity, digestibility, population of *Lactobacillus* and *E. coli* in feces, and the fecal odor emission by In vitro and In vivo.**
Kwang-Sik Kim*¹, Jin-Ho Cho², Ki Hyun Kim¹, and Young Hwa Kim¹, ¹*National institute of animal science, Cheonan, Chungnam, Korea*, ²*Chungbuk National University, Cheongju, Chungbuk, Korea.*
- M495 **Effect of a functional feed additive on the stress nervous modulation response—Application on both the feeding behavior and performance of lactating sows and their litters.**
Mónika Kormondi¹, Bertrand Medina*², and Tamás Tóth^{1,3}, ¹*Adexgo Ltd, Balatonfüred, Hungary*, ²*Laboratoires Phodé, Terssac, France*, ³*Department of Animal Nutrition, University of West Hungary, Mosonmagyaróvár, Hungary.*
- M496 **Improved piglets performance with sodium heptanoate.**
M. Puyalto*¹, P. Honrubia¹, M. I. Gracia², and J. J. Mallo¹, ¹*Norel S.A, Spain*, ²*IMASDE Agroalimentaria S.L, Spain.*
- M497 **Feeder space may affect pig performance in the early growing-finishing period.**
David Solà-Oriol, Patricia Romero, Deborah Temple, Laia Blavi*, and Josep Gasa, *Animal Nutrition and Welfare Service, Department of Animal and Food Sciences, Universitat Autònoma de Barcelona, Bellaterra, Spain.*
- M498 **The effect of immunocastration on growth performances and carcass quality of heavy males and gilts.**
Maria A. Latorre*¹, Argimiro Daza², Alvaro Olivares³, Jesus Suarez-Belloch¹, and Clemente J. Lopez-Bote³, ¹*Universidad de Zaragoza, Zaragoza, Spain*, ²*Universidad Politecnica de Madrid, Madrid, Spain*, ³*Universidad Complutense de Madrid, Madrid, Spain.*
- M499 **Is the lactation period the main variable responsible for reducing the efficiency of the swine production?**
Sergi López-Vergé, David Solà-Oriol, Laia Blavi*, and Josep Gasa, *Animal Nutrition and Welfare Service, Department of Animal and Food Sciences, Universitat Autònoma de Barcelona, Bellaterra, Spain.*
- M500 **Evaluation of the efficacy of sodium heptanoate or butyrate in front of an enterotoxigenic *Escherichia coli* (ETEC) K88 oral challenge in piglets.**
P. López-Colom¹, L. Castillejos¹, M. Puyalto², J. J. Mallo*², and S. M. Martín-Orúe¹, ¹*Animal Nutrition and Welfare Service, Departament de Ciència Animal i dels Aliments, Universitat Autònoma de Barcelona, Bellaterra, Barcelona, Spain*, ²*Norel S.A, Madrid, Madrid, Spain.*
- M501 **The use of multiple imputation for the accurate measurements of individual feed intake by electronic feeders.**
Shihui Jiao*¹, Christian Maltecca¹, Yijian Huang², and Kent A. Gray², ¹*North Carolina State University, Raleigh, NC*, ²*Smithfield Premium Genetics, Rose Hill, NC.*
- M502 **Effect of using nonconventional legumes (narbon vetch, black chickpea, and winter pea) as protein sources in piglet diets.**
Eduardo de Mercado¹, Jose Gómez-Fernández¹, Cristina Tomás¹, Emilio Gómez-Izquierdo¹, Eva Guillamón², Alejandro Varela², Pacual López³, and Maria A. Latorre*⁴, ¹*Centro de Pruebas de Porcino, ITACYL, Hontalbilla, Segovia, Spain*, ²*Departamento de Tecnología de los Alimentos, INIA, Madrid, Spain*, ³*Copiso Soria Sociedad Cooperativa, Soria, Spain*, ⁴*Universidad de Zaragoza, Zaragoza, Spain.*
- M503 **Effects of breed, sex, and birth weight on growth and carcass composition traits in pigs.**
L. L. Lo*¹, C. C. Tsai¹, and R. S. Lin², ¹*Chinese Culture University, Taipei, Taiwan, Republic of China*, ²*National I-Lan University, I-Lan, Taiwan, Republic of China.*
- M504 **Reducing malodorous compounds on swine in vitro fermentation using probiotics.**
Yeon Jae Choi, Lovelia L. Mamuad, Seung Hyun Kim, and Sang Suk Lee*, *Sunchon National University, Suncheon, Jeonnam, South Korea.*

- M505 **Relationship between birth weight and subsequent piglet performance: A meta-analytic study.**
Eloiza Lanferdini¹, Ines Andretta², Leonardo da Silva Fonseca¹, Rennan Herculano Rufino Moreira¹, Vinicius de Souza Cantarelli¹, Rony Antônio Ferreira¹, Alysson Saraiva³, Cesar Augusto Pospissil Garbossa¹, and Márvio Lobão Teixeira de Abreu*², ¹Universidade Federal de Lavras, Lavras, Minas Gerais, Brazil, ²Universidade Federal do Rio Grande do Sul, Porto Alegre, Rio Grande do Sul, Brazil, ³Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.
- M506 **Meat quality of finishing pigs from sows supplemented with arginine during gestation.**
Leonardo da Silva Fonseca¹, Eloiza Lanferdini¹, Rennan Herculano Rufino Moreira¹, Rhuan Fillipe Chaves¹, Peter Bitencourt Faria¹, Marianne Kutschenko², Eduardo Terra Nogueira², Alysson Saraiva³, Cesar Augusto Pospissil Garbossa¹, and Márvio Lobão Teixeira de Abreu*¹, ¹Universidade Federal de Lavras, Lavras, Minas Gerais, Brazil, ²Ajinomoto Animal Nutrition, Limeira, São Paulo, Brazil, ³Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.
- M507 **Growth curve analysis of placental and fetal growth influenced by adjacent fetal sex status under crowded uterine conditions in pigs.**
Brad A. Freking* and Clay A. Lents, *USDA, ARS, US Meat Animal Research Center, Clay Center, NE.*
- M508 **Effect of mineral sources on reproductive performance in sows.**
Tsung-cheng Tsai*¹, Gary A. Apgar², Mark J. Estienne³, Mark Wilson⁴, and Charles V. Maxwell¹, ¹University of Arkansas, Fayetteville, AR, ²Southern Illinois University, Carbondale, IL, ³Virginia Tech, Blacksburg, VA, ⁴Zinpro Inc., Eden Prairie, MN.
- M509 **Transcriptome profile of boar spermatozoa as revealed by RNA-sequencing.**
Jean M. Feugang*¹, Shengfa S. Liao¹, William S. Sanders^{2,3}, Jingqiao Lu⁴, Mark A. Crenshaw¹, Scott T. Willard^{1,5}, and Peter L. Ryan^{1,6}, ¹Department of Animal and Dairy Sciences, Mississippi State University, Mississippi State, MS, ²Department of Computer Science & Engineering, Mississippi State University, Mississippi State, MS, ³Institute for Genomics, Biocomputing, and Biotechnology, Mississippi State University, Mississippi State, MS, ⁴School of Medicine, Emory University, GA, ⁵Biochemistry, Molecular Biology, Entomology and Plant Pathology, Mississippi State University, Mississippi State, MS, ⁶Pathobiology and Population Medicine, Mississippi State University, Mississippi State, MS.
- M510 **Effects of chicken egg anti-F4 antibodies supplementation on performance and diarrhea incidences in enterotoxigenic *Escherichia coli* K88⁺ challenged piglets.**
Kolawole R. Aluko*¹, Deepak Ettungalpadi Velayudhan¹, Lin Fang², and Charles M. Nyachoti¹, ¹University of Manitoba, Winnipeg, MB, Canada, ²Zyme Fast System Inc., Winnipeg, MB, Canada.
- M511 **Combined effects of chitosan and probiotic supplementation on performance and diarrhea incidences in enterotoxigenic *Escherichia coli* K88⁺ challenged piglets.**
Kolawole R. Aluko*¹, Deepak Ettungalpadi Velayudhan¹, Aike Li², Yulong Yin³, and Charles M. Nyachoti¹, ¹University of Manitoba, Winnipeg, MB, Canada, ²Academy of State Administration of Grain, Beijing, China, ³Institute of Subtropical Agriculture, Chinese Academic of Sciences, Changsha, China.
- M512 **Yeast cell wall supplementation in the diet of weaned piglets and its effect on performance and diarrhea incidence.**
Amadeo A. Alcantara*¹, Kim C. P. Isiderio¹, and Melina A. Bonato², ¹College of Veterinary Medicine, University of the Philippines Los Baños, Los Baños, Philippines, ²ICC Industrial Comércio Exportação e Importação Ltda, São Paulo, Brazil.
- M513 **Yeast cell wall supplementation in the diet of weaned piglets and its effect on gut health.**
Amadeo A. Alcantara*¹, Glorilyn M. Valesco¹, Cellito C. Mendoza¹, and Melina A. Bonato², ¹College of Veterinary Medicine, University of the Philippines Los Baños, Los Baños, Philippines, ²ICC Industrial Comércio Exportação e Importação Ltda, São Paulo, Brazil.
- M514 **Effect of chronic heat stress on mRNA expression of heat shock protein 70, uncoupling protein 3, and cytochrome p450 in pigs.**
Verónica Montesinos, Margarita Cota, Miguel Cervantes, Ernesto Avelar, Salvador Espinoza, and Adriana Morales*, *Instituto de Ciencias Agrícolas, Universidad Autónoma de Baja California, Mexicali, Baja California, México.*
- M515 **Influence of CLA supplementation on body composition of finished pigs.**
Kyle J. Stutts*, Ginger G. Vann, Mark J. Anderson, Jessica L. Leatherwood, Marcy M. Beverly, and Stanley F. Kelley, *Sam Houston State University, Huntsville, TX.*
- M516 **Effect of acute water and feed deprivation at weaning and subsequent heat stress on serum stress markers and ileal mucosa gene expression in nursery pigs.**
Nathan L. Horn*¹, Guy Miller², Frank Ruch³, Carrie R. Little³, Kolapo M. Ajuwon¹, and Olayiwola Adeola¹, ¹Purdue University, West Lafayette, IN, ²Biomatrix, Princeton, MN, ³JBS United, Sheridan, IN.

- M517 **The growth of Tamworth x Berkshire pigs farrowed outdoors and reared in a hoop structure.**
H.-S. Park¹, N. Whitley², and S.-H. Oh*¹, ¹*Department of Animal Sciences, North Carolina A&T State University, Greensboro, NC,*
²*Cooperative Extension Program, North Carolina A&T State University, Greensboro, NC.*
- M518 **Effect of postcervical artificial insemination with semen supplemented with oxytocin in sows in warm weather.**
Juan M. Romo, Javier A. Romo, Ruben Barajas, Hector R. Guemez, and Juan M. Uriarte*, *Universidad Autónoma de Sinaloa,*
Culiacan, Sinaloa, Mexico.

SYMPOSIA AND ORAL SESSIONS

Animal Health

Reproductive health and acute immune responses

Chair: Troy Wistuba, Phibro Animal Health

Sebastian I-2

- 9:30 AM 20 **Efficacy of nonsteroidal antiinflammatory drugs for the treatment of acute puerperal metritis in dairy cows.**
Alina Pohl and Wolfgang Heuwieser*, *Clinic of Animal Reproduction, Freie Universität Berlin, Berlin, Germany.*
- 9:45 AM 21 **Intrauterine cephalosporin infusion is associated with better reproduction performance in cows with purulent vaginal discharge and cytological endometritis.**
José Denis-Robichaud*¹ and Jocelyn Dubuc², ¹*Department of Population Medicine, University of Guelph, Guelph, Ontario, Canada,* ²*Faculté de Médecine Vétérinaire, Université de Montréal, Saint-Hyacinthe, Québec, Canada.*
- 10:00 AM 22 **Potential role of lactic acid bacteria in the regulation of *Escherichia coli* infection and inflammation of the bovine endometrium.**
Sandra Genís*¹, Àlex Bach^{1,2}, Francesc Fàbregas¹, Marta Terré¹, and Anna Arís¹, ¹*Department of Ruminant Production, Institut de Recerca i Tecnologia Agroalimentàries (IRTA), Torre Marimon, Caldes de Montbui, Barcelona, Spain,* ²*Institució Catalana de Recerca i Estudis Avançats (ICREA), Barcelona, Spain.*
- 10:15 AM 23 **Uterine microbiota from calving until establishment of metritis in dairy cows.**
Soo Jin Jeon*², Achilles Vieira-Neto¹, Mohanathas Gobikrushanth^{2,6}, Rodolfo Daetz², Rodolfo Mingoti¹, Ana Carolina Parize², Sabrina Freitas², Antonio Nelson da Costa⁵, Rodrigo Bicalho³, Svetlana Lima³, Kwang C. Jeong^{1,4}, and Klibis N. Galvão², ¹*Department of Animal Sciences, University of Florida, Gainesville, FL,* ²*Department of Large Animal Clinical Sciences, University of Florida, Gainesville, FL,* ³*Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, NY,* ⁴*Emerging Pathogens Institute, University of Florida, Gainesville, FL,* ⁵*Departamento de Zootecnia, Universidade Federal do Ceará, Fortaleza, Ceara, Brazil,* ⁶*Department of Agricultural, Food and Nutritional Science, University of Alberta, Alberta, Canada.*
- 10:30 AM **Break**
- 10:45 AM 25 **Association among health and fertility and survival of high-producing dairy cows in three geographic regions of Chile.**
Pablo Pinedo*^{1,2}, Pedro Melendez³, Sushil Paudyal⁴, Felipe Arias⁵, Ricardo Krauss⁵, Hernando Lopez⁶, Alejandro Luco⁵, and Cristian Vegara^{5,6}, ¹*Texas A&M AgriLife Research, Amarillo, TX,* ²*Department of Veterinary Pathobiology, College of Veterinary Medicine & Biomedical Sciences, Texas A&M University System, College Station, TX,* ³*Department of Veterinary Medicine and Surgery, College of Veterinary Medicine, University of Missouri-Columbia, Columbia, MO,* ⁴*West Texas A&M University, Canyon, TX,* ⁵*ABS Chile Ltda, Santiago, Chile,* ⁶*ABS Global Inc., DeForest, WI.*
- 11:00 AM 26 **Bovine viral diarrhea diagnostic testing results in the Intermountain West—Comparison between test methods, age, sex and beef versus dairy breeds.**
David J. Wilson*, Thomas J. Baldwin, E. Jane Kelly, Arnaud VanWettere, and Gordon Hullinger, *Utah State University, Logan, UT.*
- 11:15 AM 27 **Prewaning plane of nutrition and *Mannheimia haemolytica* dose influence inflammatory responses to a combined bovine herpesvirus-1 and *Mannheimia haemolytica* challenge in postweaned Holstein calves.**
K. P. Sharon*^{1,2}, Y. L. Liang¹, N. C. Burdick Sanchez², J. A. Carroll², P. R. Broadway², and M. A. Ballou¹, ¹*Department of Animal and Food Sciences, Texas Tech University, Lubbock, TX,* ²*USDA-ARS, Livestock Issues Research Unit, Lubbock, TX.*
- 11:30 AM 28 **Plasma leptin concentrations are increased during a vaccine-induced acute-phase response in beef cattle.**
Rodrigo Marques*¹, Reinaldo Cooke¹, Murilo Rodrigues¹, Bruno Cappellozza¹, Sergio Arispe², and David Bohnert¹, ¹*EOARC, Oregon State University, Burns, OR,* ²*Malheur County Extension, Oregon State University, Ontario, OR.*
- 11:45 AM 29 **Effect of an early-life LPS challenge on a subsequent LPS challenge in Holstein bull calves.**
Aimee L. Benjamin*¹, Filiz T. Korkmaz¹, Theodore Elsasser², and David E. Kerr¹, ¹*University of Vermont, Burlington, VT,* ²*USDA-ARS, Beltsville, MD.*

- 12:00 PM 30 **ACTH-test reactivity affect disposition for storage of fat depots in dairy cows during the transition period.**
Lena Ruda¹, Claudia Raschka¹, Lea Fieguth¹, Asako Kinoshita¹, Anja Schacht¹, Marion Piechotta¹, Korinna Huber², Akos Kenez², Ulrich Meyer³, Sven Dänicke³, and Juergen Rehage*¹, ¹*Clinic for Cattle, University of Veterinary Medicine Hannover, Hannover, Germany*, ²*Department of Physiology, University of Veterinary Medicine Hannover, Hannover, Germany*, ³*Institute of Animal Nutrition, Friedrich-Loeffler-Institute, Braunschweig, Germany*.
- 12:15 PM 31 **Use of an ex vivo/in vitro laminitis model to elucidate the role of endotoxins during equine and bovine laminitis.**
Nicole Reisinger*¹, Simone Schaumberger², and Gerd Schatzmayr¹, ¹*Biomin Research Center, Tulln, Austria*, ²*Biomin Holding GmbH, Herzogenburg, Austria*.

Bioethics Symposium
Effects of science, government, and the public in directing the future of animal agriculture
Chair: **Kathryn Proudfoot, The Ohio State University**
Sponsor: **Elanco Animal Health**
Panzacola F-3

- 9:30 AM **Introduction.**
Jessica Pempek, The Ohio State University.
- 9:30 AM 32 **Role of science in the future of animal agriculture.**
Paul H. Hemsworth*, *University of Melbourne, Parkville, Victoria, Australia*.
- 10:00 AM 33 **Update on the US Technical Advisory Group to the International Organization for Standardization (ISO) Working Group 16—Welfare of Food-Producing Animals.**
Craig A. Morris*, *United States Department of Agriculture, Agricultural Marketing Service, Washington, DC*.
- 10:30 AM 34 **Effect of consumer choices on food animal production practices in the future.**
Charlie Arnot and J. J. Jones*, *Center for Food Integrity, Gladstone, MO*.
- 11:00 AM **Panel Discussion**
- 11:30 AM **Break**
- 11:45 AM 35 **US consumer perceptions of animal use for food, recreation, and more: Are feelings about Bambi the deer, Bessie the cow, and Buster the dog more related than we thought?**
Elizabeth Byrd* and Nicole Widmar, *Purdue University, W. Lafayette, IN*.
- 12:00 PM 36 **Willingness to pay for pork chops and chicken breasts: Are hunters (and those who approve of hunting) different (from the average US consumer)?**
Elizabeth Byrd*, Nicole Widmar, and John Lee, *Purdue University, W. Lafayette, IN*.
- 12:15 PM 37 **Willingness to pay for pork chops and bacon: Effects of perceived farm sizes and information shocks.**
Ann Cummins*, Nicole Widmar, Joan Fulton, and Candace Croney, *Purdue University*.

Breeding and Genetics Symposium
Relevance of modeling in the genomics era
Chairs: **Ignacy Misztal, University of Georgia, and Jennifer M. Bormann, Kansas State University**
Panzacola F-1/2

- 9:30 AM 38 **Is complex modeling important in the age of genomic selection?**
Guilherme J. M. Rosa*, *University of Wisconsin, Madison, WI*.

| | | |
|----------|----|--|
| 10:00 AM | 39 | BLUP, REML, and other tools in the age of genomic selection. Esa A. Mäntysaari* and Martin Lidauer, <i>Natural Resources Institute Finland, Green Technology, Jokioinen, Finland.</i> |
| 10:30 AM | 40 | Practical implications for genetic modeling in the genomics era for the dairy industry. Paul M. VanRaden*, <i>Animal Genomics and Improvement Lab, Agriculture Research Service, USDA, Beltsville, MD.</i> |
| 11:00 AM | 41 | Experiences in bioinformatics. Luc L. Janss*, <i>Aarhus University, Tjele, Denmark.</i> |
| 11:30 AM | 42 | Practical implications for genetic modeling in the genomics era for the beef industry. Andy D. Herring*, <i>Texas A&M University, College Station, TX.</i> |
| 12:00 PM | | Panel Discussion |

Comparative Gut Physiology and Nonruminant Nutrition Symposium The gut–brain axis—Sensing and signaling

Chairs: **Joanne Knapp, Fox Hollow Consulting LLC (AM session) and
Joshua Jendza, BASF (PM session)**

Sponsors: **APC Inc., King Techina Group, Novus International, and Pancosma
Sebastian I-1**

| | | |
|----------|----|---|
| 9:30 AM | | Introduction. Joanne Knapp. |
| 9:45 AM | 43 | Nutrient and non-nutrient sensing in the gastrointestinal tract. Soraya P. Shirazi-Beechey*, <i>University of Liverpool, Institute of Integrative Biology, Liverpool, UK.</i> |
| 10:30 AM | 44 | Effects of supplemental amino acids in low-protein diets on intestinal tight junction and amino acid transporters in growing pigs. S. J. Zhang* ^{1,2} , W. Parnsen ¹ , and S. W. Kim ¹ , ¹ <i>Department of Animal Science, North Carolina State University, Raleigh, NC,</i> ² <i>College of Animal Science and Technology, China Agricultural University, Beijing, China.</i> |
| 10:45 AM | 45 | The emerging role of bile acids as nutrient-sensing signals. Ignacio R. Ipharraguerre* ^{1,2} , ¹ <i>Institute of Human Nutrition and Food Science, University of Kiel, Kiel, Germany,</i> ² <i>Lucta S.A, Montornes del Valles, Spain.</i> |
| 11:15 AM | 46 | The role of gut peptides in the gut–brain axis of livestock. Andrew P. Foote*, <i>USDA-ARS, US Meat Animal Research Center, Clay Center, NE.</i> |
| 11:45 AM | 47 | Nutrient sensing by glucagon-like peptide-1 secreting cells. Frank Reimann*, <i>Institute of Metabolic Science & MRC Metabolic Diseases Unit, University of Cambridge, Cambridge, UK.</i> |
| 12:30 PM | | Lunch (on your own) |
| 2:00 PM | 48 | Effect of feeding rate and glucose provision on plasma glucagon-like peptide 2 concentration in dairy calves. Sarah Y. Morrison* ¹ , Juan. J. Castro ¹ , Kristen M. Glosson ¹ , Jens. J. Holst ² , James K. Drackley ¹ , and Ignacio R. Ipharraguerre ^{3,4} , ¹ <i>University of Illinois, Urbana, IL,</i> ² <i>Department of Biomedical Sciences, University of Copenhagen, Denmark,</i> ³ <i>Institute of Human Nutrition and Food Science, University of Kiel, Germany,</i> ⁴ <i>Lucta SA, Barcelona, Spain.</i> |
| 2:15 PM | 49 | The brain within the gut—Activation of enteric cells and sensory neurons. John B. Furness* ¹ , David M. Bravo ² , Jeremy J. Cottrell ¹ , and Frank R. Dunshea ¹ , ¹ <i>University of Melbourne, Parkville, Australia,</i> ² <i>InVivo Animal Nutrition & Health, Talhouët, Saint-Nolff, France.</i> |

- 3:00 PM 50 **Xylanase supplementation in feed reduces incretin and PYY levels in piglets.**
Katherine May*¹, Saoirse E. O’Sullivan², John M. Brameld¹, Helen V. Masey O’Neill³, Tim Parr¹, and Julian Wiseman¹,
¹*School of Biosciences, University of Nottingham, Loughborough, Leicestershire, UK*, ²*School of Medicine, University of Nottingham, Derby, Derbyshire, UK*, ³*AB Vista Feed Ingredients, Marlborough, Wiltshire, UK*.
- 3:15 PM 51 **Perinatal nutrition and the gut–brain axis.**
Ryan N. Dilger*, *University of Illinois, Urbana, IL*.
- 3:45 PM 52 **Effects of increasing standardized ileal digestible tryptophan:lysine ratio on performance and ileal expression of cytokine mRNA in weaned pigs challenged with *Escherichia coli* K88.**
B. Jayaraman*¹, A. Regassa¹, W. K. Kim¹, J. K. Htoo², and C. M. Nyachoti¹, ¹*University of Manitoba, Winnipeg, Manitoba, Canada*, ²*Evonik Industries AG, Nutrition Research, Hanau-Wolfgang, Germany*.
- 4:00 PM 53 **Effect of dietary intervention of probiotic *Lactobacillus helveticus* MTCC 5463 on fecal beta-glucuronidase activity in geriatric volunteers.**
Suja Senan*¹, Jashbhai Prajapati², Chaitanya Joshi², Sreeja V², Manisha Gohel³, Sunil Trivedi³, Rupal Patel³, Himanshu Pandya³, Ajay Phatak³, Uday Shankar³, and Hasmukh Patel¹, ¹*South Dakota State University, Brookings, SD*, ²*Anand Agricultural University, Anand, Gujarat, India*, ³*H. M. Patel Center for Medical Care & Education, Karamsad, Gujarat, India*.
- 4:15 PM 54 **Brain–gut interactions in stress.**
Jackie D. Wood*, *The Ohio State University, Columbus, OH*.

Extension Education Symposium
Extension and industry outreach for tomorrow’s producers
Chair: Victor E. Cabrera, University of Wisconsin-Madison
Wekiwa 1/2

- 9:30 AM 55 **Developing partnerships between academia and industry.**
Todd R. Bilby*, *Merck Animal Health, Fort Worth, TX*.
- 10:00 AM 56 **What I’ve seen and done on both sides: Academia and Industry.**
Larry Corah*, *Certified Angus Beef, Wooster, OH*.
- 10:30 AM 57 **Training of students: Real-world experience on farm, in extension, and industry.**
Robert E. James*, *Virginia Tech, Blacksburg, VA*.
- 11:00 AM 58 **Retaining qualified extension faculty: An administrator’s perspective.**
Gregory P. Lardy*, *North Dakota State University, Fargo, ND*.
- 11:30 AM 59 **Development of mobile applications in extension.**
R. Lawton Stewart*¹ and G. Cliff Lamb², ¹*The University of Georgia, Athens, GA*, ²*The University of Florida, Marianna, FL*.
- 12:00 PM 60 **Social media to deliver extension.**
Alison Van Eenennaam*, *University of California, Davis, CA*.

Forages and Pastures
Forages for livestock systems

Chair: **Kathy Soder, USDA-ARS-Pasture Systems and Watershed Management**
Suwannee 15

- 9:30 AM 61 **Forage-finished steer performance and carcass characteristics from grazing high-energy forages during the finishing period.**
Rachel M. Martin*¹, Jason E. Rowntree¹, Kim A. Cassida¹, Joseph Paling¹, and Douglas Carmichael², ¹Michigan State University, East Lansing, MI, ²Michigan State University AgBio Lake City Research Center, Lake City, MI.
- 9:45 AM 62 **Using weekly pasture growth and utilization measurements to make management decisions on Oregon dairies.**
Troy W. Downing*, Oregon State University, Corvallis, OR.
- 10:00 AM 63 **Evaluation of sound-based detection of rumination in grazing dairy cows.**
Santiago A. Utsumi*¹, Julio R. Galli², Diego Milone^{3,4}, Hugo L. Rufiner^{3,4}, and Leonardo Giovanini^{3,4}, ¹Michigan State University, East Lansing, MI, ²Universidad Nacional de Rosario, Santa Fe, Argentina, ³Universidad Nacional del Litoral, Entre Rios, Argentina, ⁴CONICET, Argentina.
- 10:15 AM 64 **Evaluation of forage quality of five grains for use in sprouted fodder production systems for organic dairy cattle.**
Bradley J. Heins*¹, James C. Paulson², and Hugh Chester-Jones³, ¹University of Minnesota, West Central Research and Outreach Center, Morris, MN, ²University of Minnesota Extension, Rochester, MN, ³University of Minnesota, Southern Research and Outreach Center, Waseca, MN.
- 10:30 AM 65 **Protein quality of grass silage as affected by silage additives and its effects on dairy cow performance.**
Elisabet Nadeau*¹, Björn Johansson², Wolfram Richardt³, and Michael Murphy², ¹Swedish University of Agricultural Sciences, Skara, Sweden, ²Lantmännen Feed Division, Malmö, Sweden, ³LKS mbH, Lichtenwalde, Germany.
- 10:45 AM 66 **Effects of type and level of energy supplementation on stocker cattle performance from annual ryegrass.**
Carla J. Weissend*, Courtney M. Holland, Kaleb B. Marchant, Samantha R. Sechler, and Russell B. Muntiferung, Auburn University, Auburn, AL.
- 11:00 AM 67 **Performance of *Bos indicus* versus *Bos taurus* stocker cattle grazing 'Coastal' bermudagrass supplemented with distillers dried grains.**
W. Brandon Smith*¹, F. M. "Monte" Rouquette¹, Joel L. Kerby¹, Luis O. Tedeschi², Jamie L. Foster³, Jason P. Banta⁴, Kimberly C. McCuiston⁵, and Tanner J. Machado⁵, ¹Texas A&M AgriLife Research, Overton, TX, ²Texas A&M University, College Station, TX, ³Texas A&M AgriLife Research, Beeville, TX, ⁴Texas A&M AgriLife Extension, Overton, TX, ⁵Texas A&M University-Kingsville, Kingsville, TX.
- 11:15 AM 68 **Interaction between a tannin-containing legume and endophyte-infected tall fescue seed on lamb feeding behavior and physiology.**
Juan J. Villalba*¹, Casey Spackman¹, Ben Goff², James L. Klotz³, and Jennifer W. MacAdam¹, ¹Utah State University, Logan, UT, ²University of Kentucky, Lexington, KY, ³USDA-ARS, Lexington, KY.
- 11:30 AM 69 **Effect of a combination of lactic acid producing bacteria and fibrolytic enzymes on the ensiling characteristics of cool season grasses: A farm-scale application.**
Jeffrey M. Chilson*, Chia-Yu Tsai, Kirk C. Ramsey, Richard Scuderi, and Pedram Rezamand, University of Idaho, Moscow, ID.

Graduate Student Competition
ADSA Dairy Foods Graduate Student Oral Competition
Chair: **David McCoy, Dairy Management Inc.**
Wekiwa 7/8

- 9:30 AM 70 **Structural changes and texture development in milk protein concentrates induced by high hydrostatic pressure.**
Lee Cadesky*¹, Markus W. Ribeiro¹, Mukund V. Karwe², and Carmen I. Moraru¹, ¹Cornell University, Ithaca, NY, ²Rutgers University, New Brunswick, NJ.

- 9:45 AM 71 **Solubilization of rehydrated frozen highly concentrated micellar casein concentrate for use in liquid food applications.**
Ying Lu*¹, Donald McMahon¹, Lloyd Metzger², Anil Kommineni², and Almut Vollmer¹, ¹Western Dairy Center, Utah State University, Logan, UT, ²Midwest Dairy Foods Research Center, South Dakota State University, Brookings, SD.
- 10:00 AM 72 **Development of a method for characterizing high-protein dairy powders with an ultrasonic flaw detector.**
Mary Hauser* and Jayendra Amamcharla, Kansas State University, Manhattan, KS.
- 10:15 AM 73 **The effect of spray-drying parameters on the flavor of skim milk powder.**
C. W. Park*, M. A. Stout, and M. A. Drake, Southeast Dairy Foods Research Center, North Carolina State University, Raleigh, NC.
- 10:30 AM 74 **Using membrane filtration to fractionate acid whey into value-added ingredients.**
Bang Chen*¹, Karen E. Smith², John A. Lucey^{2,1}, Rebecca Kalscheuer², and Michael Molitor², ¹University of Wisconsin-Madison, Madison, WI, ²The Wisconsin Center for Dairy Research, Madison, WI.
- 10:45 AM **Break**
- 11:00 AM 75 **Hydrodynamic cavitation as a tool to improve texture, mouthfeel, and creaminess in formulated and high-protein, low-fat Greek yogurts.**
Gopinathan H. Meletharayil* and Hasmukh A. Patel, South Dakota State University, Brookings, SD.
- 11:15 AM 76 **Engineering of infant formula emulsions to enhance protein thermal stability through Maillard conjugation.**
Kamil P. Drapala*, Daniel M. Mulvihill, and James A. O'Mahony, School of Food and Nutritional Sciences, University College Cork, Cork, Ireland.
- 11:30 AM 77 **Improvement of the physicochemical and functional properties of whey protein hydrolysates by conjugation.**
Eve M. Mulcahy*, Daniel M. Mulvihill, and James A. O'Mahony, School of Food and Nutritional Sciences, University College Cork, Cork, Ireland.
- 11:45 AM 78 **Novel application of a fungal catalase preparation to control spore-forming bacteria in the dairy industry.**
Nuria Garcia-Fernandez*^{1,2} and Ashraf Hassan¹, ¹Dairy Science Department, South Dakota State University, Brookings, SD, ²Midwest Dairy Foods Research Center, South Dakota State University, Brookings, SD.
- 12:00 PM 79 **Impact of buttermilk serum fractions on the rennet coagulation properties of bovine milk.**
M.-P. Gauvin*¹, M. Britten^{1,2}, and Y. Pouliot¹, ¹STELA Dairy Research Center, Institute on Nutrition and Functional Foods (INAF), Université Laval, Québec, Québec, Canada, ²Food Research and Development Center (FRDC), Agriculture and Agri-Food Canada, St-Hyacinthe, Québec, Canada.

Graduate Student Competition
ADSA Production Division Graduate Student Oral Competition, MS
Chair: Eric Reid, Cooperative Feed Dealers
Wekiwa 6

- 9:30 AM 80 **Automated detection of estrus using multiple commercial precision dairy farming technologies in synchronized dairy cows.**
L. M. Mayo*, W. J. Silvia, G. Heersche, I. C. Tsai, B. A. Wadsworth, A. E. Stone, and J. M. Bewley, Department of Animal and Food Sciences, University of Kentucky, Lexington, KY.
- 9:45 AM 81 **Effect of nutrition and management practices on de novo fatty acid synthesis in northeastern US dairy herds.**
Melissa E. Woolpert*^{1,2}, Catarina Melilli³, Kurt W. Cotanch¹, Heather M. Dann¹, Rick J. Grant¹, Larry E. Chase³, and David M. Barbano³, ¹William H. Miner Agricultural Research Institute, Chazy, NY, ²University of Vermont, Burlington, VT, ³Cornell University, Ithaca, NY.
- 10:00 AM 82 **Pregnancy outcomes based on milk pregnancy-associated glycoprotein levels.**
Erin M. Wynands*, Stephen J. LeBlanc, and David F. Kelton, University of Guelph, Guelph, Ontario, Canada.

- 10:15 AM 83 **Prepartum dietary cation-anion difference (DCAD) and 25-hydroxyvitamin D₃ supplementation modulate β -defensin responses in postpartum dairy cattle.**
Kathryn Merriman*¹, Natalia Martinez¹, Rachel Rodney², Jessi Powell¹, Mercedes Kweh¹, Nathaniel Elliott¹, Jose Santos¹, and Corwin Nelson¹, ¹University of Florida, Gainesville, FL, ²SBSibus, Camden, Australia.
- 10:30 AM 84 **Effects of elevated subcutaneous adipose stores on fractionated peripheral blood mononuclear cells and polymorphonucleocytes fatty acid profile and polymorphonucleocytes gene expression in periparturient dairy cow.**
Cynthia M. Scholte*, Zahra Mohammadi-Amiri, Bahman Shafii, and Pedram Rezamand, University of Idaho, Moscow, ID.
- 10:45 AM 85 **Cows at a high risk for subacute rumen acidosis exhibit different feeding behavior.**
Kira Macmillan*, Xiaosheng Gao, and Masahito Oba, University of Alberta, Edmonton, Alberta, Canada.
- 11:00 AM 86 **Factors associated with aerobic plate count, coliform count, and log reduction of bacteria in automated calf feeders.**
Alyssa M. Dietrich*¹, Whitney A. Knauer², Sandra A. Godden², Christina S. Petersson-Wolfe¹, and Robert E. James¹, ¹Virginia Tech, Blacksburg, VA, ²University of Minnesota, St. Paul, MN.
- 11:15 AM 87 **Effects of supplementing slow-release urea in combination with steam-flaked corn or high-moisture corn on ruminal fermentation and lactational performance of dairy cows.**
B. M. Tye*¹, K. Neal¹, S. Y. Yang¹, J.-S. Eun¹, A. J. Young¹, and K. Mjoun², ¹Department of Animal, Dairy, and Veterinary Sciences, Utah State University, Logan, UT, ²Alltech, Brookings, SD.
- 11:30 AM 88 **Regulation of microRNA-221 gene expression in ovarian theca cells of cattle: A possible role in follicular development.**
Cheyenne L. Robinson*, Luis F. Schutz, Morgan L. Totty, and Leon J. Spicer, Oklahoma State University, Stillwater, OK.
- 11:45 AM 89 **Feeding a rumen-degradable amino acid can enhance milk production.**
Kayla M. Hultquist* and David P. Casper, South Dakota State University, Brookings, SD.
- 12:00 PM 90 **Investigation of a new anti-slip flooring technology to address slips and falls by dairy cows.**
Nancy Franco-Gendron*¹, Renée Bergeron¹, Walt Curilla², Sabine Conte³, Trevor J. DeVries⁴, and Elsa Vasseur¹, ¹Organic Dairy Research Center, University of Guelph, Alfred Campus, Alfred, Ontario, Canada, ²AB Silikal Hygienic Floors, Diamond Hard Surfaces Inc., Calgary, Alberta, Canada, ³Centre de Recherche et de Développement sur le Bovin Laitier et le Porc, Agriculture and Agri-Food Canada, Lennoxville, Quebec, Canada, ⁴Department of Animal and Poultry Science, University of Guelph, Kemptville Campus, Kemptville, Ontario, Canada.
- 12:15 PM 91 **2,4-Thiazolidinedione improves liver function but does not affect insulin sensitivity and expression of genes in adipose and mammary tissue of lactating dairy goats.**
Fernanda T. da Rosa*¹, Johan Osorio¹, Francisco Y. Rivera¹, Erminio Trevisi², Charles T. Estill¹, and Massimo Bionaz¹, ¹Oregon State University, Corvallis, OR, ²Universita Cattolica del Sacro Cuore, Piacenza, PC, Italy.
- 12:30 PM 92 **Inferring the causal effect of number of lambs born on milk yield in dairy sheep using propensity score methods.**
Vera C. Ferreira*, Bruno D. Valente, David L. Thomas, and Guilherme J. M. Rosa, University of Wisconsin, Madison, WI.

Graduate Student Competition

ADSA Southern Section Graduate Student Oral Competition

Chair: Shannon Davidson, North Carolina State University

Wekiwa 5

- 9:30 AM 93 **The effect of somatic cell score on milk yield of dairy cattle in the southeastern United States.**
Derek T. Nolan* and Jeffrey M. Bewley, University of Kentucky, Lexington, KY.
- 9:45 AM 94 **Effect of early lactation increased milking frequency on milk yield and local regulators of mammary cell activity.**
Diana K. Hardin*¹, Andrea J. Lengi¹, Hollie H. Schramm², and Benjamin A. Corl¹, ¹Department of Dairy Science, Virginia Tech, Blacksburg, VA, ²Department of Large Animal Clinical Sciences, Virginia-Maryland College of Veterinary Medicine, Blacksburg, VA.

**Lactation Biology Symposium
Mammary gland biology revisited**

Chairs: **Rupert Bruckmaier, University of Bern, and Tom McFadden, University of Missouri**
Wekiwa 3/4

- 9:30 AM 95 **Mammary gland growth—It's not just estrogen.**
Russell C. Hovey*¹, Grace E. Berryhill¹, Josephine F. Trott¹, and Adam L. Lock², ¹University of California, Davis, CA, ²Michigan State University, East Lansing, MI.
- 10:00 AM 96 **Body condition of gilts at the end of gestation affects their mammary development.**
Chantal Farmer*¹, Marie-France Palin¹, and Michel Vignola², ¹Agriculture and Agri-Food Canada, Dairy and Swine R&D Centre, Sherbrooke, QC, Canada, ²Nutreco Canada, St-Elzéar, QC, Canada.
- 10:15 AM 97 **Autocrine-paracrine regulation of the mammary gland.**
Samantha R. Weaver and Laura L. Hernandez*, *University of Wisconsin-Madison, Madison, WI.*
- 10:45 AM 98 **New insights in the importance of prolactin in dairy ruminants.**
Pierre Lacasse*¹, Séverine Ollier¹, Vanessa Lollivier², and Marion Boutinaud², ¹Dairy and Swine R&D Centre, Sherbrooke, QC, Canada, ²INRA, Agrocampus Ouest, UMR1348 PEGASE, Saint Gilles, France.
- 11:15 AM 99 **Regulation of cell number in the mammary gland via the control of the exfoliation process in milk in ruminants.**
Lucile Hervé^{1,2}, Vanessa Lollivier^{1,2}, Hélène Quesnel^{1,2}, and Marion Boutinaud*^{1,2}, ¹INRA UMR1348, Saint Gilles, France, ²Agrocampus Ouest UMR1348, Rennes, France.
- 11:45 AM 100 **Mammary response to infection: A critical balance between pathogen elimination and collateral damage.**
David E. Kerr*, *University of Vermont, Burlington, VT.*
- 12:15 PM 101 **Blood-derived proteins in milk during the colostral period: Active or passive transfer?**
Samantha K. Wall*¹, Josef J. Gross¹, Evelyne C. Kessler¹, Kris Villez², and Rupert M. Bruckmaier¹, ¹Veterinary Physiology, Vetsuisse Faculty University of Bern, Bern, Switzerland, ²Swiss Federal Institute of Aquatic Science and Technology, Dübendorf, Switzerland.

Meat Science and Muscle Biology
Chair: **Joe O. Buntyn, University of Nebraska**
Suwannee 13/14

- 9:30 AM 102 **Timing of exposure to high-concentrate diets vs. pasture on lipogenic enzyme gene expression of steers at slaughter.**
Brandon M. Koch*¹, Emanuel A. Oliveira², and Susan K. Duckett¹, ¹Clemson University, Clemson, SC, ²Universidade Estadual Paulista, Jaboticabal, SP, Brazil.
- 9:45 AM 103 **Effects of high-concentrate diets during stocker and finishing phase on lipid fractions in longissimus muscle.**
Adriana Pordomingo, Gabriela Volpi Lagreca, Brandon M. Koch, and Susan K. Duckett*, *Clemson University, Clemson, SC.*
- 10:00 AM 104 **Feeding microalgae meal (*Schizochytrium limacinum* CCAP 4087/2) to finishing cattle I: Effects on visceral and subcutaneous adipocyte size and *Longissimus lumborum* muscle fiber characteristics.**
Kelsey J. Phelps*¹, John M. Gonzalez¹, Derris D. Burnett¹, Christian A. Alvarado-Gilis¹, Mathew A. Vaughn¹, Caleb P. Weiss¹, Cadra L. Van Bibber-Krueger¹, Justin E. Axman¹, Jake D. Thieszen¹, Kate A. Jacques², and James S. Drouillard¹, ¹Kansas State University, Manhattan, KS, ²Alltech Inc., Nicholasville, KY.
- 10:15 AM 105 **Feeding microalgae meal (*Schizochytrium limacinum* CCAP 4087/2) to finishing cattle II: Effects on *Longissimus lumborum* fatty acid profile and meat quality.**
Kelsey J. Phelps*¹, John M. Gonzalez¹, Christian A. Alvarado-Gilis¹, Derris D. Burnett¹, Mathew A. Vaughn¹, Sara M. Ebarb¹, Caleb P. Weiss¹, Cadra L. Van-Bibber Krueger¹, Justin E. Axman¹, Kate A. Jacques², and James S. Drouillard¹, ¹Kansas State University, Manhattan, KS, ²Alltech Inc., Nicholasville, KY.

- 10:30 AM 106 **Intratesticular injection of zinc solution effectively castrates male pigs without affecting pork quality.**
Jason K. Apple*¹, Tsung-Cheng Tsai¹, Hae-Jin Kim¹, Min Wang², Brian P. Corbett², Tim M. Johnson¹, and Charles V. Maxwell¹, ¹Department of Animal Science, University of Arkansas Division of Agriculture, Fayetteville, AR, ²Ark Science Inc., Irvington, NY.
- 10:45 AM 107 **Prediction of red meat yield and trimmable fat yield from beef carcasses utilizing bioelectrical impedance analysis.**
Angela N. Schmitz*¹, Lee-Anne J. Walter¹, Wade T. Nichols², John P. Hutcheson², and Ty E. Lawrence¹, ¹West Texas A&M University, Canyon, TX, ²Merck Animal Health, Summit, NJ.
- 11:00 AM 108 **Dietary lysine affected the expression of genes related to lipid metabolism in skeletal muscle of finishing pigs.**
Taiji Wang*, Naresh Regmi, Jean M. Feugang, Mark A. Crenshaw, John R. Blanton, and Shengfa F. Liao, Department of Animal and Dairy Sciences, Mississippi State University, Mississippi State, MS.
- 11:15 AM 109 **Transcriptomic and metabolomic assessment of growth promoter effects on porcine muscle growth.**
John Brameld*¹, Kevin Ryan¹, Hannah Williams¹, Doug Harris², David Brown¹, Richard Emes¹, Tom Giles¹, Chungui Lu¹, Charlie Hodgman¹, and Tim Parr¹, ¹University of Nottingham, Nottingham, UK, ²Zoetis, Kalamazoo, MI.
- 11:30 AM 110 **Molecular factors underlying the discrepancy of marbling between Nelore and Angus beef.**
Taiane Martins¹, Walmir Silva¹, Leticia Sanglard¹, Ivan Carvalho Filho¹, Ygor Cassani¹, Nick Serão², Mario Chizzotti¹, Marcio Ladeira³, and Marcio Duarte*¹, ¹Federal University of Vicosa, Vicosa, MG, Brazil, ²Iowa State University, Ames, IA, ³Federal University of Lavras, Lavras, MG, Brazil.
- 11:45 AM 111 **Effect of rearing system on meat quality, lipid, and amino acid profiles of lambs.**
Jian-min Chai¹, Hai-chao Wang¹, Qi-yu Diao¹, Kai-dong Deng², Yan Tu¹, Min-li Qi¹, and Nai-feng Zhang*¹, ¹Feed Research Institute of Chinese Academy of Agricultural Sciences, Key Laboratory of Feed Biotechnology of the Ministry of Agriculture, Beijing, China, ²College of Animal Science, Jinling Institute of Technology, Nanjing, Jiangsu, China.
- 12:00 PM 112 **The effects of growth-promoting agents on ovine metabolism and growth.**
Shaker Al-Doski*¹, Tim Parr¹, Krystal Hemmings³, Zoe Daniel¹, David Brown¹, Doug Harris², Chungui Lu¹, Charlie Hodgman¹, Sean May¹, and John Brameld¹, ¹University of Nottingham, Nottingham, UK, ²Zoetis, Kalamazoo, MI, ³University of Derby, Derby, UK.

**Nonruminant Nutrition
Enzymes and processing
Chair: Joshua Jendza, BASF
Sebastian I-4**

- 9:30 AM 113 **Comparative efficacy of xylanases on energy and nutrient digestibility in growing pigs fed corn- or wheat-based diets.**
Elijah Kiarie*^{1,2}, Luis F. Romero¹, Susan Arent³, Rikke Lorentsen³, and Hans H. Stein⁴, ¹DuPont Industrial Biosciences-Danisco Animal Nutrition, Marlborough, Wiltshire, UK, ²Department of Animal Science, University of Manitoba, Winnipeg, MB, Canada, ³DuPont Nutrition Biosciences-Enzyme Research & Development, Brabrand, Aarhus, Denmark, ⁴Department of Animal Sciences, University of Illinois, Urbana, IL.
- 9:45 AM 114 **Effects of supplemental xylanase on digesta viscosity, gut health, and growth performance of nursery pigs.**
Hongyu Chen*¹, Rafael Cabrera², and Sung Woo Kim¹, ¹North Carolina State University, Raleigh, NC, ²Huvepharma Inc., Peachtree City, GA.
- 10:00 AM 115 **Effects of supplemental xylanase on growth, gut health, and ileal nutrient digestibility in nursery pigs fed corn-soybean meal-based diets with two dietary energy levels.**
I. Park*¹, H. Chen¹, J. Tyus², J. J. Wang², and S. W. Kim¹, ¹North Carolina State University, Raleigh, NC, ²BioResource International Inc., Durham, NC.
- 10:15 AM 116 **Porcine in vitro digestion and fermentation characteristics of wheat and wheat millrun without or with xylanase and β -glucanase blend.**
Tofuko A. Woyengo*^{1,2}, Elijah Kiarie^{3,4}, and Ruurd T. Zijlstra¹, ¹University of Alberta, Edmonton, AB, Canada, ²South Dakota State University, Brookings, SD, ³Danisco Animal Nutrition-DuPont Industrial Biosciences, Waukesha, WI, ⁴University of Manitoba, Winnipeg, MB, Canada.

- 10:30 AM 117 **Supplemental effects of β -mannanase on growth performance, ileal nutrient digestibility, and gut health of nursery pigs.**
Hongyu Chen*, Inkyung Park, Shihai Zhang, and Sung Woo Kim, *North Carolina State University, Raleigh, NC.*
- 10:45 AM 118 **Effect of superdosing two sources and two levels of phytases on pig performance when supplemented to commercial nursery diets.**
Chris Sparks*¹, Rafael A. Cabrera¹, Gene Gourley², and Emily Weber², ¹Huvepharma US Inc., *Peachtree City, GA*, ²Gourley Research Group LLC, *Webster City, IA.*
- 11:00 AM 119 **Effects of superdosing of microbial phytase in diets for weanling pigs.**
T. D. Crenshaw*¹, O. Adeola², M. J. Azain³, S. K. Baidoo⁴, S. D. Carter⁵, G. M. Hill⁶, S. W. Kim⁷, P. S. Miller⁸, M. C. Shannon⁹, and H. H. Stein¹⁰, ¹University of Wisconsin, *Madison, WI*, ²Purdue University, *Lafayette, IN*, ³University of Georgia, *Athens, GA*, ⁴University of Minnesota, *Minneapolis, MN*, ⁵Oklahoma State University, *Stillwater, OK*, ⁶Michigan State University, *East Lansing, MI*, ⁷North Carolina State University, *Raleigh, NC*, ⁸University of Nebraska, *Lincoln, NE*, ⁹University of Missouri, *Columbia, MO*, ¹⁰University of Illinois, *Urbana-Champaign, IL.*
- 11:15 AM 120 **Effect of water-to-feed ratio on the digestibility of diets fed to growing-finishing pigs.**
Cinta Sol*, Lorena Castillejos, Ramon Muns, and Josep Gasa, *Animal Nutrition and Welfare Service, Department of Animal and Food Sciences, Universitat Autònoma de Barcelona, Bellaterra, Spain.*
- 11:30 AM 121 **Effects of pelleting and extrusion on energy digestibility in pig diets containing different levels of fiber.**
Oscar J. Rojas*¹, Ester Vinyeta², and Hans H. Stein¹, ¹University of Illinois, *Urbana, IL*, ²Bühler AG, *Uzwil, Switzerland.*
- 11:45 AM 122 **Mix time does not affect growth performance in finishing pigs fed meal and pelleted diets with high inclusion (32% DDGS and 32% wheat midds) of alternative ingredients.**
Megan E. Morts*, Joe D. Hancock, C. Greg Aldrich, Charles R. Stark, Joel D. McAtee, and Kayla L. Kohake, *Kansas State University, Manhattan, KS.*
- 12:00 PM 123 **Effect of sieving methodology on determining particle size of ground corn, sorghum, and wheat by sieving.**
Julie R. Kalivoda*, Cassandra K. Jones, and Charles R. Stark, *Kansas State University, Manhattan, KS.*

Physiology and Endocrinology
Reproduction and estrous synchronization
Chair: Alexandre Souza, Ceva Saúde Animal Brazil
Panzacola H-4

- 9:30 AM 124 **Characterization of endometrial immune cells adjustments along pregnancy in the cow.**
Ana Carolina Furlanetto Mançanares¹, Gabriela de Paula Figueiredo², Rodrigo da Silva Nunes Barreto¹, Daniele dos Santos Martins², Flávio Vieira Meirelles^{2,1}, and Lilian J. Oliveira*¹, ¹Faculdade de Medicina Veterinária e Zootecnia, *Universidade de São Paulo, Pirassununga, SP, Brazil*, ²Faculdade de Zootecnia e Engenharia de Alimentos, *São Paulo, SP, Brazil.*
- 9:45 AM 125 **Expression of nonclassical MHC-I isoforms is deregulated in cloned placenta.**
Rodrigo Silva Nunes Barreto¹, Felipe Perecin², Flávio Vieira Meirelles², Flávia Thomaz Verechia Pereira³, Maria Angelica Miglino¹, and Lilian J. Oliveira*¹, ¹Faculdade de Medicina Veterinária e Zootecnia, *Universidade de São Paulo, São Paulo, SP, Brazil*, ²Faculdade de Zootecnia e Engenharia de Alimentos, *Pirassununga, SP, Brazil*, ³Campus Experimental de Dracena, *Universidade Estadual Paulista, Dracena, SP, Brazil.*
- 10:00 AM 126 **Behavioral and hormonal pattern around estrus and the characteristics of preovulatory follicles of repeat breeder dairy cows.**
Uzi Moallem*¹, Maya Zachut¹, and Pankaj Sood^{1,2}, ¹Department of Ruminants Science, *Volcani Center, Bet Dagan, Israel*, ²Department of Veterinary Gynecology and Obstetrics, *Palampur, India.*
- 10:15 AM 127 **Effects of dry period length on onset of ovarian activity and ovarian cyclicity in the subsequent lactation.**
Juncai Chen*¹, Noline M. Soede¹, Gerrit J. Remmelink², Bas Kemp¹, and Ariette T. M. Van Knegsel¹, ¹Adaptation Physiology Group, *Wageningen University, Wageningen, the Netherlands*, ²Livestock Research, *Wageningen University and Research Centre, Wageningen, the Netherlands.*

- 10:30 AM 128 **Effect of extending the duration of the postpartum voluntary waiting period on reproductive performance of lactating dairy cows.**
Matias L. Stangaferro*¹, Robert Wijma¹, Magdalena Masello¹, Mark J. Thomas², and Julio O. Giordano¹, ¹Department of Animal Science, Cornell University, Ithaca, NY, ²Dairy Health & Management Services, Lowville, NY.
- 10:45 AM 129 **Cows under heat stress have increased uterine size, reduced circulating progesterone, and decreased fertility compared with cows in cooler conditions.**
Giovanni M. Baez*^{1,2}, Rafael V. Barletta¹, Eduardo Trevisol¹, Jerry N. Guenther¹, João P. Ferreira³, and Milo C. Wiltbank¹, ¹University of Wisconsin-Madison, Madison, WI, ²Universidad Francisco de Paula Santander, Cucuta, NS, Colombia, ³São Paulo State University, Botucatu, SP, Brazil.
- 11:00 AM 130 **Effect of heat stress during pregnancy on intact and adrenal de-medullated fetuses: Placental, fetal, and mammary development in ewes.**
Antoni Macko*, Sean Limesand, and Robert Collier, University of Arizona, Tucson, AZ.
- 11:15 AM 131 **Timing of GnRH administration based on estrous response in beef heifers following administration of the 14-d CIDR-PG protocol with split-time AI.**
Brienne E. Bishop*, Jordan M. Thomas, Jillian M. Abel, Mark R. Ellersieck, Scott E. Poock, Michael F. Smith, and David J. Patterson, University of Missouri, Columbia, MO.
- 11:30 AM 132 **Timing of GnRH administration based on estrous response in beef cows following administration of the 7-d CO-Synch + CIDR protocol with split-time AI.**
Brienne E. Bishop*, Jordan M. Thomas, Jillian M. Abel, Mark R. Ellersieck, Scott E. Poock, Michael F. Smith, and David J. Patterson, University of Missouri, Columbia, MO.
- 11:45 AM 133 **Influence of estrus expression prior to fixed-time AI on embryo survival to maternal recognition of pregnancy.**
Emmalee J. Northrop*¹, Olivia L. Amundson¹, Brittany N. Richardson¹, Anthony K. McNeel², Robert A. Cushman², and George A. Perry¹, ¹Department of Animal Sciences, South Dakota State University, Brookings, SD, ²USDA-ARS, US Meat Animal Research Center, Clay Center, NE.
- 12:00 PM 134 **Post insemination interventions: Effect of human chorionic gonadotropin, gonadotropin-releasing hormone, and progesterone on ovulation and conception rates in Nili-Ravi buffaloes.**
Ali Husnain, Umair Riaz, Muhammad Ilyas Naveed, Mubbashar Hassan, Mian Abdul Sattar, and Nasim Ahmad*, Department of Theriogenology, University of Veterinary and Animal Sciences, Lahore, Punjab, Pakistan.
- 12:15 PM 135 **Relationships between hair coat shedding and hair cortisol concentrations and age at first calving in crossbred beef heifers.**
Rhonda C. Vann*¹, Michael Robinson², Scott T. Willard², Thomas H. Welsh⁴, and Ronald D. Randel³, ¹MAFES-E.G. (Gene) Morrison Brown Loam Branch Experiment Station, Raymond, MS, ²Department Animal & Dairy Science, Mississippi State University, Mississippi State, MS, ³Texas A&M AgriLife Research Center, Overton, TX, ⁴Texas A&M Department of Animal Science, College Station, TX.

Production, Management, and the Environment I

Chair: Phil Cardoso, University of Illinois

Panzacola F-4

- 9:30 AM 136 **Changes in milking procedures on US dairy operations: 1996–2014.**
Jason E. Lombard*¹, Charles P. Fossler¹, Ashley E. Adams^{1,2}, Chelsey B. Shivley^{1,2}, Natalie J. Urie^{1,2}, Christine A. Koprak¹, and Lindsey P. Garber¹, ¹USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO, ²Colorado State University, Fort Collins, CO.
- 9:45 AM 137 **Assessing the farm-level cost of mastitis.**
Jacqueline Holland*¹, Jason Lombard², Joleen Hadrich¹, and Christopher Wolf³, ¹Dept. of Agricultural and Resource Economics, Colorado State University, Fort Collins, CO, ²USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO, ³Department of Agricultural, Food, and Resource Economics, Michigan State University, East Lansing, MI.

- 10:00 AM 138 **Associations between housing and management practices on the incidence of lameness, hock lesions, and thin cows on US dairy operations.**
Ashley E. Adams*^{1,2}, Jason E. Lombard², Ivette N. Roman-Muniz¹, Charles P. Fossler², and Christine A. Kopral², ¹Colorado State University, Fort Collins, CO, ²USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO.
- 10:15 AM 139 **Management of nonambulatory dairy cows on US dairy operations.**
Ashley E. Adams*^{1,2}, Jason E. Lombard², Ivette N. Roman-Muniz¹, Charles P. Fossler², and Christine A. Kopral², ¹Colorado State University, Fort Collins, CO, ²USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO.
- 10:30 AM 140 **Morbidity and mortality of preweaned dairy heifer calves.**
Natalie J. Urie*^{1,2}, Jason E. Lombard¹, and Chelsey B. Shivley^{1,2}, ¹USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO, ²Colorado State University, Fort Collins, CO.
- 10:45 AM 141 **Evaluation of colostrum quality and passive transfer status of dairy heifer calves on US dairy operations.**
Chelsey B. Shivley*^{1,2}, Natalie J. Urie^{1,2}, Deborah M. Haines^{3,4}, Jason E. Lombard², and Manuel F. Chamorro³, ¹Colorado State University, Fort Collins, Colorado, ²USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, Colorado, ³Research and Technical Services, The Saskatoon Colostrum Company, Saskatoon, SK, Canada, ⁴Department of Veterinary Microbiology, Western College of Veterinary Medicine, Saskatoon, SK, Canada.
- 11:00 AM 142 **Evaluation of the Brix refractometer for measuring colostrum and serum IgG concentrations.**
Manuel F. Chamorro*¹, Ron Sargent¹, Deborah M. Haines^{2,1}, and Jason Lombard³, ¹The Saskatoon Colostrum Company Ltd, Saskatoon, Saskatchewan, Canada, ²Western College of Veterinary Medicine, Saskatoon, Saskatchewan, Canada, ³Center for Epidemiology and Animal Health USDA, Fort Collins, CO.
- 11:15 AM 143 **Prevalence of *Cryptosporidium* and *Giardia* in preweaned dairy heifer calves.**
Natalie J. Urie*^{1,2}, Jason E. Lombard¹, Ronald Fayer³, Monica Santin-Duran³, and Chelsey B. Shivley^{1,2}, ¹USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO, ²Colorado State University, Fort Collins, CO, ³USDA:ARS:NEA:BARC: Environmental Microbial and Food Safety Lab, Beltsville, MD.
- 11:30 AM 144 **Evaluation of average daily gain in preweaned dairy heifer calves based on different liquid diets and management practices.**
Chelsey B. Shivley*^{1,2}, Natalie J. Urie^{1,2}, and Jason E. Lombard², ¹Colorado State University, Fort Collins, CO, ²USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO.
- 11:45 AM 145 **Prevalence of *Campylobacter* spp. in bulk tank milk and filters from US dairies.**
Laura P. Del Collo*^{1,3}, Jeffrey S. Karns¹, Debabrata Biswas³, Jason E. Lombard², R. Camilla Kristensen², Charles P. Fossler², and Jo Ann S. Van Kessel¹, ¹USDA-ARS-NEA Environmental Microbial and Food Safety Laboratory, Beltsville, MD, ²USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO, ³Dept. of Animal and Avian Sciences, University of Maryland, College Park, MD.
- 12:00 PM 146 ***Salmonella* Dublin antibodies in bulk-tank milk on U.S. dairy operations.**
Jason E. Lombard*¹, Belinda S. Thompson², Paul D. Virkler², Bettina Wagner², R. Camilla Kristensen¹, and Charles P. Fossler¹, ¹USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO, ²Animal Health Diagnostic Center, College of Veterinary Medicine, Cornell University, Ithaca, NY.
- 12:15 PM 147 **Prevalence of *Salmonella* and *Listeria monocytogenes* in bulk tank milk and filters from US dairies.**
Jo Ann S. Van Kessel*¹, Jeffrey S. Karns¹, Jason E. Lombard², R. Camilla Kristensen², and Charles P. Fossler², ¹USDA-ARS-NEA Environmental Microbial and Food Safety Laboratory, Beltsville, MD, ²USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO.
- 12:30 PM 148 **Dry-off procedures on US dairy operations.**
Jason E. Lombard*¹, Gosia Zobel², Ashley E. Adams^{1,3}, Charles P. Fossler¹, Chelsey B. Shivley^{1,3}, Natalie J. Urie^{1,3}, and Christine A. Kopral¹, ¹USDA:APHIS:VS:Center for Epidemiology and Animal Health, Fort Collins, CO, ²University of British Columbia Animal Welfare Program, Vancouver, BC, Canada, ³Colorado State University, Fort Collins, CO.

Ruminant Nutrition
Dairy calves
Chair: Heidi Rossow, University of California, Davis
Panzacola H-3

- 9:30 AM 149 **Effects of intensive whole-milk feeding in calves on subsequent growth of dairy heifers.**
 Camila Flávia de Assis Lage¹, Mariana Magalhães Campos², Fernanda Samarini Machado², Paulo Campos Martins¹, Luigi Francis Lima Cavalcanti^{*3}, Marcelo Neves Ribas³, Luiz Gustavo Ribeiro Pereira², Thierry Ribeiro Tomich², Rafael Alves de Azevedo¹, and Sandra Gesteira Coelho¹, ¹Federal University of Minas Gerais, Belo Horizonte, Minas Gerais, Brazil, ²EMBRAPA Dairy Cattle, Coronel Pacheco, Minas Gerais, Brazil, ³CNPq, RHAÉ – SEVA Engenharia, Projeto Intergado, Contagem, Minas Gerais, Brazil.
- 9:45 AM 150 **Effect of bacteria level in colostrum on dairy heifer serum IgG concentration.**
 Christine Cummins and Emer Kennedy*, Teagasc, Ireland.
- 10:00 AM 151 **Performance of calf reared on waste milk or nonmedicated milk replacer contained sodium butyrate and *Bacillus amyloliquefaciens*.**
 O. V. Vazquez-Mendoza¹, A. E. Kholif², M. M. Y. Elghandour³, A. Z. M. Salem^{*3}, V. L. Garcia-Flor⁴, and T. A. Morsy², ¹Norel México S.A. de C.V, Parque Industrial El Marqués, Querétaro, México, ²Dairy Science Department, National Research Centre, Giza, Egypt, ³Facultad de Medicina Veterinaria y Zootecnia, Universidad Autónoma del Estado de México, Toluca, Estado de México, Mexico, ⁴Centro de Ciencias Agropecuarias, Universidad Autónoma de Aguascalientes, Aguascalientes, México.
- 10:15 AM 152 **Effects of colostrum feeding programs on passive immunity, health, and performance of Holstein dairy calves.**
 Weina Shi and Zhijun Cao*, China Agricultural University, Beijing, China.
- 10:30 AM 153 **Influences of SmartCare in milk replacer and XPC in calf starter on the performance and health of preweaning Holstein calves challenged with *Salmonella enterica* serotype Typhimurium.**
 Tyler L. Harris^{*1}, Yu Liang¹, Matt D. Sellers¹, Jeff A. Carroll², Ilkyu Yoon³, Mark F. Scott³, and Michael A. Ballou¹, ¹Department of Animal and Food Sciences, Texas Tech University, Lubbock, TX, ²USDA-ARS, Lubbock, TX, ³Diamond V, Cedar Rapids, IA.
- 10:45 AM 154 **Effect of feed type and presentation on feeding behavior, intake, and growth of dairy calves fed a high level of milk.**
 Morgan A. Overvest^{*1}, Renee Bergeron², Derek B. Haley³, and Trevor J. DeVries¹, ¹Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada, ²Department of Animal and Poultry Science, University of Guelph, Campus d'Alfred, Alfred, ON, Canada, ³Department of Population Medicine, Ontario Veterinary College, University of Guelph, Guelph, ON, Canada.
- 11:00 AM 155 **Extensive, noninvasive measurements of body temperature and posture in neonatal Holstein dairy calves bedded with deep straw in response to changes in ambient temperature and amount of milk replacer fed.**
 T. Mark Hill*, H. Gale Bateman, F. Xavier Suarez-Mena, James D. Quigley, and Rick L. Schlotterbeck, Nurture Research Center, Provimi North America, Cargill Premix and Nutrition, Brookville, OH.
- 11:15 AM 156 **Commercial dairy farm evaluation of highly digestible corn grain for calf starters when calves are fed pasteurized waste milk.**
 David P. Casper^{*1} and Mark Kirk², ¹South Dakota State University, Brookings, SD, ²Masters Choice, Anna, IL.
- 11:30 AM 157 **Vitamin D status of dairy calves fed pasteurized whole milk.**
 Jessica L. Powell^{*1}, Kathryn E. Merriman¹, Mary E. Drewnoski², and Corwin D. Nelson¹, ¹University of Florida, Gainesville, FL, ²University of Nebraska, Lincoln, NE.
- 11:45 AM 158 **Gradual weaning affects pre- and postweaning feed intake, growth, and gastrointestinal development in Holstein calves fed an elevated plane of nutrition during the pre-weaning stage.**
 Michael A. Steele^{*1,2}, Leonel Leal³, Michelle Carson¹, John H. Doelman¹, and John A. Metcalf¹, ¹Nutreco Canada AgResearch, Guelph, Ontario, Canada, ²University of Alberta, Edmonton, Alberta, Canada, ³Nutreco Research and Development, Boxmeer, the Netherlands.
- 12:00 PM 159 **Effects of pre- and postweaning nutrition on growth, efficiency, and rumen fermentation of Holstein calves.**
 Tana S. Dennis^{*1}, Michael W. Grott¹, Brad W. Shelton¹, and Tamilee D. Nennich^{1,2}, ¹Purdue University, West Lafayette, IN, ²Famo Feeds, Freeport, MN.

- 12:15 PM 160 **Commercial dairy farm evaluation of milk replacers with different protein sources and concentrations.**
K. A. Froehlich*¹, U. Salga Vegas¹, C. Soderholm², and D. P. Casper¹, ¹*South Dakota State University, Brookings, SD*, ²*Milk Specialties Global, Eden Prairie, MN*.

Ruminant Nutrition
Dairy rumen fermentation
Chair: Karen Beauchemin, Agriculture and Agri-Food Canada
Panzacola G-1

- 9:30 AM 161 **Methanogenesis reduction ability of monensin and essential oils from two Nigerian citrus species.**
Musibau A. Bamikole^{1,2}, Ibukun M. Ogunade*¹, Felipe Amaro¹, Yun Jiang¹, Thiago F. Bernardes¹, Darren D. Henry³, Vania R. Vasconcelos¹, F. O. Ugiagbe², U. J. Ikhatua², Nicolas DiLorenzo³, and Adegbola T. Adesogan¹, ¹*University of Florida, Gainesville, FL*, ²*University of Benin, Benin City, Nigeria*, ³*North Florida Research and Education Center, University of Florida, Marianna, FL*.
- 9:45 AM 162 **Changes in fermentation and biohydrogenation intermediates in continuous cultures fed corn grains differing in rates of starch degradability.**
Kaylin Young¹, Louisa Bowen¹, Mariano Alende¹, Gustavo Lascano¹, Mark D. Holt², and Thomas Jenkins*¹, ¹*Clemson University, Clemson, SC*, ²*Matrix Nutrition LLC, Chandler, AZ*.
- 10:00 AM 163 **Effects of functional oils and monensin supplementation on ruminal fermentation and milk production and composition in Holstein cows under heat stress.**
Maurício F. Martins¹, Arlindo S. Netto¹, Paulo R. Leme¹, Maria G. Pinheiro², Joan Torrent*³, Katiéli C. Welter¹, and Isadora Arruda⁴, ¹*Univ. São Paulo, Pirassununga, SP, Brazil*, ²*Agência Paulista de Tecnologia dos Agronegócios, Riberão Preto, SP, Brazil*, ³*Oligo Basics USA LLC, Cary, NC*, ⁴*Univ. Estadual Paulista, Botucatu, SP, Brazil*.
- 10:15 AM 164 **Shifts in methanogen archaea and anaerobic fungi in the rumen of dairy cows during the transition period.**
Sanjay Kumar*, Nagaraju Indugu, Bonnie Vecchiarelli, and Dipti Pitta, *Department of Clinical Studies, School of Veterinary Medicine, New Bolton Center, University of Pennsylvania, Kennett Square, PA*.
- 10:30 AM 165 **Effects of stocking density and source of forage fiber on short-term responses in ruminal fermentation and behavior of Holstein dairy cows.**
Mackenzie A. Campbell*^{1,2}, Kurt W. Cotanch¹, Catherine S. Ballard¹, Heather M. Dann¹, and Richard J. Grant¹, ¹*The William H. Miner Agricultural Research Institute, Chazy, NY*, ²*The University of Vermont, Department of Animal Science, Burlington, VT*.
- 10:45 AM 166 **Rumen bacterial communities in three breeds of dairy cattle shift from early to peak lactation.**
Melissa L. Bainbridge*¹, Laura M. Cersosimo¹, André-Denis G. Wright², and Jana Kraft¹, ¹*University of Vermont, Burlington, VT*, ²*University of Arizona, Tucson, AZ*.
- 11:00 AM 167 **Effect of 3-nitrooxypropanol on ruminal fermentation, methane and hydrogen emissions, and methane isotopic composition in dairy cows.**
Laiz F. de Matos¹, Michael T. Harper¹, Juliana Lopes*¹, Fabio Giallongo¹, Joonpyo Oh¹, Danielle Gruen², Alexander N. Hristov¹, Maik Kindermann³, and Stephane Duval⁴, ¹*Department of Animal Science, The Pennsylvania State University, University Park, PA*, ²*Department of Earth, Atmospheric and Planetary Sciences, Massachusetts Institute of Technology, Cambridge, MA*, ³*DSM Nutritional Products, Animal Nutrition and Health, Basel, Switzerland*, ⁴*DSM Nutritional Products France, Research Centre for Animal Nutrition and Health, Saint Louis Cedex, France*.
- 11:15 AM 168 **Divergent fermentation patterns of grass fructan, inulin, and glucose.**
Mary Beth Hall*, *US Dairy Forage Research Center, USDA-ARS, Madison, WI*.
- 11:30 AM 169 **The effect of lactic acid bacteria as probiotics or silage inoculants on in vitro rumen digestibility, total gas and methane production.**
Jennifer L. Ellis*^{1,2}, Andre Bannink³, Ida K. Hindrichsen⁴, Robert D. Kinley¹, Wilbert F. Pellikaan¹, Nina-Lotte Milora⁴, and Jan Dijkstra¹, ¹*Animal Nutrition Group, Wageningen University, Wageningen, the Netherlands*, ²*Centre for Nutrition Modelling, Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada*, ³*Animal Nutrition, Wageningen UR Livestock Research, Wageningen, the Netherlands*, ⁴*Chr. Hansen A/S, Horshølm, Denmark*.

- 11:45 AM 170 **Influence of diet change frequency on growth, rumen fermentation, and behavior of prepubertal dairy heifers.**
Tana S. Dennis*¹, Jason E. Tower¹, Hans F. P. Schmitz¹, Amanda M. Mosiman¹, and Tamilee D. Nennich^{1,2}, ¹*Purdue University, West Lafayette, IN*, ²*Famo Feeds, Freeport, MN*.
- 12:00 PM 171 **Effects of rumen inoculum adapted and unadapted to *Saccharomyces cerevisiae* fermentation product, culture pH, and starch fermentability on the biohydrogenation of unsaturated fatty acids in batch culture.**
Yan Sun*, Michael S. Allen, and Adam L. Lock, *Michigan State University, East Lansing, MI*.
- 12:15 PM 172 **Effects of *Saccharomyces cerevisiae* fermentation products on performance of mid-lactation dairy cows.**
Subash Acharya*¹, Jon P. Pretz¹, Ilkyu Yoon², Mark F. Scott², and David P. Casper¹, ¹*South Dakota State University, Brookings, SD*, ²*Diamond V, Cedar Rapids, IA*.

Small Ruminant Nutrition

Chair: **Uma Karki, Tuskegee University**
Suwannee 11/12

- 9:30 AM 173 **Blood chemistry, milk yield and composition, and milk fatty acids profile of lactating Anglo-Nubian goats fed *Moringa oleifera* leaf as a protein source.**
T. A. Morsy*¹, A. E. Kholif¹, G. A. Gouda¹, A. Z. M. Salem², S. M. Kholif¹, and A. M. Kholif¹, ¹*Dairy Science Department, National Research Centre, Giza, Egypt*, ²*Facultad de Medicina Veterinaria y Zootecnia, Universidad Autónoma del Estado de México, Toluca, Estado De México, Mexico*.
- 9:45 AM 174 ***Moringa oleifera* leaf as a protein source in the diet of Anglo-Nubian goats affects feed intake, digestibility, and ruminal fermentation.**
A. E. Kholif*¹, G. A. Gouda¹, A. Z. M. Salem², T. A. Morsy¹, and S. M. Kholif¹, ¹*Dairy Science Department, National Research Centre, Giza, Egypt*, ²*Facultad de Medicina Veterinaria y Zootecnia, Universidad Autónoma del Estado de México, Toluca, Estado De México, Mexico*.
- 10:00 AM 175 **Effect of dietary forage-to-concentrate ratios on urinary excretion of purine derivatives and microbial nitrogen yields in the rumen of Dorper crossbred sheep.**
Tao Ma*¹, Kai-dong Deng², Yan Tu¹, Nai-feng Zhang¹, Cheng-gang Jiang¹, and Qi-yu Diao¹, ¹*Feed Research Institute, Chinese Academy of Agricultural Sciences/Key Laboratory of Feed Biotechnology of the Ministry of Agriculture, Beijing, China*, ²*College of Animal Science, Jinling Institute of Technology, Nanjing, Jiangsu, China*.
- 10:15 AM 176 **Effects of reducing dietary cation-anion difference plus vitamin D on plasma Ca and its modulators and growth performance of goats.**
Wen-xuan Wu*, Lun-qin Zhu, Xing-zhou Tian, and Ruo-yu Liu, *College of Animal Science, Guizhou University, Guiyang, Guizhou Province, China*.
- 10:30 AM 177 **Iodine supplementation of the pregnant ewe alters serum IgG concentration and expression of genes associated with antibody transfer in the ileum of the newborn lamb.**
Fiona M. McGovern¹, Torres Sweeney², Francis P. Campion¹, Marion T. Ryan², Stephen Lott¹, and Tommy M. Boland*¹, ¹*School of Agriculture and Food Science, University College Dublin, Dublin, Ireland*, ²*School of Veterinary Medicine, University College Dublin, Dublin, Ireland*.
- 10:45 AM 178 **Metabolizable energy requirements of maintenance, energy efficiency of weight gain and fat deposition in Pelibuey and Katahdin ewes in tropical Mexico.**
Jose Valentin Cardenas Medina*, Pablo Ivan Duarte Arzapalo, Dahaivis Mena Arceo, and Olivier Santiago Ramos Trejo, *Instituto Tecnológico de Tizimin, Tizimin, Yucatan, Mexico*.
- 11:00 AM 179 **Effect of dry matter content and feeding level on dry matter digestibility and intake of perennial ryegrass fed to sheep.**
Brian Garry*^{1,2}, René Baumont³, Tommy Boland², Michael O'Donovan¹, and Eva Lewis¹, ¹*Teagasc, AGRIC Moorepark, Fermoy, Co. Cork, Ireland*, ²*School of Agriculture and Food Science, University College Dublin, Dublin, Ireland*, ³*INRA, UMR1213 Herbivores, Saint Genès Champanelle, France*.

- 11:15 AM 180 **Effects of feeding varying levels of deoiled distillers dried grains with solubles on dry matter intake, rumen fermentation, blood chemistry profile, growth, feed efficiency and carcass quality of meat goats.**
Jarvis G. Scott*, Nar K. Gurung, Byeng R. Min, Errol G. Rhoden, and Wendell H. McElhenney, *Tuskegee University, Tuskegee, AL.*
- 11:30 AM 181 **Economic analysis of feedlot finished lambs receiving diets based on different *Cynodon* hay grasses.**
Euclides Reuter Oliveira¹, Flávio Monção², Andreia Gabriel¹, Jefferson Gandra*¹, Rayanne Souza¹, Lais Moura¹, Loan Silva¹, Leandro Silva¹, Vadim Carbonari¹, and Thais Lemos¹, ¹*Universidade Federal da Grande Dourados, MS, Brazil, Dourados, MS, Brazil,* ²*Universidade Estadual Julio de Mesquita, Jaboticabal, SP, Brazil.*
- 11:45 AM 182 **Effect of concentrate supplementation during early lactation on intake, rumen function and milk production of twin suckling ewes.**
Francis P. Champion*¹, Fiona M. McGovern¹, Eva Levicnik³, Aileen McCarron¹, Philip Creighton², and Tommy M. Boland¹, ¹*University College Dublin, Dublin, Ireland,* ²*Teagasc Athenry, Co. Galway, Ireland,* ³*University of Ljubljana, Ljubljana, Lithuania.*
- 12:00 PM 183 **An investigation into the effect of crude protein intake, dry matter intake and body reserve mobilization on the ewe colostrum and IgG production in the first 18 hours postpartum.**
Francis P. Champion*¹, Fiona M. McGovern¹, Philip Creighton², Alan G. Fahey¹, and Tommy M. Boland¹, ¹*University College Dublin, Dublin, Ireland,* ²*Teagasc Athenry, Co. Galway, Ireland.*
- 12:15 PM 184 **Biochemical parameters of newborn goats raised from Saanen does supplemented with selenium and vitamin E during the transition period.**
Brenda Barcelos*¹, Arlindo Saran Netto¹, Talita Lara Conti², Eduardo Harry Birgel Junior¹, Vanessa Martins Storillo³, Daniela Becker Birgel¹, and Flávio R. B. Ribeiro⁴, ¹*University of Animal Science and Food Engineering, Pirassununga, São Paulo, Brazil,* ²*Centro Universitário Anhanguera, Leme, São Paulo, Brazil,* ³*College of Veterinary Medicine and Animal Science, São Paulo, São Paulo, Brazil,* ⁴*Cooperative Agricultural Research Center, Prairie View A&M University, Prairie View, TX.*

Swine Species

Chair: Yuzhi Li, University of Minnesota

Sebastian I-3

- 9:30 AM 185 **The effects of feeding frequency on pig performance, behavior, and tissue accretion rates.**
Jessica D. Colpoys*, Anna K. Johnson, and Nicholas K. Gabler, *Iowa State University, Ames, IA.*
- 9:45 AM 186 **Relationships between nursery stocking density and feeder space allowance with subsequent gilt estrous characteristics.**
E. B. Cook*, W. L. Flowers, and M. T. Knauer, *North Carolina State University, Raleigh, NC.*
- 10:00 AM 187 **Relationships between nursery stocking density and feeder space allowance with gilt growth performance.**
E. B. Cook*, W. L. Flowers, and M. T. Knauer, *North Carolina State University, Raleigh, NC.*
- 10:15 AM 188 **Apparent total-tract digestibility (ATTD) of total dietary fiber (TDF) between and within high fiber feed ingredients in finishing pigs.**
Zhimin Huang*, Pedro Urriola, and Gerald Shurson, *University of Minnesota, St. Paul, MN.*
- 10:30 AM 189 **Net portal-drained viscera flux of volatile fatty acids in Iberian and Landrace pigs.**
Gonzalez-Valero Lucrecia¹, Rojas-Cano Maria Luz¹, Lachica Manuel¹, Ranilla Maria Jose¹, and Fernandez-Figares Ignacio*², ¹*Estacion Experimental del Zaidin- CSIC, Granada, Spain,* ²*Universidad de Leon. Dept. Produccion Animal, Leon, Spain.*
- 10:45 AM 190 **Effects of a phytogetic feed additive in a protein-reduced diet in growing/finishing pigs.**
Carina Schieder*¹, Christiane Schwarz², Christine Hunger¹, Barbara Rueel¹, Jose Soto³, and Karl Schedle², ¹*Biomin Holding GmbH, Herzogenburg, Austria,* ²*University of Natural Resources and Life Sciences, Vienna, Institute of Animal Nutrition, Products, and Nutritional Physiology, Vienna, Austria,* ³*Biomin USA Inc., San Antonio, TX.*
- 11:00 AM **Break**

- 11:15 AM 191 **Effect of milky derived flavor inclusion in creep-feed diets on suckling piglet performance and litter homogeneity.**
Laia Blavi*¹, David Solà-Oriol¹, Francisco Javier Crespo², María del Mar Serra², and José Francisco Pérez¹, ¹*Animal Nutrition and Welfare Service, Department of Animal and Food Sciences, Universitat Autònoma de Barcelona, Bellaterra, Spain*, ²*Interquim S.A (Ferrer Health Tech), Barcelona, Spain*.
- 11:30 AM 192 **Effects of cathelicidin-BF on growth performance, intestinal morphology and inflammation in weanling piglets.**
Hongbo Yi*, Caihua Yu, Haiwen Zhang, Huahua Du, and Yizhen Wang, *Institute of Feed Science, College of Animal Sciences, Zhejiang University, Hangzhou, Zhejiang, China*.
- 11:45 AM 193 **Improving growth performance of weaning pigs with different dosages of combined natural growth promoter products.**
Jose A. Soto*¹ and Attila Kovacs², ¹*Biomin America Inc., San Antonio, TX*, ²*Biomin Holding GmbH, Herzogenburg, Austria*.
- 12:00 PM 194 **The effects of exogenous protease enzyme on growth performance, nutrient digestibility, blood profiles, fecal microflora, fecal gas emission, and fecal score in weanling pigs.**
Glenmer B. Tactacan*¹, Se-young Oh¹, Jin H. Cho², and In H. Kim³, ¹*Innovation and Development Department, Jeju Nutrition, Saint-Hyacinthe, Quebec, Canada*, ²*Department of Animal Science, Chungbuk National University, Cheongju, Chungbuk, Korea*, ³*Department of Animal Resources and Science, Dankook University, Cheonan, Korea*.
- 12:15 PM 195 **Maternal betaine supplementation during gestation attenuates hepatic cell cycle and proliferation through epigenetic regulation of the STAT3-dependent pathway in newborn piglets.**
Demin Cai*, Mengjie Yuan, Yimin Jia, Yun Hu, and Ruqian Zhao, *Nanjing Agricultural University, Nanjing City, China*.

ADSA-SAD (Student Affiliate Division) Undergraduate Competition

Dairy Foods

Chair: Dale Olver, Pennsylvania State University

St. John's 22/23

- 11:00 AM 196 **Organic versus conventional milk production systems.**
Savannah B. Meade* and Jeffrey M. Bewley, *University of Kentucky, Lexington, KY*.
- 11:15 AM 197 **Postmortem factors relevant to veal quality.**
Sloane Garcia* and Chad Carr, *University of Florida, Gainesville, FL*.
- 11:30 AM 198 **Probiotics in yogurt and human health.**
Erin M. Sole* and Gustavo J. Lascano, *Clemson University, Clemson, SC*.
- 11:45 AM 199 **Protein pricing and promoting: A renewed outlook on milk.**
Jessica M. Sentelle*, David R. Winston, and Benjamin A. Corl, *Virginia Tech, Blacksburg, VA*.
- 12:00 PM 200 **Reinventing sweetness in dairy products.**
Halee L. Wasson* and Dale R. Olver, *Pennsylvania State University, University Park, PA*.
- 12:15 PM 201 **How fair is Fairlife?**
Sarah Genest* and Cathleen C. Williams, *Louisiana State University, Baton Rouge, LA*.

ADSA Foundation PhD Symposium
Meeting the present and future demand for employees with a PhD
 Chair: **Mike Socha, Zinpro Corporation**
 Sponsor: **ADSA Foundation**
Panzacola F-4

- 2:00 PM 202 **Current and anticipated supply of people with PhDs.**
 J. R. Knapp*, *Fox Hollow Consulting LLC, Columbus, OH.*
- 2:30 PM 203 **What can industry and academia do to help maintain viability of dairy/animal science departments at land-grant institutions?**
 Kenneth G Odde*, *Kansas State University, Manhattan, KS.*
- 3:00 PM 204 **Graduate student perspective: Concerns with pursuing a PhD.**
 Curtis W. Park*, *North Carolina State University, Raleigh, NC.*
- 3:30 PM 205 **Industry–university partnerships in research and graduate student training.**
 Michael L. Day*, *Department of Animal Sciences, The Ohio State University, Columbus, OH.*
- 4:00 PM **Roundtable discussion (1 hour) with speakers on funding PhD programs:**
- 206 **Opportunities for PhD student training support at the National Science Foundation.**
 Steven Ellis*, *National Science Foundation, Arlington, VA.*
- 207 **Research funding opportunities available through Foundation for Food and Agricultural Research.**
 Christopher Mallett*^{1,2}, ¹*Cargill, Wayzata, MN,* ²*Foundation for Food and Agricultural Research, Washington, DC.*
- 208 **Dairy Management Inc.'s role in funding PhD research.**
 David R. McCoy*, *Dairy Management Inc., Rosemont, IL.*
- 209 **Funding opportunities for PhD programs in animal, dairy, and poultry science at the USDA National Institute of Food and Agriculture.**
 Mark A. Mirando*, Adele M. Turzillo, and Ray Ali, *USDA National Institute of Food and Agriculture, Washington, DC.*

ADSA Multidisciplinary and International Leadership Keynote (MILK) Symposium
Global dairy perspective—Production, processing, people, politics, and priorities
 Chair: **Leo Timms, Iowa State University**
 Sponsor: **ADSA Foundation**
Panzacola H-1

- 2:00 PM **Introduction.**
 Leo Timms, *Iowa State University.*
- 2:00 PM 210 **Role of milk and milk production in reducing poverty and malnutrition in emerging market countries.**
 Jim Yazman*, *US Agency for International Agriculture, Washington, DC.*
- 2:30 PM 211 **Meeting 2050 global milk demand while freezing the environmental footprint of dairy production.**
 Roger A. Cady and Howard B. Green*, *Elanco, Greenfield, IN.*
- 3:00 PM 212 **Global dairy: African perspective.**
 Pieter H. Henning*¹ and Lourens J. Erasmus², ¹*Meadow Feeds, Johannesburg, South Africa,* ²*University of Pretoria, Pretoria, South Africa.*
- 3:30 PM 213 **Dairy in China: Present status and future prospects.**
 Jiaqu Wang*, *Chinese Academy of Agricultural Sciences, Beijing, China.*

4:00 PM 214 **Brazil: Recent growth, importance and future of dairy markets.**
Marcelo Pereira de Carvalho*, *AgriPoint Consultoria, Piracicaba, SP, Brazil.*

4:30 PM **Discussion; questions and answers.**

ADSA Southern Section Symposium
Maximizing forage quality in the Southeast
Chair: **Shannon Davidson, North Carolina State University**
Wekiwa 1/2

2:00 PM 215 **Improving corn silage quality in the Southeast and throughout the United States.**
Donna M. Amaral-Phillips*, *University of Kentucky, Lexington, KY.*

2:30 PM 216 **The effect of forage quality on health and performance of dairy cattle.**
Adegbola T. Adesogan*, *University of Florida, Gainesville, FL.*

3:00 PM 217 **Warm season annual grasses for dairy cattle.**
J. K. Bernard*, *University of Georgia, Department of Animal and Dairy Science, Tifton, GA.*

3:30 PM 218 **Forage systems for Southern dairy production.**
John G. Andrae*, *Clemson University, Clemson, SC.*

4:00 PM 219 **Environment and crop management as determinants of forage yield and quality in the Southeast.**
Gonzalo Ferreira*, *Virginia Polytechnic Institute and State University, Blacksburg, VA.*

ADSA-SAD (Student Affiliate Division) Undergraduate Competition
Dairy Production
Chair: **Jeffrey Bewley, University of Kentucky**
St. John's 22/23

2:00 PM 220 **The effects of heat stress on reproductive fertility: An effective solution.**
Alexandra T. Lemus* and Peter J. Hansen, *University of Florida, Gainesville, FL.*

2:15 PM 221 **Effects of colostrum and milk intake on future performance in dairy calves.**
Katherine M. Kelly*, Donna M. Amaral-Phillips, and Jeffrey M. Bewley, *University of Kentucky, Lexington, KY.*

2:30 PM 222 **The effects of feeding heat-treated colostrum to dairy calves.**
Rebecca N. Klopp* and Dale R. Olver, *Pennsylvania State University, University Park, PA.*

2:45 PM 223 **Rumen development in dairy calves.**
Morgan Richard* and Cathleen C. Williams, *Louisiana State University, Baton Rouge, LA.*

3:00 PM 224 **The effect of automated calf feeders on calf welfare.**
Kelly H. Leatherman*, David R. Winston, and Robert E. James, *Virginia Tech, Blacksburg, VA.*

3:15 PM 225 **Effectiveness of DHIA herd testing frequency on management decisions and dairy herd performance.**
Lauren E. G. Clemency*, Kasimu Ingawa, Steven Washburn, John Clay, and Shannon Davidson, *North Carolina State University, Raleigh, NC.*

3:30 PM 226 **Hyperkeratosis: A costly consequence of milking equipment.**
Kayla J. Alward* and Jillian F. Bohlen, *University of Georgia, Athens, GA.*

ADSA-SAD (Student Affiliate Division) Undergraduate Competition

Original Research

Chair: Cathleen Williams, Louisiana State University

St. John's 26/27

- 2:00 PM 227 **Use of green vegetative index maps to predict nutritional quality variation of corn silage.**
Eleonor L. Cayford*¹, Leyang Feng², Shao Yang², and Gonzalo Ferreira¹, ¹*Department of Dairy Science, Virginia Polytechnic Institute and State University, Blacksburg, VA*, ²*Geography Department, Virginia Polytechnic Institute and State University, Blacksburg, VA*.
- 2:15 PM 228 **Processed water and its effect on daily intake and growth in dairy calves.**
Patrick J. Neff*¹, Matt C. Claeys¹, and Tamilee D. Nennich^{1,2}, ¹*Purdue University, West Lafayette, IN*, ²*Famo Feeds, Freeport, MN*.
- 2:30 PM 229 **Calving detection in dairy cattle using a novel vaginal temperature device.**
Megan C. Hardy*, Denise L. Ray, Joey D. Clark, and Jeffrey M. Bewley, *University of Kentucky, Lexington, KY*.
- 2:45 PM 230 **Consideration of *DGAT1* interactions with DNA markers improved genetic predictions.**
Amber N. Gabel* and Chad D. Dechow, *The Pennsylvania State University, University Park, PA*.
- 3:00 PM 231 **Effectiveness of treating subclinical ketosis in dairy cows.**
Albert J. Brown*¹, Maurice L. Eastridge¹, Leon D. Weaver², and K. J. Chapman², ¹*The Ohio State University, Columbus, OH*, ²*Bridgewater Dairy, Montpelier, OH, US*.
- 3:15 PM 232 **Assessing the impact of bovine fecal contamination in water on health and management practices.**
Sarah J. Thomsen*¹, Jillian F. Bohlen¹, and J. Brooks Crozier², ¹*University of Georgia, Athens, GA*, ²*Roanoke College, Salem, VA*.

Animal Behavior and Well-Being Symposium

Novel and multidisciplinary approaches to animal welfare

Chair: Kathryn Proudfoot, Ohio State University

Sponsor: Merck Animal Health

Suwannee 13/14

- 2:00 PM 233 **Opportunities and challenges of interdisciplinary approaches to quantifying welfare.**
Peter D. Krawczel*, *The University of Tennessee, Department of Animal Science, Knoxville, TN*.
- 2:45 PM 234 **Animal welfare as a source of confounding and variation in science.**
Amy L Stanton*, *University of Wisconsin-Madison, Madison, WI*.
- 3:30 PM 235 **Interaction between coping style/personality, social stress, and disease risk.**
J.M. Koolhaas*, *University of Groningen, Groningen, the Netherlands*.
- 4:15 PM 236 **Of nature and nurture: The role of genetics and environment in behavioral development.**
T. Bas Rodenburg*, *Behavioural Ecology Group, Wageningen University, Wageningen, the Netherlands*.

Animal Health
Swine health and transition cows
Chair: **Marnie Mellencamp, Zoetis**
Sebastian I-2

- 2:00 PM 237 **Protected sodium butyrate may reduce *Salmonella* spp. excretion in contaminated fattening pig farms.**
M. Puyalto*¹, R. C. Mainar-Jaime², S. Andres-Barranco³, E. Creus⁴, and J. J. Mallo¹, ¹Norel S.A, Spain, ²Department of Animal Pathology, University of Zaragoza, Zaragoza, Spain, ³AgriFood Research and Technology Centre of Aragon, Spain, ⁴Agrofestic S.L, Spain.
- 2:15 PM 238 **Rapid cooling after acute hyperthermia alters intestinal morphology and may negatively affect pig health.**
J. S. Johnson*, A. Sapkota, and D. C. Lay, *USDA-ARS Livestock Behavior Research Unit, West Lafayette, IN.*
- 2:30 PM 239 **Mycotoxin-contaminated diets affect immunity parameters of piglets.**
Simone Schaumberger*, Sabine Masching, and Ursula Hofstetter, *Biomin Holding GmbH, Herzogenburg, Austria.*
- 2:45 PM 240 **Butyrate enhances disease resistance of piglets through up-regulated gene expression of endogenous host defense peptides.**
Haitao Xiong*, Bingxiu Guo, and Yizhen Wang, *College of Animal Sciences of Zhejiang University, Hangzhou, Zhejiang, China.*
- 3:00 PM 241 **The effect of antiseptic compounds on umbilical cord healing and infection rates in neonatal piglets from a commercial facility.**
Amanda L. Robinson*, Jessica D. Colpoys, Glenn D. Robinson, Elizabeth A. Hines, Leo L. Timms, Erika M. Edwards, Kenneth J. Stalder, Anna K. Johnson, and Howard D. Tyler, *Iowa State University, Ames, IA.*
- 3:15 PM 242 **Porcine hepcidin protects piglet intestinal epithelial cells by aggregating *Escherichia coli* K88.**
Huahua Du*, Dan Liu, and Zhenshun Gan, *Zhejiang University, Hangzhou, China.*
- 3:30 PM 243 **Limited sun exposure increases 25(OH)D serum concentration and affects mRNA expression of the vitamin D enzymes in liver and kidney of growing pigs at high altitude.**
Samanta R. Fensterseifer*¹, D. Enette Larson-Meyer², Bennett C. Ingold², Kathleen J. Austin¹, Kacey C. Myers¹, and Brenda M. Alexander¹, ¹Department of Animal Science, University of Wyoming, Laramie, WY, ²Department of Family and Consumer Sciences, University of Wyoming, Laramie, WY.
- 3:45 PM 244 **Relationship between left displacement of the abomasum and daily milk yield in high-producing Chilean dairy cows.**
Pedro G. Melendez*¹, Catalina Romero², Maria P. Marin², Mario Duchens³, Patrick Pithua¹, and Pablo J. Pinedo^{4,5}, ¹University of Missouri-Columbia, Columbia, MO, ²University Santo Tomas, Viña del Mar, Chile, ³University of Chile, Santiago, Chile, ⁴Texas A&M AgriLife Research, Amarillo, TX, ⁵Texas A&M University System, College Station, TX.
- 4:00 PM 245 **Comparison of hematological parameters in dairy cows during periparturient period.**
Samir Kumar Dash*¹, Hemant Dasharath Kadam¹, Asmita Anant Kulkarni¹, Mohua Das Gupta¹, Narayan Laxman Phadke¹, and Arun P. Phatak², ¹BAIF Development Research Foundation, Central Research Station, Uruli Kanchan, Pune, Maharashtra, India, ²Waterford, CA.
- 4:15 PM 246 **Characterizing the effect of feed restriction on biomarkers of leaky gut.**
Sara K. Stoakes*¹, Erin A. Nolan¹, David J. Valko¹, Mohannad Abuajamieh¹, Jake Seibert¹, Maria V. Sanz Fernandez¹, Patrick J. Gorden¹, Howard B. Green², Katie M. Schoenberg², William E. Trout², and Lance H. Baumgard¹, ¹Iowa State University, Ames, IA, ²Elanco Animal Health, Indianapolis, IN.
- 4:30 PM 247 **Neutrophil function is dysregulated over the transition period.**
Mallory A. Crookenden*¹, Caroline G. Walker¹, Axel Heiser^{6,5}, Juan J. Loor², Kasey M. Moyes³, Jane K. Kay¹, Susanne Meier¹, Alan Murray⁵, Venkata S. R. Dukkipati⁵, Murray Mitchell⁴, and John R. Roche¹, ¹DairyNZ, Hamilton, New Zealand, ²University of Illinois, Champaign-Urbana, IL, ³University of Maryland, College Park, MD, ⁴University of Queensland, Brisbane, Queensland, Australia, ⁵Massey University, Palmerston North, New Zealand, ⁶AgResearch, Palmerston North, New Zealand.

- 4:45 PM 248 **The effects of grain-induced subacute ruminal acidosis on blood plasma proteomic characterization in dairy cows.**
S. C. Li^{*1}, A. M. Danscher², P. Azevedo², P. H. Andersen³, P. Ezzati⁴, J. A. Wilkins⁴, E. Khafipour¹, and J. C. Plaizier¹,
¹Department of Animal Science, University of Manitoba, Winnipeg, Manitoba, Canada, ²Department of Large Animal Sciences, University of Copenhagen, Copenhagen, Denmark, ³Department of Clinical Sciences, Swedish University of Agricultural Sciences, Uppsala, Sweden, ⁴Manitoba Centre for Proteomics & Systems Biology, Winnipeg, Manitoba, Canada.

Animal Health Symposium
**Understanding and reducing the impact of various stressors on
immune responses and health of cattle**
Chair: **Charlie Elrod, Balchem Corporation**
Sponsor: **Merck Animal Health**
Sebastian I-3

- 2:00 PM 249 **Understanding what stresses a dairy cow and the effect on immunity.**
Michael A. Ballou^{*}, *Texas Tech University, Department of Animal and Food Sciences, Lubbock, TX.*
- 2:45 PM 250 **Stress, immunity, and management of calves.**
Lindsey E. Hulbert^{*} and Sonia J. Moisé^a, *Department of Animal Sciences and Industry, Kansas State University, Manhattan, KS.*
- 3:15 PM **Break**
- 3:30 PM 251 **Effects of late-gestation heat stress on immunity and performance of calves.**
Geoffrey Dahl^{*1}, Ana Monteiro², and Sha Tao², ¹University of Florida, Gainesville, FL, ²University of Georgia, Tifton, GA.
- 4:00 PM 252 **Social stressors and their effects on immunity and health of periparturient dairy cows.**
Ricardo C. Chebel^{*1,2}, Paula R. B. Silva², Karen Luchterhand², and Marcia Endres², ¹University of Florida, Gainesville, FL, ²University of Minnesota, St. Paul, MN.
- 4:30 PM 253 **Metabolic and physiological stressors during the periparturient period and effects on immunity and health of dairy cows.**
José E. P. Santos^{*}, Eduardo S. Ribeiro, and Natalia Martinez, *University of Florida, Gainesville, FL.*

Bovine tuberculosis (TB) and paratuberculosis (Johne's disease) Symposium
What we know and what we need to know
Chair: **Ken Olson, KEO Consulting**
Sponsor: **American Association of Mycobacterial Diseases (AAMD)**
Panzacola F-3

- 2:00 PM **Introduction.**
Vivek Kapur, *The Pennsylvania State University.*
- 2:00 PM 254 **A three-year study of bovine tuberculosis in an enzootic area, the Nile Delta.**
Adel M. Talaat^{*1}, Hazem A. Abdelaal¹, and Essam A. Nasr², ¹University of Wisconsin-Madison, Madison, WI, ²Veterinary Serum and Vaccine Research Institute, Cairo, Egypt.
- 2:30 PM 255 **Host genomics—What have we learned?**
Holly L. Neiberger^{*}, *Washington State University, Pullman, WA.*

- 3:00 PM 256 **Johne's disease and bovine tuberculosis: Updates on control and prevention.**
Scott J. Wells*¹, Kimberley L. VanderWaal¹, Catalina Picasso¹, Eva A. Enns¹, Meggan Craft¹, Federico Fernandez², Andres Gil³, Julio Alvarez¹, Lucas Dominguez¹, and Andres Perez¹, ¹University of Minnesota, St Paul, MN, ²Ministerio de Ganadería, Agricultura y Pesca, Montevideo, Uruguay, ³Facultad de Veterinaria, Universidad de la República, Montevideo, Uruguay.
- 3:30 PM 257 **MDA outreach: Communicating for a change.**
Julia M. Smith*, *University of Vermont, Burlington, VT.*
- 4:00 PM 258 **Zoonotic potential of bTB and MAP—Nothing to worry about...right?**
Tim Bull*, *Institute of Infection and Immunity, St George's University of London, London, UK.*
- 4:30 PM **Discussion—Where do we go?**
Ken Olson, *KEO Consulting.*

Breeding and Genetics: EAAP Genetics Symposium
Breeding for environmental sustainability
Chairs: Eileen Wall, SRUC, and Han Mulder, Wageningen University
Sponsor: European Federation of Animal Science (EAAP)
Panzacola F-1/2

- 2:00 PM 259 **ASAS-EAAP Speaker Exchange Presentation: Breeding goals to deal with climate change and food security.**
Eileen Wall*, *Scotland's Rural College (SRUC), Edinburgh, UK.*
- 2:45 PM 260 **ASAS-EAAP Speaker Exchange Presentation: Genomic selection for the high-hanging fruit in livestock breeding programs.**
Donagh P. Berry*¹, Yvette de Haas², Roel F. Veerkamp², Mike Coffey³, and Mario P. L. Calus², ¹Animal & Grassland Research and Innovation Centre, Teagasc, Moorepark, Co. Cork, Ireland, ²Animal Breeding and Genomics Centre, Wageningen UR Livestock Research, Wageningen, the Netherlands, ³Animal and Veterinary Sciences, SRUC, Easter Bush Campus, Easter Bush, Edinburgh, UK.
- 3:30 PM 261 **ASAS-EAAP Speaker Exchange Presentation: Statistical approaches to increase resilience of animals towards environmental challenges and to increase homogeneity of animal products.**
Han A. Mulder*¹, Ewa Sell-Kubiak¹, Juanma Herrero-Medrano^{1,2}, Pramod K. Mathur², and Egbert F. Knol², ¹Animal Breeding and Genomics Centre, Wageningen University, Wageningen, the Netherlands, ²TOPIGS Norsvin BV, Beuningen, the Netherlands.
- 4:15 PM 262 **ASAS-EAAP Speaker Exchange Presentation: The role of sustainable commercial pig and poultry breeding for food security.**
Pieter W. Knap*¹, Anne-Marie Neeteson-Van Nieuwenhoven², and Santiago Avendaño², ¹Genus-PIC, Schleswig, Germany, ²Aviagen, Newbridge, UK.

Forages and Pastures
Grasses and silages
Chair: Jeffrey W. Lehmkuhler, University of Kentucky
Suwannee 15

- 2:00 PM 263 **Maturity is a larger driver of fatty acid content in summer annuals than nitrogen fertility.**
Caleb P. Goossen*, Sidney C. Bosworth, Heather M. Darby, and Jana Kraft, *University of Vermont, Burlington, VT.*

- 2:15 PM 264 **Effect of grazing seedhead-suppressed tall fescue pasture on the vasoactivity of serotonin receptors.**
James L. Klotz*¹, Glen E. Aiken¹, Amanda M. Egert², and David L. Harmon², ¹USDA-ARS, Forage-Animal Production Research Unit, Lexington, KY, ²Department of Animal and Food Sciences, University of Kentucky, Lexington, KY.
- 2:30 PM 265 **Microbial count, fermentation, and aerobic stability of regular- and brown midrib-corn hybrids ensiled with and without a combo inoculant.**
Juan J. Romero*¹, Yuchen Zhao², Youngho Joo³, Jinwoo Park³, Marco A. Balseca-Paredes¹, Adam J. Heitman¹, and Miguel S. Castillo¹, ¹Department of Crop Science, North Carolina State University, Raleigh, NC, ²Department of Animal Nutrition and Feed Science, China Agricultural University, Beijing, China, ³Department of Animal Science, Gyeongsang National University, Jinju, Korea.
- 2:45 PM 266 **In vitro digestion kinetics of NDF from stockpiled Tifton 85 bermudagrass as influenced by N fertilization.**
Samantha R. Sechler*, Courtney M. Holland, Carla J. Weissend, Mary K. Mullenix, and Russell B. Muntifering, Auburn University, Auburn, AL.
- 3:00 PM 267 **Variation in aerobic stability of maize silage with and without microbial inoculant.**
Ida K. Hindrichsen* and Nina Milora, Chr. Hansen A/S, Hørsholm, Denmark.
- 3:15 PM 268 **A comparative study of lignin assays and relationship with grass digestibility.**
Alejandro Vargas Velásquez* and Romualdo Shiguelo Fukushima, Department of Animal Nutrition and Production (VNP), Faculty of Veterinary and Animal Science (FMVZ), University of São Paulo, Pirassununga, São Paulo, Brazil.
- 3:30 PM 269 **Using Bayesian inference to delineate diet composition of mixed forages.**
Napoleón Vargas Jurado*¹, Amy E. Tanner², and Ronald M. Lewis¹, ¹University of Nebraska, Lincoln, NE, ²Virginia Tech, Blacksburg, VA.
- 3:45 PM 270 **Interaction of isoflavones and endophyte-infected tall fescue seed extract on vasoactivity of bovine mesenteric vasculature.**
Yang Jia*¹, David L. Harmon¹, and James L. Klotz², ¹Department of Animal and Food Sciences, University of Kentucky, Lexington, KY, ²USDA-ARS, Forage-Animal Production Research Unit, Lexington, KY.
- 4:00 PM 271 **Proximate and fiber composition of leaves and stems of *Pennisetum purpureum* varieties fertilized with animal manure.**
Victoria O. Ojo*, Sarafadeen T. Adewuyi, Alaba O. Jolaosho, Adebayo O. Oni, and Oludotun O. Adelusi, Federal University of Agriculture, Abeokuta, Ogun State, Nigeria.
- 4:15 PM 272 **Effects of inoculated lactic acid bacteria on aflatoxin B₁ in corn silage.**
Zhengxin Ma*, Felipe X. Amaro, Juan J. Romero, and Adegbola T. Adesogan, Department of Animal Sciences, University of Florida, Gainesville, FL.
- 4:30 PM 273 **In vitro digestibility of dried cassava peel, mushroom degraded cassava peel and silage from guinea grass.**
Bolanle T. Akinyemi*, Moronfolu Ige, Alaba O. Jolaosho, Moses O. Arigbede, and Shamsideen O. Iposu, Federal University of Agriculture, Abeokuta, Abeokuta, Ogun State, Nigeria.

Graduate Student Competition
ADSA Production Division Graduate Student Oral Competition, PhD
Chair: Eric Reid, Cooperative Feed Dealers
Wekiwa 6

- 2:00 PM 274 **Carry-over effect of an individual feeding strategy on milk production of Holstein cows managed for extended lactation.**
Charlotte Gaillard*¹, Nicolas C. Friggens², Martin R. Weisbjerg¹, and Jakob Sehested¹, ¹Aarhus University, Foulum, Tjele, Denmark, ²AgroParisTech, INRA UMR 0791 MoSAR, Paris, France.
- 2:15 PM 275 **Moisture, temperature, cow health, and bedding bacteria relationships in compost bedded pack barns.**
Elizabeth A. Eckelkamp*, Joseph L. Taraba, Robert J. Harmon, Katherine A. Akers, and Jeffrey M. Bewley, University of Kentucky, Lexington, KY.

- 2:30 PM 276 **Effect of dry period length and dietary energy source in dairy cows on natural antibody titers and somatic cell count in milk.**
Novi Mayasari*^{1,2}, Wilke Rijks¹, Ger de Vries Reilingh¹, Gerrit Remmelink³, Bas Kemp¹, Henk Parmentier¹, and Ariette van Knegsel¹, ¹*Adaptation Physiology Group, Department of Animal Science, Wageningen University, Wageningen, Gelderland, the Netherlands*, ²*Faculty of Animal Husbandry, Universitas Padjadjaran, Bandung, West Java, Indonesia*, ³*Livestock Research, Wageningen University and Research Centre, Wageningen, Gelderland, the Netherlands*.
- 2:45 PM 277 **Towards a better understanding of the effect of genetic merit for milk production on post-partum cyclicity of first lactation dairy cows.**
Nicolas Bedere*¹, Luc Delaby¹, Vincent Ducrocq², Ségolène Leurent-Colette³, and Catherine Disenhaus¹, ¹*INRA-Agro-campus-Ouest UMR 1348 PEGASE, Saint-Gilles, France*, ²*INRA UMR 1313 GABI, Jouy-en-Josas, France*, ³*INRA UE 326 Domaine Expérimental du Pin-au-Haras, Exmes, France*.
- 3:00 PM 278 **Forage yield, quality, and digestibility when intercropping vining soybean with MasterGraze seed corn at different seeding rates.**
Ishwary Acharya*¹, David Casper¹, Xingyou Gu², and Ahamed Charif², ¹*Dairy Science Department, South Dakota State University, Brookings, SD*, ²*Department of Plant Science, South Dakota State University, Brookings, SD*.
- 3:15 PM 279 **Intravaginal administration of prostaglandin F_{2α} induces luteolysis in lactating dairy cows.**
Robert Wijma*, Matias L. Stangaferro, and Julio O. Giordano, *Department of Animal Science, Cornell University, Ithaca, NY*.
- 3:30 PM 280 **Dry period plane of energy: Effects on glucose tolerance in peripartum dairy cows.**
Sabine Mann*¹, Francisco A. Leal Yepes², Thomas R. Overton², Joseph J. Wakshlag³, Bethany P. Cummings⁴, and Daryl V. Nydam¹, ¹*Department of Population Medicine and Diagnostic Sciences, College of Veterinary Medicine, Cornell University, Ithaca, NY*, ²*Department of Animal Science, College of Agriculture and Life Sciences, Cornell University, Ithaca, NY*, ³*Department of Clinical Sciences, College of Veterinary Medicine, Cornell University, Ithaca, NY*, ⁴*Department of Biomedical Sciences, College of Veterinary Medicine, Cornell University, Ithaca, NY*.
- 3:45 PM 281 **Infusion of 5-hydroxytryptophan increases serum calcium and mammary gland calcium pump activity during the transition period.**
Samantha R. Weaver*¹, Austin P. Prichard¹, Elizabeth L. Endres¹, Stefanie A. Newhouse², Rupert M. Bruckmaier³, Matt S. Akins¹, and Laura L. Hernandez¹, ¹*University of Wisconsin-Madison, Madison, WI*, ²*University of Wisconsin-Platteville, Platteville, WI*, ³*University of Bern, Bern, Switzerland*.
- 4:00 PM 282 **The use of gene expression in milk fat as an indicator of trace mineral status in dairy cows.**
M. J. Faulkner*¹, E. H. Wall², and W. P. Weiss¹, ¹*OARDC, The Ohio State University, Wooster, OH*, ²*Pancosma, Geneva, Switzerland*.
- 4:15 PM 283 **Feed efficiency and performance of lactating Holstein dairy cows fed two different concentrations of dried distillers grains with solubles.**
Eric D. Testroet*, Stephanie Clark, and Donald C. Beitz, *Iowa State University, Ames, IA*.
- 4:30 PM 284 **Including sunflower seed in prepartum diet positively influenced postpartum ovarian function without affecting uterine health.**
R. Salehi*¹, M. G. Colazo², U. Basu¹, A. Ruiz-Sanchez¹, and D. J. Ambrose^{1,2}, ¹*University of Alberta, Edmonton, Alberta, Canada*, ²*Alberta Agriculture and Rural Development, Edmonton, Alberta, Canada*.
- 4:45 PM 285 **Pretreatment with saturated and unsaturated fatty acids regulates [1-¹⁴C] C16:0 metabolism in Madin-Darby bovine kidney cells.**
Katherine E. Boesche*, Stephanie L. Koser, and Shawn S. Donkin, *Purdue University, West Lafayette, IN*.
- 5:00 PM 286 **A novel method to determine rumen biohydrogenation kinetics of alpha-linolenic acid (18:3 n-3).**
Michel Baldin*¹, Natalie L. Urrutia¹, Daniel E. Rico², Kelsie Baxter¹, Yun Ying¹, and Kevin J. Harvatine¹, ¹*Penn State University, University Park, PA*, ²*Université Laval, Québec, QC, Canada*.
- 5:15 PM 287 **Effects of feeding algae rich in docosahexaenoic acid (DHA) on lactation and reproductive performance of dairy cows.**
Leticia D. P. Sinedino*¹, Thiago F. Fabris¹, Cesar D. Narciso², Leticia R. Lucena¹, Paula M. Honda¹, Gilson G. Maia¹, Maurice P. Boland³, Charles R. Staples¹, William W. Thatcher¹, and Jose E. P. Santos¹, ¹*University of Florida, Gainesville, FL*, ²*Sequoia Veterinary Services, Tulare, CA*, ³*Alltech Animal Nutrition and Health, Nicholasville, KY*.

Graduate Student Competition
ADSA-ASAS Northeast Section Graduate Student Oral Competition
Chair: Kristen E. Govoni, University of Connecticut
Wekiwa 7/8

- 2:00 PM 288 **Assessment of acute pain during and after knife and band castration of beef calves at three different industry-relevant ages.**
 Daniela M. Meléndez*^{1,2}, Sonia Marti¹, Eugene D. Janzen², Diego Moya^{1,2}, Ed Pajor², and Karen S. Schwartzkopf¹, ¹*Agriculture and Agri-Food Canada, Lethbridge, Alberta, Canada*, ²*University of Calgary, Calgary, Alberta, Canada*.
- 2:15 PM 289 **The influence of dietary strong ions on rumen ion concentrations.**
 Tracy L. Catterton* and Richard A. Erdman, *Department of Animal and Avian Sciences, University of Maryland, College Park, MD*.
- 2:30 PM 290 **Disbudding and dehorning practices in dairy calves among Ontario bovine veterinarians.**
 Charlotte B. Winder*¹, Stephen J. LeBlanc¹, Derek B. Haley¹, Kerry D. Lissemore², M. Ann Godkin², and Todd F. Duffield¹, ¹*University of Guelph, Guelph, Ontario, Canada*, ²*Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA), Guelph, Ontario, Canada*.
- 2:45 PM 291 **Identification of early pregnancy and fetal landmarks via transabdominal ultrasound in sheep.**
 Amanda K. Jones*¹, Rachael E. Gately², Katelyn K. McFadden¹, Steven A. Zinn¹, Kristen E. Govoni¹, and Sarah A. Reed¹, ¹*Department of Animal Science, University of Connecticut, Storrs, CT*, ²*Department of Environmental and Population Health, Tufts Cummings School of Veterinary Medicine, North Grafton, MA*.
- 3:00 PM 292 **Isolation and characterization of chemical components of *Leucaena leucocephala* with anti-methanogenic properties by using in vitro gas production technique.**
 D. Dineshkumar*¹, A. L. Abdalla¹, C. L. Linander¹, A. P. Massarioli², A. L. Abdalla Filho¹, P. P. Santos¹, A. S. Natel¹, S. M. Alencar², and H. Louvandini¹, ¹*Centre for Nuclear Energy in Agriculture, University of Sao Paulo, Piracicaba, Sao Paulo, Brazil*, ²*College of Agriculture "Luiz de Queiroz," University of Sao Paulo, Piracicaba, Sao Paulo, Brazil*.
- 3:15 PM 293 **Immune cells populate mesenteric adipose tissues of Holstein Friesian cows.**
 Bridget A. Aylward*¹, Megan Clark¹, Amanda Barnard¹, Jen Wilson¹, Candice Gittens¹, Tanya Gressley¹, Erin Brannick¹, Marie Fecteau², and Robert Dyer¹, ¹*Department of Animal and Food Sciences, College of Agricultural and Natural Resources, University of Delaware, Newark, DE*, ²*Department of Clinical Studies, New Bolton Center, University of Pennsylvania, School of Veterinary Medicine, Kennet Square, PA*.
- 3:30 PM 294 **Effects of under- and over-feeding during gestation on organ development of offspring at days 45 and 90 of gestation.**
 Sambhu M. Pillai*, Joseline S. Raja, Maria L. Hoffman, Amanda K. Jones, Katelyn K. McFadden, Sarah A. Reed, Steven A. Zinn, and Kristen E. Govoni, *University of Connecticut, Storrs, CT*.

Lactation Biology I

Chairs: **Ben Corl, Virginia Tech, and Monique Rijnkels, Texas A&M University**
Wekiwa 3/4

- 2:00 PM 295 **CLOCK regulation of mammary epithelial cell growth.**
 Theresa Casey*¹, Jennifer Crodian¹, Aridany Suárez-Trujillo², Emily Erickson¹, Bethany Weldon¹, Kristi Crow¹, Avi Shamay³, Sameer Majbeesh⁴, and Karen Plaut¹, ¹*Purdue University, West Lafayette, IN*, ²*Universidad de Las Palmas de Gran Canaria, Arucas, Canary Islands, Spain*, ³*Agriculture Research Organization, Volcani Center, Bet Dagan, Israel*, ⁴*The Hebrew University of Jerusalem, Rehovot, Israel*.
- 2:15 PM 296 **CLOCK regulates mammary differentiation and output.**
 Aridany Suárez Trujillo*², Jennifer Crodian¹, Emily Erickson¹, Avi Shamay³, Sameer Majbeesh⁴, Karen Plaut¹, and Theresa Casey¹, ¹*Purdue University, West Lafayette, IN*, ²*Universidad de Las Palmas de Gran Canaria, Arucas, Canary Islands, Spain*, ³*Agriculture Research Organization, Volcani Center, Bet Dagan, Israel*, ⁴*The Hebrew University of Jerusalem, Rehovot, Israel*.

- 2:30 PM 297 **Expression of putative stem cell marker, hepatocyte nuclear factor 4 alpha, in mammary gland of water buffalo.**
Ratan K. Choudhary*¹, Harmanjot Kaur¹, Shanti Choudhary¹, and Devendra Pathak², ¹*School of Animal Biotechnology, Guru Angad Dev Veterinary and Animal Science University, Ludhiana, Punjab, India*, ²*Department of Veterinary Anatomy, College of Veterinary Sciences, Guru Angad Dev Veterinary and Animal Science University, Ludhiana, Punjab, India*.
- 2:45 PM 298 **Optimization of transfection and real-time monitoring of fluorescent proteins in bovine cells: An untapped molecular biology approach for dairy sciences.**
J. S. Osorio* and M. Bionaz, *Oregon State University, Corvallis, OR*.
- 3:00 PM 299 **Palmitate and peroxisome proliferator-activated receptor (PPAR) γ synthetic agonists but not *trans*-10,*cis*-12 CLA activates PPAR in MacT and primary goat mammary cells.**
J. S. Osorio* and M. Bionaz, *Oregon State University, Corvallis, OR*.
- 3:15 PM 300 **Protection of bovine mammary epithelial cells from hydrogen peroxide-induced oxidative cell damage by resveratrol.**
X. L. Jin*^{1,3}, Kai Wang², H. Y. Liu^{1,3}, F. L. Hu², F. Q. Zhao^{1,4}, and J. X. Liu^{1,3}, ¹*Institute of Dairy Science, College of Animal Sciences, Zhejiang University, Hangzhou, China*, ²*Institute of Sericulture and Apiculture, College of Animal Sciences, Zhejiang University, Hangzhou, China*, ³*MOE Key Laboratory of Molecular Animal Nutrition, Zhejiang University, Hangzhou, China*, ⁴*Laboratory of Lactation and Metabolic Physiology, Department of Animal Science, University of Vermont, Burlington, VT*.
- 3:30 PM 301 **Stabilization of Nrf2 by tBHQ attenuates heat shock-induced cell damage in bovine mammary epithelial cells.**
X. L. Jin*^{1,2}, H. Y. Liu^{1,2}, and J. X. Liu^{1,2}, ¹*Institute of Dairy Science, College of Animal Sciences, Zhejiang University, Hangzhou, China*, ²*MOE Key Laboratory of Molecular Animal Nutrition, Zhejiang University, Hangzhou, China*.

Nonruminant Nutrition
Amino acids and minerals
Chair: Zach Rambo, BASF
Sebastian I-4

- 2:00 PM 302 **Long-term leucine and branched-chain amino acid supplementation in a protein and energy deficient diet increases muscle mTORC1 activation in neonatal pigs.**
Rodrigo Manjarín*, Daniel A. Columbus, Agus Suryawan, Hanh V. Nguyen, Adriana Hernández-García, Rosemarie D. Parada, Marta L. Forotto, and Teresa Davis, *USDA-ARS, Children's Nutrition Research Center, Houston, TX*.
- 2:15 PM 303 **Effect of fermentation on ileal digestibility of nutrients and amino acids in soybean meal with low solubility in growing pigs.**
S. D. Upadhaya*¹, J. H. Ryu², K. I. Kang², S. J. Cho², and I. H. Kim¹, ¹*Department of Animal Resource & Science, Dankook University, Cheonan, Chungnam, South Korea*, ²*CJ Food Ingredients R&D Center, Seoul, South Korea*.
- 2:30 PM 304 **Requirement of valine and optimal valine:lysine ratio in diets for 8- to 18-kg pigs.**
John K. Htoo*¹ and Georg Dusel², ¹*Evonik Industries AG, Hanau-Wolfgang, Germany*, ²*University of Applied Sciences Bingen, Bingen am Rhein, Germany*.
- 2:45 PM 305 **Effects of dietary fiber on the optimum threonine:lysine ratio for 25- to 50-kg gilts.**
John K. Mathai*¹, John K. Htoo², John Thomson³, Kevin J. Touchette⁴, and Hans H. Stein¹, ¹*University of Illinois, Urbana, IL*, ²*Evonik Industries AG, Hanau-Wolfgang, Hesse, Germany*, ³*Evonik Degussa Corporation, Kennesaw, GA*, ⁴*Ajinomoto Heartland Inc., Chicago, IL*.
- 3:00 PM 306 **Evaluation of L-methionine bioavailability in piglet diets.**
Helvio C. Ferreira Júnior*¹, Melissa I. Hannas¹, Luiz F. T. Albino¹, Horácio S. Rostagno¹, Lyssa Otani², and Lília T. Lopes¹, ¹*Federal University of Viçosa, Viçosa, Minas Gerais, Brazil*, ²*CJ of Brazil Ltda, São Paulo, São Paulo, Brazil*.

- 3:15 PM 307 **Oral tryptophan supplementation to nursing piglets increases serotonin synthesis and improves performance after weaning under social mixing stress.**
T. J. Pasquetti*^{1,2}, I. Park¹, J. Y. Guo¹, P. C. Pozza², and S. W. Kim¹, ¹*Department of Animal Science, North Carolina State University, Raleigh, NC*, ²*Departamento de Zootecnia, Universidade Estadual de Maringá, Bolsista do Ciências sem Fronteiras / CNPQ, Maringá, PR, Brazil*.
- 3:30 PM 308 **Concentrations of nitrogen-corrected apparent metabolizable energy and amino acid digestibility in soybean meal from Argentina, Brazil, China, Thailand, and the United States fed to broilers.**
Kelly M. Sotak-Peper*¹, Rommel C. Sulabo², Carl M. Parsons¹, and Hans H. Stein¹, ¹*University of Illinois at Urbana-Champaign, Urbana, IL*, ²*University of the Philippines Los Banos, Los Banos, Luzon, Philippines*.
- 3:45 PM 309 **Effect of dietary cation-anion difference during late gestation and lactation on blood and urine parameters of sow.**
J. Y. Guo*¹, D. E. Axe², and S. W. Kim¹, ¹*Department of Animal Science, North Carolina State University, Raleigh, NC*, ²*Granco Minerals, Disputanta, VA*.
- 4:00 PM 310 **Effects of copper sources and levels on growth performance and carcass traits in wean-finishing pigs.**
Ferdinando N. Almeida*¹, Jeffery Escobar¹, Gary Allee², Junmei Zhao¹, Yulin L. Ma¹, and Mercedes Vazquez-Anon¹, ¹*Novus International Inc., St. Charles, MO*, ²*Porktech LLC, Columbia, MO*.

Physiology and Endocrinology
Nutrition, reproduction, and metabolism
Chair: Kimberly A. Vonnahme, North Dakota State University
Panzacola H-4

- 2:00 PM 311 **ASAS Omega Protein Innovative Research Award Presentation: Dietary omega-3 supplementation alters gene expression in equine endometrial and embryonic tissues.**
Robert D. Jacobs*¹, Alan D. Ealy¹, Parker M. Pennington^{2,3}, Budhan Pukazhenth², Lori K. Warren⁴, Ashley L. Wagner⁵, Tanja M. Hess⁶, and Rebecca K. Splan^{1,7}, ¹*Virginia Polytechnic Institute and State University, Blacksburg, VA*, ²*Smithsonian Conservation Biology Institute, Front Royal, VA*, ³*George Mason University, Fairfax, VA*, ⁴*University of Florida, Gainesville, FL*, ⁵*Cooperative Research Farms, Richmond, VA*, ⁶*Colorado State University, Fort Collins, CO*, ⁷*Virginia Tech MARE Center, Middleburg, VA*.
- 2:15 PM 312 **Omega-6 fatty acid-rich sunflower oil supplements in diet affect uterine health, ovarian function and oocyte characteristic in heat-stressed dairy cows.**
Chainarong Navanukraw*^{1,2}, Aree Kraison¹, Vilaivan Khanthusaeng¹, Suthipong Uriyapongson¹, and Chuchart Kamollirt³, ¹*Department of Animal Science, Khon Kaen University, Khon Kaen, Thailand*, ²*Agricultural Biotechnology Research Center for Sustainable Economy, Khon Kaen University, Khon Kaen, Thailand*, ³*Department of Anatomy, Faculty of Veterinary Medicine, Khon Kaen, Thailand*.
- 2:30 PM 313 **Effects of excess dietary MP from corn gluten meal or soybean meal on ovarian function of beef cows consuming low quality forage.**
Taylor C. Geppert*¹, George A. Perry², and Patrick J. Gunn¹, ¹*Department of Animal Science, Iowa State University, Ames, IA*, ²*Department of Animal Sciences, South Dakota State University, Brookings, SD*.
- 2:45 PM 314 **Effects of supplementing excess amounts of MP from a moderately abundant RUP source on ovarian function of beef cows consuming low quality forage.**
Taylor C. Geppert*¹, George A. Perry², and Patrick J. Gunn¹, ¹*Department of Animal Science, Iowa State University, Ames, IA*, ²*Department of Animal Sciences, South Dakota State University, Brookings, SD*.
- 3:00 PM 315 **Effect of top-dressing rumen-protected methionine in lactating Holstein cows II: Fertility and embryo development.**
Mateus Z. Toledo*¹, Giovanni M. Baez¹, Eduardo Trevisol¹, Nelson E. Lobos¹, Alvaro Garcia-Guerra¹, Jerry N. Guenther¹, Daniel Luchini², Randy D. Shaver¹, and Milo C. Wilbank¹, ¹*University of Wisconsin-Madison, Madison, WI*, ²*Adisseo, Alpharetta, GA*.

- 3:15 PM 316 **Intravenous glucose infusion in early postpartum dairy cows: Effects on plasma metabolites, milk production, and interval to first ovulation.**
Stephen Butler*¹, Shane Leane¹, Francis Curran¹, Stephen Moore¹, Mark Crowe², and Matthew Lucy³, ¹*Teagasc Moorepark-Animal & Grassland Research and Innovation Centre, Fermoy, Ireland*, ²*School of Veterinary Medicine, University College Dublin, Dublin, Ireland*, ³*Department of Animal Sciences, University of Missouri, Columbia, MO.*
- 3:30 PM 317 **Intravenous glucose infusion during pregnancy in dairy cows: Effects on plasma hormones, metabolites, milk production, and conceptus growth.**
Matthew Lucy*¹, Shane Leane², Francis Curran², Stephen Moore², Mark Crowe³, and Stephen Butler², ¹*Department of Animal Sciences, University of Missouri, Columbia, MO*, ²*Teagasc Moorepark-Animal & Grassland Research and Innovation Centre, Fermoy, Ireland*, ³*School of Veterinary Medicine, University College Dublin, Dublin, Ireland.*
- 3:45 PM 318 **Rumen-protected methyl donors during late pregnancy: 1. Maternal Smartamine M and its association with neonatal Holstein calf blood immunometabolic biomarkers.**
Carolina Bespalhok Jacometo*¹, Zheng Zhou², Erminio Trevisi³, Daniel Luchini⁴, Marcio Nunes Corrêa¹, and Juan J. Loo², ¹*Universidade Federal de Pelotas, Pelotas, Rio Grande do Sul, Brazil*, ²*University of Illinois, Urbana, IL*, ³*Università Cattolica del Sacro Cuore, Piacenza, Italy*, ⁴*Adissee NA, Alpharetta, GA.*
- 4:00 PM 319 **Rumen-protected methyl donors during late pregnancy: 2. Maternal Smartamine M and its association with hepatic gene expression in neonatal Holstein calves.**
Carolina Bespalhok Jacometo*¹, Zheng Zhou², Daniel Luchini³, Marcio Nunes Corrêa¹, and Juan J. Loo², ¹*Universidade Federal de Pelotas, Pelotas, Rio Grande do Sul, Brazil*, ²*University of Illinois, Urbana, IL*, ³*Adissee NA, Alpharetta, GA.*
- 4:15 PM 320 **Rumen-protected methyl donors during late pregnancy: 3. Maternal Smartamine M and its association with neonatal Holstein calf neutrophil gene network expression.**
Carolina Bespalhok Jacometo*¹, Zheng Zhou², Erminio Trevisi³, Daniel Luchini⁴, Marcio Nunes Corrêa¹, and Juan J. Loo², ¹*Universidade Federal de Pelotas, Pelotas, Rio Grande do Sul, Brazil*, ²*University of Illinois, Urbana, IL*, ³*Università Cattolica del Sacro Cuore, Piacenza, Italy*, ⁴*Adissee NA, Alpharetta, GA.*
- 4:30 PM 321 **Chromium supplementation alleviates heat stress in growing pigs.**
Fan Liu*¹, Jeremy J Cottrell¹, Danni Wijesiriwardana¹, Fletcher W. Kelly¹, Pietro Celi^{2,1}, Brian J. Leury¹, and Frank R. Dunshea¹, ¹*Faculty of Veterinary and Agricultural Sciences, the University of Melbourne, Parkville, VIC, Australia*, ²*Faculty of Veterinary Science, the University of Sydney, Camden, NSW, Australia.*
- 4:45 PM 322 **Metabolome-based relationships of four biofluids from dairy cows.**
H. Z. Sun*^{1,2}, L. L. Guan³, and J. X. Liu^{1,2}, ¹*Institute of Dairy Science, College of Animal Sciences, Hangzhou, China*, ²*MoE Key Laboratory of Molecular Animal Nutrition, Zhejiang University, Hangzhou, China*, ³*Department of Agricultural, Food & Nutritional Science, University of Alberta, Edmonton, Canada.*

Physiology and Endocrinology Symposium
Progesterone as an endocrine regulator of fertility in cattle
Chair: Cliff Lamb, University of Florida
Sebastian L-1

- 2:00 PM 323 **The role of progesterone in uterine biology of ruminants.**
Thomas E. Spencer*, *University of Missouri, Columbia, MO.*
- 2:30 PM 324 **Cellular and molecular mechanisms controlling corpus luteum function and progesterone concentrations in cattle.**
Milo Wiltbank*¹, Giovanni Baez¹, Julian Ochoa^{1,2}, Joao Ferreira², Eduardo Trevisol², Wenxiang Luo¹, and Roberto Sartori³, ¹*University of Wisconsin-Madison, Madison, WI*, ²*São Paulo State University, Botucatu, SP, Brazil*, ³*University of São Paulo, Piracicaba, SP, Brazil.*
- 3:00 PM 325 **Novel concepts on the role of prostaglandins on luteal maintenance and maternal recognition of pregnancy in ruminants.**
Joe A. Arosh*¹, JeHoon Lee¹, Jone A. Stanley¹, John A. McCracken², and Sakhila K. Banu¹, ¹*Department of Veterinary Integrative Biosciences, College of Veterinary Medicine and Biomedical Sciences, Texas A&M University, College Station, TX*, ²*Department of Animal Science, University of Connecticut, Storrs, CT.*

- 3:30 PM 326 **The role of progesterone receptor on control of ovulation and oviductal transport in mammals.**
Rebecca Robker*, Darryl Russell, and Lisa Akison, *University of Adelaide, Adelaide, South Australia, Australia.*
- 4:00 PM 327 **Contrasting effects of progesterone on fertility of dairy and beef cows.**
Jeffrey S. Stevenson*¹ and G. Cliff Lamb², ¹*Kansas State University, Manhattan, KS*, ²*University of Florida, Marianna, FL.*
- 4:30 PM 328 **The influence of progesterone (P4) during follicle development on endometrial and conceptus biology and fertility in dairy cows.**
Rafael S. Bisinotto*, Eduardo S. Ribeiro, Leandro F. Greco, Natalia Martinez, Leticia D. P. Sinedino, Fabio S. Lima, William W. Thatcher, and Jose E. P. Santos, *Department of Animal Sciences, University of Florida, Gainesville, FL.*
- 4:45 PM 329 **Effect of manipulating progesterone before timed artificial insemination on reproductive and endocrine parameters in Irish Holstein-Friesian dairy cows.**
Paul M. Fricke*¹, Paulo D. Carvalho¹, Matthew C. Lucy², Francis Curran³, Mary M. Herlihy³, and Stephen T. Butler³, ¹*University of Wisconsin - Madison, Madison, WI*, ²*University of Missouri, Columbia, MO*, ³*Teagasc Moorepark-Animal & Grassland Research and Innovation Centre, Fermoy, Ireland.*

**Ruminant Nutrition
General
Chair: Phillip Lancaster, University of Florida
Panzacola H-3**

- 2:00 PM 330 **Effect of trace minerals and different levels of starch on digestibility and ruminal fermentation in diets for dairy heifers.**
Felipe Pino* and Jud Heinrichs, *The Pennsylvania State University, State College, PA.*
- 2:15 PM 331 **Small intestinal starch digestion in cattle is linearly increased by duodenal glutamic acid flow.**
Ethan J. Blom*¹, Derek W. Brake¹, and David E. Anderson², ¹*South Dakota State University, Brookings, SD*, ²*University of Tennessee Knoxville, Knoxville, TN.*
- 2:30 PM 332 **Protein chemical profile, energy values, protein fractions, and rumen degradation characteristics of the newly developed yellow and brown carinata lines for dairy cattle compared with commercial canola seeds.**
Yajing Ban*, David A. Christensen, John J. McKinnon, and Peiqiang Yu, *Department of Animal and Poultry Science, College of Agricultural and Bioresources, University of Saskatchewan, Saskatoon, SK, Canada.*
- 2:45 PM 333 **Effect of an increased ruminal ammonia supply on lysine utilization by growing steers.**
A. H. Hussein*¹, E. D. Batista^{1,2}, M. D. Miesner³, and E. C. Titgemeyer¹, ¹*Department of Animal Sciences and Industry, Kansas State University, Manhattan, KS*, ²*Departamento de Zootecnia, Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil*, ³*Department of Clinical Sciences, Kansas State University, Manhattan, KS.*
- 3:00 PM 334 **Relationship between antioxidant capacity, oxidative stress, and feed efficiency in beef steers.**
J. R. Russell*¹, W. J. Sexten², M. S. Kerley², and S. L. Hansen¹, ¹*Iowa State University, Ames, IA*, ²*University of Missouri, Columbia, MO.*
- 3:15 PM 335 **Efficiency of lysine utilization by growing steers.**
Erick D. Batista*^{1,2}, Ali H. Hussein¹, Matt Miesner¹, Edenio Detmann², and Evan C. Titgemeyer¹, ¹*Kansas State University, Manhattan, KS*, ²*Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.*
- 3:30 PM 336 **Effects of preweaning nutrient supply on growth and pre and post-weaning glucose tolerance test in male Holstein calves.**
Isabela Pena Carvalho de Carvalho*, Leonel Neto Leal, Harma Berends, and Javier Martín-Tereso, *Nutreco Ruminant Research Center, Boxmeer, the Netherlands.*

- 3:45 PM 337 **Effects of hemp seed oil on serum antioxidant indicators in dairy water buffalo.**
Cai-xia Zou*¹, Sheng-ju Wei¹, Dan Wan^{1,2}, Xin Liang¹, Li-Li Li¹, Bo Lin¹, Xian-wei Liang¹, Bing-zhuang Yang¹, and Zhong-sheng Xia^{1,2}, ¹Key Laboratory of Buffalo Genetics, Breeding and Reproduction Technology, Ministry of Agriculture and Guangxi, Buffalo Research Institute, Chinese Academy of Agricultural Sciences, Nanning, China, ²College of Animal Science and Technology, Guangxi University, Nanning, China.
- 4:00 PM 338 **Effects of maternal metabolizable protein supply during late gestation on maternal and fetal intestinal development in sheep.**
G. Q. Jia*, J. S. Caton, K. A. Vonnahme, T. J. Swanson, L. A. Lekatz, P. P. Borowicz, S. T. Dorsam, A. M. Meyer, and L. P. Reynolds, *North Dakota State University, Fargo, ND.*
- 4:15 PM 339 **Effects of supplementation to steers consuming green chopped wheat pasture on energy losses and nitrogen balance.**
Adam L. Shreck*¹, Pake J. Ebert³, Eric A. Bailey³, Jenny S. Jennings², Ken D. Casey², and N. Andy Cole¹, ¹USDA-ARS, Bushland, TX, ²Texas Agrilife Research, Amarillo, TX, ³West Texas A&M University, Canyon, TX.
- 4:30 PM 340 **Supplement and undegradable protein influence on beef calf performance grazing stockpiled tall fescue.**
Dylan L. Hamlin*, Robert L. Kallenbach, and William J. Sexten, *University of Missouri, Columbia, MO.*
- 4:45 PM 341 **Performance and economics of supplementing calves with distillers grains or fertilization of smooth brome grass pastures.**
Cody A. Welchons*, Terry J. Klopfenstein, James C. MacDonald, Andrea K. Watson, and Robert G. Bondurant, *University of Nebraska-Lincoln, Lincoln, NE.*

Ruminant Nutrition Symposium

Time required for diet adaptation and minimization of carry-over effect in ruminants: Evidence-based decisions

Chair: **Mary Beth Hall, U.S. Dairy Forage Research Center, USDA-ARS, Madison, WI**
Panzacola G-1

- 2:00 PM 342 **Time required for adaptation of rumen fermentation and the rumen microbiome.**
Timothy Hackmann*, *University of Florida, Gainesville, FL.*
- 2:30 PM 343 **Time required for adaptation of behavior, feed intake, and dietary digestibility in cattle.**
Richard J. Grant*, Heather M. Dann, and Melissa E. Woolpert, *William H. Miner Agricultural Research Institute, Chazy, NY.*
- 3:00 PM 344 **Time required for adaptation of protein metabolism.**
G. I. Zanton*, *USDA, Agricultural Research Service, US Dairy Forage Research Center, Madison, WI.*
- 3:30 PM 345 **Time required for diet adaptation and minimization of carry-over effect in ruminants: The perspective of an experimental researcher.**
Kevin J. Harvatine*, *Penn State University, University Park, PA.*
- 4:00 PM 346 **The perspectives of a beef cattle nutritionist.**
Shawn L. Archibeque*¹ and Gerald B. Huntington², ¹Department of Animal Sciences, Colorado State University, Fort Collins, CO, ²Department of Animal Science, North Carolina State University, Raleigh, NC.
- 4:30 PM 347 **Algae meal for ruminants: I. Nutrient digestibility in finishing lambs.**
Rebecca S. Stokes*, Megan L. Van Emon, Daniel D. Loy, and Stephanie L. Hansen, *Department of Animal Science, Iowa State University, Ames, IA.*
- 4:45 PM 348 **Algae meal for ruminants: II. Growth and carcass characteristics of finishing steers.**
Rebecca S. Stokes*, Daniel D. Loy, and Stephanie L. Hansen, *Department of Animal Science, Iowa State University, Ames, IA.*

Tuesday, July 14

POSTER PRESENTATIONS

Animal Health Lactating cows

- T1 **Health and productive responses of dairy cows treated with reduced doses of recombinant bovine somatotropin during the periparturient period.**
Paula R. B. Silva^{*1}, Henrique F. Soares¹, Gabriel D. Bombardelli¹, Wagner D. Braz¹, Daniela N. Liboreiro¹, and Ricardo C. Chebel^{1,2}, ¹University of Minnesota, St Paul, MN, ²University of Florida, Gainesville, FL.
- T2 **Reduction in hepatic functionality can delay resumption of ovarian activity postpartum in dairy cows.**
Paula Montagner^{*1,2}, Rubens A. Pereira^{1,2}, Ana Rita T. Krause^{1,2}, Marina M. Weschenfelder^{1,2}, Elizabeth Schwegler^{1,2}, Fernanda M. Gonçalves^{1,2}, Carolina B. Jacometo^{1,2}, Cássio C. Brauner^{1,2}, and Marcio N. Corrêa^{1,2}, ¹Federal University of Pelotas, Pelotas, RS, Brazil, ²Center for Research, Teaching and Extension in Animal Science (NUPEEC), Pelotas, RS, Brazil.
- T3 **Organic trace minerals during the transition period. 4. Corium gene expression profiling reveals a beneficial effect of supplementing Zn, Mn, and Cu from Availa Mins and Co from CoPro on hoof health of periparturial dairy cows.**
J. S. Osorio^{*1}, E. F. Garrett¹, M. M. Elhanafy¹, E. Trevisi², J. K. Drackley¹, M. T. Socha³, and J. J. Looor¹, ¹University of Illinois at Urbana-Champaign, Urbana, IL, ²Università Cattolica del Sacro Cuore, Piacenza, Italy, ³Zinpro Corporation, Eden Prairie, MN.
- T4 **Effects of postpartum uterine diseases on milk yield, milk components, and culling in dairy cows under certified organic management.**
J. M. Piñeiro^{*1}, M. G. Maquivar², A. A. Barragan¹, J. S. Velez³, H. Bothe³, and G. M. Schuenemann¹, ¹The Ohio State University, Columbus, OH, ²Washington State University, Pullman, WA, ³Aurora Organic Farms, Boulder, CO.
- T5 **Cows diagnosed with metritis showed blood alterations related to innate immunity and carbohydrate and lipid metabolism during early dry off period.**
Guanshi Zhang, Dagnachew W. Hailemariam, Elda Dervishi, Qilan Deng, Tran H. Lam, Seyed A. Goldansaz, Suzanna M. Dunn, and Burim N. Ametaj^{*}, Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada.
- T6 **Activation of innate immunity ahead of occurrence of ketosis.**
Guanshi Zhang, Dagnachew W. Hailemariam, Elda Dervishi, Qilan Deng, Tran H. Lam, Seyed A. Goldansaz, Suzanna M. Dunn, and Burim N. Ametaj^{*}, Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada.
- T7 **Effects of repeated oral administration of lipopolysaccharide and lipoteichoic acid either alone or in combination with subcutaneous exposure on metabolite responses in periparturient dairy cows.**
Emily F. Eckel^{*}, Dagnachew W. Hailemariam, Grzegorz Zwierzchowski, Guanshi Zhang, Suzanna M. Dunn, and Burim N. Ametaj, University of Alberta, Edmonton, AB, Canada.
- T8 **Effect of repeated oral administration of lipopolysaccharide and lipoteichoic acid either alone or in combination with subcutaneous exposure on humoral immunity in periparturient dairy cows.**
Emily F. Eckel^{*}, Dagnachew W. Hailemariam, Grzegorz Zwierzchowski, Guanshi Zhang, Suzanna M. Dunn, and Burim N. Ametaj, University of Alberta, Edmonton, AB, Canada.
- T9 **Blood alterations indicate subclinical mastitis diagnosed postpartum might start during early dry-off period.**
Guanshi Zhang, Dagnachew W. Hailemariam, Elda Dervishi, Qilan Deng, Seyed A. Goldansaz, Suzanna M. Dunn, and Burim N. Ametaj^{*}, Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada.
- T10 **The effect of lipopolysaccharide (LPS) and phorbol 12-myristate 13-acetate (PMA) on whole blood oxidative response as assessed by luminol-amplified chemiluminescence in dairy cows.**
Y. Qu^{*1}, S. Kahl², T. H. Elsasser², E. E. Connor², and K. M. Moyes¹, ¹University of Maryland, College Park, MD, ²Agricultural Research Service, US Department of Agriculture, Beltsville, MD.
- T11 **Efficacy of a novel antimicrobial post-milking teat dip on rate of new intramammary infections with an experimental bacterial challenge against contagious mastitis organisms.**
David M. Galton¹ and Leo L. Timms^{*2}, ¹Cornell University, Ithaca, NY, ²Iowa State University, Ames, IA.

- T12 **Effects of a 6-week duodenal supplementation of quercetin on metabolic stress and liver health in peripartur dairy cows.**
Ann-Kathrin Stoldt¹, Manfred Mielenz¹, Alexander Starke², Siegfried Wolfram³, and Cornelia C. Metges*¹, ¹*Institute of Nutritional Physiology, Leibniz Institute for Farm Animal Biology, Dummerstorf, Germany*, ²*Faculty of Veterinary Medicine, University of Leipzig, Leipzig, Germany*, ³*Institute of Animal Nutrition and Physiology, Christian-Albrechts University of Kiel, Kiel, Germany*.
- T13 **Effects of manipulated insulin and glucose plasma concentrations on glucagon secretion during intramammary LPS challenge in dairy cows.**
Mousa Zarrin*^{1,2}, Olga Wellnitz¹, and Rupert Bruckmaier¹, ¹*Veterinary Physiology Vetsuisse Faculty, University of Bern, Bern, Switzerland*, ²*Department of Animal Science, Yasouj University, Yasouj, Iran*.
- T14 **Total immunoglobulin concentration in colostrum produced by dairy cows in Costa Rica.**
J. A. Elizondo-Salazar*¹, D. Benavides-Varela², and A. Vargas-Ramírez¹, ¹*Estación Experimental Alfredo Volio Mata. Facultad de Ciencias Agroalimentarias, Universidad de Costa Rica, San José, Costa Rica*, ²*Alimentos del Norte S.A-DIPCR, Costa Rica*.
- T15 **Risk factors associated with milk fever occurrence in Costa Rican dairy cattle.**
Alejandro Saborío-Montero*², Bernardo Vargas-Leitón¹, Juan José Romero-Zúñiga¹, and Jorge M. I. Sánchez², ¹*Programa de Investigación en Medicina Poblacional, Escuela de Medicina Veterinaria, Universidad Nacional, Heredia, Costa Rica*, ²*Centro de Investigaciones en Nutrición Animal y Escuela de Zootecnia, Universidad de Costa Rica, San José, Costa Rica*.
- T16 **Serum calcium concentration during the peripartur period in a Jersey herd grazing tropical pastures and supplemented with a low calcium grain mixture.**
Jorge M. I. Sánchez* and Alejandro Saborío-Montero, *Centro de Investigaciones en Nutrición Animal y Escuela de Zootecnia, Universidad de Costa Rica, San José, Costa Rica*.
- T17 **Bacterial diversity and pathogen load in recovered dairy cows bedding materials following an aerobic composting of dairy manure.**
Maral Rahmani*, Hooman Derakhshani, Hein M. Tun, Jacqueline Donogh, Shadi Sepehri, and Ehsan Khafipour, *University of Manitoba, Winnipeg, MB, Canada*.
- T18 **Massive shotgun metagenomic sequencing reveals the potential mode of action of *Saccharomyces cerevisiae* fermentation product (SCFP) on rumen microbiome during subacute ruminal acidosis (SARA) in dairy cows.**
H. M. Tun*¹, S. Li¹, I. Yoon², M. Scott², J. C. Plaizier¹, and E. Khafipour¹, ¹*Department of Animal Science, University of Manitoba, Winnipeg, MB, Canada*, ²*Diamond V, Cedar Rapids, IA*.
- T19 **Effects of *Saccharomyces cerevisiae* fermentation product (SCFP) on the predicted functional profiles of rumen microbiome in lactating dairy cows with subacute ruminal acidosis (SARA).**
S. C. Li*¹, H. M. Tun¹, P. Azevedo¹, I. Yoon², M. Scott², J. C. Plaizier¹, and E. Khafipour¹, ¹*Department of Animal Science, University of Manitoba, Winnipeg, MB, Canada*, ²*Diamond V, Cedar Rapids, IA*.
- T20 **Effect of milk yield genotype on response to repeated lipopolysaccharide (LPS) administration to lactating Holstein cows.**
Georgina Cousillas*¹, Wanda J. Weber¹, Stanislaw Kahl², Bruce Walcheck¹, Ricardo Chebel¹, David Kerr³, Theodore H. Elsasser², and Brian A. Crooker¹, ¹*University of Minnesota, St. Paul, MN*, ²*USDA-ARS, Beltsville, MD*, ³*University of Vermont, Burlington, VT*.
- T21 **Use of chitosan microparticles to prevent metritis in lactating dairy cows.**
Rodolfo Daetz*², Frederico Cunha², Yosuke Maeda³, Carlos A. Risco², Kwang C. Jeong^{1,4}, Jose Eduardo P. Santos¹, and Klibs N. Galvão², ¹*Department of Animal Sciences, University of Florida, Gainesville, FL*, ²*Department of Large Animal Clinical Sciences, University of Florida, Gainesville, FL*, ³*School of Veterinary Medicine, Kitasato University, Towada, Japan*, ⁴*Emerging Pathogens Institute, University of Florida, Gainesville, FL*.
- T22 **The role of Bacteroidetes and Bacteroides species in the development of metritis and fever in dairy cows.**
Soo Jin Jeon*², Achilles Vieira-Neto¹, and Klibs N. Galvão², ¹*Department of Animal Sciences, University of Florida, Gainesville, FL*, ²*Department of Large Animal Clinical Sciences, University of Florida, Gainesville, FL*.
- T23 **Incidence of health treatments among pure Holsteins of 8 high-performance dairies in Minnesota.**
M. R. Donnelly*¹, A. R. Hazel¹, B. J. Heins², and L. B. Hansen¹, ¹*University of Minnesota, St. Paul, MN*, ²*West-Central Research and Outreach Center, Morris, MN*.
- T24 **Rumination behavior alert indexes for detecting health disorders during early lactation.**
Sushil Paudyal¹, Fiona Maunsell², Carlos Risco², Arthur Donovan², Albert De Vries³, John Richeson¹, and Pablo Pinedo*^{4,5}, ¹*West Texas A&M University, Canyon, TX*, ²*Department of Large Animal Clinical Sciences, College of Veterinary Medicine, University of Florida, Gainesville, FL*, ³*Department of Animal Sciences, University of Florida, Gainesville, FL*, ⁴*Texas A&M AgriLife Research, Amarillo, TX*, ⁵*Department of Veterinary Pathobiology, College of Veterinary Medicine & Biomedical Sciences, Texas A&M University System, College Station, TX*.

- T25 **OmniGen-AF alters rectal temperature (RT) and leukocyte profiles in dairy cows exposed to heat stress (HS) following acute activation of the stress axis.**
Nicole C. Burdick Sanchez*¹, Jeffery A. Carroll¹, Paul R. Broadway¹, Matthew L. McBride², Xavier A. Ortiz², Jayne L. Collier², James D. Chapman³, Derek McLean³, and Robert J. Collier², ¹USDA-ARS, Livestock Issues Research Unit, Lubbock, TX, ²University of Arizona, Department of Animal Science, Tucson, AZ, ³Phibro Animal Health Corp, Quincy, IL.
- T26 **Altered microbiomes in bovine digital dermatitis lesions, and the gut as a pathogen reservoir.**
Martin Zinicola*¹, Fabio Lima¹, Svetlana Lima¹, Vinicius Machado¹, Charles Guard¹, Dörte Döpfer², and Rodrigo Bicalho¹, ¹Cornell University, Ithaca, NY, ²University of Wisconsin, Madison, WI.
- T27 **Characterization of the leukocyte transcriptome in cows challenged with *Mycobacterium bovis* and healthy controls.**
Robmay Garcia*, Dianelys Gonzalez-Pena, and Sandra L. Rodriguez-Zas, University of Illinois at Urbana Champaign, Urbana, IL.
- T28 **Evaluation of antimicrobial activity of chitosan microparticles in different matrices from dairy cows.**
Zhengxin Ma*^{1,2}, Lin Teng^{1,2}, Donghyeon Kim¹, Klíbs N. Galvão³, Corwin D. Nelson¹, Adegbola T. Adesogan¹, and K. Casey Jeong^{1,2}, ¹Department of Animal Sciences, University of Florida, Gainesville, FL, ²Emerging Pathogens Institute, University of Florida, Gainesville, FL, ³Department of Large Animal Clinical Sciences, University of Florida, Gainesville, FL.
- T29 **Targeted oxylipid analyses of milk obtained from periparturient dairy cows.**
Jeffery C. Gandy*, Vengai Mavangira, and Lorraine M. Sordillo, Michigan State University, East Lansing, MI.
- T30 **Prevalence and antimicrobial resistance of mastitis pathogens in cattle dairy in a region of Colombia.**
Maria del P. Sanchez*, Norma P. Gutierrez, and Ivan J. Posada, Universidad Cooperativa de Colombia Sede Ibagué, Ibagué, Tolima, Colombia.
- T31 **Variation in clinical mastitis detection frequency and etiology among milkers.**
Paulo Cesar Duque-Madrid^{1,3}, Cedric Blanc², and Alfonso Lago*³, ¹Universidad de Caldas, Manizales, Colombia, ²GTV Dairies, Tipton, CA, ³DairyExperts Inc., Tulare, CA.
- T32 **The effect of concentrate allocation strategy on the metabolic and immune function of high genetic merit dairy cows offered a grass silage based diet.**
Mark W. Little*^{1,2}, Niamh O'Connell², Jason Barley³, Michael D. Welsh³, and Conrad P. Ferris¹, ¹Agri-Food and Biosciences Institute, Hillsborough, UK, ²School of Biological Sciences, Queens University Belfast, Belfast, UK, ³Agri-Food and Biosciences Institute, Veterinary Sciences Division, Belfast, UK.
- T33 **Evaluation of experimental novel germicide postmilking teat dips and a commercial iodine barrier postmilking teat dip on teat end and teat skin health and integrity.**
Rae Sires, Kia Knutson, and Leo L. Timms*, Iowa State University, Ames, IA, 50011.
- T34 **Study of the activity of soluble and nanostructured IFN γ and metalloproteinases as a new tool for the optimization of the dry-off of dairy cows.**
Francesc Fabregas¹, Olivia Cano^{2,3}, Sandra Genís*¹, Silvia Parés¹, Joaquim Seras-Franzoso^{2,3}, Alex Bach^{1,4}, Antonio Villaverde^{2,3}, Elena Garcia-Fruitos^{2,3}, and Anna Aris¹, ¹Department of Ruminant Production, Institute of Research in Agriculture and Technology, Caldes de Montbui, Spain, ²Department of Genetics and Microbiology, Institute of Biotechnology and Biomedics, Universitat Autònoma de Barcelona, Bellaterra, Spain, ³CIBER de Bioingeniería, Biomateriales y Nanomedicina, Bellaterra, Spain, ⁴ICREA, Barcelona, Spain.
- T35 **Metabolic parameters of cows with different status for bovine leukemia.**
Irina V. Vinogradova*¹, Elena A. Gladyr¹, Ludmila A. Ivanova², Alexandr S. Kramarenko¹, Igor V. Gusev¹, Roman V. Rykov¹, Michael I. Guljukin², and Natalia A. Zinovieva¹, ¹L.K. Ernst Institute of Animal Husbandry, Dubrovitsy, Moscow, Russia, ²Y.R. Kovalenko Institute of Experimental Veterinary Medicine, Moscow, Russia.
- T36 **High forage diet alters feeding behavior, health, and milk production in fresh Holstein dairy cows.**
Juliana M. Huzzey*^{1,2}, Hesam A. Seifi^{1,3}, Muhammad A. Khan^{1,4}, Marina A. G. von Keyserlingk¹, and Daniel M. Weary¹, ¹Animal Welfare Program, University of British Columbia, Vancouver, BC, Canada, ²Animal Science Department, California Polytechnic State University, San Luis Obispo, CA, ³Department of Clinical Sciences, School of Veterinary Medicine, Ferdowsi University of Mashhad, Iran, ⁴AgResearch, Grasslands Research Centre, Palmerston North, New Zealand.
- T37 **Prepartum rumination patterns in dairy cows that develop health disorders in the early postpartum period.**
Matias L. Stangaferro*, Robert Wijma, Miranda M. Medrano, Mohammed A. Al Abri, and Julio O. Giordano, Department of Animal Science, Cornell University, Ithaca, NY.

- T38 **Plasma phosphatidylcholine and lysophosphatidylcholine profiling of heat-stressed lactating dairy cows.**
He Tian¹, Jianbo Cheng², Yangdong Zhang¹, Nan Zheng^{*1}, and Jiaqi Wang¹, ¹*Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China*, ²*College of Animal Science and Technology, Anhui Agricultural University, Hefei, China*.
- T39 **Assessment of an application to collect calving-related events in dairy herds.**
A. A. Barragan^{*}, J. D. Workman, S. Bas, K. L. Proudfoot, and G. M. Schuenemann, *The Ohio State University, Columbus, OH*.
- T40 **Diffructose anhydride III supplementation promotes passive calcium absorption in the small intestine immediately after calving in dairy cows.**
Makoto Teramura^{*1,2}, Syaw Wynn¹, Maimaiti Reshalaitihan³, Wakana Kyuuno², Tadashi Sato², Masayuki Ohtani², Chiho Kawashima³, and Masaaki Hanada³, ¹*United Graduate School of Agricultural Sciences, Iwate University, Morioka, Iwate, Japan*, ²*Nippon Beet Sugar Manufacturing Co., Ltd, Obihiro, Hokkaido, Japan*, ³*Obihiro University of Agriculture and Veterinary Medicine, Obihiro, Hokkaido, Japan*.
- T41 **Supplementation with *Bacillus pumilus* 8G-134 enhances expression of T cell markers in dairy cows during early lactation.**
Megan Duersteler^{*1}, Mike Brouk², and Elizabeth Galbraith¹, ¹*DuPont, Waukesha, WI*, ²*Kansas State University, Manhattan, KS*.
- T42 **A stochastic estimate of the economic impact of oral calcium supplementation in postparturient dairy cows.**
J. A. A. McArt¹ and G. R. Oetzel^{*2}, ¹*Department of Population Medicine and Diagnostic Services, Cornell University, Ithaca, NY*, ²*Department of Medical Sciences, University of Wisconsin-Madison, Madison, WI*.
- T43 **Mastitic cows management practices on California dairies.**
Pau Pallarés^{*1}, Arnau Espadamala¹, Alfonso Lago², and Noelia Silva-del-Rio¹, ¹*UC Davis School of Veterinary Medicine, VMTRC, Tulare, CA*, ²*DairyExperts, Tulare, CA*.
- T44 **Concentrations of saturated fatty acids in whole raw milk of dairy cows under different management systems and country of origin: A meta-analytical study.**
Grzegorz Zwierzchowski^{*} and Burim Ametaj, *Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada*.
- T45 **Concentrations of unsaturated fatty acids in the whole raw milk of dairy cows under different management systems and country of origin: A meta-analytical study.**
Grzegorz Zwierzchowski^{*} and Burim Ametaj, *Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, Alberta, Canada*.
- T46 **Owner and veterinarian involvement on fresh cow health management on California dairies.**
Pau Pallarés^{*1}, Arnau Espadamala¹, Alfonso Lago², and Noelia Silva-del-Rio¹, ¹*UC Davis School of Veterinary Medicine, VMTRC, Tulare, CA*, ²*DairyExperts, Tulare, CA*.
- T47 **Fresh cow evaluations and treatments on California dairies.**
Arnau Espadamala^{*1}, Pau Pallares¹, Alfonso Lago², and Noelia Silva-del-Rio¹, ¹*UC Davis School of Veterinary Medicine, VMTRC, Tulare, CA*, ²*DairyExperts, Tulare, CA*.
- T48 **Association among gestation length with health, reproduction, and production in Holstein cows.**
Achilles Vieira-Neto^{*}, Klibs N. Galvao, and Jose E. P. Santos, *University of Florida, Gainesville, FL*.
- T49 **Hepatic mRNA expression of genes related to inflammatory and immune responses of dairy cows treated with recombinant bovine somatotropin during the periparturient period.**
Paula R. B. Silva^{*1}, Wanda Weber¹, Brian Crooker¹, and Ricardo C. Chebel^{1,2}, ¹*University of Minnesota, St Paul, MN*, ²*University of Florida, Gainesville, FL*.
- T50 **Changes in serum triacylglycerols may indicate disease risk for retained placenta and mastitis in multiparous dairy cows.**
Fereshteh Zandkarimi, Massimo Bionaz, Jan S. Stevens, Claudia S. Maier, and Gerd Bobe^{*}, *Oregon State University, Corvallis, OR*.
- T51 **Changes in serum nonesterified fatty acids precede retained placenta and mastitis in multiparous dairy cows.**
Fereshteh Zandkarimi, Massimo Bionaz, Jan S. Stevens, Claudia S. Maier, and Gerd Bobe^{*}, *Oregon State University, Corvallis, OR*.
- T52 **Distribution of most common coagulase-negative species over parity and lactation in Canadian dairy herds.**
Larissa A. Z. Condas^{*1}, Diego B. Nobrega^{2,1}, Domonique Carson¹, Jeroen De Buck¹, and Herman W. Barkema¹, ¹*University of Calgary, Calgary, AB, Canada*, ²*Universidade Estadual de Campinas, Campinas, SP, Brazil*.

- T53 **Phospholipids are potential early risk indicator for retained placenta and mastitis in multiparous dairy cows.**
Fereshteh Zandkarimi, Massimo Bionaz, Jan S. Stevens, Claudia S. Maier, and Gerd Bobe*, *Oregon State University, Corvallis, OR.*
- T54 **Hoof measurements before and after hoof trimmer intervention on dairy lame cows on California dairies.**
Marc Pineda*¹, Ibrahim Akin², and Noelia Silva-del-Rio¹, ¹*Veterinary Medicine Teaching and Research Center. UC Davis, Tulare, CA,* ²*Adnan Menderes University Veterinary Faculty Department of Surgery, Aydin, Turkey.*
- T55 **Correlation of ACTH test results with hormonal, metabolic and cardiac stress responses during stress challenge in dairy cows.**
Lea Fieguth¹, Lena Locher¹, Anja Schacht¹, Akos Kenez², Asako Kinoshita¹, Ulrich Meyer³, Sven Dänicke³, and Juergen Rehage*¹, ¹*Clinic for Cattle, University of Veterinary Medicine Hannover, Hannover, Germany,* ²*Department of Physiology, University of Veterinary Medicine Hannover, Hannover, Germany,* ³*Department of Animal Nutrition, Friedrich-Loeffler-Institute, Braunschweig, Hannover.*

ASAS Undergraduate Student Poster Competition

Chair: W. L. Flowers, NCSU, Raleigh, NC

- T56 **Weather-related cold stress on conception rates in Sim-Angus cattle.**
Jessica A. Stone* and Julie D. Weathers, *Southeast Missouri State University, Cape Girardeau, MO.*
- T57 **Number of pigs born alive in parity-1 sows associated with lifetime performance and removal hazard in high- or low-performing herds in Japan.**
Satomi Tani*, Ryosuke Iida, and Yuzo Koketsu, *Meiji University, Kawasaki, Kanagawa, Japan.*
- T58 **Beneficial effects of a short-term provision of forage to intensively reared broiler chickens.**
Oluwaseun S. Iyasere, Toluwatope O. Sodipo, and Anuoluwapo V. Subulokun*, *Federal University of Agriculture, Abeokuta, Ogun State, Nigeria.*
- T59 **Inosine 5'-monophosphate increases glutamic acid induced cholecystokinin release from bovine proximal small intestine.**
Erin L. Doherty*, Derek W. Brake, and George A. Perry, *South Dakota State University, Brookings, SD.*
- T60 **Overexpression and inhibition of specificity protein 1 (SP1) affect milk fat formation in goat mammary epithelial cells.**
Jiangjiang Zhu* and Jun Luo, *Shaanxi Key Laboratory of Molecular Biology for Agriculture, College of Animal Science and Technology, Northwest A&F University, Yangling, Shaanxi, China.*
- T61 **Effects of plant-derived compounds on *Staphylococcus aureus* infection of primary bovine mammary epithelial cells.**
Ellen V. Valley*¹, Devi Jaganathan¹, Kumar Venkitanarayanan¹, Gary W. Kazmer¹, Lynn Kuo², Yu Bo Wang², and Kristen E. Govoni¹, ¹*Department of Animal Science, University of Connecticut, Storrs, CT,* ²*Department of Statistics, University of Connecticut, Storrs, CT.*
- T62 **Extended-spectrum cephalosporin, carbapenem, and fluoroquinolone-resistant gram-negative coliform bacteria present on equine environmental surfaces.**
Rachael Adams*², Dixie Mollenkopf¹, Dimitria Mathys¹, Joshua Daniels¹, and Thomas Wittum¹, ¹*The Ohio State University College of Veterinary Medicine, Columbus, OH,* ²*The Ohio State University College of Food, Agricultural, and Environmental Sciences, Columbus, OH.*
- T63 **Interleukin-6, tumor necrosis factor- α , insulin-like growth factor-1 and fibroblast growth factor-2 alter proliferation and differentiation of equine satellite cells.**
Emma K. LaVigne*¹, Alfredo Sanchez Londoño², and Sarah A. Reed¹, ¹*Department of Animal Science, University of Connecticut, Storrs, CT,* ²*Department of Environmental and Population Health, Cummings School of Veterinary Medicine at Tufts University, North Grafton, MA.*
- T64 **Effects of varying anthelmintic formulations on hindgut microflora in horses.**
John Rowe*, Katelyn Barnhart, Elizabeth Share, John Mark Reddish, and Kimberly Cole, *The Ohio State University College of Food, Agricultural, and Environmental Sciences, Columbus, OH.*

- T65 **Effects of poor maternal nutrition during gestation on protein expression in the liver of lambs.**
Katelyn K. McFadden*, Maria L. Hoffman, Kristen N. Peck, Sarah A. Reed, Steven A. Zinn, and Kristen E. Govoni, *Department of Animal Science, University of Connecticut, Storrs, CT.*
- T66 **Effects of rubber covers for concrete slats on lameness in confined feedlots.**
Bryant R. Chapman*, Derrick S. Smith, Colleen N. Curtiss, Monica J. Atkin, Steven R. Rust, and Daniel L. Grooms, *Michigan State University, East Lansing, MI.*
- T67 **Associations between animal performance measures and rumen pH of growing feedlot steers in drought simulated conditions.**
Sara E. Place¹, Michelle S. Calvo-Lorenzo¹, Clint R. Krehbiel¹, Christopher J. Richards¹, Douglas L. Step², Kristi Allwardt¹, Catherine L. Haviland¹, Emily A. Andreini¹, Jacob Reed¹, Andrew Grimes¹, Ashley Broocks¹, Justin L. Lyles¹, Kyre E. Larrabee*¹, Kimberly Branham¹, Megan M. Rolf¹, ¹*Department of Animal Science, Oklahoma State University, Stillwater, OK,* ²*Veterinary Clinical Sciences, Oklahoma State University, Stillwater, OK.*
- T68 **Macrominerals requirements for growth of Canindé goats.**
Luana P. S. Ribeiro*¹, Ariosvaldo N. Medeiros², Francisco F. R. Carvalho³, Elzânia S. Pereira⁴, Anaiane P. Souza⁵, José Maurício S. Neto⁵, Cláudio G. S. Junior², Gabriel C. L. Branco², and Andreia B. Bezerra², ¹*Federal University of Bahia, Salvador, Bahia, Brazil,* ²*Federal University of Paraíba, Areia, Paraíba, Brazil,* ³*Federal University Rural of Pernambuco, Recife, Pernambuco, Brazil,* ⁴*Federal University Ceará, Fortaleza, Ceara, Brazil,* ⁵*State University Sao Paulo, Jaboticabal, Sao Paulo, Brazil.*
- T69 **Back to basics: Are beef cattle good at showing estrus? An assessment of estrus response, length of sexual receptivity, follicular growth, and pregnancy rate in beef cattle following a 5-day CO-Synch + CIDR estrus synchronization program.**
Victoria Morrow*, Shannon Edwards, Stephanie Webb, Jeremy Hemmer, Jennifer Bouland, Steve Parish, and Martin Maquivar, *Washington State University, Pullman, WA.*
- T70 **Single nose ringed swine behavior in free-range production system.**
Patrícia M. Gomes*¹, Amanda R. R. Cabral¹, Jacqueline N. Paiva¹, Karoline M. Silva¹, Frederico L. Silva¹, Felipe H. Soares¹, Carlos A. Silva Júnior¹, Julia E. G. N. Perini², Jessica M. Araujo¹, Angela P. Santana¹, and Luci S. Murata¹, ¹*University of Brasilia, Brasilia, Federal District, Brazil,* ²*Brasilia Federal Institute, Brasilia, Federal District, Brazil.*
- T71 **Conception rates of beef heifers and cows based on facilities.**
Miriam A. Snider* and Julie D. Weathers, *Southeast Missouri State University, Cape Girardeau, MO.*
- T72 **A comparison of Dorper and blackface lambs in growth and carcass performance.**
Kayley R. Wall* and Chris R. Kerth, *Texas A&M University, College Station, TX.*
- T73 **Gait score of broilers supplemented with vitamin D (25-OHD₃).**
Grace Alessandra Araujo Baldo*¹, Ibiara Correia de Lima Almeida Paz¹, Edivaldo Antônio Garcia¹, Andréa Britto Molino¹, and Marlon Sávio Amadori², ¹*School of Veterinary Medicine of Animal Science, UNESP, Botucatu, SP, Brazil,* ²*School of Agricultural Sciences, UFGD, Dourados, MS, Brazil.*
- T74 **Effects of corn particle size and diet form on nursery pig growth performance.**
Ashton D. Yoder*, Grace E. Bokelman, and Cassandra K. Jones, *Kansas State University, Manhattan, KS.*
- T75 **Effect of herbal liniment on equine back pain over time: A preliminary study.**
Shannon M. Heibeck*¹, Kelly W. Walter¹, Jay A. Altman², Brady J. Karren², Miriam B. Altman³, and Kevin K. Hausler⁴, ¹*Agricultural Science Department, Truman State University, Kirksville, MO,* ²*Arenus, Fort Collins, CO,* ³*Organic Exchange Ltd, Fort Collins, CO,* ⁴*Clinical Sciences Department, Colorado State University, Fort Collins, CO.*
- T76 **Evaluation of inter-day variation of horses on total fecal collection.**
Elizabeth F. Miller*¹, Francesca R. Melgar², Trevor D. Morgan², Shanna L. Ivey², Clint L. Loest², Laura M. White², and Kelly W. Walter¹, ¹*Agricultural Science Department, Truman State University, Kirksville, MO,* ²*Department of Animal and Range Sciences, New Mexico State University, Las Cruces, NM.*

Breeding and Genetics

Application and methodology in animal breeding—Beef

- T77 **Genetic parameters for breeding phase in Hereford x Aberdeen Angus crosses in grazing system of Uruguay.**
Ana C. Espasandin^{*1}, Diego Gimeno^{2,1}, Jorge Urioste¹, and Fernando Pereyra¹, ¹Udelar, School of Agronomy, Bernardo Rosen-gurttt Experimental Station, Cerro Largo, Uruguay, ²Uruguayan Wool Secretariat, Montevideo, Uruguay.
- T78 **Estimates of genetic parameters for reproductive traits in Brahman cattle breed.**
Ligia Cavani^{*1}, Diogo Anastácio Garcia², Luis Orlando Duitama Carreño², Rafael Keith Ono², Henrique Torres Ventura³, and Ri-cardo Fonseca¹, ¹São Paulo State University (Unesp), Dracena, São Paulo, Brazil, ²São Paulo State University (Unesp), Jaboticabal, São Paulo, Brazil, ³Brazilian Association of Zebu Breeders (ABCZ), Uberaba, Minas Gerais, Brazil.
- T79 **Assessment of genetic variability of Brazilian Brahman cattle raised either on pasture or stabled by pedigree analysis.**
Ligia Cavani^{*1}, Rafael Medeiros de Oliveira Silva², Michel Marques Farah³, Rafael Keith Ono², Luis Orlando Duitama Carreño², Henrique Torres Ventura⁴, and Ricardo Fonseca¹, ¹São Paulo State University (Unesp), Dracena, São Paulo, Brazil, ²São Paulo State University (Unesp), Jaboticabal, São Paulo, Brazil, ³Brazilian Agricultural Research Corporation (Embrapa), Juiz de Fora, Minas Gerais, Brazil, ⁴Brazilian Association of Zebu Breeders (ABCZ), Uberaba, Minas Gerais, Brazil.
- T80 **Use of a robust Bayesian regression model in genome-wide association study of growth traits in Brangus heifers.**
Sunday O. Peters^{*1}, Kadir Kizilkaya², Dorian J. Garrick³, Rohan L. Fernando³, Ikhide G. Imumorin⁴, and Milton G. Thomas⁵, ¹Berry College, Mount Berry, GA, ²Adnan Menderes University, Aydin, Turkey, ³Iowa State University, Ames, IA, ⁴Cornell University, Ithaca, NY, ⁵Colorado State University, Fort Collins, CO.
- T81 **Genetic parameter estimates for fatty acid profile of *longissimus thoracis* beef from Nellore cattle finished in feedlot.**
Carolyn A. Santos¹, Angélica S. C. Pereira², Fabieli L. B. Feitosa¹, Marcos V. A. Lemos¹, Hermenegildo L. J. Chiaia¹, Mariana P. Berton¹, Adrielle M. Ferrinho², Lenise F. Mueller³, Joyce M. Furlan², Monica R. Mazalli³, and Fernando S. Baldi^{*1}, ¹Universidade Estadual Paulista, Faculdade de Ciências Agrárias e Veterinárias, Departamento de Zootecnia, Jaboticabal, São Paulo, Brazil, ²Universidade de São Paulo, Faculdade de Medicina Veterinária e Zootecnia, Departamento de Nutrição e Produção Animal, Pirassununga, São Paulo, Brazil, ³Universidade de São Paulo, Faculdade de Zootecnia e Engenharia de Alimentos, Pirassununga, São Paulo, Brazil.
- T82 **Genetic evaluation of growth traits in Brahman cattle.**
A. M. Mariorano², M. E. Z. Mercadante³, J. N. S. G. Cyrillo³, L. A. L. Chardulo¹, and J. A. V. Silva^{*1}, ¹Universidade Estadual Pau-lista, Botucatu, SP, Brasil, ²Universidade Estadual Paulista, Jaboticabal, SP, Brazil, ³Instituto de Zootecnia, Sertãozinho, SP, Brazil.
- T83 **Effect of prediction method and cross-validation approach on accuracy of DGV for feed efficiency traits.**
Rafael M. O. Silva^{*1}, Daniela A. L. Lourenco², Breno O. Fragomeni², Luciana Takada¹, Rafael Espigolan¹, Maria E. Z. Mercadante³, Fernando Baldi¹, Guilherme C. Venturini¹, Joslaine N. S. G. Cyrillo³, Ignacy Misztal², Roberto Carvalheiro¹, and Lucia G. Albu-querque¹, ¹Univ Est Paulista Julio de Mesquita Filho, FCAV-UNESP, Jaboticabal, SP, Brazil, ²The University of Georgia, Athens, GA, ³APTA Center for Beef Cattle, Animal Science Institute, Sertaozinho, SP, Brazil.
- T84 **Genetic correlation estimates between the profile of individual beef fatty acids of meat and carcass traits and meat in Nel-lore cattle finished in feedlot.**
Fabieli Loise Braga Feitosa, Carolyn Aboujaoude, Marcos Vinícius Antunes de Lemos, Mariana Piatto Berton, Guilherme Costa Venturini, Rafael Lara Tonussi, Rafael Espigolan, Bianca Ferreira Olivieri, Lucia Galvão de Albuquerque, and Fernando Baldi^{*}, Universidade Estadual Paulista, FCAV-UNESP, Jaboticabal, São Paulo, Brazil.
- T85 **Genetic parameter estimates for carcass and meat quality traits in Nellore cattle finished in feedlot.**
Bianca Ferreira Olivieri¹, Fabiele Loise Braga Feitosa¹, Hermenegildo Lucas Justino Chiaia¹, Guilherme Costa Venturini¹, Carolyn Aboujaoude¹, Marcos Vinícius Antunes de Lemos¹, Mariana Piatto Berton¹, Rafael Lara Tonussi¹, Rafael Espigolan¹, Joyce de Jesus Mangini Furlan², Angélica Simone Cravo Pereira^{*2}, Lucia Galvão de Albuquerque¹, and Fernando Baldi¹, ¹Universidade Es-tadual Paulista, FCAV-UNESP, Jaboticabal, São Paulo, Brazil, ²Universidade de São Paulo, FMVZ-USP, Pirassununga, São Paulo, Brazil.

Breeding and Genetics

Applications and methodology in animal breeding—Dairy

- T86 **Genetic and phenotypic trends for age at first calving and milk yield in daughters from imported and Thai Holstein sires.**
Tawirat Konkrua¹, Skorn Koonawootrittriron^{*1}, Thanathip Suwanasopee¹, and Mauricio A. Elzo², ¹*Kasetsart University, Bangkok, Thailand*, ²*University of Florida, Gainesville, FL*.
- T87 **Genomic-polygenic evaluation for milk yield and fat yield in a multibreed dairy cattle population in central Thailand.**
Bodin Wongpom¹, Skorn Koonawootrittriron^{*1}, Mauricio A. Elzo², and Thanathip Suwanasopee¹, ¹*Kasetsart University, Bangkok, Thailand*, ²*University of Florida, Gainesville, FL*.
- T88 **Genomic evaluation, breed identification, and population structure of North American, English and Island Guernsey dairy cattle.**
Tabatha A. Cooper^{*1}, Sophie A. E. Eaglen², George R. Wiggans¹, Janez Jenko², Heather J. Huson³, David M. Morrice², Maurice Bichard⁴, William G. Luff⁵, John A. Woolliams², and Brian P. Van Doormaal⁷, ¹*Animal Genomic and Improvement Laboratory, Agricultural Research Service, USDA, Beltsville, MD*, ²*The Roslin Institute & R(D)SVS, University of Edinburgh, Easter Bush, United Kingdom*, ³*Department of Animal Science, Cornell University, Ithaca, NY*, ⁴*English Guernsey Cattle Society, Launceston, United Kingdom*, ⁵*World Guernsey Cattle Federation, Castel, Guernsey, United Kingdom*, ⁶*Select Sires, Plain City, OH*, ⁷*Canadian Dairy Network, Guelph, ON, Canada*.
- T89 **Genetic relationship between final score and production traits in Brazilian Holstein cattle.**
Victor B. Pedrosa^{*1}, Pedro G. Ribas Neto², Silvano F. Valoto², Luis F. B. Pinto³, and Gabrieli S. Romano³, ¹*Universidade Estadual de Ponta Grossa, Ponta Grossa, Parana, Brazil*, ²*Associacao Paranaense dos Criadores de Bovinos da Raca Holandesa, Curitiba, Parana, Brazil*, ³*Universidade Federal da Bahia, Salvador, Bahia, Brazil*.
- T90 **Genetic trends in dairy production of Brazilian Holstein cow.**
Victor B. Pedrosa^{*1}, Altair A. Valloto², Jose A. Horst², Avelino M. Figueiredo², and Adriana S. Martins¹, ¹*Universidade Estadual de Ponta Grossa, Ponta Grossa, Parana, Brazil*, ²*Associacao Paranaense dos Criadores de Bovinos da Raca Holandesa, Curitiba, Parana, Brazil*.
- T91 **Association between genomic SNPs and dairy production traits in Thai multibreed dairy cattle.**
Pimchanok Yodklaew¹, Skorn Koonawootrittriron^{*1}, Mauricio A. Elzo², and Thanathip Suwanasopee¹, ¹*Kasetsart University, Bangkok, Thailand*, ²*University of Florida, Gainesville, FL*.
- T92 **Accuracy of genomic prediction using principal component analysis on an imputed high -density SNP panel in Italian Holstein cattle.**
Antonio Puleda¹, Giustino Gaspa¹, Ezequiel L. Nicolazzi², Corrado Dimauro¹, Paolo Ajmone Marsan³, Alessio Valentini⁴, and Nicolo PP Macciotta^{*1}, ¹*Dipartimento di Agraria, Università di Sassari, Sassari, Italy*, ²*Fondazione Parco Tecnologico Padano, Lodi, Italy*, ³*Istituto di Zootecnica, Università Cattolica del Sacro Cuore, Piacenza, Italy*, ⁴*Dipartimento per l'Innovazione dei sistemi biologici, agroalimentari e forestali, Università della Tuscia, Viterbo, Italy*.
- T93 **Estimation of genetic parameters for calving ease of Holstein cattle in Korea.**
Mahboob Alam, Kwang Hyeon Cho^{*}, Tae Jeong Choi, Chung Il Cho, and Yun Ho Choy, *National Institute of Animal Science, Rural Development Administration, Cheonan-si, Chungcheongnam-do, Republic of Korea*.
- T94 **Modeling for estimation of genetic parameters of milk production traits using random regression models in Korean Holstein cattle.**
Chung Il Cho, Tae Jeong Choi^{*}, Kwang Hyeon Cho, Mahboob Alam, Yun Ho Choi, and Jae Gu Lee, *National Institute of Animal Science, Rural Development Administration, Cheonan-si, Chungcheongnam-do, Republic of Korea*.
- T95 **Estimation of genetic trends and profitability of dairy herds using different reproductive and genetic culling strategies with a stochastic simulation model which includes multitrait genetics.**
K. Kaniyamattam^{*} and A. De Vries, *University of Florida, Gainesville, FL*.
- T97 **Genetic parameters and trends for dairy traits in Holstein Friesian under North African conditions.**
Salem Abdalla-Bozrayda¹, Emhimad A. E. Abdalla¹, and Mauricio A. Elzo^{*2}, ¹*University of Benghazi, Benghazi, Libya*, ²*University of Florida, Gainesville, FL*.
- T98 **Genetic parameters for production traits and age at first calving in Gyr dairy cattle.**
Marco Prata^{*1,2}, Francesca Malchiodi², Filippo Miglior^{3,2}, Lenira El Faro⁴, Anibal Vercesi Filho⁵, and Vera Cardoso¹, ¹*Departament of Genetics, Ribeirão Preto Medical School, University of São Paulo, Ribeirão Preto, SP, Brazil*, ²*Centre for Genetic Improvement of Livestock, University of Guelph, Guelph, ON, Canada*, ³*Canadian Dairy Network, Guelph, ON, Canada*, ⁴*Centro Avançado de Pesquisa Tecnológica do Agronegócio de Bovinos de Corte, Instituto de Zootecnia, Sertãozinho, SP, Brazil*, ⁵*Centro Avançado de Pesquisa Tecnológica do Agronegócio de Bovinos de Leite, Instituto de Zootecnia, Nova Odessa, SP, Brazil*.

- T99 **Evaluation of genetic diversity of three indigenous Russian cattle breeds using whole-genome scanning.**
Elena A. Gladyr¹, Alexander A. Sermyagin*¹, Tatiana E. Deniskova¹, Alexey A. Traspov¹, Veronika R. Kharsinova¹, Gottfried Brem², Natalia A. Zinovieva¹, and Alexey V. Shakhin¹, ¹L.K.Ernst Institute of Animal Husbandry, Dubrovitsy, Moscow, Russia, ²Institute of animal breeding and genetics, University of Veterinary Medicine, Vienna, Austria.
- T100 **Exploring methodology for application of genomic information in South African dairy breeds.**
Bernice E. Mostert¹, Robert R. Van der Westhuizen², Este Van Marle-Köster*¹, and Brian Van Doormaal³, ¹Department of Animal and Wildlife Sciences, University of Pretoria, Pretoria, South Africa, ²SA Stud Book and Animal Improvement Association, Bloemfontein, South Africa, ³Canadian Dairy Network, Guelph, ON, Canada.
- T101 **Genetic parameters of fertility indicators in Holstein.**
Dianelys Gonzalez-Pena*¹, Pablo J. Pinedo², Jose E. P. Santos³, Gustavo M. Schuenemann⁴, Guilherme J. M. Rosa⁵, Robert Gilbert⁶, Rodrigo C. Bicalho⁶, Ricardo C. Chebel³, Klíbs N. Galvão³, Christopher M. Seabury², John Fetrow⁷, William W. Thatcher³, and Sandra L. Rodriguez-Zas¹, ¹University of Illinois at Urbana-Champaign, Urbana, IL, ²Texas A&M University, College Station, TX, ³University of Florida, Gainesville, FL, ⁴The Ohio State University, Columbus, OH, ⁵University of Wisconsin, Madison, WI, ⁶Cornell University, Ithaca, NY, ⁷University of Minnesota, Saint Paul, MN.
- T102 **Selection signature analysis in Holstein cattle identified genes known to affect reproduction.**
Li Ma¹, Tad S. Sonstegard², Curtis Van Tassell², John B. Cole², George R. Wiggans², Brian A. Crook³, F. Abel Ponce de Leon³, and Yang Da*³, ¹Department of Animal and Avian Sciences, University of Maryland, College Park, MD, ²Animal Genomics and Improvement Laboratory, ARS-USDA, Beltsville, MD, ³Department of Animal Science, University of Minnesota, Saint Paul, MN.
- T103 **Genetic interactions for heat stress and herd yield level: predicting foreign genetic merit from domestic data.**
Janice R. Wright* and Paul M. VanRaden, *Animal Genomics and Improvement Laboratory, Agricultural Research Service, US Department of Agriculture, Beltsville, MD.*
- T104 **Application of milk mid-infrared (MIR) spectrometry in the dairy cattle industry in Canada.**
Saranya Gunasegaram*¹, Allison Fleming¹, Astrid Koeck¹, Francesca Malchiodi¹, Mehdi Sargolzaei^{1,2}, Milena Corredig^{3,4}, Flavio Schenkel¹, Bonnie Mallard⁵, Ayesha Ali⁷, and Filippo Miglior^{1,7}, ¹CGIL, University of Guelph, Guelph, ON, Canada, ²Semex Alliance, Guelph, ON, Canada, ³Gay Lea, Guelph, ON, Canada, ⁴Department of Food Science, University of Guelph, Guelph, ON, Canada, ⁵Department of Pathobiology, OVC, University of Guelph, Guelph, ON, Canada, ⁶Department of Mathematics and Statistics, University of Guelph, Guelph, ON, Canada, ⁷Canadian Dairy Network, Guelph, ON, Canada.
- T105 **Development of a daily stochastic dynamic dairy simulation model including the 12 traits in the Net Merit Index.**
K. Kaniyamattam*, M. A. Elzo, and A. De Vries, *University of Florida, Gainesville, FL.*
- T106 **Genetic correlations between days open and milk, fat, and protein yields for the Uruguayan Holstein.**
Nicolas Frioni*¹, Jorge I. Urioste¹, Ignacio Aguilar², and Gabriel Rovere¹, ¹Facultad de Agronomía Universidad de la República, Montevideo, Montevideo, Uruguay, ²Instituto Nacional de Investigación Agropecuaria Las Brujas, Rincon de Colorado, Canelones, Uruguay.

Dairy Foods Dairy products

- T107 **Angiotensin-converting enzyme inhibitory activity of whey proteins obtained from the manufacture of traditional Mexican cheeses.**
Yuridia S. Tarango-Hernandez, Alma D. Alarcon-Rojo, Nestor Gutierrez-Mendez, and Jose C. Rodriguez-Figueroa*, *Universidad Autonoma de Chihuahua, Chihuahua, Mexico.*
- T108 **The effect of partially hydrolyzed different milk species on xanthine oxidase activity of fetal enterocyte culture.**
Hristina Kocic*, *Medical Faculty University Maribor, Maribor, Slovenia.*
- T109 **Case study: Comparison of biologically active compounds in milk from organic and conventional dairy herds.**
Diane L. Van Hekken*¹, Michael H. Tunick¹, Hubert J. Karreman², Elaine R. Ingham^{2,3}, and Peggy M. Tomasula¹, ¹USDA, ARS, Wyndmoor, PA, ²Rodale Institute, Kutztown, PA, ³Soil Foodweb Inc., Corvallis, OR.

- T110 **Evaluation of the effect of diets containing grape seed and linseed on milk fatty acid composition in Sarda sheep by principal component analysis.**
Fabio Correddu, Anna Nudda*, Giustino Gaspa, Gianni Battacone, and Giuseppe Pulina, *Dipartimento di Agraria, University of Sassari, Sassari, Italy.*
- T111 **Interaction between whey protein and inulin in model system.**
Cuina Wang¹, Hao Wang¹, and Mingruo Guo*^{1,2}, ¹Jilin University, Changchun, Jilin, China, ²University of Vermont, Burlington, VT.
- T112 **Characterizing the dissolution behavior of whey protein concentrate with an ultrasonic flaw detector.**
Mary Hauser* and Jayendra Amamcharla, *Kansas State University, Manhattan, KS.*
- T113 **Effect of pH and Ca-ion activity on the heat stability of reconstituted reduced Ca milk protein concentrate dispersions.**
Gopinathan H. Meletharayil¹, Anil Kommineni*¹, Chenchaiah Marella², and Lloyd E. Metzger¹, ¹Midwest Dairy Foods Research Center, Dairy Science Department, South Dakota State University, Brookings, SD, ²Idaho Milk Products, Jerome, ID.
- T114 **Rennet coagulation and cold gelation properties of recombined highly concentrated micellar casein concentrate and cream.**
Ying Lu*¹, Donald McMahon¹, Lloyd Metzger², Anil Kommineni², and Almut Vollmer¹, ¹Western Dairy Center, Utah State University, Logan, UT, ²Midwest Dairy Foods Research Center, South Dakota State University, Brookings, SD.
- T115 **Formation of sodium caseinate-maltodextrin conjugates and the rheological properties of acid gels.**
Shuwen Zhang*^{1,2}, Yuansheng Gong¹, Som Khanal¹, Yanjie Lu¹, and John A. Lucey¹, ¹Department of Food Science, University of Wisconsin-Madison, Madison, WI, ²Institute of Agro-Product Processing Science and Technology, Chinese Academy of Agricultural Sciences, Beijing, China.
- T116 **Edible packaging films from calcium-caseinate and citric pectin.**
Laetitia M. Bonnaille* and Peggy M. Tomasula, *USDA/ARS/NEA/ERRC, Wyndmoor, PA.*
- T117 **Changes in volatile compounds in whey protein concentrate stored at elevated temperature and humidity.**
Michael H. Tunick*¹, Diane L. Van Hekken¹, Susan K. Iandola¹, Russell Bazemore², Caitlin Allison², and Katherine M. Bazemore², ¹USDA, ARS, Eastern Regional Research Center, Dairy & Functional Foods Research Unit, Wyndmoor, PA, ²Volatile Analysis Corporation, Grant, AL.
- T118 **Characterization of milk, soymilk, and almond milk through consumer affective and emotional responses.**
Hayley L. Potts*, Kristen A. Leitch, Laurie M. Bianchi, and Susan E. Duncan, *Virginia Polytechnic Institute & State University, Blacksburg, VA.*
- T119 **Effect of storage temperature on physico-chemical and sensory attributes of ready-to-drink breakfast smoothie.**
Dipakkumar Mehta*¹, Latha Sabikhi², Sathish Kumar², and Hasumukh Patel¹, ¹South Dakota State University, Brookings, SD, ²National Dairy Research Institute, Karnal, Haryana, India.
- T120 **Physico-chemical profile and mineral content of yogurts and whey beverages available in the Brazilian market.**
Thaiza Serrano, Simone Lorena, Adriano Cruz, and Renata Raices*, *Federal Institute of Science and Technology of Rio de Janeiro (IFRJ), Rio de Janeiro, Brazil.*
- T121 **Probiotic fermented milk with banana flour: Understanding the prebiotic effect.**
Aline Silva, Renata Raices, Marcia Cristina, Luciana Nogueira, and Adriano Cruz*, *Federal Institute of Science and Technology of Rio de Janeiro (IFRJ), Rio de Janeiro, Brazil.*
- T122 **Probiotic yogurt with glucose oxidase: Performance with commercial products and potential advantages.**
Aline Batista, Marcia Silva*, Renata Raices, Luciana Nogueira, and Adriano Cruz, *Federal Institute of Science and Technology of Rio de Janeiro (IFRJ), Rio de Janeiro, Brazil.*
- T123 **Physical characteristics of set-type probiotic yogurt produced from mixtures of cow and sheep milk.**
Felipe S. Vianna, Celso Fasura Balthazar*, and Adriana C. O. Silva, *Department of Food Technology, Veterinary College, Federal Fluminense University, Niterói, Rio de Janeiro, Brazil.*
- T124 **Physical characteristics of set-type yogurts produced using milk from different ruminants species.**
Felipe S. Vianna, Celso Fasura Balthazar*, and Adriana C. O. Silva, *Department of Food Technology, Veterinary College, Federal Fluminense University, Niterói, Rio de Janeiro, Brazil.*

- T125 **Fatty Acid Profile In Prebiotic Sheep Milk Yogurt.**
Celso Fasura Balthazar*¹, Jeremias Moraes², Hugo Leandro A. Silva¹, Renata S. L. Raices², and Adriano G. Cruz², ¹Department of Food Technology, Veterinary College, Federal Fluminense University, Niterói, Brazil, ²Instituto Federal de Educação, Ciência e Tecnologia do Rio de Janeiro, Rio de Janeiro, Brazil.
- T126 **Acidity in sheep milk yogurt: The inulin effect.**
Celso Fasura Balthazar*¹, Rodrigo B. A. Oliveira¹, and Adriano G. Cruz², ¹Department of Food Technology, Veterinary College, Federal Fluminense University, Niterói, Brazil, ²Instituto Federal de Educação, Ciência e Tecnologia do Rio de Janeiro, Rio de Janeiro, Brazil.
- T127 **A clean label approach for manufacture of yogurts using tailored milk protein interactions.**
Gopinathan H. Meletharayil* and Hasmukh A. Patel, *South Dakota State University, Brookings, SD.*
- T128 **Application of computing technology in simulation of consumer acceptance of typical hard ice creams during storage.**
Maryam Bahram-Parvar*^{1,2}, Fakhreddin Salehi², and Seyed Razavi², ¹University of Guelph, Guelph, ON, Canada, ²Ferdowsi University of Mashhad, Mashhad, Khorasan Razavi, Iran.
- T129 **Evaluation of textural property changes in three types of low-fat goat milk ice creams during 8 weeks of frozen storage.**
Christopher E. McGhee, Brittany I. Davis, Krishna P. Bastola*, Jolethia O. Jones, and Young W. Park, *Fort Valley State University, Fort Valley, GA.*
- T130 **Dulce de leche: Characterization by physicochemical and instrumental methods.**
Leonardo Gaze², Carlos Conte-Junior², Adriano Cruz¹, Renata Raices*¹, and Monica Freitas², ¹Federal Institute of Science and Technology of Rio de Janeiro (IFRJ), Rio de Janeiro, Brazil, ²Federal University Fluminense, Rio de Janeiro, Brazil.

Dairy Foods Microbiology

- T131 ***Lactobacillus plantarum* L67 suppresses allergic inflammation.**
Sooyeon Song*¹, Anna Jeong¹, Geun-Bae Kim², Dong-June Park³, and Sejong Oh¹, ¹Div. of Animal Science, Chonnam National University, Gwangju, South Korea, ²Dept. Animal Science, Chung-Ang University, Anseong, South Korea, ³Korea Food Research Institute, Seongnam, South Korea.
- T132 **Metal-chelating and ACE-inhibitory activity of a milk fermented with bacteria isolated from double cream cheese of Chiapas, Mexico.**
Claudia Y. Figueroa*, Gustavo F. Gutiérrez, and Humberto Hernández, *Escuela Nacional de Ciencias Biológicas-IPN, México City, México.*
- T133 **Virulence and regulator gene expression in *Bacillus* spp. from ultrapasteurized organic milk.**
Alyssa Grutsch* and John McKillip, *Ball State University, Muncie, IN.*
- T134 **Sequencing and annotation of novel plasmids from *Lactobacillus curvatus*.**
Jordan Hendricks¹, Craig Oberg*¹, Michele Culumber¹, Taylor Oberg², Donald McMahon², and Jeff Broadbent², ¹Weber State University, Ogden, UT, ²Utah State University, Logan, UT.
- T135 **Comparative analysis of prebiotics on growth kinetics, fermentation, and antioxidant activity of probiotics.**
Evelyn Puspitasari*¹, Chi Kong Yeung², and Marie Yeung¹, ¹Biological Sciences Department, California Polytechnic State University, San Luis Obispo, CA, ²Dairy Science Department, California Polytechnic State University, San Luis Obispo, CA.
- T136 **Heat tolerance of *Lactococcus lactis* with prior subjection to mild heat stress.**
Ingrid Osorio* and Kayanush J. Aryana, *School of Animal Sciences, Louisiana State University Agricultural Center, Baton Rouge, LA.*
- T137 **Effect of ultraviolet light exposure and mild heat shock on the salt tolerance of *Lactococcus lactis*.**
Ernesto E. Gonzalez-Duran* and Kayanush J. Aryana, *School of Animal Sciences, Louisiana State University Agricultural Center, Baton Rouge, LA.*

- T138 **Influence of osmotic adaptation and lactose deprivation on the salt tolerance of *Lactococcus lactis*.**
Ernesto E. Gonzalez-Duran* and Kayanush J. Aryana, *School of Animal Sciences, Louisiana State University Agricultural Center, Baton Rouge, LA.*
- T139 ***Lactobacillus wasatchii* WDC04 associated with late gas production in aged Cheddar cheese.**
Lauren Montierth¹, Craig Oberg¹, Michele Culumber*¹, Donald McMahon², Fatih Ortakci², and Jeff Broadbent², ¹Weber State University, Ogden, UT, ²Utah State University, Logan, UT.
- T140 **The effect of xenon pulsed-light technology on biofilm adhered to stainless steel surfaces.**
Stephanie Jacquez* and Rafael Jimenez-Flores, *California Polytechnic State University, San Luis Obispo, CA.*
- T141 **Slime production by *Bacillus* strains affects biofilm formation on dairy separation membranes.**
Nuria Garcia-Fernandez*^{1,2}, Ashraf Hassan¹, and Sanjeev Anand^{1,2}, ¹Dairy Science Department, South Dakota State University, Brookings, SD, ²Midwest Dairy Foods Research Center, South Dakota State University, Brookings, SD.
- T142 **Identification of gram-negative bacteria in cooling tanks of dairy farms.**
Magali Soares Santos Pozza*¹, Gilberto Henrique Simões², Maximiliane Alarvase Zambom², Maichel Lange², and Grasielle Scaramal Madrona¹, ¹Universidade Estadual de Maringá, Maringá, Brazil, ²Universidade Estadual do Oeste do Paraná, Marechal Cândido Rondon, Paraná, Brazil.
- T143 **Can probiotic bacteria survive in a beverage made from “acid whey” from Greek yogurt?**
Alexis Duferene*, Dasom Park, Douglas Olson, and Kayanush J. Aryana, *School of Animal Sciences, Louisiana State University Agricultural Center, Baton Rouge, LA.*
- T144 **Evaluation of microbial quality of raw goat and ewe’s milk produced in Sabrata, Libya.**
Yahiah Abojnah¹, Nahed Khatabi², Said Gnan², and Marvin Moncada*³, ¹University of Tripoli, Tripoli Libya, ²School of Science, Academy of Graduate Studies, Tripoli, Libya, ³School of Animal Sciences, Louisiana State University, Baton Rouge, LA.
- T145 **Quantification of spoilage and contaminants bacteria in samples of raw milk.**
Magali Pozza*¹, Gilberto Simões², Maximiliane Zambom², Marcelo Neumann², and Paulo Pozza¹, ¹Universidade Estadual de Maringá, Maringá, Brazil, ²Universidade Estadual do Oeste do Paraná, Paraná, Brazil.
- T146 **The identification of lactic acid bacteria in the traditional Carpathian ewe’s cheese.**
Orysya Tsisaryk*¹, Iryna Slyvka¹, and Tomasz Bocer², ¹Lviv National University of Veterinary Medicine and Biotechnology, Ukraine, ²Rzeszow University, Poland.
- T147 **Studies of microbiological parameters of cultured butter during storage.**
Orysya Tsisaryk* and Lubov Musiy, *Lviv National University of Veterinary Medicine and Biotechnology, Ukraine.*

Extension Education

- T148 **Utilization of fixed-time artificial insemination (TAI) to reduce breeding season length and its effects on subsequent calf value: A case study.**
Vitor R. G. Mercadante*, Darren D. Henry, Francine M. Ciriaco, Guilherme H. L. Marquezini, Tera E. Black, Kalyn M. Waters, Pedro L. P. Fontes, Nicolas DiLorenzo, and G. Cliff Lamb, *North Florida Research and Education Center, University of Florida, Marianna, FL.*
- T149 **Silage safety issues for large-scale bunker silos and drive-over piles: Avalanches.**
Ruth E. Bolsen and Keith K. Bolsen*, *Kansas State University, Manhattan, KS.*
- T150 **Production system characteristics related to technology transfer facility to improve milk quality of small dairy farms.**
Luiz C. Roma*, Marcia S. V. Salles, Fernando A. Salles, and Lenira El Faro, *APTA, Ribeirao Preto, SP, Brazil.*
- T151 **Participation in the 2015 Margin Protection Program by Idaho dairy producers.**
Richard J. Norell*¹ and Benjamin M. Eborn², ¹University of Idaho, Idaho Falls, ID, ²University of Idaho, Driggs, ID.
- T152 **Comparing lying behaviors on commercial Croatian dairy farms.**
Nicole L. Eberhart*¹, Pero Mijic², Goran Vuckovic², and Peter D. Krawczel¹, ¹Department of Animal Science, University of Tennessee, Knoxville, TN, ²Faculty of Agriculture, Josip Juraj Strossmayer University of Osijek, Osijek, Croatia.

- T153 **A demonstration on the use of small ruminants for unwanted vegetation management.**
Enrique N. Escobar*¹, Jorge J. Rodriguez², and Harry Taylor², ¹University of Maryland Extension-1890 Program, University of Maryland Eastern Shore (UMES), Princess Anne, MD, ²Department of Agriculture, Food and Resource Sciences, University of Maryland Eastern Shore (UMES), Princess Anne, MD.
- T154 **Bedding characteristics are associated with milk quality in Illinois dairy farms: A Dairy Focus Team approach.**
Maria I. Rivelli*¹, Katie J. Haerr¹, Sarah Y. Morrison¹, Saige A. Sulzberger¹, Cassandra S. Skenandore¹, Leo L. Timms², and Felipe C. Cardoso¹, ¹University of Illinois, Urbana, IL, ²Iowa State University, Ames, IA.
- T155 **On-farm field days as a tool to demonstrate and educate about dairy waste management practices.**
Mario E. de Haro-Marti*¹, Mireille Chahine², Lide Chen², and Howard W. Neibling³, ¹University of Idaho, Gooding, ID, ²University of Idaho, Twin Falls, ID, ³University of Idaho, Kimberly, ID.
- T156 **Reproductive performance in dairy farms throughout Illinois: A Dairy Focus Team approach.**
Maria I. Rivelli*¹, Tonja Egan¹, Diego A. Velasco Acosta^{1,2}, Katie J. Haerr¹, Sarah Y. Morrison¹, Saige A. Sulzberger¹, Cassandra S. Skenandore¹, and Felipe C. Cardoso¹, ¹University of Illinois, Urbana, IL, ²Universidade Federal de Pelotas, Pelotas, Brazil.
- T157 **Evaluation of seed corn hybrids to provide nutrients that are highly digestible for South Dakota livestock operations.**
David P. Casper*, Sara Sontag, Laura McMartin, William Weich, and Jonathan Kleinjan, South Dakota State University, Brookings, SD.

Food Safety

- T158 **Consumer perception regarding beef quality and food safety.**
Maribel Ruiz-Leon, Karina Leon-Lucio, Gilberto Aranda-Osorio*, and Agustin Ruiz-Flores, Universidad Autonoma Chapingo, Chapingo, Texcoco, Mexico.
- T159 **Levels of aflatoxin M₁ in dairy products from Londrina supermarkets and its estimated daily intake.**
Joice Sifuentes dos Santos*, Ana Beatriz C. Ribeiro, Vanessa R. França, Shiguedy Katto, and Elsa Helena W. Santana, University North of Paraná, Londrina, Paraná, Brazil.
- T160 **Occurrence of aflatoxin M₁ and somatic cell count in milk from farms in São Paulo, Brazil.**
AF Rosa¹, MS Miranda¹, JRP Arcaro¹, R. Braghini², E. Pinatti³, and CR Pozzi*¹, ¹Instituto de Zootecnia, Nova Odessa, São Paulo, Brazil, ²Instituto de Ciências Biomédicas, São Paulo, São Paulo, Brazil, ³Instituto de Economia Agrícola, São Paulo, São Paulo, Brazil.
- T161 **Risk assessment of seven toxic elements residues in raw milk in China.**
XueYin Qu^{1,2}, Nan Zheng^{1,2}, JiaQi Wang*^{1,2}, XueWei Zhou^{1,2}, and SongLi Li^{1,2}, ¹Ministry of Agriculture-Laboratory of Quality & Safety Risk Assessment for Dairy Products (Beijing), Beijing, China, ²State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China.
- T162 **Concentration of 22 elements in milk, feed and water of dairy cow, goat, and buffalo from different regions of China.**
Xuewei Zhou^{1,2}, Xueyin Qu^{1,3}, Nan Zheng^{1,3}, Fadi Li², and Jiaqi Wang*^{1,3}, ¹Ministry of Agriculture Laboratory of Quality & Safety Risk Assessment for Dairy Products (Beijing), Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ²College of Animal Science and Technology, Gansu Agriculture University, Lanzhou, Gansu, China, ³State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China.
- T163 **Effect of HTST and UHT processing on the stability of cephalosporin residues in milk.**
Meixia Chen^{1,2}, Nan Zheng^{1,2}, Fang Wen^{1,2}, Hui Wang^{1,2}, Songli Li¹, and Jiaqi Wang*^{1,2}, ¹Ministry of Agriculture Laboratory of Quality & Safety Risk Assessment for Dairy Products (Beijing), Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ²Ministry of Agriculture-Milk and Dairy Product Inspection Center, Beijing, China, ³State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China.
- T164 **Toxins in milk of cows fed with transgenic maize.**
Geraldo Neto Balieiro*^{1,3}, Keila Maria Roncato Duarte², Roberto Botelho Ferraz Branco¹, and Acyr Vanderley de Paula Freitas¹, ¹São Paulo State Agency Agribusiness Technology, Ribeirão Preto, São Paulo, Brazil, ²São Paulo State Agency Agribusiness Technology, Nova Odessa, São Paulo, Brazil, ³Research Supported by FAPESP, São Paulo, Brazil.

- T165 **Aflatoxin B₁ and aflatoxin M₁ induced cytotoxicity and DNA damage in differentiated and undifferentiated Caco-2 cells.**
Jie Zhang^{1,2}, Nan Zheng^{1,3}, Fadi Li², Songli Li^{1,3}, and Jiaqi Wang^{*1,3}, ¹Ministry of Agriculture Laboratory of Quality & Safety Risk Assessment for Dairy Products (Beijing), Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ²College of Animal Science and Technology, Gansu Agricultural University, Lanzhou, China, ³State Key Laboratory of Animal Nutrition, Institute of Animal Sciences, Chinese Academy of Agricultural Sciences, Beijing, China.
- T166 **Interaction of aflatoxin M1, ochratoxin A, zearalenone, and α -zearalenol combinations on Caco-2 cells.**
Yanan Gao^{1,2}, Nan Zheng^{1,2}, Songli Li^{1,2}, Yangdong Zhang^{1,2}, and Jiaqi Wang^{*1,2}, ¹Ministry of Agriculture Laboratory of Quality & Safety Risk Assessment for Dairy Products (Beijing), Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ²State Key Laboratory of Animal Nutrition, Institute of Animal Sciences, Chinese Academy of Agricultural Sciences, Beijing, China.
- T167 **Clean-in-place cleaning validation at lower temperatures with alkaline chlorinated detergent Cool CIP.**
Gary Smith*, John Partridge, and Zey Ustunol, *Michigan State University, East Lansing, MI.*
- T168 **Metagenomic evidence of the prevalence and distribution patterns of antimicrobial resistant genes in dairy agroecosystems.**
Dipti Pitta*, Sanjay Kumar, Nagaraju Indugu, Zhengxia Dou, John Toth, Bonnie Vecchiarelli, and Bhima Bhukya, *Department of Clinical Studies, School of Veterinary Medicine, New Bolton Center, University of Pennsylvania, Kennett Square, PA.*
- T169 **Antimicrobial resistance of *Escherichia coli* isolates from cheese made from unpasteurized milk in Brazil.**
Laryssa Freitas Ribeiro^{*1,2}, Mayhara Martins Cordeiro Barbosa³, Fernanda de Rezende Pinto⁴, Renato Pariz Maluta⁵, Mônica Costa Oliveira², Viviane de Souza⁶, Maria Izabel Merino de Medeiros⁷, Lucimara Antonio Borges², Priscila Arrigucci Bernardes¹, Luiz Augusto do Amaral², and John Morris Fairbrother¹, ¹Faculté de Médecine Vétérinaire, Université de Montréal, Saint-Hyacinthe, QC, Canada, ²Universidade Estadual Paulista, Jaboticabal, São Paulo, Brazil, ³Instituto Federal de Educação, Ciência e Tecnologia do Ceará, Quixadá, Ceará, Brazil, ⁴Universidade Federal de Pelotas, Pelotas, Rio Grande do Sul, Brazil, ⁵Universidade de Campinas, Campinas, São Paulo, Brazil, ⁶Embrapa Caprinos e Ovinos, Sobral, Ceará, Brazil, ⁷Instituto Tecnológico de Alimentos, Campinas, São Paulo, Brazil.
- T170 **Ecoepidemiology of *Staphylococcus* spp. in small-scale goat milk dairy plants in northeastern Brazil.**
Candice de Leon¹, Celso Oliveira^{*1}, Iara Siqueira², Maria G. Carvalho², and Denis Spricigo³, ¹Federal University of Paraíba (UFPB), Brazil, Areia, PB, Brazil, ²Federal University of Campina Grande, Patos, PB, Brazil, ³LANAGRO, Porto Alegre, RS, Brazil.
- T171 **Effects of purple prairie clover (*Dalea purpurea* Vent.) on feed intake, nutrient digestibility and fecal shedding of *Escherichia coli* O157: H7 in lambs.**
Qianqian Huang^{1,2}, Long Jin¹, Zhong Xu¹, Ruth Barbieri¹, Surya Acharya¹, Tianming Hu², Tim McAllister¹, Kim Stanford³, and Yuxi Wang^{*1}, ¹Lethbridge Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB, Canada, ²College of Animal Science and Technology, Northwest A&F University, China, ³Alberta Agriculture and Rural Development, Lethbridge Agriculture Centre, Lethbridge, AB, Canada.
- T172 **Reduction of biological hazards in animal feed mills via a decontamination protocol.**
Anne R. Huss*, Roger A. Cochrane, Aiswariya Deliephan, Charles R. Stark, and Cassandra K. Jones, *Kansas State University, Manhattan, KS.*
- T173 **Evaluation of select bacterial populations in poultry excreta and potential treatments for their disinfection.**
C. Arzola^{*1}, J. Corrales¹, R. Anderson², M. Hume², O. Ruiz¹, A. Corral¹, C. Rodriguez-Muela¹, Y. Castillo³, J. L. Guevara¹, and R. Lechuga¹, ¹Universidad Autonoma de Chihuahua, Chihuahua, Chihuahua, Mexico, ²ARS,USDA, SPARC, College Station TX, ³Universidad Autonoma de Ciudad Juarez, Casas Grandes, Chihuahua, Mexico.
- T174 ***Trypanorhyncha* cestodes in *Brachyplatystoma rousseauxii*, *Cynoscion leiarchus*, *Cichla* spp., and *Colossoma macropomum*, captured in coast of Amazon/Brazil.**
Raquel L. Salgado^{*1} and Josemir S. Gonçalves², ¹Universidade Federal Fluminense, Niterói, Rio de Janeiro, Brazil, ²Universidade Federal Rural do Semi Árido, Mossoró, Rio Grande do Norte, Brazil.
- T175 **Helminth with zoonotic potential in fish of Amazon/Brazil.**
Raquel L. Salgado^{*1} and Josemir S. Gonçalves², ¹Universidade Federal Fluminense, Niterói, Rio de Janeiro, Brazil, ²Universidade Federal Rural do Semi Árido, Mossoró, Rio Grande do Norte, Brazil.

Forages and Pastures

Silages and forages in beef and sheep production systems

- T176 **Tiller population stability index from the spring in palisadegrass previously used in deferred grazing.**
Simone Pedro da Silva*¹, Manoel Eduardo Rozalino Santos², Bruno Humberto Rezende Carvalho², Ludiêmilem Keith Parreira da Costa², Denis Douglas Pessoa², Heron Alves de Oliveira², Róger Carvalho Cardoso², Miriã Gonçalves Simplício², and Dilermando Miranda da Fonseca³, ¹Instituto Federal Goiano, Hidrolândia, Goiás, Brazil, ²Universidade Federal de Uberlândia, Uberlândia, Minas Gerais, Brazil, ³Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.
- T177 **Performance of crossbred cows on Tanzania grass pastures subjected to two pasture-management strategies.**
Alberto Magno Fernandes*¹, Ricardo Augusto Mendonça Vieira¹, Tadeu Silva de Oliveira¹, and Fermio Deresz², ¹Universidade Estadual do Norte Fluminense, Campos dos Goytacazes, Rio de Janeiro, Brazil, ²EMBRAPA-Gado de Leite, Juiz de Fora, Minas Gerais, Brazil.
- T178 **Performance of cows and calves grazing limpograss pastures as affected by creep-feeding protein supplements.**
J. M. D. Sanchez*¹, J. M. B. Vendramini¹, P. A. Lancaster¹, J. K. Yarborough¹, F. A. Kuwahara², and V. C. Gomes³, ¹Range Cattle Research and Education Center, University of Florida, Ona, FL, ²Faculdade de Medicina Veterinária e Zootecnia, Universidade Estadual Paulista, Botucatu, Sao Paulo, Brazil, ³Instituto de Zootecnia, Nova Odessa, Sao Paulo, Brazil.
- T179 **Decreased reproductive rates in sheep fed a high selenium diet.**
Thomas Z. Davis*¹, Bryan L. Stegelmeier¹, Kip E. Panter¹, and Jeffery O. Hall², ¹United States Department of Agriculture-Agricultural Research Service, Poisonous Plant Research Laboratory, Logan, UT, ²Utah State University Veterinary Diagnostic Laboratory, Logan, UT.
- T180 **Total nitrogen in Marandu-grass pastures under different grazing intensities in southeast Brazil.**
Mariana Vieira Azenha*¹, Liziane Figueiredo Brito², Andre Alves Oliveira², Elisamara Raposo², Estella Rosseto Januszkiewicz², Ricardo Andrade Reis², and Ana Claudia Ruggieri², ¹EMBRAPA Pecuária Sudeste, São Carlos, Sao Paulo, Brazil, ²UNESP / FCAV, Jaboticabal, Sao Paulo, Brazil.
- T181 **Effects of conservation method on condensed tannin content, ruminal and intestinal digestion characteristics of purple prairie clover.**
Qianqian Huang^{1,2}, Tianming Hu¹, Long Jin², Surya Acharya², Tim McAllister², Alan Iwaasa³, Mike Schellenberg³, and Yuxi Wang*², ¹College of Animal Science and Technology, Northwest A&F University, Yangling, Shaanxi, China, ²Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, AB, Canada, ³Agriculture and Agri-Food Canada, Semiarid Prairie Agricultural Research Centre, Swift Current, SK, Canada.
- T182 **Nutrient content of *Atriplex canescens* (Pursh Nutt) as a function of soil electrical conductivity.**
Aracely Zúñiga*¹, Luz M. Tejada¹, Juan C. Martínez-Alfaro², and Miguel Mellado¹, ¹Autonomous Agrarian University Antonio Narro, Saltillo, México, ²Regional Academic Center UAAAN, Chiapas, México.
- T183 **Nutritional composition of a *Musa* sp. fodder bank located in the central part of Costa Rica.**
Pablo Chacon Hernandez*, Carlos Boschini Figueroa, and Ricardo Russo Andrade, Universidad de Costa Rica, San Pedro, San José, Costa Rica.
- T184 **Litter lignin and phosphorus content in different grazing intensities of Marandu-grass pasture in Southeast Brazil.**
Mariana Vieira Azenha¹, Elisamara Raposo², Andre Alves Oliveira², Liziane Figueiredo Brito², Estella Rosseto Januszkiewicz², Ricardo Andrade Reis², and Ana Claudia Ruggieri*², ¹EMBRAPA Pecuária Sudeste, São Carlos, Sao Paulo, Brazil, ²UNESP/FCAV, Jaboticabal, Sao Paulo, Brazil.
- T185 **Adding medium quality hay to the diet of stocker calves grazing annual ryegrass did not improve beef production.**
Guillermo Scaglia*¹, Cathy Williams², and Ashley Dolesji², ¹LSU AgCenter, Iberia Research Station, Jeanerette, LA, ²LSU AgCenter, School of Animal Sciences, Baton Rouge, LA.
- T186 **Cow-calf performance and gain per ha from bermudagrasses overseeded with 'Apache' arrowleaf clover or 'TAM-90' annual ryegrass and stocked at three intensities.**
Francis M. Rouquette*, Joel L. Kerby, Kelli D. Norman, and Gerald R. Smith, Texas A&M AgriLife Research, Overton, TX USA.
- T187 **Performance of steers raised on pastures of elephant and mombasa grasses.**
Alberto Magno Fernandes*¹, Ricardo Augusto Mendonça Vieira¹, Tadeu Silva de Oliveira¹, and Fermio Deresz², ¹Universidade Estadual do Norte Fluminense, Av. Alberto Lamego - 2000, Campos dos Goytacazes, Rio de Janeiro, Brazil, ²EMBRAPA-Gado de Leite, Rua Eugênio do Nascimento - 610, Juiz de Fora, Minas Gerais, Brazil.

- T188 **Diurnal time to move animals to a new paddock: Forage nonstructural carbohydrates concentration, grazing patterns, and performance of beef cattle.**
F. C. Leite de Oliveira*¹, C. O. Rocha¹, J. M. D. Sanchez², R. S. Ferigato³, L. E. T. Pereira¹, C. G. Lima¹, P. H. C. Luz¹, and V. R. Herling¹, ¹University of São Paulo, Faculty of Animal Science and Food Engineering, Department of Animal Science, Pirassununga, Sao Paulo, Brazil, ²Range Cattle Research and Education Center, University of Florida, Ona, FL, ³Anhanguera Faculties, Department of Veterinary, Leme, Sao Paulo, Brazil.
- T189 **Sequential and mixed grazing of stockpiled toxic tall fescue by fall-calving Angus cows and Katahdin ewes.**
Taylor N. Drane*, Richard E. Daugherty, James D. Caldwell, Bruce C. Shanks, Chris L. Boeckmann, Cindy A. Deornellis, Amy L. Bax, Abbey J. Kempker, and Jason D. Walker, *Lincoln University, Jefferson City, MO.*
- T190 **Performance and reproductive measurements by spring-born Katahdin ewes grazing stockpiled toxic tall fescue, non-toxic tall fescue, or Persist orchardgrass.**
H. L. Bartimus*^{1,2}, B. C. Shanks¹, J. D. Caldwell¹, A. L. Bax¹, L. S. Wilbers¹, A. J. Kempker¹, J. D. Walker¹, C. A. Clifford-Rathert¹, and A. K. Busalacki¹, ¹Lincoln University, Jefferson City, MO, ²University of Arkansas, Fayetteville, AR.

Graduate Student Competition
ADSA Dairy Foods Graduate Student Poster Competition
Chair: Elizabeth Ng, Daisy Brand, Garland, TX

- T191 **Characteristics of cheese powders and the role of color on consumer perception of cheese flavor.**
Ni Cheng*, Yeijin Jo, and M. A. Drake, *Southeast Dairy Foods Research Center, North Carolina State University, Raleigh, NC.*
- T192 **The effect of raw milk cooling on sensory perception and shelf life of pasteurized skim milk.**
Andy Lee*¹, D. M. Barbano², and M. A. Drake¹, ¹Southeast Dairy Foods Research Center, North Carolina State University, Raleigh, NC, ²Cornell University, Ithaca, NY.
- T193 **Reducing protein bar hardening via whey protein-polyphenol ingredients.**
Margaret Schneider*, Mary Ann Lila, and E. Allen Foegeding, *Department of Food, Bioprocessing and Nutrition Sciences, North Carolina State University, Raleigh, NC.*
- T194 **Development and characterization of whey protein nanoparticles for beverage applications.**
Ty B. Wagoner*¹, Loren S. Ward², Chris W. Pernell¹, and E. Allen Foegeding¹, ¹North Carolina State University, Raleigh, NC, ²Glanbia Nutritionals, Twin Falls, ID.
- T195 **Casein and exopolysaccharide degrading activities of *Bacillus* strains isolated from the dairy environment.**
Dipakkumar Mehta*¹, Hasmukh Patel¹, Ashraf Hassan², and Brandon Nelson², ¹South Dakota State University, Brookings, SD, ²Daisy Brand, Garland, TX.
- T196 **Chemosensory analysis of light-emitting diode and fluorescent light on fluid milk volatiles.**
Kemia N. Amin*, Maria A. Hadley, Susan E. Duncan, and Kumar Mallikarjunan, *Virginia Polytechnic Institute State University, Blacksburg, VA.*
- T197 **Inactivation of thermotolerant bacterial endospores in milk by combined effect of cavitation and thermal treatment.**
Dikshi Bawa*, Sanjeev Anand, Harsh Dahiya, and Hasmukh Patel, *South Dakota State University, Brookings, SD.*

Graduate Student Competition
ADSA Production Division Graduate Student Poster Competition, PhD
Chair: Jeffrey Firkins, The Ohio State University

- T198 **Effects of estrus number on milk yield and estrus expression in Holstein cows managed for extended lactation.**
Charlotte Gaillard*, Mogens Vestergaard, and Jakob Sehested, *Aarhus University, Foulum, Tjele, Denmark.*

- T199 **Effects of canola meal as a source of rumen-undegraded protein on ruminal fermentation using a dual-flow continuous-culture system.**
Eduardo Marostegan de Paula*¹, Lorryny Galoro da Silva¹, Pedro Del Bianco Benedeti^{1,2}, Hugo Monteiro^{1,3}, Yenling Yeh¹, Teshome Shenkoru¹, Glen A. Broderick⁴, and Antonio Faciola¹, ¹University of Nevada, Reno, NV, ²Federal University of Viçosa, Viçosa, MG, Brazil, ³Maringa State University, Maringa, PR, Brazil, ⁴Broderick Nutrition & Research, Madison, WI.
- T200 **Comparison of lying times of lame versus sound dairy cattle using a leg-based accelerometer.**
Barbara A. Wadsworth*, Lauren M. Mayo, Nicky I. Tsai, Amanda E. Stone, Denise L. Ray, Joey D. Clark, and Jeffrey M. Bewley, University of Kentucky, Lexington, KY.
- T201 **Survey of management of reproduction on Canadian dairy farms.**
José Denis-Robichaud*¹, Ronaldo L. A. Cerri², Andria Jones-Bitton¹, and Stephen J. LeBlanc¹, ¹Department of Population Medicine, University of Guelph, Guelph, ON, Canada, ²Faculty of Land and Food Systems, University of British Columbia, Vancouver, BC, Canada.
- T202 **Lactational performance of early lactation, high-producing dairy cows fed corn silage produced by different seed corn hybrids.**
Ishwary Acharya*¹, Mark Kirk², and David Casper¹, ¹Dairy Science Department, South Dakota State University, Brookings, SD, ²Masters Choice, Anna, IL.
- T203 **Nitrogen utilization and growth effects in Holstein dairy calves fed a moderately high protein or conventional milk replacer.**
Colleen E. Chapman*¹, Thelton M. Hill², and Peter S. Erickson¹, ¹University of New Hampshire, Durham, NH, ²Provimi North America, Brookville, OH.
- T204 **Blood calcium changes after prophylactic subcutaneous treatment with calcium.**
Cynthia L. Miltenburg*, Elizabeth Scholtz, Dorothee Bienzle, Todd F. Duffield, and Stephen J. LeBlanc, University of Guelph, Guelph, ON, Canada.
- T205 **Moved to Ruminant Nutrition: General II (page 161)**
- T206 **Quantification of select ruminal bacterial in Holstein bull calves treated with daily oral sodium bicarbonate.**
Taylor T. Yohe*^{1,2}, Rene R. Delgado-Peraza¹, Hannah L. M. Tucker^{1,2}, and Kristy M. Daniels^{1,2}, ¹The Ohio State University, OARDC, Wooster, OH, ²Virginia Tech, Blacksburg, VA.
- T207 **Cost of days open equations accounting for variable market and dairy herd conditions.**
Karmella A. Dolecheck* and Jeffrey M. Bewley, University of Kentucky, Lexington, KY.
- T208 **Checks and balances: Evaluating reliability of dairy nutrient management data to better protect groundwater resources.**
Christine Miller* and Deanne Meyer, University of California, Davis, Davis, CA.
- T209 **Distribution of quarter-level SCC across the dry and early post-partum period.**
Stephanie A. Metzger*, Laura L. Hernandez, and Pamela L. Ruegg, University of Wisconsin, Madison, WI.
- T210 **Protein nutrient supply and feed milk value of two newly developed genotypes of transgenic alfalfa compared with non-transgenic alfalfa in dairy cattle.**
Xinxin Li*^{1,2}, Yonggen Zhang², and Peiqiang Yu¹, ¹Department of Animal and Poultry Science, University of Saskatchewan, Saskatoon, Saskatchewan, Canada, ²College of Animal Science and Technology, Northeast Agricultural University, Harbin, China.
- T211 **Probiotic *Enterococcus faecium* increased the propionate and total volatile fatty acids on in vitro rumen fermentation.**
Lovelia L. Mamud, Ashraf A. Biswas, and Sang Suk Lee*, Suncheon National University, Suncheon, Jeonnam, South Korea.
- T212 **Effects of replacing soybean meal with canola meal or treated canola meal on performance of lactating dairy cows.**
E. M. Paula*¹, M. A. C. Danes², N. E. Lobos², G. I. Zanton³, G. A. Broderick⁴, and A. Faciola¹, ¹University of Nevada, Reno, NV, ²University of Wisconsin, Madison, WI, ³USDA-Agricultural Research Service, US Dairy Forage Research Center, Madison, WI, ⁴Broderick Nutrition & Research, Madison, WI.
- T213 **Transport of a fluorescent analog of glucose (2-NBDG) by rumen bacteria.**
Junyi Tao*, Rebecca K. Diaz, and Timothy J. Hackmann, University of Florida, Gainesville, FL.
- T214 **Characteristics of dairy cows with a greater or lower risk of subacute rumen acidosis: Volatile fatty acid absorption, rumen digestion kinetics and consistency of the risk.**
Xiaosheng Gao* and Masahito Oba, University of Alberta, Edmonton, AB, Canada.

- T215 **Systems nutrition in dairy cattle: Integrating hepatic metabolomics and transcriptomics in late pregnancy to better understand postpartal ketosis.**
Khuram Shahzad*¹, Johan Osorio², Daniel Luchini³, and Juan J. Loo¹, ¹University of Illinois, Urbana, IL, ²Oregon State University, Corvallis, OR, ³Adisseo NA, Alpharetta, GA.
- T216 **Laboratory validation of a prototype cow-side instrument for the measurement of blood ionized calcium concentrations in dairy cattle.**
Rafael C. Neves*, Tracy Stokol, and Jessica A. A. McArt, *Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, NY.*
- T217 **Validation of a hand-held meter for measuring β -hydroxybutyrate in plasma and serum of dairy cows.**
Arnulfo Pineda* and Felipe C. Cardoso, *University of Illinois, Urbana, IL.*
- T218 **Effects of feeding calcium hydroxide-treated corn stover on milk production and milk composition in lactating Holstein cows.**
Brittany A. Casperson*¹, Aimee E. Wert-Lutz², and Shawn S. Donkin¹, ¹Purdue University, West Lafayette, IN, ²ADM Alliance Nutrition, Quincy, IL.
- T219 **Increased stocking density at the feed bunk may affect the welfare and productivity of dairy cows and growth of their heifer calves.**
Jessica A. Pempek*, Maurice L. Eastridge, Kathryn L. Proudfoot, Gregory G. Habing, Lohendy M. Muñoz Vargas, and Danielle N. Coleman, *The Ohio State University, Columbus, OH.*
- T220 **Unraveling the mechanisms that regulate activation of β -defensin antimicrobial peptide responses in cattle.**
Mercedes F. Kweh*, Kathryn E. Merriman, and Corwin D. Nelson, *University of Florida, Gainesville, FL.*
- T221 **Ellipsoid equation improves accuracy and efficiency of estimating protozoal volume.**
Benjamin A. Wenner*, Brooklyn K. Wagner, and Jeffrey L. Firkins, *Department of Animal Sciences, The Ohio State University, Columbus, OH.*
- T222 **Milk yield at dry-off and other factors affecting risk of intramammary infections at calving.**
Paige N. Gott*¹, Päivi J. Rajala-Schultz¹, Gustavo M. Schuenemann¹, and Joseph S. Hogan², ¹The Ohio State University, Columbus, OH, ²The Ohio State University, Wooster, OH.

Growth and Development I

- T223 **Exogenous estradiol decreases relative endometrial gene expression for $ER\alpha$ and $ER\beta$ in pre-pubertal dairy heifers.**
Chelsea T.L. Holloway*¹, Adam J. Geiger¹, Jennifer Malkus¹, Alan D. Ealy², Rebecca R. Cockrum¹, and R. Michael Akers¹, ¹Virginia Polytechnic Institute and State University, Department of Dairy Science, Blacksburg, VA, ²Virginia Polytechnic Institute and State University, Department of Animal and Poultry Sciences, Blacksburg, VA.
- T224 **Plane of nutrition affects muscle fiber hypertrophy and satellite cell activity in neonatal bull calves.**
Jennifer S. Bradley*, Meghan E. MacGhee, Sarah R. McCoski, Amanda M. Reeg, Alan D. Ealy, and Sally E. Johnson, *Virginia Polytechnic Institute and State University, Blacksburg, VA.*
- T225 **Effects of heat-treatment of colostrum on absorption and gut development in neonatal bull calves during the first 12 hours of life.**
Coral Kent-Dennis¹ and Thomas McFadden*², ¹University of Alberta, Edmonton, AB, Canada, ²University of Missouri, Columbia, MO.
- T226 **Direct-fed microbial efficacy and milk plan: Effect on heifer growth in an automated feeding system.**
Melissa C. Cornett* and Amy L. Stanton, *University of Wisconsin-Madison, Madison, WI.*
- T227 **Anti-oxidative status and inflammatory response in neonatal calves fed quercetin with or without colostrum.**
Harald M. Hammon*¹, Jeannine Gruse¹, Manfred Mielenz¹, and Siegfried Wolfram², ¹Leibniz Institute for Farm Animal Biology (FBN), Dummerstorf, Germany, ²Christian Albrechts University, Kiel, Germany.

- T228 **Effect of milk aroma flavor on starter consumption, growth, and feed conversion in female Holstein calves.**
Yaqi Wu, Yanliang Bi, Shengli Li*, Yajing Wang, and Zhijun Cao, *College of Animal Science and Technology, China Agriculture University, Beijing, China.*
- T229 **Caloric restriction reduces protein accretion in skeletal muscle by attenuating IGF-1 signaling in young calves.**
Yue Lu¹, Jennifer S. Bradley¹, Sarah R. McCoski¹, John M. Gonzalez², Adam J. Geiger¹, R. Michael Akers¹, Alan D. Ealy¹, and Sally E. Johnson*¹, ¹Virginia Polytechnic Institute and State University, Blacksburg, VA, ²Kansas State University, Manhattan, KS.
- T230 **Use of ultrasound for assessment of muscle area and depth in postmortem preweaned Holstein calves.**
Jessica H. Davis*¹, Heidi A. Rossow¹, and Chris M. Barker², ¹Veterinary Medicine Teaching and Research Center, University of California, Davis, Tulare, CA, ²Center for Vectorborne Diseases, University of California, Davis, Davis, CA.
- T231 **Increasing the metabolizable protein supply enhanced growth performance and humoral immune response of preconditioning beef steers.**
Philippe Moriel¹, Luis Felipe Arelaro*¹, Matt Poore², Rodrigo Marques³, and Reinaldo Cooke³, ¹North Carolina State University, Waynesville, NC, ²North Carolina State University, Raleigh, NC, ³Oregon State University, Burns, OR.
- T232 **Characterization of key factors constraining lamb survival in marginal environments.**
Francisco A. Sales*¹, Sue A. McCoard², and Raúl J. Lira¹, ¹Instituto de Investigaciones Agropecuarias, Punta Arenas, Chile, ²AgResearch, Palmerston North, New Zealand.

Horse Species

- T233 **Velocity-related changes in stride variables of the intermediate gait of the Irish Draught horse of North America.**
Molly Nicodemus*¹, Rachel Fletcher¹, and Jeannette Beranger², ¹Mississippi State University, Mississippi State, MS, ²Livestock Conservancy, Pittsboro, NC.
- T234 **Influence of fibrolytic enzymes and yeast addition in horse's diet on digestibility, blood chemistry and fecal coliform.**
M. M. Y. Elghandour¹, A. E. Kholif², A. Z. M. Salem*¹, J. C. Vázquez Chagoyán¹, J. S. Martínez Castañeda¹, L. M. Camacho³, R. Montes de Oca¹, and T. A. Morsy², ¹Facultad de Medicina Veterinaria y Zootecnia, Universidad Autónoma del Estado de México, Toluca, Estado De México, Mexico, ²Dairy Science Department, National Research Centre, Giza, Egypt, ³Unidad Académica de Medicina Veterinaria y Zootecnia, Universidad Autónoma de Guerrero, Altamirano, México.
- T235 **Changes in salivary IgA and nasopharyngeal leukocyte populations in response to prolonged head elevation.**
Jill M. Bobel*, Megan R. Di-Lernia, Jeffrey R. Abbott, Maureen T. Long, and Lori K. Warren, *University of Florida, Gainesville, FL.*
- T236 **Utilization of the equine SNP 70 beadchip in monitoring inbreeding and describing the genetic background in an Arab horse herd.**
Mohammed Al Abri*¹, Samantha Brooks², and König von Borstel³, ¹Cornell University, Ithaca, NY, ²University of Florida, Gainesville, FL, ³Göttingen University, Göttingen, Germany.
- T237 **Evaluation of single nucleotide polymorphisms effects on injury predisposition in a population of multi-discipline athletically trained horses.**
Sarah Mercer¹, Neely Walker², and Matthew Garcia*^{1,2}, ¹Louisiana State University, Baton Rouge, LA, ²LSU AgCenter, Baton Rouge, LA.
- T238 **Effect of oil supplementation on milk IgG, serum insulin, glucose, placental efficiency, and immune status of foals.**
Lauren B. Hodge*, Brian J. Rude, Caleb O. Lemley, and Toree L. Bova, *Mississippi State University, Starkville, MS.*
- T239 **Testis tissue explant culture supports the viability of equine spermatogonial stem cells.**
Kyle C. Caires*¹, Louie Y. Chen², Rachel A. Lemcke¹, and Laurie A. Seigler¹, ¹Berry College, Department of Animal Sciences, Mount Berry, GA, ²RDBL, National Institute of Environmental Health Sciences, National Institutes of Health, Research Triangle Park, NC.
- T240 **Valerenic acid detection in equine urine after administration of calming supplement.**
Celina M. Checura*¹, Nikki McGreevey¹, Travis J. De Wolfe¹, Simon F. Peek¹, Greg A. Barrett-Wilt¹, Richard G. Godbee², and Benjamin J. Darien¹, ¹University WI-Madison, Madison, WI, ²Central Garden & Pet, Phoenix, AZ.

- T241 **Influence of α -linolenic acid supplementation in mature horses at maintenance: Body composition.**
Jessica L. Leatherwood*¹, Emily D. Lamprecht², Mark J. Anderson¹, Kyle J. Stutts¹, Marcy M. Beverly¹, and Stanley F. Kelley¹,
¹Sam Houston State University, Huntsville, TX, ²Cargill Incorporated, Elk River, MN.
- T242 **In vitro evaluation of protein content on forage digestion using equine fecal inocula.**
Taylor L. Hansen*, Brooke M. Eubanks, Emily K. Rizzo, and Lori K. Warren, *University of Florida, Gainesville, FL.*
- T243 **Changes in plasma calcium and phosphorus concentrations in mares fed decreasing amounts of dietary Ca and P just prior to weaning.**
Ashley L. Fowler*, Brittany E. Harlow, Morgan B. Pyles, Susan H. Hayes, Andrea D. Crum, and Laurie M. Lawrence, *University of Kentucky, Lexington, KY.*
- T244 **Relationship between training difficulty and aggression in horses.**
M. J. Anderson*, J. L. Leatherwood, K. Jones, K. J. Stutts, M. M. Beverly, and S. F. Kelley, *Sam Houston State University, Huntsville, TX.*
- T245 **The occurrence of different mycotoxins (aflatoxins, fumonisins, zearalenone, ochratoxin, deoxynivalenol, ergot alkaloids) in horse feed.**
Nicole Reisinger*¹, Paula Kovalsky², Verena Starkl², Simone Schaumberger², Michael Sulyok³, and Ursula Hofstetter², ¹Biomim Research Center, Tulln, Austria, ²Biomim Holding GmbH, Herzogenburg, Austria, ³Center for Analytical Chemistry, Department for Agrobiotechnology (IFA-Tulln), University of Natural Resources and Life Sciences (BOKU), Tulln, Austria.
- T246 **Effectiveness of a brewer's yeast supplement with or without fat for performance horses.**
Jeneva R. Seidl*¹, Toree L. Bova¹, J. Latham Brister¹, Lauren B. Hodge¹, Angela R. Mays², and Brian J. Rude¹, ¹Mississippi State University, Starkville, MS, ²F.L. Emmert Company, Cincinnati, OH.
- T247 **Effectiveness of a brewer's yeast supplement with or without fat for weanling horses.**
J. Latham Brister*¹, Toree L. Bova¹, Jeneva R. Seidl¹, Lauren B. Hodge¹, Angela R. Mays², and Brian J. Rude¹, ¹Mississippi State University, Starkville, MS, ²F.L. Emmert Company, Cincinnati, OH.

International Animal Agriculture

- T248 **Proposal for standard methods and procedure for guinea pig carcass evaluation, jointing, and tissue separation.**
Davinia Sánchez-Macías*¹, Noemi Castro², Miguel Rivero³, Anastasio Argüello², and Antonio Morales-delaNuez⁴, ¹Department of Agroindustrial Engineering, Universidad Nacional de Chimborazo, Riobamba, Chimborazo, Ecuador, ²Animal Science Department, Universidad de Las Palmas de Gran Canaria, Arucas, Las Palmas, Spain, ³Department of Veterinary Histology and Pathology, Universidad de Las Palmas de Gran Canaria, Arucas, Las Palmas, Spain, ⁴Facultad de Ciencia Pecuarias, Escuela Superior Politécnica de Chimborazo, Riobamba, Chimborazo, Ecuador.
- T249 **Cow-calf production performance under different management systems in Thailand.**
Jirayut Khemsawat¹, Skorn Koonawootrittriron*¹, Thanathip Suwanasopee¹, and Mauricio A. Elzo², ¹Kasetsart University, Bangkok, Thailand, ²University of Florida, Gainesville, FL.
- T250 **Chemical composition, physical parameters and cholesterol status of fertile and unfertile eggs from chicken and quail birds.**
Patience Olusola Fakolade*, *Osun State University, Ejigbo, Osun State, Nigeria.*
- T251 **Correlation between the guinea pig tissue composition and carcass measurements.**
Iván Barba¹, Lida Barba*^{1,2}, César Hernández¹, Julio Palmay¹, Nibaldo Rodríguez², and Davinia Sánchez Macías¹, ¹Department of Agroindustrial Engineering, Universidad Nacional de Chimborazo, Riobamba, Chimborazo, Ecuador, ²School of Informatics Engineering, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile.
- T252 **Prediction of guinea pig carcass tissue composition from weight and linear normalized measurements.**
Lida Barba*^{1,2}, Iván Barba¹, Julio Palmay¹, César Hernández¹, Nibaldo Rodríguez², and Davinia Sánchez Macías¹, ¹Department of Agroindustrial Engineering, Universidad Nacional de Chimborazo, Riobamba, Chimborazo, Ecuador, ²School of Informatics Engineering, Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile.

- T253 **Comparison between a method based upon the anatomical structure and a method based upon standardized butchering practice of guinea pig carcass.**
Julio Palmay¹, César Hernández¹, Iván Barba¹, Roberto Remache¹, Antonio Morales de la Nuez², Anastasio Argüello³, Noemí Castro³, and Davinia Sánchez Macías*¹, ¹Department of Agroindustrial Engineering, Universidad Nacional de Chimborazo, Riobamba, Chimborazo, Ecuador, ²Facultad de Ciencia Pecuarias, Escuela Superior Politécnica de Chimborazo, Riobamba, Chimborazo, Ecuador, ³Animal Science Department, Universidad de Las Palmas de Gran Canaria, Arucas, Las Palmas, Spain.
- T254 **Carcass tissue composition in fattening or discarded guinea pigs.**
Julio Palmay¹, Iván Barba¹, César Hernández¹, Erick Ureña¹, Antonio Morales de la Nuez², Noemí Castro³, Anastasio Argüello³, and Davinia Sánchez Macías*¹, ¹Department of Agroindustrial Engineering, Universidad Nacional de Chimborazo, Riobamba, Chimborazo, Ecuador, ²Facultad de Ciencia Pecuarias, Escuela Superior Politécnica de Chimborazo, Riobamba, Chimborazo, Ecuador, ³Animal Science Department, Universidad de las Palmas de Gran Canaria, Arucas, Las Palmas, Spain.
- T255 **Substitution of commercial concentrate by mulberry forage (*Morus alba* 'Linn') in the ration of fattening tropical Pelibuey lambs.**
Andrés Alpizar-Naranjo¹, Javier Arece-García², Marcos Esperance², Yoel López¹, Michael Molina², and Eliel González-García*³, ¹Escuela de Ciencias Agrarias, Facultad de Ciencias de la Tierra y el Mar, Universidad Nacional de Costa Rica, Heredia, Costa Rica, ²Estación Experimental de Pastos y Forrajes "Indio Hatuey," Matanzas, Cuba, ³INRA UMR868, Systèmes d'Élevage Méditerranéens et Tropicaux (SELMET), Montpellier Cedex 2, France.
- T256 **Carcass quality of guinea pigs: Sex effect on fattening or discarded animals.**
César Hernández¹, Iván Barba¹, Julio Palmay¹, Lisbeth Medina¹, Antonio Morales de la Nuez², Noemí Castro³, Anastasio Argüello³, and Davinia Sánchez Macías*¹, ¹Department of Agroindustrial Engineering, Universidad Nacional de Chimborazo, Riobamba, Chimborazo, Ecuador, ²Facultad de Ciencia Pecuarias, Escuela Superior Politécnica de Chimborazo, Riobamba, Chimborazo, Ecuador, ³Animal Science Department, Universidad de las Palmas de Gran Canaria, Arucas, Las Palmas, Spain.
- T257 **Comparison of linear carcass measurements in male or female fattening and discarded guinea pigs.**
César Hernández¹, Julio Palmay¹, Iván Barba¹, Jairo Espinoza¹, Antonio Morales de la Nuez², Noemí Castro³, Anastasio Argüello³, and Davinia Sánchez Macías*¹, ¹Department of Agroindustrial Engineering, Universidad Nacional de Chimborazo, Riobamba, Chimborazo, Ecuador, ²Facultad de Ciencia Pecuarias, Escuela Superior Politécnica de Chimborazo, Riobamba, Chimborazo, Ecuador, ³Animal Science Department, Universidad de las Palmas de Gran Canaria, Arucas, Las Palmas, Spain.
- T258 **Fatty acid composition of fats from female and male muskoxen (*Ovibos moschatus*) living in western Greenland.**
Susana P. Alves¹, Angelo Cabo¹, Katrine Raundrup², Rui J. B. Bessa¹, and André M. de Almeida*³, ¹CIISA/FMV - Centro Interdisciplinar de Investigação em Sanidade Animal, Faculdade de Medicina Veterinária, Universidade de Lisboa, Lisboa, Portugal, ²Greenland Institute of Natural Resources, Nuuk, Greenland, ³Instituto de Biologia Experimental e Tecnológica, Oeiras, Portugal.
- T259 **Body condition score, subcutaneous fat and reproductive performance relationship in *Bos indicus* cows in a tropical region of Mexico.**
Ivette Rubio, Victoria Blas, Manuel D. Corro*, Clara Murcia, and Carlos S. Galina, Faculty of Veterinary Medicine and Zootechnics National Autonomous University of Mexico, Mexico, DF, Mexico.
- T260 **Effects of diet type and a yeast product in performance, nutrient digestibility, intestinal morphology, carcass composition and visceral organ mass by guinea pigs.**
Andres E. Idrobo, Karina M. Boada, Patricia X. Falconi, and Christian H. Ponce*, Departamento de Ciencias de la Vida y Agricultura, Universidad de las fuerzas Armadas ESPE, Sangolquí, Ecuador.
- T261 **Energy flow analysis on dairy farms in North Carolina and Malawi.**
Shalimbala Chizonda* and Jonathan C. Allen, North Carolina State University, Raleigh, NC.
- T262 **Nestlé China Dairy Farming Institute: Development of collaborative, science-based, practical, sustainable courses.**
Karen Nielsen*, Pamela Ruegg, and David Combs, University of Wisconsin, Madison, WI.

Lactation Biology II

- T263 **Risk factors for undergoing lactations >15 months in high-producing Holstein cows in a hot environment.**
Jessica María Flores-Salas*¹ and Miguel Mellado², ¹Universidad Autonoma Agraria Antonio Narro Unidad Laguna, Torreón, Coahuila, México, ²Universidad Autonoma Agraria Antonio Narro, Saltillo, Coahuila, México.

- T264 **Enhanced pre-weaning nutrition stimulates mammary gland development in dairy heifer calves.**
Adam J. Geiger^{*1}, Robert E. James¹, Catherine L. Parsons¹, Anthony V. Capuco², and R. Michael Akers¹, ¹Department of Dairy Science, Virginia Polytechnic Institute and State University, Blacksburg, VA, ²United States Department of Agriculture-Agricultural Research Service, Beltsville, MD.
- T265 **Bovine, caprine and ovine serotonin receptors expression in the mammary gland during lactating and dry off by immunohistochemistry.**
Aridany Suarez-Trujillo^{*1}, Miguel A. Rivero², Anastasio Argüello¹, Juan Capote³, and Noemi Castro¹, ¹Department of Animal Science, Universidad de Las Palmas de Gran Canaria, Arucas, Las Palmas, Spain, ²Department of Morphology, Universidad de Las Palmas de Gran Canaria, Arucas, Las Palmas, Spain, ³Canarian Agronomic Science Institute, La Laguna, Tenerife, Spain.
- T266 **Effect of the supplementation of a functional additive in prepartal cows of two breeds on the level of IgG in colostrum.**
Angela Moreno and Claudia Ariza-Nieto^{*}, Corporacion Colombiana de Investigacion Agropecuaria CORPOICA, Bogota, Colombia.
- T267 **The effects of cabergoline administration at dry-off of lactating cows on udder engorgement, milk leakages, lying behavior, and udder health at calving.**
Alex Bach^{*1,3}, Naomi Isaka², Audrey Deflandre², and Anna Arís³, ¹CREA (Institució Catalana de Recerca i Estudis Avançats), Barcelona, Spain, ²CEVA Santé Animale, Libourne, France, ³Department of Ruminant Production-IRTA, Caldes de Montbui, Spain.
- T268 **Dry-off facilitator cabergoline hastened the GLUT-1 decrease and lactoferrin increase in the mammary tissue during drying-off in dairy cows.**
Marion Boutinaud^{*1,2}, Naomi Isaka³, Audrey Deflandre³, Sandra Wiart^{1,2}, Philippe Lambertson¹, Ana Isabel De Prado Taranilla³, and Vanessa Lollivier^{1,2}, ¹INRA UMR1348, Saint Gilles, France, ²Agrocampus Ouest UMR1348, Rennes, France, ³CEVA Santé Animale, Libourne, France.
- T269 **Transcriptome analysis of the mammary gland reveals new insights for the role of serotonin in lactation.**
Jimena Laporta^{*1}, Francisco Peñagaricano¹, and Laura L. Hernandez², ¹University of Florida, Gainesville, FL, ²University of Wisconsin-Madison, Madison, WI.
- T270 **Lactation performance of dairy cows milked 3 times per day and supplemented with two different formulations of bovine somatotropin.**
Jozivaldo P. G. Morais^{*}, Andressa P. da S. Cruz, Natalia S. Minami, Luiz P. Veronese, Tiago A. Del Valle, and Simone D. Sartorio, Universidade Federal de São Carlos, UFSCAR, Araras, SP, Brazil.
- T271 **Effects of milking frequency and prolactin on milk production and expression of prolactin receptors in the mammary gland of dairy cows.**
Izabella Thompson^{*1}, Severine Ollier¹, Xin Zhao², and Pierre Lacasse¹, ¹AAFC-Dairy and Swine Research and Development Centre, Sherbrooke, QC, Canada, ²Department of Animal Science, McGill University, Sainte-Anne-de-Bellevue, QC, Canada.
- T272 **Effects of inhibiting the lactogenic signal at calving on milk production and metabolic perturbations in cows.**
Noémie Vanacker^{*1}, Ollier Séverine¹, Blouin Richard², and Lacasse Pierre¹, ¹AAFC-Dairy and Swine Research and Development Centre, Sherbrooke, Québec, Canada, ²Département de Biologie, Université de Sherbrooke, Sherbrooke, Québec, Canada.
- T273 **Effect of increased milking frequency in early lactation on milk production, proliferation and apoptosis of mammary cells in dairy cow.**
Juliana Mergh Leão^{*1}, Juliana Aparecida Mello Lima¹, Sandra Gesteira Coelho¹, José Reinaldo Mendes Ruas², Anilton César Vasconcelos¹, Ângela Maria Quintão Lana¹, Ronaldo Braga Reis¹, and Helton Mattana Saturnino¹, ¹Universidade Federal de Minas Gerais-UFMG, Belo Horizonte, Minas Gerais, Brazil, ²Empresa de Pesquisa Agropecuária de Minas Gerais-EPAMIG, Felixlândia, Minas Gerais, Brazil.
- T274 **Effect of cortisol on mammary epithelial cell turnover: milk synthesis, proliferation and apoptosis.**
J. A. Negrao^{*}, G. M. Krempel, S. A. Oliveira, G. F. Bomfim, H. Z. Polato, and F. C. Lahr, Basic Science Department, FZEA/USP, Pirassununga, SP, Brazil.
- T275 **Effects of growth hormone and insulin-like growth factor on synthesis and secretion of β -casein, β -lactalbumin and lactoferrin in mammary epithelial cells.**
J. A. Negrao^{*}, G. M. Krempel, S. A. Oliveira, G. F. Bomfim, F. C. Lahr, and H. Z. Polato, Basic Science Department, FZEA/USP, Pirassununga, SP, Brazil.
- T276 **The barrier integrity of bovine mammary epithelial cells in vitro in response to lipopolysaccharide (LPS) and lipoteichoic acid (LTA) treatment.**
Christina Zbinden^{*1,2}, Rupert M. Bruckmaier¹, and Olga Wellnitz¹, ¹Veterinary Physiology, Vetsuisse Faculty University of Bern, Bern, Switzerland, ²Graduate School for Cellular and Biomedical Sciences, University of Bern, Bern, Switzerland.

- T277 **Intravenous challenge with lipopolysaccharide does not induce a mammary immune response in dairy cows and does not affect the blood-milk barrier.**
Olga Wellnitz*^{1,2}, Emmanouil Kalaitzakis^{1,2}, Heinrich Bollwein², and Rupert M. Bruckmaier¹, ¹*Veterinary Physiology, Vetsuisse Faculty University of Bern, Bern, Switzerland*, ²*Clinic of Reproductive Medicine, Vetsuisse Faculty University of Zurich, Zurich Switzerland.*
- T278 **Characterization of mammary glucose metabolism during milk fat depression.**
Natalie L. Urrutia*¹, Kevin J. Harvatine¹, and Dale E. Bauman², ¹*The Pennsylvania State University, University Park, PA*, ²*Cornell University, Ithaca, NY.*
- T279 **Transcriptome adaptation of the bovine mammary gland to a diet supplemented with linseed oil.**
Eveline M. Ibeagha-Awemu¹, Ran Li¹, Adolf A. Ammah¹, Nathalie Bissonnette*¹, Chaouki Benchaar¹, and Xin Zhao², ¹*Agriculture and Agri-Food Canada, Dairy and Swine Research and Development Centre, Sherbrooke, Quebec, Canada*, ²*Department of Animal Science, McGill University, Ste-Anne-De-Bellevue, Quebec, Canada.*

Nonruminant Nutrition General II

- T280 **Chemical treatment of corn stover with calcium hydroxide increases its energy value for swine.**
Victor G. Perez*, Lester Pordesimo, Amanda Knorr, and Terry Radke, *ADM Animal Nutrition, Quincy, IL.*
- T281 **Hammer status in hammer mill affects feed particle size and piglet performance after weaning.**
David Solà-Oriol, Laia Blavi*, and Roser Sala, *Animal Nutrition and Welfare Service, Department of Animal and Food Sciences, Universitat Autònoma de Barcelona, Bellaterra, Spain.*
- T282 **Effect of salt particle size and extended mixing times on the mixing uniformity of a corn-soy swine diet.**
Marut Saensukjaroenphon*¹, Cassandra K. Jones¹, Charles H. Fahrenholz², Kessinee Chitakasempornkul¹, and Charles R. Stark¹, ¹*Kansas State University, Manhattan, Kansas*, ²*Phibro Animal Health Corporation, Manhattan, Kansas.*
- T283 **Optimization of different probiotics on improving the quality of cottonseed meal fermentation using response surface methodology.**
X. M. Liu¹, C. W. Yang*², Z. Y. Li³, Z. B. Yang¹, and Y. Wang⁴, ¹*College of Animal science, Shandong Agricultural University, Shandong, China*, ²*College of Life science, Shandong Agricultural University, Shandong, China*, ³*CRVAB Bio-tech Group, Shanghai, China*, ⁴*Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, AB, Canada.*
- T284 **Effects of ginger root, star anise, and *Salvia miltiorrhiza* on growth performance, antioxidant status and serum metabolites in growing pigs.**
Z. B. Yang*¹, X. Y. Li¹, S. Z. Jiang¹, and C. W. Yang², ¹*College of Animal science, Shandong Agricultural University*, ²*College of Life science, Shandong Agricultural University.*
- T285 **Effect of oregano essential oil supplementation on oxidative stability of eggs enriched with polyunsaturated fatty acids during storage.**
Ronald E. Ortiz*^{1,2}, Germán Afanador-Tellez², Diana R. Vásquez¹, and Claudia Ariza-Nieto¹, ¹*Corporación Colombiana de Investigación Agropecuaria, Bogotá, Cundinamarca, Colombia*, ²*Universidad Nacional de Colombia, Bogotá, Cundinamarca, Colombia.*
- T286 **Effects of dietary inclusion of *Lactobacillus acidophilus* on growth performance, health, and carcass traits of growing-finish-ing pigs.**
A. S. Loftus*, I. Park, N. E. Manzke, and S. W. Kim, *Department of Animal Science, North Carolina State University, Raleigh, NC.*
- T287 **Nutrient digestibility of high oleic soybean meal by broilers.**
Guilherme Hosotani*, Monty S. Kerley, and Marcia C. Shannon, *University of Missouri, Columbia, MO.*
- T288 **Effect of dietary quercetin and oregano essential oil on growth performance, carcass characteristics, meat quality and antioxidant properties in pigs under transport stress conditions.**
Yi Zou, Yuanfei Zhou*, Hongkui Wei, and Jian Peng, *Department of Animal Nutrition and Feed Science, College of Animal Science and Technology, Huazhong Agricultural University, Wuhan, Hubei, China.*

- T289 **Effect of vitamin E supplementation on performance of male broiler chickens—A meta-analytic approach.**
M. A. Pompeu*¹, L. F. L. Cavalcanti², and F. L. B. Toral¹, ¹*Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brazil*, ²*CNPq, RHA/E, Seva Engenharia, Projeto Intergado, Contagem, MG, Brazil*.
- T290 **The duration required to detect differences in bone mass accumulation in young pigs fed diets with varied vitamin D, Ca, and P concentrations.**
Lynzie M. Miller*, Laura A. Amundson, and Thomas D. Crenshaw, *University of Wisconsin, Madison, Wisconsin*.
- T291 **Comparison of response criteria used to assess dietary vitamin D₃ requirements in young pigs.**
Laura A. Amundson* and Thomas D. Crenshaw, *University of Wisconsin, Madison, WI*.

Nonruminant Nutrition Sows and piglets

- T292 **Meta-analysis of the influence of live yeast addition on feed intake in lactating sows.**
Eric Chevaux*¹, David Guillou¹, and Ernest Keith², ¹*Lallemand Animal Nutrition, Blagnac, France*, ²*Lallemand Animal Nutrition, Milwaukee, WI*.
- T293 **Effects of palm kernel expellers on productive performance, nutrient digestibility, and white blood cells of lactating sows.**
J. Kim*¹, Y. Jang¹, S. Kim¹, W. Kim¹, K. Jang¹, K. Kim¹, B. Kim¹, S. Park¹, I. Park¹, Y. H. Kim², J. C. Park², J. Seo³, Y. Kim⁴, S. Seo¹, M. Song¹, ¹*Chungnam National University, Daejeon, Republic of Korea*, ²*National Institute of Animal Science, Cheonan, Republic of Korea*, ³*Pusan National University, Miryang, Republic of Korea*, ⁴*Chonbuk National University, Jeonju, Republic of Korea*.
- T294 **Effects of the level of bovine plasma in pregnant gilts on the birth weight of the litter.**
Bárbara V. Freitas*, Simone M. M. K. Martins, Jose A. R. Ulloa, Gustavo A. Campos, and Lúcio F. Araújo, *University of São Paulo, Pirassununga, São Paulo, Brazil*.
- T295 **Effect of dietary supplementation of oregano essential oils to sows on oxidative stress status, lactation feed intake and reproductive performance.**
Chengquan Tan¹, Jiangtao Ao¹, Guang Long¹, Haiqing Sun^{1,2}, and Jian Peng*¹, ¹*Department of Animal Nutrition and Feed Science, College of Animal Science and Technology, Huazhong Agricultural University, Wuhan, Hubei, China*, ²*YangXiang Joint Stock Company, Guigang, Guangxi, China*.
- T296 **Sow productivity at farrowing was not affected when 50% of a co-product combination was included in the gestation diet.**
Elizabeth Magowan¹, Paul McMullen¹, Aishling O'Connell², Rosanna Wregor², and Wallace Henry*³, ¹*Agri-Food and Biosciences Institute, Hillsborough, United Kingdom*, ²*JMW Farms, Tynan, United Kingdom*, ³*Rektify Limited, Gilford, United Kingdom*.
- T297 **Effect of supplying a nucleotide product (Harv-con NT) to sow diets on the reproductive performance and the health status of the offspring.**
I-Fen Hung*¹, Fuguei Li², Shigeng Zou³, and Merlin D. Lindemann¹, ¹*University of Kentucky, Lexington, KY*, ²*Interflavor Ltd, Zhongshan City, Guangdong, China*, ³*WENS Group, Yunfu City, Guangdong, China*.
- T298 **The effect of coated sodium butyrate supplementation in sow and nursery diets on reproductive performance and nursery pig performance.**
Young Dal Jang*, Merlin D. Lindemann, H. James Monegue, and James S. Monegue, *University of Kentucky, Lexington, KY*.
- T299 **Nucleotide supplementation improves growth performance of weaned piglets.**
Gabriela de Mello Miassi*¹, Luan Sousa Santos², Livea Maria Gomes¹, Patrícia Nardin Berto¹, Mayra Dib Saleh¹, Alessandro Borges Amorin³, Marcos Livio Panhoza Tse¹, and Dirlei Antonio Berto¹, ¹*Faculdade de Medicina Veterinária e Zootecnia, FMVZ/UNESP, Botucatu, São Paulo, Brazil*, ²*Faculdade de Ciências Agrárias e Veterinárias, FCAV/UNESP, Jaboticabal, São Paulo, Brazil*, ³*Instituto de Ciências Agrárias e Tecnológicas, ICAT/UFMT, Rondonópolis, Mato Grosso, Brazil*.
- T300 **Effect of nucleotide supplementation in high soybean meal inclusion diets on weight gain and inflammatory process in weanling pigs.**
David Solà-Oriol¹, Wellington Coloma¹, Elisabet Borda*², and José Francisco Pérez¹, ¹*Animal Nutrition and Welfare Service, Department of Animal and Food Sciences, Universitat Autònoma de Barcelona, Bellaterra, Spain*, ²*R&D Animal Nutrition, Bioibérica, Palafolls, Spain*.

- T301 **Effects of palm kernel expellers on growth performance, nutrient digestibility, and blood profiles of weaned pigs.**
Y. Jang^{*1}, J. Kim¹, S. Kim¹, W. Kim¹, K. Jang¹, K. Kim¹, B. Kim¹, S. Park¹, I. Park¹, Y. H. Kim², J. C. Park², J. Seo³, Y. Kim⁴, S. Seo¹, M. Song¹, ¹Chungnam National University, Daejeon, Republic of Korea, ²National Institute of Animal science, Cheonan, Republic of Korea, ³Pusan National University, Miryang, Republic of Korea, ⁴Chonbuk National University, Jeonju, Republic of Korea.
- T302 **Beneficial effects of a prebiotic supplement on growth and performance of weaned piglet.**
Edi Vianello, Anne-Kathrin Blässe*, and Bernhard Eckel, *Dr. Eckel GmbH, Niederzissen, Germany.*
- T303 **Effect of dietary melatonin supplementation on growth performance and behavior, and their correlations in weaned pigs.**
Kyeongsu Chae^{*1}, Junseung Choi², Jonggun Kim¹, and Kwang-Youn Whang¹, ¹Department of Biotechnology, Graduate School, Korea University, Seoul, Korea, ²Dodram Swine Service, Gyeonggi, Korea.

Physiology and Endocrinology Environment, metabolism, and physiological processes

- T304 **Effect of the environmental conditions over the vaginal temperature and respiration rate on wild type and slick-haired Puerto Rican Jersey cows.**
Amneris M. Castro-Ramos*, Gladycia C. Muñiz-Colón, Jaime E. Curbelo-Rodríguez, Melvin Pagán-Morales, Alexander Mesonero-Morales, Adalberto de Jesus-de Jesus, Neftalí Lluch-García, and Héctor L. Sánchez-Rodríguez, *University of Puerto Rico at Mayagüez Campus, Mayagüez, Puerto Rico.*
- T305 **Effects of the thermal humidity index on vaginal temperature of slick- and wild type-haired Puerto Rican Holstein cows.**
Héctor L. Sánchez-Rodríguez*, Amneris M. Castro-Ramos, Melvin Pagán-Morales, Jaime E. Curbelo-Rodríguez, Alexander Mesonero-Morales, and Gladycia C. Muñiz-Colón, *University of Puerto Rico at Mayagüez Campus, Mayagüez, Puerto Rico.*
- T306 **Relationship between daily milk production and core-body temperature of lactating Holstein cows.**
E. O. S. Batista^{*1,2}, C. Collar¹, P. D. Carvalho³, N. Silva-Del-Rio¹, P. S. Baruselli², and A.H. Souza¹, ¹University of California, Tulare, CA, ²University of Sao Paulo, Sao Paulo, SP, Brazil, ³University of Wisconsin, Madison, WI.
- T307 **Effect of castration and multi alleviation treatment on growth and physiological responses in Korean cattle.**
Seung Ju Park, Min Yu Piao, Hyun Jin Kim, Hyeok Joong Kang, and Myunggi Baik*, *Seoul National University, Gwanak-gu, Seoul, Republic of Korea.*
- T308 **The effect of exercise in pregnant Holstein heifers on fitness and heat tolerance.**
Jessica Winkler* and Timothy G. Rozell, *Kansas State University, Manhattan, KS.*
- T309 **Comparative efficacy of dexamethasone or corticotropin releasing hormone and vasopressin administration as a model to induce chronic physiological stress in beef cattle.**
Nathan D. May^{*1}, Jeff A. Carroll³, Nicole C. Burdick Sanchez³, Shelby L. Roberts¹, Heather D. Hughes¹, Paul R. Broadway³, Kate P. Sharon^{2,3}, Michael A. Ballou², and John T. Richeson¹, ¹Department of Agricultural Sciences, West Texas A&M University, Canyon, TX, ²Department of Food and Animal Sciences, Texas Tech University, Lubbock, TX, ³USDA-ARS, Livestock Issues Research Unit, Lubbock, TX.
- T310 **Intraperitoneal administration of lipopolysaccharide induces differential expression of mRNA encoding inflammatory mediators in the oviducts of mice.**
Katheryn L. Cerny* and Phillip J. Bridges, *University of Kentucky, Lexington, KY.*
- T311 **Effects of lipopolysaccharide (LPS)-induced inflammatory response on early embryo survival in ewes.**
M. R. Graham^{*1}, E. C. Bowdridge¹, S. A. Bowdridge¹, I. Holásková¹, T. H. Elsasser², and R. A. Dailey¹, ¹West Virginia University, Morgantown, WV, ²United States Department of Agriculture-Agricultural Research Service (USDA-ARS), Beltsville Agricultural Research Center (BARC), Beltsville, MD.
- T312 **Intramammary lipopolysaccharide induces increased luteal mRNA abundance of tumor necrosis factor alpha and toll-like receptor 2 but not luteolysis in dairy cows.**
Johannes Lüttgenau¹, Olga Wellnitz^{1,2}, David Kradolfer³, Christina Zbinden², Susanne E. Ulbrich³, Rupert M. Bruckmaier^{*2}, and Heiner Bollwein¹, ¹Clinic of Reproductive Medicine, Vetsuisse Faculty, University of Zurich, Zurich, Switzerland, ²Veterinary Physiology, Vetsuisse Faculty, University of Bern, Bern, Switzerland, ³ETH Zurich, Animal Physiology, Institute of Agricultural Sciences, Zurich, Switzerland.

- T313 **Different weaning age changes piglets blood parameters related to stress prior anxiety test.**
Patricia M. Ramos*^{1,2}, Maicon Sbardella^{1,2}, Marcelo A. S. Coutinho^{1,2}, Valdomiro S. Miyada^{1,2}, and Eduardo F. Delgado^{1,2}, ¹“Luiz de Queiroz” College of Agriculture, Piracicaba, SP, Brazil, ²University of São Paulo, São Paulo, Brazil.
- T314 **Conjugated linoleic acid (CLA) isomers strongly improves the redox status of bovine mammary epithelial cells (BME-UV1).**
Loredana Basiricò¹, Arnoulf Troscher*², Daniele Dipasquale¹, Patrizia Morera¹, Andrea Serra³, Marcello Mele³, and Umberto Bernabucci¹, ¹Dipartimento di scienze e tecnologie per l’Agricoltura, le Foreste, la Natura e l’Energia, Università degli Studi della Tuscia, Viterbo, Italy, ²BASF-SE, Ludwigshafen, Germany, ³Dipartimento di Scienze Agrarie, Alimentari e Agro-ambientali, Università di Pisa, Pisa, Italy.
- T315 **Antioxidant potential in the gut of juvenile fish fed with lyophilized bovine colostrum.**
Debora B. Moretti*, Wiolene M. Nordi, Thaline M. P. Cruz, Jose Eurico P. Cyrino, and Raul Machado-Neto, University of São Paulo, Piracicaba, São Paulo, Brazil.

Physiology and Endocrinology

Reproductive tissues, gametes and embryo development

- T316 **Stem cell factor (SCF) activates AKT-p70RSK-S6 signaling in porcine trophoblast cells.**
Yurina Choi*, Wooyoung Jeong, Heejo Bang, Yujin Sung, and Jinyoung Kim, Dankook University, Cheonan, Korea.
- T317 **In vitro fertilization (IVF) from low or high antral follicle count pubertal beef heifers using semi-defined culture conditions.**
C. C. Chase*¹, R. A. Cushman¹, A. K. McNeel¹, E. C. Wright-Johnson¹, O. L. Amundson², E. L. Larimore², B. N. Richardson², G. A. Perry², S. C. Tenley³, J. R. Wood³, A. S. Cupp³, J. L. Vallet¹, D. D. Sypherd¹, and J. L. Miles¹, ¹USDA, ARS, US Meat Animal Research Center, Clay Center, NE, ²Dept. of Animal Science, South Dakota State Univ, Brookings, SD, ³Dept. of Animal Science, University of Nebraska, Lincoln, Lincoln, NE.
- T318 **Effect of L-carnitine in serum-supplemented IVM medium on mitochondrial membrane potential, ROS levels and subsequent embryo development of bovine oocytes.**
Beatriz C. S. Leao*, Nathália A. S. Rocha Frigoni, Priscila C. Dall’Acqua, and Gisele Z. Mingoti, Laboratory of Physiology of Reproduction, School of Veterinary Medicine, Sao Paulo State University, Araçatuba, Sao Paulo, Brazil.
- T319 **Cell proliferation in ovarian follicles in nonpregnant ewes: Effects of plane of nutrition and arginine.**
Anna T. Grazul-Bilska*, Samantha L. Kaminski, Casie S. Bass, Kaitlyn K. Ebel, and Dale A. Redmer, North Dakota State University, Fargo, ND.
- T320 **Comparison of mRNA expression of dominant follicle and follicular cyst in lactating dairy cows.**
Diego A. Velasco Acosta*^{1,2}, Tonja Egan², Cassandra Skenandore², Saige Sulzberger², Augusto Schneider², Fabio Lima², Marcio Corrêa¹, and Felipe Cardoso², ¹Universidade Federal de Pelotas, Pelotas, Rio Grande do Sul, Brazil, ²University of Illinois, Urbana, IL.
- T321 **Colony-stimulating factor 2 affects development of the bovine preimplantation embryo differently for females than males.**
Luiz G. B. Siqueira*^{1,2} and Peter J. Hansen¹, ¹University of Florida, Department of Animal Sciences, Gainesville, FL, ²Embrapa Gado de Leite, Juiz de Fora, MG, Brazil.
- T322 **Effect of fertility stressors on transcriptome of peripheral blood leukocytes (PBL) in dairy cows at the onset of conceptus implantation.**
Eduardo S. Ribeiro*^{1,2}, Rafael S. Bisinotto^{1,2}, Fabio S. Lima^{1,2}, Natalia P. Martinez^{1,2}, Leandro F. Greco^{1,2}, William W. Thatcher^{1,2}, and José E. Santos^{1,2}, ¹Department of Animal Sciences, University of Florida, Gainesville, FL, ²D.H. Barron Reproductive and Perinatal Biology Research Program, University of Florida, Gainesville, FL.
- T323 **Circulating concentrations of bovine pregnancy associated glycoproteins and late embryonic mortality in lactating dairy herds.**
Ky G. Pohler*¹, Marcos H. Pereira², Francisco R. Lopes², Jose L. M. Vasconcelos², Michael F. Smith¹, and Jon A. Green¹, ¹Division of Animal Sciences, University of Missouri, Columbia, MO, ²FMVZ-UNESP, Botucatu, SP, Brazil.
- T324 **Etiology of early pregnancy losses in Holstein dairy cows based on serum pregnancy-associated glycoprotein and progesterone concentrations.**
Maria J. Fuenzalida*, Paulo D. Carvalho, Milo C. Wiltbank, Pamela L. Ruegg, and Paul M. Fricke, University of Wisconsin-Madison, Madison, WI.

- T325 **Supplementation with insulin-like growth factor-1 during in vitro culture protects bovine embryos from deleterious actions of menadione.**
Nathália A. S. Rocha-Frigoni*, Beatriz C. S. Leão, Priscila C. Dall'Acqua, and Gisele Z. Mingoti, *Laboratory of Physiology of Reproduction, School of Veterinary Medicine, University of Sao Paulo State (UNESP), Araçatuba, Sao Paulo, Brazil.*
- T326 **Menadione induces oxidative stress and reduces embryo development.**
Priscila C. Dall'Acqua*, Nathália A. S. Rocha-Frigoni, Beatriz C. S. Leão, and Gisele Z. Mingoti, *Laboratory of Physiology of Reproduction, School of Veterinary Medicine, University of Sao Paulo State (UNESP), Araçatuba, São Paulo, Brazil.*
- T327 **Antioxidants improve membrane integrity and acrosome and sperm mitochondrial activity in ram sperm after cryopreservation.**
Elenice A. Moraes*¹, Wildelfrancys L. Souza¹, Jonathan M. S. Costa¹, and James K. Graham², ¹*Federal University of San Francisco Valley, Petrolina, PE, Brazil,* ²*Colorado State University, Fort Collins, CO.*
- T328 **Testosterone enhances basal, FSH- and IGF-I-stimulated aromatase gene expression in porcine granulosa cells in vitro.**
Leon J. Spicer*, John R. Evans, and Nicole B. Schreiber, *Oklahoma State University, Stillwater, OK.*
- T329 **Ovarian follicular dynamics in early- and late-maturing Brahman cows.**
Rui A. d'Orey Branco*^{1,2}, Thomaz H. Welsh², Don Neuendorff¹, and Ron D. Randel¹, ¹*Texas A&M AgriLife Research, Overton, TX,* ²*Department of Animal Science, Texas A&M University, College Station, TX.*

Production, Management, and the Environment II

- T330 **Influence of egg holding time on hatchability of Hubbard broiler eggs.**
Modupe Orunmuyi*¹ and Chidiebere Livinus Akanwa², ¹*Federal University, Oye-Ekiti, Ikole-Ekiti, Ekit State, Nigeria,* ²*Ahmadu Bello University, Zaria, Kaduna State, Nigeria.*
- T331 **Performance of dual-purpose cows supplemented with two sources of energy in subtropical conditions.**
Isela Salvador-Loreto¹, Benito Albarran-Portillo*¹, Fernando Vicente-Mainar², Isela G. Salas-Reyes¹, Carlos M. Arriaga-Jordan¹, and Julieta G. Estrada-Flores¹, ¹*Universidad Autonoma del Estado de Mexico, Toluca, Mexico, Mexico,* ²*Servicio Regional de Investigación y Desarrollo Agroalimentario, Villaviciosa, Asturias, España.*
- T332 **Evaluation of the feedlot performance, carcass yield, and production costs of finishing beef cattle supplemented with β -agonists.**
Silvia Larios-Cueto, Gilberto Aranda-Osorio*, Rodolfo Ramirez-Valverde, Hermilo Suarez-Dominguez, and Jose M. Monzon-Armenta, *Universidad Autonoma Chapingo, Chapingo, Texcoco, Mexico.*
- T333 **Physiological responses in Santa Ines ewes submitted to stressful conditions of management.**
Monalissa de Melo Stradiotto*^{1,2}, Alice Deléo Rodrigues^{1,2}, and João Alberto Negrão^{1,2}, ¹*University of Sao Paulo-USP, Pirassununga, SP, Brazil,* ²*University of Sao Paulo State-UNESP, Jaboticabal, SP, Brazil.*
- T334 **Goal structure and reasons for selecting a goat enterprise by US meat goat producers.**
Narayan P. Nyaupane*², Jeffrey M. Gillespie¹, and Kenneth W. McMillin¹, ¹*Louisiana State University, Agricultural Center, Baton Rouge, LA,* ²*The Samuel Roberts Noble Foundation Inc., Ardmore, OK.*
- T336 **The production performance of egg layers in different rearing systems.**
Bilgehan Yilmaz Dikmen*, Aydin Ipek, Ümran Sahan, and Arda Sözcü, *Department of Animal Science, Faculty of Agriculture, University of Uludag Bursa, Turkey.*
- T337 **Effect of a single dose of injectable trace minerals on measurements of performance, innate and humoral immune responses of beef heifers.**
Luana S. Caramalac*¹, Philippe Moriel², Luis F. A. Artioli², and John D. Arthington³, ¹*Mato Grosso do Sul State University, Aquidauana, MS, Brazil,* ²*North Carolina State University, Waynesville, NC,* ³*University of Florida, Ona, FL.*
- T338 **Pre-weaning injections of bovine somatotropin enhanced post-weaning growth performance and puberty attainment of beef heifers.**
Philippe Moriel¹, Luis F. A. Artioli*¹, Phillip Lancaster³, John D. Arthington³, and Reinaldo F. Cooke², ¹*North Carolina State University, Waynesville, NC,* ²*Oregon State University, Burns, OR,* ³*University of Florida, Ona, FL.*

- T340 **Modeling and simulation for beef cattle stocker-finishing systems analysis.**
Julio Otavio Barcellos*¹, Leonardo C. Canellas¹, Vinicius N. Lampert², Fernanda G. Moojen¹, Marcela Kuczynski Rocha¹, Eduardo T. Azevedo¹, Gabriel R. Pereira¹, Silvio R. O. Menegassi¹, and Eduardo Antunes Dias¹, ¹NESPRO/UFRGS, Porto Alegre, RS, Brazil, ²EMBRAPA/CPPSUL, Bagé, RS, Brazil.
- T341 **Performance and profitability on beef cattle in intensive tropical pasture in Amazon biome.**
Fabiano Alvim Barbosa*¹, Vando Telles Oliveira², Filipe Lage Bicalho³, Luciano Bastos Lopes⁴, Juliana Mergh Leão¹, and Lucas Luz Emerick¹, ¹Universidade Federal de Minas Gerais, UFMG, Belo Horizonte, Minas Gerais, Brazil, ²Instituto Centro de Vida, ICV, Alta Floresta, Mato Grosso, Brazil, ³Soluções Integradas ao Agronegócio, SIGA, Alta Floresta, Mato Grosso, Brazil, ⁴Empresa Brasileira de Pesquisa Agropecuária, Embrapa, Sinop, Mato Grosso, Brazil.
- T342 **Carcass quality of grain-finished first-calf heifers.**
Jose A. Arce*¹, Shawn L. Archibeque¹, Jason K. Ahola¹, Richard K. Peel¹, Dale R. Woerner¹, Jack C. Whittier², and George E. Seidel³, ¹Department of Animal Sciences, Colorado State University, Fort Collins, CO, ²Department of Animal Science and Panhandle Research and Extension Center, University of Nebraska, Scottsbluff, NE, ³Department of Biomedical Sciences, Colorado State University, Fort Collins, CO.
- T343 **Occurrence of mycotoxins in corn samples collected in the United States in 2014.**
Simone Schaumberger*¹, Paula Kovalsky¹, Michael Sulyok², and Ursula Hofstetter¹, ¹Biomin Holding GmbH, Herzogenburg, Austria, ²University of Natural Resources and Life Sciences, Department IFA Tulln, Vienna, Austria.
- T344 **Antibiotic resistance gene abundance in feces of calves fed pirlimycin-containing whole milk.**
Tiffany Casteel*, Heather Littier, Partha Ray, Amy Pruden, and Katharine Knowlton, Virginia Tech, Blacksburg, VA.
- T345 **Endocrine profiles during early gestation are affected by breed: Suffolk versus Cheviot dams.**
Ana Meikle*¹, Milena Sequeira¹, L. M. Fermin², Sarah Pain², Paul Kenyon², and H. T. Blair², ¹Veterinary Faculty, Montevideo, Uruguay, ²University of Massey, New Zealand.
- T346 **Gene expression in the kidneys of broilers fed dietary ochratoxin A for different time periods.**
C. P. Zeferino*¹, K. D. Wells¹, A. S. A. M. T. Moura², G. E. Rottinghaus¹, and D. R. Ledoux¹, ¹University of Missouri, Columbia, MO, ²São Paulo State University, Botucatu, São Paulo, Brazil.
- T347 **Maintenance energy requirements of gestating beef cows and effects on cow reproduction and performance of calves.**
Brit H. Boehmer* and Robert P. Wettemann, Oklahoma Agricultural Experiment Station, Stillwater, OK.
- T348 **Activation and deactivation of renal genes of chicken associated with induced ochratoxicosis at different exposure times.**
C. P. Zeferino*¹, K. D. Wells¹, A. S. A. M. T. Moura², G. E. Rottinghaus¹, and D. R. Ledoux¹, ¹University of Missouri, Columbia, MO, ²São Paulo State University, Botucatu, São Paulo, Brazil.
- T349 **Evaluation of models for predicting acidosis risk of barley grain in finishing beef cattle.**
Uchenna Y. Anele¹, Marylou Swift², Tim A. McAllister¹, and Wenzhu Yang*¹, ¹Lethbridge Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB, Canada, ²Alberta Agriculture & Rural Development, Lethbridge, Lethbridge, AB, Canada.
- T350 **Influence of growth-promoting implants on endocrine factors and efficiency of replacement beef heifers.**
Laura R. Meyer*¹, Thomas L. Devine¹, Michael L. Looper¹, Dirk Philipp¹, Donald S. Hubbell², Rick W. Rorie¹, and Charles F. Rosenkrans¹, ¹Department of Animal Science, Division of Agriculture, University of Arkansas, Fayetteville, AR, ²Livestock and Forestry Research Station, Division of Agriculture, University of Arkansas, Batesville, AR.

Ruminant Nutrition Beef II

- T351 **Effect of monensin inclusion on intake and digestion in *Bos indicus* and *Bos taurus* steers consuming bermudagrass hay.**
Natasha L. Bell^{*1,2}, Todd R. Callaway³, Robin C. Anderson³, Marcia O. Franco⁴, and Tryon A. Wickersham¹, ¹Texas A&M University, College Station, TX, ²Texas A&M University-Kingsville, Kingsville, TX, ³Southern Plains Agricultural Research Center, Agricultural Research Service, USDA, College Station, TX, ⁴Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.
- T352 **Effect of rumen protected B vitamins supplementation during the receiving period on the productive performance of beef cattle.**
Helene Leclerc^{*1}, Diana A. Espinosa², Essi Evans³, Roberto Zambrano Gaytan², and Juan de Dios Garza Flores², ¹Jefo Nutrition, St-Hyacinthe, QC, Canada, ²Rancho El 17, Hermosillo, Sonora, Mexico, ³Technical Advisory Services, Bowmanville, ON, Canada.
- T353 **Effects of including virginiamycin in feedlot diets containing monensin under commercial conditions in Mexico.**
Jorge R. Kawas², Rene Alvarado², Milton A. Gorocica-Buenfil^{*1}, and Francis L. Fluharty³, ¹Phibro Animal Health de Mexico, Queretaro, Qro. Mexico, ²MNA de Mexico, San Nicolas de los Garza, NL, Mexico, ³The Ohio State University, Wooster, OH.
- T354 **Growth performance of yellow cattle in southern China weaned at different ages.**
C. Wang^{*1}, Y. F. Xia¹, H. L. Mao¹, Y. Tu², C. G. Jiang², H. F. Wang¹, Q. Y. Diao², and D. X. Ren³, ¹College of Animal Science and Technology, Zhejiang A & F University, Hangzhou-Lin'an, Zhejiang Province, China, ²Feed Research Institute, Chinese Academy of Agricultural Sciences, Beijing, China, ³Institute of Dairy Science, Zhejiang University, Hangzhou, Zhejiang Province, China.
- T355 **Decreasing the frequency of energy supplementation to beef steers impairs growth and antibody production against bovine viral diarrhoea virus 1b.**
Luis F. Artioli^{*1}, Philippe Moriel¹, Rodrigo S. Marques², and Reinaldo Cooke², ¹North Carolina State University, Waynesville, NC, ²Oregon State University, Burns, OR.
- T356 **Pre and postpartum herbage allowances of grasslands affected productive and reproductive performances of primiparous beef cows.**
Mariana Carriquiry^{*1}, Martín Claramunt², Ana L. Astessiano¹, and Pablo M. Soca³, ¹Facultad de Agronomía, Montevideo, Uruguay, ²Facultad de Veterinaria, Paysandú, Uruguay, ³Facultad de Agronomía, Paysandú, Uruguay.
- T357 **The effects of adding 3-nitrooxypropanol and monensin to a finishing diet on methane production using the rumen simulation technique (Rusitec).**
A. Romero-Perez^{*1,2}, E. K. Okine², L. L. Guan², S. M. Duval³, M. Kindermann⁴, and K. A. Beauchemin¹, ¹Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, AB, Canada, ²Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada, ³DSM Nutritional Products France, Research Centre for Animal Nutrition and Health, Saint Louis Cedex, France, ⁴DSM Nutritional Products, Basel, Switzerland.
- T358 **Nutritional performance and metabolic characteristics of cattle fed tropical forage with nitrogen and starch supplementation.**
Marcia de Oliveira Franco^{*}, Edenio Detmann, Alexandre Ribeiro Lopes, Luana Marta de Almeida Rufino, and Erick Darlison Batista, Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.
- T359 **Nutritional performance and metabolic characteristics of cattle fed low-quality tropical forage and supplemented with nitrogen associated with different starch proportions.**
Marcia de Oliveira Franco^{*}, Edenio Detmann, Marcília Medrado Barbosa, Gabriel Cipriano Rocha, and Claudia Batista Sampaio, Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.
- T360 **Effect of rumen protected carbohydrate supplementation on performance in feedlot finishing steers during heat stress.**
Juan P. Russi^{*1,3}, Patricio Davies⁴, Nicolas DiLorenzo², and Alejandro E. Relling¹, ¹Facultad de Cs Veterinarias, UNLP, La Plata, Buenos Aires, Argentina, ²University of Florida, Mariana, FL, ³RUPCA LLC, Merced, CA, ⁴INTA, Gral Villegas, Buenos Aires, Argentina.
- T361 **Partially replacing corn with glycerin increases total VFA, propionate, and ruminal NH₃-N concentrations in finishing beef diets evaluated in a dual-flow continuous culture system.**
Pedro Del Bianco Benedetti^{1,2}, Lorryny Galoro da Silva¹, Eduardo Marostegan de Paula¹, Teshome Shenkoru¹, Hugo Monteiro¹, Brad Amorati¹, Yehling Yeah¹, Marcos Marcondes², and Antonio Faciola^{*1}, ¹University of Nevada, Reno, NV, ²Federal University of Viçosa, Viçosa, MG, Brazil.
- T362 **Herbage allowance of grasslands during calf fetal and early life: Effects on body weight and composition.**
Mariana Carriquiry^{*1}, Martín Claramunt², Alberto Casal¹, Ana L. Astessiano¹, and Pablo M. Soca³, ¹Facultad de Agronomía, Ude-laR, Montevideo, Uruguay, ²Facultad de Veterinaria, UdelaR, Paysandú, Uruguay, ³Facultad de Agronomía, Paysandú, Uruguay.

- T363 **Effects of a standardized blend of phytochemicals on performance of beef cattle in two distinct dietary contexts using multiple trial analysis method.**
Clementine Oguey¹ and Christian Bruneau^{*2}, ¹*Pancosma SA, Le Grand Saconnex, GE, Switzerland*, ²*Pancosma, St Hyacinthe, QC, Canada*.
- T364 **Nutrient intake and productive performance of beef cattle fed diets containing soybean, corn, or sorghum silages.**
Lilian Oliveira Rosa^{*1}, Odilon Gomes Pereira¹, Karina Guimarães Ribeiro¹, Sebastião de Campos Valadares Filho¹, Stefanie Alvarenga Santos², Rilene Ferreira Diniz Valadares², and Andressa Fernanda Campos³, ¹*Viçosa Federal University, Viçosa, Minas Gerais, Brazil*, ²*Bahia Federal University, Salvador, Bahia, Brazil*, ³*Sao Paulo State University, Jaboticabal, Sao Paulo, Brazil*.
- T365 **Nutrient intake, total digestibility, ruminal pH, and ammonia concentration of beef cattle fed diets containing soybean, corn, or sorghum silages.**
Lilian Oliveira Rosa^{*1}, Odilon Gomes Pereira¹, Karina Guimarães Ribeiro¹, Sebastião de Campos Valadares Filho¹, Stefanie Alvarenga Santos², Rilene Ferreira Diniz Valadares², and Andressa Fernanda Campos³, ¹*Viçosa Federal University, Viçosa, Minas Gerais, Brazil*, ²*Bahia Federal University, Salvador, Bahia, Brazil*, ³*Sao Paulo State University, Jaboticabal, Sao Paulo, Brazil*.
- T366 **Enteric methane emissions in cattle fed diets containing sugar cane or corn silage.**
Lays Mariz^{1,4}, Stefanie Alvarenga Santos², Laura Franco Prados¹, Paloma de Melo Amaral^{*1,4}, Diego Zanetti¹, Gustavo Chamon de Castro Menezes¹, Sebastiao Valadares Filho¹, Antonio Faciola⁴, and Luiz Gustavo Pereira³, ¹*Federal University of Vicosa, Vicosa, MG, Brazil*, ²*School of Veterinary Medicine and Animal Science of the Federal University of Bahia (UFBA), Salvador, BA, Brazil*, ³*Embrapa Dairy Cattle, Juiz de Fora, MG, Brazil*, ⁴*University of Nevada, Reno, NV*.
- T367 **Effects of oscillating dietary crude protein on nutrient intake, digestibility, performance, and carcass traits of finishing cross-bred bulls in feedlot.**
Paloma de Melo Amaral^{*1,3}, Stefanie Alvarenga Santos², Laura Franco Prados¹, Lays Mariz^{1,3}, Lyvian Cardoso Alves¹, Ana Clara Baiao Menezes¹, Faider Alberto Castano Villadiego¹, Flavia Adriane de Sales Silva¹, Sebastiao Valadares Filho¹, and Antonio Faciola³, ¹*Federal University of Vicosa, Vicosa, MG, Brazil*, ²*School of Veterinary Medicine and Animal Science of the Federal University of Bahia (UFBA), Salvador, BA, Brazil*, ³*University of Nevada, Reno, NV*.
- T368 **Identification and removal of outliers in feed databases for beef cattle.**
Huyen Tran^{*1}, William Weiss², Galen Erickson³, and Phillip S. Miller³, ¹*National Animal Nutrition Program, University of Kentucky, Lexington, KY*, ²*The Ohio State University, Wooster, OH*, ³*University of Nebraska, Lincoln, NE*.
- T369 **Effects of energy and nitrogen supplementation of cheatgrass on ruminal fermentation using a dual-flow continuous culture system.**
Lorrayny Galoro da Silva^{*1}, Farnaz Malekjahani^{1,4}, Pedro Del Bianco Benedetti^{1,2}, Eduardo Marostegan de Paula¹, Teshome Shenkoru¹, Paloma de Melo Amaral^{1,2}, Lays Mariz^{1,2}, Hugo Monteiro^{1,3}, and Antonio Faciola¹, ¹*University of Nevada, Reno, NV*, ²*Federal University of Viçosa, Viçosa, MG, Brazil*, ³*Maringa State University, Maringa, PR, Brazil*, ⁴*Ferdowsi University, Mashhad, Iran*.
- T370 **Interactions between physical form of the feed and previous experience on concentrate spillage in Holstein calves.**
Maria Devant^{*1}, Alex Bach^{2,1}, Josep Ribó³, and Anna Solé¹, ¹*IRTA-Ruminant Production, Animal Nutrition, Management, and Welfare Research Group, Caldes Montbui, Spain*, ²*ICREA, Barcelona, Spain*, ³*Grup Alimentari Guissona, Guissona, Spain*.
- T371 **Effect of zinc amino acid complex on growth performance and carcass characteristics of finishing beef steers fed ractopamine hydrochloride.**
C. K. Larson and M. E. Branine^{*}, *Zinpro Corporation, Eden Prairie, MN*.
- T372 **Sources of nonfiber carbohydrate in sugarcane silage based diets.**
Viviane B. Ferrari^{*}, Nara R. B. Consolo, Rafael T. Sousa, Frederich D. Rodriguez, and Luís Felipe P. Silva, *University of São Paulo, São Paulo, Brazil*.
- T373 **Effects of starch content on in vitro ruminal fermentation of ground and dry-rolled barley grain.**
Uchenna Y. Anele¹, Basim Refat^{1,4}, Mary-Lou Swift², Yanli Zhao^{1,3}, Tim McAllister¹, and Wenzhu Yang^{*1}, ¹*Agriculture and Agri-Food Canada, Research Centre, Lethbridge, AB, Canada*, ²*Alberta Agriculture & Rural Development, Lethbridge, AB, Canada*, ³*Inner Mongolia Agricultural University, Hohhot, Inner Mongolia, China*, ⁴*Zagazig University, Zagazig, Egypt*.
- T374 **Effect of sainfoin hay and pomegranate peel extracts on in vitro fermentation and protein degradation using the Rusitec technique.**
Basim Refat^{1,2}, Uchenna Y. Anele¹, Zhixiong He^{*1,3}, S. M. Bassiony², G. A. Abdel-Rahman², and Wenzhu Yang¹, ¹*Agriculture and Agri-Food Canada, Research Centre, Lethbridge, AB, Canada*, ²*Faculty of Agriculture, University of Zagazig, Zagazig, Egypt*, ³*Institute of Subtropical Agriculture, The Chinese Academy of Science, Changsha, Hunan, China*.

- T375 **Effects of starch content and processing method on in situ rumen digestibility of barley grain in beef heifers.**
Yanli Zhao^{1,2}, Sumei Yan², Uchenna Y. Anele¹, Mary-Lou Swift³, Tim A. McAllister¹, and Wenzhu Yang^{*1}, ¹Lethbridge Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB, Canada, ²College of Animal Science, Inner Mongolia Agricultural University, Hohhot, Inner Mongolia, China, ³Alberta Agriculture and Rural Development, Lethbridge, AB, Canada.
- T376 **Effect of physical form of concentrate on performance, eating pattern, and behavior in Holstein bulls fed finishing high-concentrate diets.**
Marçal Verdú^{*1}, Alex Bach^{2,1}, and Maria Devant¹, ¹IRTA-Ruminant Production, Animal Nutrition, Management, and Welfare Research Group, Caldes Montbui, Spain, ²ICREA, Barcelona, Spain.
- T377 **Carcass and sensory traits and free amino acid contents among quality grades in loin and rump of Korean cattle steer.**
MinYu Piao, Cheorun Jo, Hyun Joo Kim, Hyun Jung Lee, Hyun Jin Kim, and Myunggi Baik^{*}, *Department of Agricultural Biotechnology, College of Agriculture and Life Science, Seoul National University, Seoul, Republic of Korea.*
- T378 **Plasma creatinine concentration of beef heifers fed with different lipid sources and frequency supplementation.**
Marcia Cristina A. Santana^{*1}, Ricardo A. Reis², Gabriel M. P. Melo², Viviane C. Modesto³, Telma T. Berchielli², Jucilene Cavali⁴, and Juliana F. H. Rodrigues⁴, ¹EMATER, Goiania, Goias, Brazil, ²Unesp, Jaboticabal, Sao Paulo, Brazil, ³Unesp, Ilha Solteira, Sao Paulo, Brazil, ⁴UNIR, Presidente Médici, Rondônia, Brazil.
- T379 **Efficacy of supplying lasalocid sodium via a self-fed trace mineralized salt block supplement to growing beef calves grazing warm season grass.**
Brandon Stewart^{*1}, Paul Beck¹, John Tucker², Tom Hess², and Don Hubbell², ¹University of Arkansas SWREC, Hope, AR, ²University of Arkansas LFRS, Batesville, AR.

Ruminant Nutrition Dairy II

- T380 **Dietary grain source and oil supplement: Milk fat synthesis and milk fatty acid profile of Holstein cows.**
Shahryar Kargar^{*1}, Gholam Reza Ghorbani², Veerle Fievez³, and David J. Schingoethe⁴, ¹Shiraz University, Shiraz, Iran, ²Isfahan University of Technology, Isfahan, Iran, ³Ghent University, Melle, Belgium, ⁴South Dakota State University, Brookings.
- T381 **Effect of biotin and pantothenic acid supplementation on performance and concentration of avidin-binding substances (ABS) in lactating dairy cows.**
Gonzalo Ferreira, Alston N. Brown^{*}, and Christy Teets, *Department of Dairy Science, Virginia Polytechnic Institute and State University, Blacksburg, VA.*
- T382 **Assessment of in vitro ruminal fermentation characteristics of lactation dairy diets supplemented with slow-release urea using continuous cultures.**
F. Mason¹, K. Neal², S. Y. Yang², J.-S. Eun^{*2}, and M. Spanghero¹, ¹Department of Agricultural and Environmental Science, University of Udine, Udine, Italy, ²Department of Animal, Dairy, and Veterinary Sciences, Utah State University, Logan, UT.
- T383 **Ruminal fermentation characteristics of lactation dairy diets with different forage-to-concentrate ratios without or with lipid extract algae in continuous cultures.**
S. Y. Yang^{*1}, K. Neal¹, J.-S. Eun¹, A. J. Young¹, and R. C. Sims², ¹Department of Animal, Dairy, and Veterinary Sciences, Utah State University, Logan, UT, ²Department of Biological Engineering, Utah State University, Logan, UT.
- T384 **In vitro ruminal metabolism of a lactation dairy diet supplemented with virgin coconut oil and pine bark extract in continuous cultures.**
S. Y. Yang^{*1}, R. W. S. Ningrat², K. Neal¹, B. R. Min³, and J.-S. Eun¹, ¹Department of Animal, Dairy, and Veterinary Sciences, Utah State University, Logan, UT, ²Faculty of Animal Sciences, Andalas University, Padang, Indonesia, ³Department of Agricultural and Environmental Sciences, Tuskegee University, Tuskegee, AL.
- T385 **Methane production from dairy cows fed regular or brown midrib corn silage.**
Fadi Hassanat^{*1}, Rachel Gervais², and Chaouki Benchaar¹, ¹Agriculture and Agri-Food Canada, Dairy and Swine Research and Development Centre, Sherbrooke, QC, Canada, ²Département des Sciences Animales, Université Laval, Québec, QC, Canada.

- T386 **Determination of in vivo and in situ bioavailability of a rumen-protected lysine product, AjiPro-L.**
Makoto Miura*¹, Atsushi Haruno¹, Hiroyuki Sato¹, Yuki Miyazawa¹, Eri Ikegami¹, Takeshi Fujieda¹, and Izuru Shinzato², ¹Research Institute for Bioscience Products & Fine Chemicals, Ajinomoto Co. Inc., Kawasaki, Kanagawa, Japan, ²Ajinomoto Heartland Inc., Chicago, IL.
- T387 **Handling characteristics of AjiPro-L in the practical use.**
Makoto Miura*¹, Yuki Miyazawa¹, Eri Ikegami¹, Mizuki Tanida¹, Takeshi Fujieda¹, and Izuru Shinzato², ¹Research Institute for Bioscience Products & Fine Chemicals, Ajinomoto Co. Inc., Kawasaki, Kanagawa, Japan, ²Ajinomoto Heartland Inc., Chicago, IL.
- T388 **Effects of corn silage hybrids on metabolic parameters and lactational performance of transition dairy cows.**
A. W. Kelley, K. Neal, J.-S. Eun*, and A. J. Young, Department of Animal, Dairy, and Veterinary Sciences, Utah State University, Logan, UT.
- T389 **Effects of thermal processed clay in nonmedicated rations in Japanese dairy farms.**
Fang Chi*¹, Fumiaki Atarashi², Kenji Wada², Hiroshi Endo², San Ching¹, and LeAnn Johnston¹, ¹Amlan International, Chicago, IL, ²Okitama Food Animal Clinic, Federation of Agricultural Mutual Aid Association, Yamagata Prefecture, Japan.
- T390 **Associations of behavior and production in lactating dairy cows.**
Carleigh Johnston and Trevor J. DeVries*, Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada.
- T391 **Growth performance and sorting behavior of heifers offered diets with forage dilution.**
Wayne Coblenz*¹, Nancy Esser², Patrick Hoffman³, and Matt Akins³, ¹US Dairy Forage Research Center, Marshfield, WI, ²University of Wisconsin, Marshfield, WI, ³University of Wisconsin, Madison, WI.
- T392 **Response of lactating cows to a blend of essential oils and pepper extract.**
Rayana B. Silva¹, Renata A. N. Pereira^{3,2}, Rafael C. Araújo⁴, and Marcos N. Pereira*^{1,2}, ¹Universidade Federal de Lavras, Lavras, MG, Brazil, ²Better Nature Research Center, Ijaci, MG, Brazil, ³Empresa de Pesquisa Agropecuária de Minas Gerais, Lavras, MG, Brazil, ⁴GRASP Ind. e Com. LTDA, Curitiba, PR, Brazil.
- T393 **Supplementation of herbage-based diets with corn meal or liquid molasses changes the milk fatty acids profile in grazing dairy cows.**
S. F. Reis¹, A. F. Brito*¹, P. Y. Chouinard³, K. J. Soder², and S. Ross¹, ¹University of New Hampshire, Durham, NH, ²USDA-Agricultural Research Service, University Park, PA, ³Université Laval, Québec City, Québec, Canada.
- T394 **Health, milk, milk components, milk quality and reproduction evaluated in Holstein cows fed OmniGen-AF from dry-off through 120 days in milk.**
Amanda E. Holland*¹, Frank E. Rivera¹, James D. Chapman¹, and Lane O. Ely², ¹Phibro Animal Health Corporation, Quincy, IL, ²University of Georgia, Athens, GA.
- T395 **Supplementing lactating cow diets with long chain fats has minimal effects on total tract NDF digestibility: A quantitative review.**
Kristina A. Weld* and Louis E. Armentano, University of Wisconsin-Madison, Madison, WI.
- T396 **Sodium and potassium carbonates added to continuous cultures of ruminal microorganisms had similar effects on reducing biohydrogenation intermediates linked to milk fat depression.**
Kaylin Young¹, Elliot Block², Joseph Harrison³, and Thomas Jenkins*¹, ¹Clemson University, Clemson, SC, ²Arm and Hammer Animal Nutrition, Princeton, NJ, ³Washington State University, Puyallup, WA.
- T397 **Effects of starch content and fermentability, and culture pH on biohydrogenation of unsaturated fatty acids and NDF digestibility in batch culture.**
Yan Sun*, Michael S. Allen, and Adam L. Lock, Michigan State University, East Lansing, MI.
- T398 **The effect of replacing corn silage with sugarcane on milk yield and intake of lactating dairy cows: An analysis using CNCPS v6.5.**
Edgar A. Collao-Saenz*¹, Andreas Foskolos², Ryan J. Higgs², Vera L. Banys¹, Marcos N. Pereira³, and Michael E. Van Amburgh², ¹Universidade Federal de Goiás, Jataí, GO, Brazil, ²Cornell University, Ithaca, NY, ³Universidade Federal de Lavras, Lavras, MG, Brazil.
- T399 **Effect of dietary energy source and protein supply on dairy cow performance.**
Helio Rezende Lima Neto¹, Helene Lapierre², and Lorraine Doepel*¹, ¹University of Calgary, Calgary, Alberta, Canada, ²Agriculture and Agri-Food Canada, Sherbrooke, Quebec, Canada.

- T400 **Effect of dietary energy source and protein supply on mammary amino acid metabolism of dairy cows.**
Helio Rezende Lima Neto¹, Helene Lapierre², and Lorraine Doepel*¹, ¹University of Calgary, Calgary, AB, Canada, ²Agriculture and Agri-Food Canada, Sherbrooke, QC, Canada.
- T401 **Effect of supplemental level of Optigen on the milk performance and plasma biochemical indices of dairy goat.**
Wang Hui¹, Xue Neil², and Luo Jun*¹, ¹Alltech-NWAFU Animal Science Research Alliance, Northwest A&F University, Yangling, Shaanxi, China, ²Alltech China, Chaoyang District, Beijing, China.
- T402 **A sensory additive increases milk and protein responses to concentrate supplementation in grazing dairy cows.**
R. Pulido¹, M. Ruiz¹, F. Bargo*², G. Tedó², R. Cussen³, J. Acuña³, J. R. Roche⁴, and I. R. Ipharraguerre², ¹UACh, Valdivia, Chile, ²Lucta SA, Barcelona, Spain, ³BestFed, Osorno, Chile, ⁴Down to Earth Advice Ltd, Hamilton, New Zealand.
- T403 **Effect of intensified milk feeding on immune status and hepatic energy metabolism of calves.**
Christine T. Schäff*¹, Tadeusz Stefaniak², Paulina Jawor², and Harald M. Hammon¹, ¹Leibniz Institute for Farm Animal Biology (FBN), Dummerstorf, Germany, ²Faculty of Veterinary Medicine, Wrocław University of Environmental and Life Science, Wrocław, Poland.
- T404 **Effect of lactation stage and rate of increase of concentrate allowance on rumen adaptation in dairy cows.**
Kasper Dieho*¹, André Bannink², Thomas J. Schonewille³, and Jan Dijkstra¹, ¹Animal Nutrition Group, Wageningen University, Wageningen, the Netherlands, ²Animal Nutrition, Wageningen UR Livestock Research, Wageningen, the Netherlands, ³Department of Farm Animal Health, Faculty of Veterinary Medicine, Utrecht University, Utrecht, the Netherlands.
- T405 **Breed and stage of lactation affect the content of bioactive fatty acids in milk.**
Melissa L. Bainbridge*¹, Laura M. Cersosimo¹, André-Denis G. Wright², and Jana Kraft¹, ¹University of Vermont, Burlington, VT, ²University of Arizona, Tucson, AZ.
- T406 **Rumen microbial protein outflow, and plasma amino acid levels, in early lactation multiparity Holstein cows on commercial California dairy farms.**
Nadia Swanepoel*^{1,2}, Peter H. Robinson¹, and Lourens J. Erasmus², ¹Department of Animal Science, University of California, Davis, CA, ²Department of Animal and Wildlife Sciences, University of Pretoria, Pretoria, South Africa.
- T407 **Evaluating different physical concentrate forms in preweaned calves.**
Marta Terré¹, Maria Devant*¹, and Alex Bach^{2,1}, ¹IRTA, Caldes de Montbui, Spain, ²ICREA, Barcelona, Spain.
- T408 **Fetal programming on dairy cows: Effect of dam's parity and days in milk at conception on first-lactation milk yield in dairy cows.**
Ayelen Chiarle¹, Ramiro Rearte¹, Santiago Corva¹, R. Luzbel de la Sota^{1,2}, Mauricio Giuliodori¹, and Alejandro Relling*^{1,3}, ¹Fac. Cs Veterinarias, UNLP, La Plata, Argentina, ²CCT La Plata, CONICET, Argentina, ³IGEVET, CCT La Plata, CONICET, Argentina.
- T409 **Transcriptome profile in cows resistant to milk fat depression.**
Adriana Siurana¹, Sergio Calsamiglia*¹, David Gallardo³, and Angela Canovas², ¹Animal Nutrition and Welfare Service, Universitat Autònoma de Barcelona, Bellaterra, Spain, ²Servei Veterinari de Genètica Molecular, Universitat Autònoma de Barcelona, Bellaterra, Spain, ³Departament de Genètica Animal, Centre de Recerca en Agrigenòmica, Universitat Autònoma de Barcelona, Bellaterra, Spain.
- T410 **Apparent synthesis of vitamin B₆ and folates in the rumen of lactating dairy cows fed alfalfa or orchardgrass silages.**
D. S. Castagnino*^{1,2}, M. Seck^{1,2}, K. L. Kammer³, J. A. Voelker Linton³, M. S. Allen³, R. Gervais², P. Y. Chouinard², and C. L. Girard¹, ¹Agriculture and Agri-Food Canada, Sherbrooke, QC, Canada, ²Département des Sciences Animales, Université Laval, Québec, QC, Canada, ³Department of Animal Science, Michigan State University, East Lansing, MI.
- T411 **Noninvasive indicators to identify lactating dairy cows with the greater risk of subacute rumen acidosis.**
Xiaosheng Gao* and Masahito Oba, University of Alberta, Edmonton, Alberta, Canada.
- T412 **Effects of different dosages of *Saccharomyces cerevisiae* fermentation product on lactation performance of dairy cows under heat stress.**
Wen Zhu*¹, B. X. Zhang¹, K. Y. Yao¹, I. Yoon², Ruby Chung², J. K. Wang¹, J. A. Ye¹, and J. X. Liu¹, ¹Institute of Dairy Science, College of Animal Science, Zhejiang University, Hangzhou, China, ²Diamond V, Cedar Rapids, IA.
- T413 **Effects of *Saccharomyces cerevisiae* fermentation products on lactation performance, rumen fermentation and microbial communities in dairy cows fed a diet containing low quality forages.**
Wen Zhu*¹, Z. H. Wei¹, N. N. Xu¹, Fan Yang¹, I. Yoon², Ruby Chung², J. K. Wang¹, J. A. Ye¹, and J. X. Liu¹, ¹Institute of Dairy Science, College of Animal Science, Zhejiang University, Hangzhou, China, ²Diamond V, Cedar Rapids, IA.

- T414 **Response of dairy cows to monensin on diets differing in starch content and source.**
Eugenio F. Barbosa¹, Julia D. L. Dias¹, Fabiana F. Cardoso¹, Túlio H. R. Souza¹, Lucas C. Resende¹, Ozana F. Zacaroni¹, Renata A. N. Pereira^{3,2}, and Marcos N. Pereira^{*1,2}, ¹Universidade Federal de Lavras, Lavras, MG, Brazil, ²Better Nature Research Center, Ijaci, MG, Brazil, ³Empresa de Pesquisa Agropecuária de Minas Gerais, Lavras, MG, Brazil.
- T415 **Growth performance of dairy heifers fed reduced-fat distillers grains in replacement of forage in limit-fed rations.**
Angela K. Manthey^{*1}, Jill L. Anderson¹, and George A. Perry², ¹Dairy Science Department, South Dakota State University, Brookings, SD, ²Department of Animal Science, South Dakota State University, Brookings, SD.
- T416 **Ruminal degradation and intestinal digestibility of camelina and carinata meal compared with other protein sources.**
Rhea D. Lawrence^{*} and Jill L. Anderson, Dairy Science Department, South Dakota State University, Brookings, SD.
- T417 **The decline in digestive efficiency of US dairy cows during the last 44 years.**
Sarah B. Potts^{*}, Melissa Shaughnessy, and Richard A. Erdman, University of Maryland, College Park, MD.
- T418 **Ruminal degradation and intestinal digestibility of microbially treated soybean meal and dried distillers grains compared with the original feeds.**
Jennifer L. Casperson¹, Jill L. Anderson^{*1}, Jason R. Croat², and William R. Gibbons², ¹Dairy Science Department, South Dakota State University, Brookings, SD, ²Department of Biology and Microbiology, South Dakota State University, Brookings, SD.
- T419 **Meta-analysis of feeding trials to estimate energy requirements of dairy cows under tropical conditions.**
André S. Oliveira^{*}, Universidade Federal de Mato Grosso, Campus Sinop, Sinop, Mato Grosso, Brazil.
- T420 **Effect of a ration change from a TMR to a pasture-based ration on rumen bacteria in dairy cows.**
Melanie Schären^{*1}, Ulrich Meyer¹, Sven Dänicke¹, and Gerhard Breves², ¹Friedrich Loeffler Institut (FLI)-Federal Research Institute for Animal Health - Institute for Animal Nutrition, Braunschweig, Germany, ²University of Veterinary Medicine Hannover, Foundation - Institute for Physiology, Hannover, Germany.
- T421 **Morphology change and expression of genes related to tight junctions, cytokines, proliferation and apoptosis in the rumen of lactating dairy cows fed corn stover or rice straw replacing alfalfa as forage source.**
Bing Wang^{*1,3}, Mei Liu^{1,3}, X. B. Huang^{1,3}, J. S. Wu², and J. X. Liu^{1,3}, ¹Institute of Dairy Science, College of Animal Sciences, Zhejiang University, Hangzhou, China, ²Department of Veterinary Science, College of Animal Sciences, Zhejiang University, Hangzhou, China, ³MOE Key Laboratory of Molecular Animal Nutrition, Zhejiang University, Hangzhou, China.
- T422 **Effect of a calcium oral bolus administered after calving on the metabolic parameters of dairy cows.**
J. M. Béguin^{*1}, R. P. Dagorne¹, and P. Courty², ¹Néolait, Yffiniac, France, ²ESITPA, Mont-Saint-Aignan, France.
- T423 **Urea kinetics in dairy cows fed soybean meal (SBM), canola meal (CM), corn high protein dried distillers grains (HPDDG) or wheat dried distillers grains with solubles (WDDGS).**
D. R. Ouellet^{*1}, G. Maxin², and H. Lapierre¹, ¹Dairy and Swine R&D Centre, Agriculture and Agri-Food Canada, Sherbrooke, QC, Canada, ²INRA UMR 1213 Herbivores, Saint-Genès-Champagnelle, France.
- T424 **Determining bioavailability of Lys in rumen-protected Lys products using the plasma free AA dose-response technique.**
Nancy L. Whitehouse^{*1}, Andre B. D. Pereira¹, Adam C. Crowther¹, Devan L. Chirgwin¹, Andre F. Brito¹, Charles G. Schwab², and Jack E. Garrett³, ¹University of New Hampshire, Durham, NH, ²Schwab Consulting, LLC, Boscobel, WI, ³QualiTech Inc., Chaska, MN.
- T425 **Blood ketone bodies incidence and concentration from intensively housed early-lactation dairy cows in Brazil.**
Rafahel C. Souza¹, Rogério C. Souza¹, Breno M. Sousa², and Andre B. D. Pereira^{*3}, ¹Pontifícia Universidade Católica de Minas Gerais, Betim, MG, Brazil, ²Centro Universitário UniBH, Belo Horizonte, MG, Brazil, ³University of New Hampshire, Durham, NH.
- T426 **Evaluation of camelina meal as a feedstuff for growing dairy heifers.**
Rhea D. Lawrence^{*} and Jill L. Anderson, Dairy Science Department, South Dakota State University, Brookings, SD.
- T427 **Evaluation of the incidence of subclinical ketosis for F₁ Gir x Holstein lactating dairy cows supplemented with medium-chain fatty acids.**
Rafahel C. Souza¹, Rogério C. Souza¹, Vanessa A. Teixeira¹, Joaquim H. C. M. Souza Junior¹, Igor C. Leal¹, Andre B. D. Pereira^{*2}, and Maria I. V. Melo¹, ¹Pontifícia Universidade Católica de Minas Gerais, Betim, MG, Brazil, ²University of New Hampshire, Durham, NH.

- T428 **Milk production and composition of F₁ Gir x Holstein lactating cows supplemented with medium-chain fatty acids during the periparturient period.**
Rafael C. Souza¹, Rogério C. Souza¹, Vanessa A. Teixeira¹, Igor G. Leal¹, Joaquim H. C. M. Souza Junior¹, Andre B. D. Pereira^{*2}, and Maria I. V. Melo¹, ¹Pontifícia Universidade Católica de Minas Gerais, Betim, MG, Brazil, ²University of New Hampshire, Durham, NH.
- T429 **Effects of casein, glucose, and acetate infused into the abomasum of feed-restricted cows on milk and milk components yield.**
Marina A. C. Danes^{*1}, Michel A. Wattiaux¹, and Glen A. Broderick², ¹University of Wisconsin-Madison, Madison, WI, ²Broderick Nutrition & Research LLC.
- T430 **The effect of pelletized corn stover replacing alfalfa hay on lactation performance, blood parameters and rumen fermentation in mid-lactation dairy cows.**
H. Z. Sun^{*1,2}, Z. H. Wei^{1,2}, Wen Zhu^{1,2}, X. Xie^{1,2}, J. K. Wang^{1,2}, L. L. Guan³, and J. X. Liu^{1,2}, ¹Institute of Dairy Science, College of Animal Sciences, Zhejiang University, Hangzhou, China, ²MoE Key Laboratory of Molecular Animal Nutrition, Zhejiang University, Hangzhou, China, ³Department of Agricultural, Food & Nutritional Science, University of Alberta, Edmonton, Canada.
- T431 **Supplementation with artificial sweetener improves milk yield and composition and alters nutrient partitioning in lactating dairy cows.**
Emma H. Wall^{*1,2} and David M. Bravo², ¹Pancosma, Geneva, Switzerland, ²InVivo Animal Nutrition & Health, Saint-Nolff, France.
- T432 **Effect of fish oil on transportation of fatty acids in plasma lipoproteins of lactating and nonlactating cows.**
Einar Vargas-Bello-Pérez^{*1}, Gonzalo Íñiguez-González¹, Philip C. Garnsworthy², and Juan J. Lóor³, ¹Pontificia Universidad Católica de Chile, Santiago, Chile, ²The University of Nottingham, Loughborough, UK, ³University of Illinois, Urbana, IL.
- T433 **Development and evaluation of predictive models of intake for crossbred Holstein-Zebu dairy cows.**
V. L. Souza^{*1}, T. Z. Albertini¹, R. Almeida², G. B. Mourão¹, J. K. Drackley³, and D. P. D. Lanna¹, ¹Esalq/USP, Piracicaba, SP, Brazil, ²Universidade Federal do Paraná, Curitiba, PR, Brazil, ³University of Illinois, Urbana, IL.
- T434 **Soil contamination in forages: Estimation and geographical distribution.**
J. R. Knapp^{*1}, W. P. Weiss², R. T. Ward³, and K. R. Perryman⁴, ¹Fox Hollow Consulting LLC, Columbus, OH, ²Dept. of Animal Sciences, The Ohio State University, Wooster, OH, ³Cumberland Valley Analytical Services, Hagerstown, MD, ⁴Micronutrients Inc., Indianapolis, IN.
- T435 **Comparison of two methods to quantify free amino acids in cow plasma.**
Nelson Lobos^{*1}, Glen Broderick², Nancy Whitehouse⁵, Daniel Luchini³, Michel Wattiaux¹, and Peter Crump⁴, ¹Department of Dairy Science, University of Wisconsin-Madison, Madison, WI, ²Broderick Nutrition & Research LLC, Madison, WI, ³Adisseo S.A.S, Alpharetta, GA, ⁴Department of Computing and Biometry, University of Wisconsin-Madison, Madison, WI, ⁵Department of Biological Sciences, University of New Hampshire, Durham, NH.
- T436 **Fecal starch and starch digestibility: An indirect interrelationship.**
C. E. Owens¹, R. A. Zinn², and F. N. Owens^{*3}, ¹Duke University, Durham, NC, ²University of California, El Centro, CA, ³DuPont Pioneer, Johnston, IA.
- T437 **Starch and NDF digestibility by high-producing lactating cows: A field study.**
B. Powel-Smith, L. J. Nuzback, W. C. Mahanna, and F. N. Owens^{*}, DuPont Pioneer, Johnston, IA.
- T438 **Effects of diets with different energy levels on growth performance and rumen environment of heifer.**
Yan Tu^{*1,2}, Xiang Cui¹, Tao Ma^{1,2}, Bing-wen Si^{1,2}, Nai-feng Zhang^{1,2}, and Qi-yu Diao^{1,2}, ¹Feed Research Institute of Chinese Academy of Agricultural Sciences, Key Laboratory of Feed Biotechnology of the Ministry of Agriculture, Beijing, China, ²Beijing Key Laboratory for Dairy Cow Nutrition, Beijing, China.
- T439 **Effect of tallow and soybean oil addition to calf starters fed to dairy calves from birth to four months of age on calf performance and digestion.**
T. Mark Hill^{*}, H. Gale Bateman, James M. Aldrich, James D. Quigley, and Rick L. Schlotterbeck, Nurture Research Center, Provimi North America, Brookville, OH.
- T440 **Relationships between udder resistance and dietary levels of copper and zinc.**
Alfredo J. Escribano¹, Juan Jose Mallo^{*1}, Luis Miguel Jiménez², and Nuria Roger², ¹NOREL Animal Nutrition, Madrid, Spain, ²Servet Talavera S.L, Talavera de la Reina, Toledo, Spain.
- T441 **Use of a fermented ammoniated condensed whey product in lactating dairy cattle.**
John P. McNamara^{*1}, Drina Huisman¹, Heather M. Hastings¹, and Gerald Poppy², ¹Washington State University, Pullman, WA, ²Packerland Whey Product Inc., Luxemburg, WI.

- T442 **Evaluating varying dietary protein and energy levels for economical productive performance of Nili-Ravi buffalo heifer calves.**
Zeeshan Muhammad Iqbal*¹, Muhammad Abdullah¹, Khalid Javed¹, Makhdoom Abdul Jabbar¹, and Juan J. Loo², ¹University of Veterinary and Animal Sciences, Lahore, Pakistan, ²University of Illinois at Urbana-Champaign, Urbana, IL.
- T443 **Trace mineral variation in dairy forages: Where are the hot spots?**
J. R. Knapp*¹, W. P. Weiss², R. T. Ward³, and K. R. Perryman⁴, ¹Fox Hollow Consulting LLC, Columbus, OH, ²Dept. of Animal Sciences, The Ohio State University, Wooster, OH, ³Cumberland Valley Analytical Services, Hagerstown, MD, ⁴Micronutrients Inc., Indianapolis, IN.
- T444 **Evaluating carbon and oxygen flux variability and heat production in dairy cows using a portable automated gas quantification system.**
Andre B. D. Pereira*¹, Andre F. Brito¹, Santiago A. Utsumi², Brianna J. Isenberg¹, and Kelly S. O'Connor¹, ¹University of New Hampshire, Durham, NH, ²Michigan State University, W. K. Kellogg Biological Station, Hickory Corners, MI.
- T445 **Influence of a grape seed and grape marc meal extract (GSGME) on performance parameters, hepatic expression of pro-inflammatory and ER stress-related genes and antioxidant status in dairy cows.**
Denise K. Gessner¹, Christian Koch², Franz-Josef Romberg², Anne Winkler³, Georg Dusel³, Eva Herzog¹, Erika Most¹, Anne-Kathrin Blässe*⁴, Bernhard Eckel⁴, and Klaus Eder¹, ¹Justus Liebig University Giessen, Giessen, Germany, ²Lehr- und Versuchsanstalt Hofgut Neumühle, Neumühle, Germany, ³University of Applied Sciences Bingen, Bingen, Germany, ⁴Dr. Eckel GmbH, Niederzissen, Germany.
- T446 **Effects of *Saccharomyces cerevisiae* fermentation products on dairy calf: I. Pre-weaning performance and post-weaning stress.**
G. M. Alugongo*¹, J. X. Xiao¹, R. Chung², S. Z. Dong¹, S. L. Li¹, I. Yoon², and Z. J. Cao¹, ¹State Key Laboratory of Animal Nutrition, Department of Animal Nutrition and Feed Sciences, China Agricultural University, Beijing, China, ²Diamond V, Cedar Rapids, IA.
- T447 **Fibrolytic enzyme and corn silage differing in particle size for lactating dairy cows.**
Gilson S. Dias Júnior*¹, Alan S. Pereira¹, Fabiana F. Cardoso¹, Renata A. N. Pereira^{3,2}, and Marcos N. Pereira^{1,2}, ¹Universidade Federal de Lavras, Lavras, MG, Brazil, ²Better Nature Research Center, Ijaci, MG, Brazil, ³Empresa de Pesquisa Agropecuária de Minas Gerais, Lavras, MG, Brazil.
- T448 **Meta-analysis to examine the effect of supplemental sugar on dairy cow performance as influenced by diet nutrient components.**
Stephen M. Emanuele*¹, Mary Beth de Ondarza², and Charles J. Sniffen³, ¹Quality Liquid Feeds, Dodgeville, WI, ²Paradox Nutrition LLC, West Chazy, NY, ³Fencrest LLC, Holderness, NH.
- T449 **Pre- and post weaning performance and health of dairy calves fed milk replacers with plant and milk protein by-product sources balanced for selected amino acids.**
Hugh Chester-Jones*¹, Dustin Dean², David Ziegler¹, and Kevin Halpin², ¹University of Minnesota Southern Research and Outreach Center, Waseca, MN, ²International Ingredients Corporation, St. Louis, MO.
- T450 **The effect of biochemical fulvic acid (BFA) on heat stress and lactation performance in lactating cows.**
Yifan Fan*, Xiaoming Zhang, and Zhijun Cao, State Key Laboratory of Animal Nutrition, Department of Animal Nutrition and Feed Sciences, China Agricultural University, Beijing, China.
- T451 **Pre- and post-weaning performance and health of dairy calves fed all-milk protein milk replacers or partially replacing milk protein with plasma and plant proteins in varying combinations.**
Bruce Ziegler*¹, David Ziegler², Hugh Chester-Jones², Daniel Schimek¹, Mary Raeth³, and David Cook⁴, ¹Hubbard Feeds, Inc., Mankato, MN, ²University of Minnesota Southern Research and Outreach Center, Waseca, MN, ³University of Minnesota Department of Animal Science, St. Paul, MN, ⁴Milk Products, Chilton, WI.
- T452 **Flow of microbial crude protein out of the rumen when dairy cattle are supplemented with 2-hydroxy-4-methylthio-butanoic acid (HMTBa).**
C. J. R. Jenkins¹, S. C. Fernando¹, C. L. Anderson³, N. D. Aluthge², E. Castillo-Lopez^{4,1}, H. A. Tucker⁵, G. I. Zanton⁵, D. Hostetler*⁶, and P. J. Kononoff¹, ¹Department of Animal Science, University of Nebraska-Lincoln, Lincoln, NE, ²Food Science and Technology Department, University of Nebraska-Lincoln, Lincoln, NE, ³School of Biological Sciences, University of Nebraska-Lincoln, Lincoln, NE, ⁴Instituto de Investigaciones Oceanológicas, Universidad Autónoma de Baja California, Ensenada, México, ⁵Novus International Inc., St. Charles, MO, ⁶The School of Veterinary Medicine and Biomedical Sciences, University of Nebraska-Lincoln, Lincoln, NE.

- T453 **Differences in microbial community structure associated with metabolizable protein and 2-hydroxy-4-methylthio-butanoic acid (HMTBa) supplementation when using in vitro and in vivo methods.**
C. J. R. Jenkins¹, N. D. Aluthge², C. Anderson³, S. C. Fernando*¹, H. A. Tucker⁴, G. I. Zanton⁴, D. Hostetler⁵, and P. J. Kononoff¹,
¹Department of Animal Science, University of Nebraska-Lincoln, Lincoln, NE, ²Food Science and Technology Department, University of Nebraska-Lincoln, Lincoln, NE, ³School of Biological Sciences, University of Nebraska-Lincoln, Lincoln, NE, ⁴Novus International Inc., St. Charles, MO, ⁵The School of Veterinary Medicine and Biomedical Sciences, University of Nebraska-Lincoln, Lincoln, NE.
- T454 **The effect of long-day photoperiod on behavior of lactating dairy cows.**
Kira Macmillan*, Santiago Espinoza, and Masahito Oba, *University of Alberta, Edmonton, Alberta, Canada.*
- T455 **Effects of *Saccharomyces cerevisiae* fermentation products on dairy calf: II) rumen fermentation and gastrointestinal development.**
Jianxin Xiao*¹, Gibson Maswayi Alungo¹, Ruby Chung², Dongshuang Zhao¹, Shengli Li¹, Ilkyu Yoon², and Zhijun Cao¹, ¹State Key Laboratory of Animal Nutrition, Department of Animal Nutrition and Feed Sciences, China Agricultural University, Beijing, China, ²Diamond V, Cedar Rapids, IA.
- T456 **Effects of exogenous C16:0 and C18 fatty acids (FA) on milk lipid metabolism in bovine mammary epithelial cells.**
N. Dan*¹, H. Zhang², C. J. Ao¹, and Khas-Erdene¹, ¹College of Animal Science, Inner Mongolia Agricultural University, Hohhot, Inner Mongolia, China, ²College of Animal Science, Inner Mongolia University for the Nationalities, Tongliao, Inner Mongolia, China.
- T457 **Does ruminal pH affect flow of N fractions in high-producing dairy cows?**
Danilo Domingues Millen*¹, Charles Schwab², and Sergio Calsamiglia³, ¹Sao Paulo State University, Dracena, Sao Paulo, Brazil, ²Department of Animal and Nutritional Sciences, University of New Hampshire, Durham, NH, ³Animal Nutrition and Welfare Service, Universidad Autonoma de Barcelona, Bellaterra, Spain.

Ruminant Nutrition General II

- T205 **Effects of prophylactic subcutaneous calcium treatment at calving on macro mineral status and health in Holstein cows.**
Hamid Amanlou¹, Ahmad Pourakbari¹, Noelia Silva del Rio*², and Najme Eslamian Farsuni¹, ¹Zanjan University, Zanjan, Zanjan, Iran, ²University of California, Davis, CA.
- T458 **Effect of time of gestation on fatty acid transporter and receptor mRNA concentration in bovine placenta.**
Ramiro Desantadina¹, Silvina Quntana², Mariana Recavarren², Luis Fazzino³, and Alejandro Relling*^{1,3}, ¹Fc Cs Veterinarias, UNLP, La Plata, Argentina, ²Lab. Farestaie, Mar del Plata, Argentina, ³IGEVET CCT La Plata, CONICET, Argentina.
- T459 **Ensiling carinata meal with forages to decrease glucosinolate concentrations.**
Karla Rodriguez-Hernandez*^{1,2}, Jill L. Anderson¹, and Mark A. Berhow³, ¹Dairy Science Department, South Dakota State University, Brookings, SD, ²CIRNOC, INIFAP, Matamoros, Mexico, ³USDA, ARS, NCAUR, Peoria, IL.
- T460 **Double-layered S/O/W emulsions as rumen delivery system for potential site-selective delivery of lysine in cows.**
Yongguang Guan and Qixin Zhong*, *Department of Food Science and Technology, University of Tennessee, Knoxville, TN.*
- T461 **Effects of dietary n-6 and n-3 fatty acid sources on intake, digestibility, rumen microbes and fatty acid profile in sheep.**
Sardar M. Amanullah^{1,3}, Sam Churl Kim*¹, Dong Hyeon Kim¹, Hyuk Jun lee¹, Young Ho Joo¹, and Eun Tae Kim², ¹Division of Applied Life Science (BK21Plus, Insti. of Agric. & Life Sci.), Gyeongsang National University, Jinju, Gyeongsangnam-do, South Korea, ²Dairy Science Division, National Institute of Animal Science, RDA, Cheonan, Chungcheongnam-do, South Korea, ³Bangladesh Livestock Research Institute, Dhaka, Bangladesh.
- T462 **Approaches to confidence intervals for the energy requirements of beef cattle.**
Hugo Colombarolli Bonfá*, Edenio Detmann, Paulo Roberto Cecon, Sebastião de Campos Valadares Filho, and José Gilson Louzada Regadas Filho, *Universidade Federal de Minas Gerais, Viçosa, Minas Gerais, Brazil.*
- T463 **Predicting ruminal methane inhibition by condensed tannins using nonlinear exponential decay regression analysis.**
Harley D. Naumann¹, Mozart A. Fonseca*², and Luis O. Tedeschi², ¹University of Missouri, Columbia, MO, ²Texas A&M University, College Station, TX.

- T464 **Effect of lipid sources with different fatty acid profiles on intake and nutrient digestion of feedlot Nellore steers.**
Juliana Duarte Messana*, Giovani Fiorentini, Isabela P. C. Carvalho, Pablo S. Castagnino, and Telma T. Berchielli, *UNESP - Univ. Estadual Paulista, Jaboticabal, São Paulo, Brazil.*
- T465 **Experimental design and data-reporting needs to help support the advancement of nutrition research and nutrient requirement models.**
C. Roselina Angel⁷, Mark Hanigan², Ermias Kebreab³, Brian Kerr⁴, John P. McNamara⁵, Nathalie Trottier¹, Luis O. Tedeschi⁶, Mike J. Vandehaar¹, and Robin R. White^{*2}, ¹Michigan State University, East Lansing, MI, ²Virginia Tech University, Blacksburg, VA, ³University of California Davis, Davis, CA, ⁴ARS USDA, Ames, IA, ⁵Washington State University, Pullman, WA, ⁶Texas A&M, College Station, TX, ⁷University of Maryland, College Park, MD.
- T466 **Oxygen uptake by splanchnic tissues of sheep infused with different N compounds into the mesenteric vein.**
Simone Stefanello, Gilberto V. Kozloski*, Mariana P. Mezzomo, Alsiane S. Capelesso, Tiago Orlandi, Fernanda Hentz, and Diego Zeni, *Universidade Federal de Santa Maria, Santa Maria, RS, Brazil.*
- T467 **Net flux of metabolites by liver of sheep infused with different N compounds into the mesenteric vein.**
Simone Stefanello, Gilberto V. Kozloski*, Renato N. Libardoni, Gabriela P. Coradini, Sabrina Bäumer, Marta L. R. Leal, and André V. Soares, *Universidade Federal de Santa Maria, Santa Maria, RS, Brazil.*
- T468 **Evaluation of dairy and beef farm greenhouse gas emissions in different areas of Spain.**
Ibidhi Ridha and Sergio Calsamiglia*, *Animal Nutrition and Welfare Service, Universitat Autònoma de Barcelona, Bellaterra, Spain.*
- T469 **Detect the association of protein structures to protein nutrient utilization and availability of co-products from bio-fuel and bio-brewing processing.**
Xuewei Zhang¹, Limei Chen^{2,1}, Yajing Ban², and Peiqiang Yu^{*2,1}, ¹Department of Animal Science, Tianjin Agricultural University, Tianjin, China, ²Department of Animal and Poultry Science, University of Saskatchewan, Saskatoon, SK, Canada.
- T470 **Effects of essential oils from wormwood hybrids on in vitro digestibility, microbial diversity and rumen fermentation of bermudagrass hay and soybean meal.**
Seong Shin Lee^{*1}, Hee Yoon¹, Hyuk Jun Lee¹, Dong Hyeon Kim^{1,3}, Sardar M. Amanullah¹, Young Ho Joo¹, Eun Tae Kim², Adegbola T. Adesogan³, and Sam Churl Kim¹, ¹Division of Applied Life Science (BK21Plus, Insti. of Agri. & Life Sci.), Gyeongsang National University, Jinju, Gyeongsangnam-do, South Korea, ²Dairy Science Division, National Institute of Animal Science, RDA, Cheonan, Chungcheongnam-do, South Korea, ³Department of Animal Science, Institute of Food and Agricultural Sciences, University of Florida, Gainesville, FL.
- T471 **Dry matter intake and feeding behavior of cattle fed cottonseed and vitamin E.**
Ricardo Galbiatti Sandoval Nogueira*, Flavio Perna, Eduardo Cuellar Orlandi Cassiano, Lizbeth Collazo Paucar, Mariane Cheschin Ernandes, Diana Carolina Zapata Vasquez, Adrielle Matias Ferrinho, Romulo Germano de Resende, Felipe Bispo Mendonça, Renata Gardenalli, Angélica Simone Cravo Pereira, and Paulo Henrique Mazza Rodrigues, *University of São Paulo, Pirassununga, São Paulo, Brazil.*
- T472 **In situ degradability, rumen bacteria population, and in vitro gas production in cannulated steers fed diets with and without HMTBa.**
Y. Liang, S. E. Bettis, M. Wehmeyer, G. I. Zanton, H. A. Tucker*, and M. Vazquez-Anon, *Novus International Inc., St. Charles, MO.*
- T473 **Effect of sustained-release mineral dietetic feed bolus on plasma trace minerals status in grazing heifers.**
J. M. Beguin^{*1}, R. P. Dagorne¹, and R. Lecrubier², ¹NEOLAIT, Yffiniac, France, ²ESA, Angers, France.
- T474 **Crambe meal (*Crambe abyssinica*) inclusion in feed of Santa Inês crossbred lambs on blood serum urea.**
Karilyn Ferreira Moreira, Darcilene Maria Figueiredo*, Adriano Oliveira Cruz, Ronald Matos dos Santos, Juscilene Aparecida Silva Pacheco, Cassiane Gomes dos Santos, Daniela Cordeiro Rocha, Marianne Schorer, and Aldrin Vieira Pires, *Universidade Federal dos Vales do Jequitinhonha e Mucuri, Diamantina, MG, Brazil.*
- T475 **Crambe meal (*Crambe abyssinica*) inclusion in food of Santa Inês crossbred lambs on urea nitrogen.**
Karilyn Ferreira Moreira, Darcilene Maria Figueiredo*, Adriano Oliveira Cruz, Ronald Matos dos Santos, Juscilene Aparecida Silva Pacheco, Cassiane Gomes dos Santos, Daniela Cordeiro Barbosa, Marianne Schorer, and Aldrin Vieira Pires, *Universidade Federal dos Vales do Jequitinhonha e Mucuri, Diamantina, MG, Brazil.*
- T476 **Induction of subacute ruminal acidosis affects gene expression in rumen epithelial tissue.**
J. C. McCann*, S. Alqarni, S. Luan, F. C. Cardoso, and J. J. Loor, *University of Illinois at Urbana-Champaign, Urbana, IL.*

- T477 **Effects of monensin and essential oils from some Nigerian spices on methane production and ruminal fermentation in vitro.**
Musibau A. Bamikole^{1,2}, Ibukun M. Ogunade^{*1}, Felipe Amaro¹, Yun Jiang¹, Thiago F. Bernardes¹, Darren D. Henry³, F. O. Ugiagbe², U. J. Ikhatua², Nicolas DiLorenzo³, and Adegbola T. Adesogan¹, ¹University of Florida, Gainesville, FL, ²University of Benin, Benin city, Nigeria, ³North Florida Research and Education Center, University of Florida, Marianna, FL.
- T478 **Effect of heating method on alteration of protein molecular structure in flaxseed: Relationship with changes in protein sub-fraction profile and digestion in dairy cows.**
Nazir A. Khan¹, Helen Booker², Yajing Ban¹, and Peiqiang Yu^{*1}, ¹Department of Animal and Poultry Science, University of Saskatchewan, Saskatoon, SK, Canada, ²Department of Plant Sciences, University of Saskatchewan, Department of Plant Sciences, University of Saskatchewan, Saskatoon, SK, Canada.
- T479 **Investigation of protein digestion kinetics in vitro using ¹⁵N-labeled timothy and red clover.**
Merko Vaga^{*}, Kerstin Huss-Danell, Mårten Hetta, and Pekka Huhtanen, *Dept. of Agricultural Research for Northern Sweden, Swedish University of Agricultural Sciences, Umeå, Sweden.*
- T480 **Effects of yam (*Dioscorea opposita*) supplementation on in vitro digestibility and rumen fermentation characteristics of ground corn and perennial ryegrass.**
Jin Yeon Park^{*1}, Tea Hyeon Kim¹, Hyuk Jun Lee², Young Ho Joo², Sardar M. Amanullah², Dong Hyeon Kim², In Hak Choi³, and Sam Churl Kim^{1,2}, ¹Department of Animal Science, Gyungang National University, Jinju, Gyeongsangnam-do, South Korea, ²Division of Applied Life Science (BK21Plus, Insti. of Agric. & Life Sci.), Gyungang National University, Jinju, Gyeongsangnam-do, South Korea, ³Department of Companion Animal & Animal Resources Sciences, Joongbu University, Geumsan, Chungcheongnam-do, South Korea.
- T481 **In vitro study of yeast cell-wall β -glucans behavior in ruminal fluid.**
Nadia Yacoubi¹, Jean Philippe Marden³, and Corine Bayourthe^{*2}, ¹INRA UR1268 Biopolymers Interactions Assemblies, Nantes, France, ²Université de Toulouse, INRA, UMR 1388 INRA-INPT GenPhySE, Castanet-Tolosan, France, ³Phileo Lesaffre Animal Care, Marcq en Baroeul, France.
- T482 **Effect of different sources of glycerol on in vitro fermentation parameters of corn silage.**
E. H. C. B. van Cleef^{*1,2}, E. S. Castro Filho¹, M. T. C. Almeida¹, J. R. Paschoaloto¹, I. Monsignati¹, S. F. B. Buzinaro³, and J. M. B. Ezequiel¹, ¹São Paulo State University, Jaboticabal, São Paulo, Brazil, ²FAPESP, São Paulo, Brazil, ³University of São Paulo, Pirassununga, São Paulo, Brazil.
- T483 **Quality evaluation of corn silage prepared with microbial inoculants.**
Luiz Keller^{*1,4}, Marcos Aronovich³, Christiane Perali^{2,4}, Eliane Rodrigues³, Airton Castagna³, and Carlos Rosa^{2,4}, ¹Universidade Federal Fluminense (UFF), Rio de Janeiro, RJ, Brazil, ²Universidade Federal Rural do Rio de Janeiro (UFRRJ), Rio de Janeiro, RJ, Brazil, ³Empresa de Desenvolvimento Agropecuário do Estado do Rio de Janeiro (PESAGRO-RJ), Rio de Janeiro, RJ, Brazil, ⁴Conselho Nacional de Pesquisas Científicas (CNPq), Belo Horizonte, MG, Brazil.
- T484 **Utilization of equations to predict carbohydrate fractions in some tropical grasses.**
Romualdo S. Fukushima^{*}, Carolina B. Bacha, Adriana P. Fuzeto, Ana C. R. Port, Valdo R. Herling, and Alejandro V. Velasquez, *Sao Paulo University, Pirassununga, SP, Brazil.*
- T485 **Analysis of microbial populations in Rusitec fermenters fed diets of variable composition.**
Ivan Mateos², Maria Jose Ranilla^{*2,3}, Cristina Saro², Alexey Díaz², Maria Gracia De Garnica², Jairo Garcia², and Maria Dolores Carro¹, ¹Technical University of Madrid, Madrid, Spain, ²University of León, León, Spain, ³IGM (CSIC-ULE), Grulleros, León, Spain.
- T486 **Influence of inoculum preparation method on in vitro methane production by ruminal microorganisms.**
Mireia Ramos¹, Ivan Mateos², Cristina Saro², Alexey Díaz², Maria Jose Ranilla^{*2,3}, and Maria Dolores Carro¹, ¹Technical University of Madrid, Madrid, Spain, ²University of León, León, Spain, ³IGM (CSIC-ULE), Grulleros, León, Spain.
- T487 **Microbial rDNA sequences as markers to determine microbial synthesis in Rusitec fermenters: A comparison with ¹⁵N.**
Cristina Saro², Maria Jose Ranilla^{*2,3}, Ivan Mateos², Alexey Díaz², Jairo Garcia², Maria Gracia de Garnica², and Maria Dolores Carro¹, ¹Technical University of Madrid, Madrid, Spain, ²University of León, León, Spain, ³IGM (CSIC-ULE), Grulleros, León, Spain.
- T488 **Comparison of Roche 454 and Ion Torrent Personal Genome Machine sequencing on the rumen bacterial profiles of dairy cows.**
Nagaraju Indugu^{*}, Sanjay Kumar, Bonnie Vecchiarelli, and Dipti Pitta, *Department of Clinical Studies, School of Veterinary Medicine, New Bolton Center, University of Pennsylvania, Kennett Square, PA.*

- T489 **Effect of chitosan in dairy cows diets on ruminal fermentation and milk yield and composition.**
Carlos Eduardo Cardoso Consentini¹, Elmeson Ferreira de Jesus², Pablo Gomes de Paiva^{*2}, Tiago Antonio Del Valle¹, Gustavo Ferreira de Almeida¹, Artur Gabriel Brao Vilas Boas Costa¹, Fernanda Carolina Ramos dos Santos¹, Victor Chiaroni Galvão¹, and Francisco Palma Rennó¹, ¹*School of Veterinary Medicine and Animal Science of USP, Pirassununga, São Paulo, Brazil*, ²*School of Agricultural and Veterinary Sciences of UNESP, Jaboticabal, São Paulo, Brazil*.
- T490 **Method to measure production of volatile fatty acids and gases in vitro.**
Latisha M. Judd* and Richard A. Kohn, *University of Maryland, College Park, MD*.
- T491 **A rapid mold and yeast enumeration technique is comparable to a conventional technique for animal feedstuffs.**
Lauren Meyer*¹ and John Goeser^{1,2}, ¹*Rock River Laboratory, Watertown, WI*, ²*University of Wisconsin-Madison, Madison, WI*.
- T492 **Comparison of acetyl bromide lignin with acid detergent lignin and relationship with in vitro forage degradability.**
Romualdo S. Fukushima*^{1,2}, Monty Kerley², Marcelo H. Ramos², James H. Porter², and Robert L. Kallenbach², ¹*Sao Paulo University, Pirassununga, SP, Brazil*, ²*University of Missouri, Columbia, MO*.
- T493 **What roles do viruses play in the rumen?**
Christopher Anderson, Galen Erickson, and Samodha Fernando*, *University of Nebraska, Lincoln, NE*.

Small Ruminant II

- T494 **Effects of short term inclusion of mixed fish and sunflower oils in finishing diet on carcass characteristics and performance of fat tailed Afshari lambs.**
H. R. Mirzaei Alamouti*, T. Khademi, M. H. Shahir, and M. Hajilo, *Department of Animal Science, University of Zanjan, Iran*.
- T495 **Growth, hepatic enzymes and carcass characteristics of lambs fed diets containing increasing levels of crude glycerin.**
D. M. Polizel¹, R. S. Gentil¹, E. M. Ferreira¹, R. A. Souza¹, A. P. A. Freire¹, M. C. A. Sucupira², and I. Susin*¹, ¹*Escola Superior de Agricultura Luiz de Queiroz (ESALQ)/USP, Piracicaba, SP, Brazil*, ²*Faculdade de Medicina Veterinária e Zootecnia (FMVZ)/USP, São Paulo, SP, Brazil*.
- T496 **Effect of supplementation with dried citrus pulp, urea, and DDGS on reproductive performance of goats.**
Mayra A. Liñan Gonzalez¹, Hugo Bernal Barragan*¹, Fernando Sanchez Davila¹, Rogelio A. Ledezma Torres¹, Miguel Cervantes Ramirez², and Braulio Valles de la Mora³, ¹*Universidad Autonoma de Nuevo Leon, San Nicolas de los Garza, Nuevo Leon, Mexico*, ²*Universidad Autonoma de Baja California, Mexicali, Baja California, Mexico*, ³*Universidad Nacional Autonoma de Mexico, Martinez de la Torre, Veracruz, Mexico*.
- T497 **Effect of feed restriction on protein metabolism of Saanen goats of different sexes.**
Nhayandra C. D. Silva*, Izabelle A. M. A. Teixeira, Carla J. Härter, Simone P. Silva, Amélia K. Almeida, Diogo C. Soares, and Kléber T. Resende, *Unesp Univ Estadual Paulista, Jaboticabal, São Paulo, Brazil*.
- T498 **Female goat kids change their energy metabolism when subjected to feed restriction.**
Nhayandra C. D. Silva*¹, Izabelle A. M. A. Teixeira¹, Carla J. Härter¹, Fernanda O. M. Figueiredo¹, Rafael F. Leite¹, Moaceli M. Freire², and Kléber T. Resende¹, ¹*Unesp Univ Estadual Paulista, Jaboticabal, São Paulo, Brazil*, ²*Universidade Federal de Alagoas, Maceió, Alagoas, Brazil*.
- T499 **Effects of restricted diet access on intake and performance by dairy goats in mid- to late lactation.**
Nhayandra C. D. Silva*^{1,2}, Ryszard Puchala¹, Terry A. Gipson¹, Yoko Tsukahara¹, Tilahun Sahl¹, and Arthur L. Goetsch¹, ¹*American Institute for Goat Research, Langston University, Langston, OK*, ²*UNESP, Universidade Estadual Paulista, Department of Animal Science, Jaboticabal, SP, Brazil*.
- T500 **Effect of sodium monensin on rumen metabolism in lambs fed high-forage diets.**
Mariana F. Westphalen*¹, Daniel M. Polizel², Marcelo H. Santos², Renan G. Silva², Analisa V. Bertoloni¹, Gabriela B. Oliveira¹, Thiago S. Andrade², Vinicius N. Gouvea², Marcos V. Biehl², and Alexandre V. Pires^{1,2}, ¹*University of São Paulo, Piracicaba, São Paulo, Brazil*, ²*University of São Paulo, Pirassununga, São Paulo, Brazil*.

- T501 **Either intramuscular or submucous vulvar administration of HCG positively affects the reproductive outcomes of anovulatory Alpine goats in Northern Mexico.**
Karen Isabel Tapia-Robles*¹, Cesar Alberto Meza-Herrera², Jessica Maria Flores-Salas¹, Alan Sebastian Alvarado-Espino¹, Vicente Homero Gonzalez-Alvarez¹, Evaristo Carrillo-Castellanos³, Juan Manuel Guillen-Muñoz¹, Francisco Gerardo Veliz-Deras¹, and Rafael Rodriguez-Martinez¹, ¹Universidad Autonoma Agraria Antonio Narro, Torreon, Mexico, ²Universidad Autonoma Chapingo, Unidad Regional Universitaria de Zonas Aridas, Bermejillo, Durango, Mexico, ³Instituto Tecnológico de Torreon, Torreon, Mexico.
- T502 **Performance of Santa Inês meat lambs receiving cactus pear (*Nopalea cochenillifera*) in substitution of Tifton hay with or without access of water.**
Alma V. Cordova Torres¹, Leonardo S. Knupp², Antonello Cannas*², Giustino Gaspa², José T. Araújo Filho¹, Ariosvaldo N. Medeiros¹, Neymar L. Alves³, and Roberto G. Costa¹, ¹Programa de Pós Graduação em Ciência e Tecnologia de Alimentos, Universidade Federal da Paraíba, João Pessoa, Paraíba, Brazil, ²Dipartimento di Agraria, University of Sassari, Sardinia, Italy, ³Departamento de Zootecnia, Universidade Federal de Alagoas, Rio Largo, Alagoas, Brazil.
- T503 **Influence of supplementing lamb with dried algae + live yeast product on growth and blood metabolites during summer.**
Ekin Sucu*¹, Duygu Udum Küçüksen², and Nazmiye Günes², ¹Department of Animal Science, Faculty of Agriculture, Uludag University, Bursa, Turkey, ²Department of Biochemistry, Faculty of Veterinary Medicine, Uludag University, Bursa, Turkey.
- T504 **Net energy and protein requirements for growth of Moxotó goats grazing in the semiarid region of Brazil.**
Marcos J. Araújo*¹, Ariosvaldo N. Medeiros², Carlo A. T. Marques¹, Roberto G. Costa², Francisco F. R. Carvalho³, and Jacira N. C. Torreão⁴, ¹Federal University of Piauí, Bom Jesus, Piauí, Brazil, ²Federal University of Paraíba, Areia, Paraíba, Brazil, ³Federal Rural University of Pernambuco, Recife, Pernambuco, Brazil, ⁴Colégio Técnico de Bom Jesus, Bom Jesus, Piauí, Brazil.
- T505 **Reproductive outcomes of anovulatory females exposed to males treated with either i.m. or s.c. testosterone.**
Andrea González-Tavizón*¹, Cezar A. Meza-Herrera², Alan Sebastián Alvarado-Espino¹, Vicente Homero González-Álvarez¹, M. de los Angeles de Santiago-Miramontes¹, M. Guadalupe Calderón-Leyva¹, Juan Manuel Guillen Muñoz¹, Fernando Arrellano-Rodríguez¹, and Francisco Gerardo Véliz-Deras¹, ¹Universidad Autónoma Agraria Antonio Narro, Torreón Coahuila, México, ²Universidad Autónoma Chapingo, Unidad Universitaria de Zonas Aridas, Bermejillo Durango, México.
- T506 **Mineral requirements for growth and maintenance of F₁ Boer × Saanen male kids.**
Izabelle A. M. A. Teixeira*¹, Carla J. Härter¹, José M. Pereira Filho², Américo G. Silva Sobrinho¹, and Kleber T. Resende¹, ¹UNESP, Universidade Estadual Paulista, Department of Animal Science, Jaboticabal, SP, Brazil, ²Universidade Federal De Campina Grande, Patos, PB, Brazil.
- T507 **Analysing the diversity of five Spanish sheep breeds by combining massive genotyping and RNA-seq data.**
Antonia Noce¹, Arianna Manunza¹, Ángela Cánovas¹, Silvia Adán², Luis A. Bermejo³, Juan Capote⁴, Juan Vicente Delgado⁵, Jordi Jordana⁶, Vincenzo Landi⁵, Agueda Pons⁷, Armand Sánchez¹, Oriol Vidal⁸, Amparo Martínez⁵, Marcel Amills¹, Joaquim Casellas*⁶, ¹Centro de Investigación en Agrigenómica, Bellaterra, Spain, ²Federación de Razas Autóctonas de Galicia, Coles, Spain, ³Universidad de La Laguna, San Cristóbal de la Laguna, Spain, ⁴Instituto Canario de Investigaciones Agrarias, San Cristóbal de la Laguna, Spain, ⁵Universidad de Córdoba, Córdoba, Spain, ⁶Universitat Autònoma de Barcelona, Bellaterra, Spain, ⁷Serveis de Millora Agrària i Pesquera, Son Ferriol, Spain, ⁸Universitat de Girona, Girona, Spain.
- T508 **Body condition as a reference for slaughter of feedlot lambs fed sunflower cake.**
Flavio Monção², Euclides Oliveira¹, Andréia Gabriel¹, Rodrigo Sousa¹, Jefferson Gandra*¹, Mariana Santos¹, Lais Moura¹, Luiz Henrique Silva¹, Leandro Silva¹, Loan Silva¹, Thais Pereira¹, and Vadim Carbonari¹, ¹Faculdade de Ciências Agrárias, Universidade Federal da Grande Dourados, Dourados, MS, Brazil, ²Universidade Estadual Julio de Mesquita, Jaboticabal, SP, Brazil.
- T509 **Performance of Santa Inês meat lambs receiving cactus pear (*Opuntia ficus indica* Mill) in substitution of forage with or without access of water.**
José Matias Porto Filho¹, Leonardo S. Knupp², Antonello Cannas*², Alberto S. Atzori², Ariosvaldo N. Medeiros¹, George R. B. Cruz¹, Genilson B. Silva¹, and Roberto G. Costa¹, ¹Programa de Pós Graduação em Ciência e Tecnologia de Alimentos, Universidade Federal da Paraíba, João Pessoa, Paraíba, Brazil, ²Dipartimento di Agraria, University of Sassari, Sardinia, Italy.
- T510 **Effects of oral glycerol dosage on short duration transportation shrink in goats.**
Amy L. Bax*¹, James D. Caldwell¹, Taylor N. Drane¹, Kelsey L. Basinger², Haley L. Bartimus², Jessica K. Clark², Cindy A. DeOrnelis¹, Jeri D. Rippetto¹, Abbey J. Kempker¹, Mikel J. Thompson¹, Blake E. Koelling¹, and Bruce C. Shanks¹, ¹Lincoln University, Jefferson City, MO, ²University of Arkansas, Fayetteville, AR.

- T511 **Effects of breed and resistance classification of sire on progeny growth performance and response to artificial infection with *Haemonchus contortus* in a central performance test.**
Yoko Tsukahara*¹, Terry A. Gipson¹, Steven P. Hart¹, Lionel J. Dawson^{1,2}, Zaisen Wang¹, Ryszard Puchala¹, Tilahun Sahlu¹, and Arthur L. Goetsch¹, ¹American Institute for Goat Research, Langston University, Langston, OK, ²Center of Veterinary Health Sciences, Oklahoma State University, Stillwater, OK.
- T512 **Growth performance and resistance to internal parasitism of small ruminant males from the south-central US in a centralized test.**
Yoko Tsukahara*¹, Terry A. Gipson¹, Steven P. Hart¹, Lionel J. Dawson^{1,2}, Zaisen Wang¹, Ryszard Puchala¹, Tilahun Sahlu¹, and Arthur L. Goetsch¹, ¹American Institute for Goat Research, Langston University, Langston, OK, ²Center of Veterinary Health Sciences, Oklahoma State University, Stillwater, OK.
- T513 **The *FecG*^E allele of the ovine *GDF9* gene in the Pelibuey breed in México and its effects on prolificacy.**
Felipe A. Rodríguez-Almeida*, Claudia P. Pérez-Camacho, María E. Burrola-Barraza, and Joel Domínguez-Viveros, *Facultad de Zootecnia y Ecología, Universidad Autónoma de Chihuahua, Chihuahua, México.*
- T514 **Methane concentration and degradation profile of broom sorghum based-diets for sheep.**
M. A. Cerrillo-Soto¹, A. L. Abdalla², R. C. Lucas², A. Estrada-Angulo³, F. G. Rios-Rincón³, and M. Guerrero-Cervantes*¹, ¹Universidad Juárez del Estado de Durango, Durango, Dgo, México, ²Centro de Energia Nuclear na Agricultura, Piracicaba, São Paulo, Brazil, ³Universidad Autónoma de Sinaloa, Culiacán, Sin., México.
- T515 **Effect of timing of PGF_{2α} administration in a short-term progesterone-based estrous synchronization protocol on fertility in ewes.**
Callayn D. Paul*, Erin N. Greenleaf, Adam K. Redhead, Abiodun E. Adebisi, and Marlon Knights, *West Virginia University, Morgantown, WV.*
- T516 **Method of zilpaterol hydrochloride supplementation on meat quality of feedlot lambs.**
Horacio Davila-Ramos*, Karla Hildeliza Leyva-Medina, Salvador Garcia-Sandoval, Jessica Berenice Zuñiga-Villegas, and Juan Carlos Robles-Estrada, *Universidad Autonoma de Sinaloa, Culiacan, Sinaloa, Mexico.*
- T517 **Effect of weaning on rapid rebreeding in Katahdin ewes.**
Erin N. Greenleaf*, Callayn D. Paul, Abiodun E. Adebisi, Kyle J. Powell, Adam K. Redhead, and Marlon Knights, *West Virginia University, Morgantown, WV.*
- T518 **Effect of supplementation with propylene glycol and lactation period on energy metabolism of lactating ewes.**
Simone Pedro da Silva*¹, Gilberto de Lima Macedo Junior², Rogério Pereira dos Santos³, Jhone Talisson Lira de Sousa³, Marina Elizabeth Barbosa de Andrade⁴, Érica Beatriz Schultz², Luciano Fernandes de Sousa³, Adriano Santana Crozara², and Nhayandra Christina Dias e Silva⁴, ¹Instituto Federal Goiano, Hidrolândia, Goiás, Brazil, ²Universidade Federal de Uberlândia, Uberlândia, Minas Gerais, Brazil, ³Universidade Federal do Tocantins, Araguaína, Tocantins, Brazil, ⁴Universidade Estadual Paulista, Jaboticabal, São Paulo, Brazil.
- T519 **Crude glycerin added into low-starch diets improved fatty acid profile of lamb meat.**
V. B. Carvalho*, J. M. B. Ezequiel, R. F. Leite, M. T. C. Almeida, J. R. Paschoaloto, H. L. Perez, E. A. Oliveira, A. C. Homem Junior, E. B. Carvalho, and E. S. Castro Filho, *Universidade Estadual Paulista, Jaboticabal, São Paulo, Brazil.*
- T520 **Detection of gene expression and location of receptors activated by the oral administration of lithium chloride for conditioned taste aversion in sheep.**
Katariina Vara¹, Ahmed K. K. Salama^{1,2}, Carmen L. Manuelian¹, Maristela Rovai*¹, Juan J. Loo³, Elena Albanell¹, Xavier Such¹, and Gerardo Caja¹, ¹Group of Ruminant Research (G2R), Universitat Autònoma de Barcelona, Bellaterra, Spain, ²Animal Production Research Institute, Dokki, Giza, Egypt, ³Department Animal Science. University of Illinois, Urbana, IL.
- T521 **Conditioned taste aversion generalization by aroma in sheep.**
Carmen L. Manuelian¹, Elena Albanell¹, Maristela Rovai*¹, Ahmed K. K. Salama^{1,2}, and Gerardo Caja¹, ¹Group of Ruminant Research (G2R), Universitat Autònoma de Barcelona, Bellaterra, Barcelona, Spain, ²Animal Production Research Institute, Dokki, Giza, Egypt.
- T522 **Microbial population and in vitro gas production of sheep fed diets with starch and neutral detergent-soluble fiber.**
Josemir S. Gonçalves*¹, Jane M. B. Ezequiel¹, Eric H. C. B. Van Cleef¹, Antonio C. Homem Junior², and Raquel L. Salgado³, ¹UNESP - Univ Estadual Paulista, Faculdade de Ciências Agrárias e Veterinárias, Jaboticabal, São Paulo, Brazil, ²UNESP - Univ Estadual Paulista, Faculdade de Engenharia, Ilha Solteira, São Paulo, Brazil, ³UFERSA - Federal University of Semi-arid, Mossoró, Rio Grande do Norte, Brazil.

- T523 **Effects of replacement of soybean meal with handmade fish meal on productive performance of Pelibuey ewes and their suckling kids.**
Jose L. Loya-Olguin*¹, Yissel S. Valdes-Garcia¹, Lilia E. Nuñez-Gonzalez¹, Alberto Barreras², Alejandro Plascencia², Francisco Escalera-Valente¹, and Alejandro A. Gomez-Danes¹, ¹Posgrado en Ciencias Biológico Agropecuarias/Unidad Académica de Medicina Veterinaria y Zootecnia de Universidad Autónoma de Nayarit, Tepic, Nayarit, Mexico, ²Instituto de Investigaciones en Ciencias Veterinarias, Universidad Autónoma de Baja California, Mexicali, Baja California, Mexico.
- T524 **Ruminal kinetics on sheep fed diets with starch and neutral detergent-soluble fiber.**
Josemir S. Gonçalves*¹, Jane M. B. Ezequiel¹, Eric H. C. B. Van Cleef¹, Antonio C. Homem Junior², and Raquel L. Salgado³, ¹UNESP - Univ Estadual Paulista, Faculdade de Ciências Agrárias e Veterinárias, Jaboticabal, São Paulo, Brazil, ²UNESP-Univ Estadual Paulista, Faculdade de Engenharia, Ilha Solteira, São Paulo, Brazil, ³UFERSA-Federal University of Semi-arid, Mossoró, Rio Grande do Norte, Brazil.
- T525 **Relationship between body condition score and body fat depots in Pelibuey ewes.**
Gamaliel Antonio-Molina¹, Alfonso Chay-Canul*¹, Juan Ku-Vera², Armando Gomez-Vazquez¹, and Aldenamar Cruz-Hernandez¹, ¹División Académica de Ciencias Agropecuarias, Universidad Juárez Autónoma de Tabasco, Tabasco, Mexico, ²Facultad de Medicina Veterinaria y Zootecnia, Universidad Autónoma de Yucatán, Yucatán, Mexico.
- T526 **The sexual behavior of male goats treated with exogenous testosterone is affected by the feeding level.**
Ma de Santiago Miramontes*¹, J. F. Alvarado-Espinosa¹, F. G. Véliz-Deras¹, O. Ángel-García¹, A. Gonzalez-Tavizón¹, M. G. Calderón-Leyva¹, L. I. Vélez-Monroy², J. D. Hernández-Bustamante¹, and M. Mellado¹, ¹Universidad Autónoma Agraria Antonio Narro, ²Instituto Nacional de Investigaciones Agrícolas y Pecuarias.
- T527 **Pre-weaning and post-weaning growth performance of F₁ intact male Kiko × Boer goat kids from does divided into high and low lines for parasite resistance—One year summary.**
Kelsey L. Basinger*^{1,2}, Bruce C. Shanks¹, Jason K. Apple², James D. Caldwell¹, Luke S. Wilbers¹, Chevisse L. Thomas¹, Whitney M. Haslag¹, Shelby N. Kleithermes¹, and Amy L. Bax¹, ¹Lincoln University, Jefferson City, MO, ²University of Arkansas, Fayetteville, AR.
- T528 **Effect of adding zeolite (clinoptilolite) on growth performance and carcass characteristics in hair lambs fed a finishing diet.**
Luis Antonio Rojas Roman¹, Beatriz Isabel Castro Perez*¹, Francisco Coronel Burgos¹, Alfredo Estrada Angulo¹, Alejandro Plascencia Jorquera², Andrea Cerrillo Soto³, Carlos Raul Rivera Mendez¹, Francisco Gerardo Rios Rincon¹, and German Contreras Perez¹, ¹Universidad Autónoma de Sinaloa, Culiacan, Sinaloa, Mexico, ²Universidad Autónoma de Baja California, Mexicali, Baja California, Mexico, ³Universidad Juárez del Estado de Durango, Durango, Durango, Mexico.
- T529 **Indices of enzyme activities and atherogenicity of lamb meat fed high levels of crude glycerin.**
R. F. Leite*, V. B. Carvalho, J. M. B. Ezequiel, M. T. C. Almeida, J. R. Paschoaloto, H. L. Perez, E. A. Oliveira, A. C. Homem Junior, E. B. Carvalho, E. S. Castro Filho, and E. M. O. D'Aurea, Universidade Estadual Paulista, Jaboticabal, São Paulo, Brazil.
- T530 **Performance of lambs fed corn stalk silages plus pig excreta, poultry litter and urea, or cane molasses and bakery by-products.**
Daniel Trujillo-Gutiérrez¹, José L. Bórquez-Gastelum¹, Sergio S. González-Muñoz*², Mario A. Cobos-Peralta², and Ignacio A. Domínguez-Vara¹, ¹Universidad Autónoma del Estado de México, Toluca, Estado de México, México, ²Colegio de Postgraduados, Montecillo, Estado de México, México.

Teaching/Undergraduate and Graduate Education

- T531 **Instructors' perceptions of the importance and adequacy of "high-impact educational practices" in the animal science undergraduate curriculum in the United States.**
Sanjeeva D. Ranathunga*¹, Michel A. Wattiaux¹, and Peter Crump², ¹Department of Dairy Science, University of Wisconsin, Madison, WI, ²Department of Computing and Biometry, University of Wisconsin, Madison, WI.
- T532 **Effect of volunteer activities on the students' understanding of equine assisted therapy.**
Molly Nicodemus*, Toree Bova, and Jennifer Lockhart, Mississippi State University, Mississippi State, MS.
- T533 **Students' perceptions of learning effectiveness in a capstone dairy management course.**
Lisa A. Holden*, Pennsylvania State University, University Park, PA.
- T534 **Ever wonder what they're thinking? Using a reflective academic journal to gauge learning in a content heavy classroom.**
Douglas Vincent*, University of Hawaii at Manoa, Honolulu, HI.

- T535 **Retention of concepts related to beef palatability from classroom experience of an informal consumer sensory panel in conjunction with discussion.**
Jay A. Daniel*¹, George R. Gallagher¹, and T. Dean Pringle², ¹*Berry College, Mount Berry, GA*, ²*University of Georgia, Athens, GA*.
- T536 **Relationship between course performance and graduation rates of animal science majors.**
M. J. Anderson*, J. L. Leatherwood, M. M. Beverly, K. J. Stutts, and S. F. Kelley, *Sam Houston State University, Huntsville, TX*.
- T537 ***Fine Focus*: A new international undergraduate microbiology research journal.**
John L. McKillip*, *Ball State University, Muncie, IN*.

SYMPOSIA AND ORAL SESSIONS

ADSA Production Division Symposium

Production efficiency of the dairy cow

Chair: Barry Bradford, Kansas State University

Sponsors: Adisseo and Ajinomoto Heartland
Panzacola F-2

- 9:30 AM **Introduction.**
Ken McGuffey.
- 9:45 AM 349 **Genetics of productive life.**
Chad Dechow*, *Penn State University, University Park, PA.*
- 10:15 AM 350 **Economics of production efficiency: Nutritional grouping.**
Victor E. Cabrera*, *University of Wisconsin-Madison, Madison, WI.*
- 10:45 AM **Break**
- 11:00 AM 351 **Potential benefits of nutrition on reproductive performance of high-efficiency dairy cows.**
Milo Wiltbank*¹, Paulo Carvalho¹, Alex Souza¹, Paul Fricke¹, Mateus Toledo¹, Roberto Sartori², Jose Santos³, Guilherme Pontes², Daniel Luchini⁴, Francisco Penagaricano³, Hasan Khatib¹, Katherine Hackbart¹, and Randy Shaver¹,
¹*University of Wisconsin-Madison, Madison, WI*, ²*University of Sao Paulo, Piracicaba, SP, Brazil*, ³*University of Florida, Gainesville, FL*, ⁴*Adisseo, Alpharetta, GA.*
- 11:30 AM 352 **Providing facilities to improve health, welfare, and productive life.**
Trevor J. DeVries*¹, Marina A. G. von Keyserlingk², and Daniel M. Weary², ¹*Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada*, ²*Animal Welfare Program, University of British Columbia, Vancouver, BC, Canada.*
- 12:00 PM 353 **Precision dairy monitoring technologies as tools to improve dairy production efficiency.**
J. M. Bewley*, R. A. Russell, A. E. Stone, B. A. Wadsworth, K. A. Dolecheck, M. R. Borchers, M. E. Weatherly, L. M. Mayo, I. C. Tsai, M. C. Hardy, and J. M. Klefot, *University of Kentucky, Lexington, KY.*

Animal Health

Transition cow health

Chair: Tom Overton, Cornell University

Sebastian I-2

- 9:30 AM 354 **Characterizing critical thresholds of subclinical ketosis using the in-line milk monitoring system Herd Navigator.**
Elizabeth R. Ellis*, Tom C. Wright, John P. Cant, and Vern R. Osborne, *Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada.*
- 9:45 AM 355 **Monitoring rumination in transition dairy cows for the early detection of subclinical ketosis.**
Emily I. Kaufman*¹, Stephen J. Leblanc², Brian W. McBride¹, Todd F. Duffield², and Trevor J. DeVries¹, ¹*Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada*, ²*Department of Population Medicine, University of Guelph, Guelph, ON, Canada.*
- 10:00 AM 356 **Use of a rumination and activity monitoring for the identification of dairy cows with health disorders.**
Matias L. Stangaferro*, Robert Wijma, Cristian E. Quinteros, Miranda M. Medrano, Magdalena Masello, and Julio O. Giordano, *Department of Animal Science, Cornell University, Ithaca, NY.*
- 10:15 AM 357 **Development of a ketosis prevalence tool in Holstein dairy cows based on milk component data and cow test-day information.**
Tawny L. Chandler*¹, Ryan S. Pralle¹, Garrett R. Oetzel¹, Robert H. Fourdraine², and Heather M. White¹, ¹*University of Wisconsin-Madison, Madison, WI*, ²*AgSource Cooperative Services, Verona, WI.*

- 10:30 AM 358 **Evaluation of recurrence of frequent diseases and disorders in early postpartum dairy cows.**
Achilles Vieira-Neto*¹, Ana Carolina Parize³, Carlos A. Risco², José Eduardo P. Santos¹, and Klíbs N. Galvão², ¹*Department of Animal Sciences, University of Florida, Gainesville, FL*, ²*Department of Large Animal Clinical Sciences, University of Florida, Gainesville, FL*, ³*Escola de Veterinária e Zootecnia, Universidade Federal de Goiás, Goiânia, GO, Brazil*.
- 10:45 AM 359 **Early lactation disease incidence in Holstein cows across multiple US regions.**
Pablo Pinedo*^{1,6}, Jose Santos², Gustavo Schuenemann³, Rodrigo Bicalho⁴, Ricardo Chebel², Klíbs Galvão², Robert Gilbert⁴, Sandra Rodriguez-Zas⁵, Guilherme Rosa⁶, Christopher Seabury⁷, John Fetrow⁸, and William Thatcher², ¹*Texas A&M AgriLife Research, Amarillo TX*, ²*University of Florida, Gainesville, FL*, ³*The Ohio State University, Columbus, OH*, ⁴*Cornell University, Ithaca, NY*, ⁵*University of Illinois, Urbana-Champaign, IL*, ⁶*University of Wisconsin, Madison, WI*, ⁷*Texas A&M University, College Station, TX*, ⁸*University of Minnesota, Saint Paul, MN*.
- 11:00 AM 360 **Association between dry matter intake pre- and postpartum and postpartum diseases in dairy cows.**
Johanny Perez Baez*², Carlos A. Risco², Jorge A. Hernandez², Gabriel C. Gomes², Leandro F. Greco¹, Sha Tao^{1,3}, Izabella Thompson^{1,4}, Bruno do Amaral^{1,5}, Charles Staples¹, Jose Eduardo P. Santos¹, and Klíbs N. Galvão², ¹*Department of Animal Sciences, University of Florida, Gainesville, FL*, ²*Department of Large Animal Clinical Sciences, University of Florida, Gainesville, FL*, ³*Department of Animal and Dairy Science, University of Georgia, Tifton, GA*, ⁴*Agriculture and Agri-Food Canada, Ottawa, Ontario, Canada*, ⁵*Land O'Lakes, Inc., St. Paul, MN*.
- 11:15 AM 361 **Laboratory validation of a prototype cow-side instrument for the measurement of blood ionized calcium concentrations in dairy cattle.**
Rafael C. Neves*, Tracy Stokol, and Jessica A. A. McArt, *Department of Population Medicine & Diagnostic Sciences, Cornell University, Ithaca, NY*.
- 11:30 AM 362 **Assessment of daily activity patterns in lactating dairy cows diagnosed with metritis.**
Santiago Bas*, Adrian A. Barragan, Juan M. Piñeiro, Gustavo M. Schuenemann, Päivi J. Rajala-Schultz, and Troy A. Brick, *Department of Veterinary Preventive Medicine, College of Veterinary Medicine, The Ohio State University, Columbus, OH*.
- 11:45 AM 363 **The effect of ketosis on milk production in early lactation.**
Khaled Gohary*, Todd Duffield, and Stephen Leblanc, *Department of Population Medicine, Ontario Veterinary College, University of Guelph, Guelph, Ontario, Canada*.
- 12:00 PM 364 **Estimating glucose requirements of an activated immune system in lactating Holstein cows.**
Sara K. Stoakes*, Erin A. Nolan, David J. Valko, Mohannad Abuajamieh, Edith J. Mayorga, Jake Seibert, Maria V. Sanz Fernandez, Patrick J. Gordon, and Lance H. Baumgard, *Iowa State University, Ames, IA*.
- 12:15 PM 365 **DNA methylation patterns in peripheral blood leukocytes as a marker of uterine function.**
Caroline Walker*¹, Barbara Kuhn-Sherlock², Susanne Meier², John Roche², and Murray Mitchell³, ¹*DairyNZ, Auckland, New Zealand*, ²*DairyNZ, Hamilton, New Zealand*, ³*University of Queensland, Queensland, Brisbane, Australia*.

ARPAS Symposium

Reproductive efficiency of beef cows—Current status and new technologies

Chair: Robert P. Wettemann, Oklahoma State University

Sponsor: Merck Animal Health

Panzacola G-1

- 9:30 AM 366 **Nutrition and management of cows—Supplementation and feed additives.**
Richard J. Rasby*¹ and Rick N. Funston², ¹*University of Nebraska, Lincoln, NE*, ²*University of Nebraska West Central Research and Extension Center, North Platte, NE*.
- 10:15 AM 367 **Selection of a calving season.**
R. N. Funston*¹, E. E. Grings², A. J. Roberts³, and B. T. Tibbitts⁴, ¹*University of Nebraska West Central Research and Extension Center, North Platte, NE*, ²*South Dakota State University, Brookings, SD*, ³*Fort Keogh Livestock and Range Research Laboratory, Miles City, MT*, ⁴*University of Nebraska West Central Research and Extension Center, North Platte, NE*.

- 11:00 AM 368 **Advantages of current and future reproductive technologies for beef cattle production.**
G. Cliff Lamb*, Vitor R. G. Mercadante, Darren D. Henry, Pedro L. P. Fontes, and Nicolas DiLorenzo, *North Florida Research and Education Center, University of Florida, Marianna, FL.*
- 11:45 AM 369 **Use of ultrasonography to make management decisions.**
George A. Perry*¹, Olivia L. Amundson¹, and Robert A. Cushman², ¹*Department of Animal Sciences; South Dakota State University, Brookings, SD,* ²*USDA, ARS, US Meat Animal Research Center, Clay Center, NE.*

Beef Species Symposium

Keeping beef in the center of the plate—Meeting consumer demand in a period of reduced cattle numbers and increased prices

Chair: **Patrick Gunn, Iowa State University**

Panzacola F-1

- 9:30 AM 370 **Reducing antibiotic use in cattle: Making healthier cattle starting at conception.**
Daniel Thomson*, *Kansas State University, Manhattan, KS.*
- 10:15 AM 371 **Can we produce more with less? A critical look at technology in the feedlot sector.**
Clint R. Krehbiel*¹, Casey L. Maxwell¹, Bryan C. Bernhard², Blake K. Wilson¹, Cathy L. Haviland¹, Michelle S. Calvo-Lorenzo¹, Sara E. Place¹, Deb L. VanOverbeke¹, Gretchen G. Mafi¹, Chris J. Richards¹, and D. L. Step¹, ¹*Oklahoma State University, Stillwater, OK,* ²*Texas Tech University, Lubbock, TX.*
- 11:00 AM 372 **Keeping the eating experience enjoyable: Postmortem management of heavy carcasses.**
Chris Calkins*, *University of Nebraska, Lincoln, NE.*
- 11:45 AM **Panel Discussion**

Breeding and Genetics

Application and methods—Dairy I

Chair: **John B. Cole, Animal Genomics and Improvement Laboratory, ARS-USDA**

Panzacola F-3

- 9:30 AM 373 **Montbéliarde × Holstein and Viking Red × Holstein crossbreds compared with pure Holsteins during first lactation in eight high-performance dairies in Minnesota: I. Production.**
A. R. Hazel*¹, B. J. Heins², and L. B. Hansen¹, ¹*University of Minnesota, St. Paul, MN,* ²*West Central Research and Outreach Center, Morris, MN.*
- 9:45 AM 374 **Montbéliarde × Holstein and Viking Red × Holstein crossbreds compared with pure Holsteins during first lactation in eight high-performance dairies in Minnesota: II. Fertility, survival, and conformation.**
A. R. Hazel*¹, B. J. Heins², and L. B. Hansen¹, ¹*University of Minnesota, St. Paul, MN,* ²*West Central Research and Outreach Center, Morris, MN.*
- 10:00 AM 375 **Milk production and fertility performance of Holstein, Friesian, Jersey, Holstein x Jersey, and Friesian x Jersey crossbred cows on commercial Irish farms.**
E. L. Coffey*^{1,2}, B. Horan¹, R. D. Evans³, K. M. Pierce², and D. P. Berry¹, ¹*Teagasc Moorepark, Fermoy, Co. Cork, Ireland,* ²*School of Agricultural and Food Science, UCD, Dublin, Ireland,* ³*Irish Cattle Breeding Federation, Bandon, Co. Cork, Ireland.*
- 10:15 AM 376 **Fertility and production of 3-breed and third-generation Holstein-sired crossbreds compared with pure Holstein cows in a seasonal pasture production system.**
Bradley J. Heins*^{1,2}, Amy R. Hazel², and Leslie B. Hansen², ¹*University of Minnesota, West Central Research and Outreach Center, Morris, MN,* ²*University of Minnesota, Saint Paul, MN.*

- 10:30 AM 377 **Relationships between yield, fitness, and type traits in US Brown Swiss.**
Keith D. Gibson* and Chad D. Dechow, *The Pennsylvania State University, State College, PA.*
- 10:45 AM 378 **Genetic disorders in Indian dairy cattle.**
Prasad Dinkar Deshpande*, Marimuthu Swaminathan, Jayant Ramchandra Khadse, Hemant Dasharath Kadam, Ashok Bhaskarrao Pande, Sumit Prakashrao Totade, and Priyanka Shivaji Garad, *BAIF Development Research Foundation, Central Research Station, Urulikanchan, Pune, Maharashtra, India.*
- 11:00 AM **Break**
- 11:15 AM 380 **SNP-analysis solves questions on the genetic background of the rare Dutch breed of Red Friesian cattle.**
Kor Oldenbroek*¹, Ina Hulsege^{2,3}, Jack Windig^{2,3}, and Mario Calus^{2,3}, ¹*Centre for Genetic Resources the Netherlands, Wageningen, the Netherlands*, ²*Animal Breeding and Genomics Centre, Wageningen, the Netherlands*, ³*Wageningen UR Livestock Research, Wageningen, the Netherlands.*
- 11:30 AM 381 **Genetic variation and breeding values of casein in Holstein cattle using novel FTIR predictive modeling.**
Herwin Eding¹, Gerben de Jong*¹, Hiemke Knijn¹, Jan Rademaker², and Nisha Shetty², ¹*CRV, Arnhem, the Netherlands*, ²*Qlip, Zutphen, the Netherlands.*
- 11:45 AM 382 **Use of infrared spectroscopy to enhance technological and nutritional quality of milk: Genetic components of FTIR spectra and breeding values estimates in Italian Simmental cattle.**
Valentina Bonfatti*¹, Daniele Vicario², Lorenzo Degano², Andrea Lugo³, and Paolo Carnier¹, ¹*Department of Comparative Biomedicine and Food Science, University of Padova, Legnaro, Italy*, ²*National Simmental Cattle Breeders Association, Udine, Italy*, ³*Friuli Venezia Giulia Milk Recording Agency, Codroipo, Italy.*
- 12:00 PM 383 **Association between *INHA* A192G polymorphism and dairy traits in Holstein cattle of Antioquia-Colombia.**
Stephania Madrid*, Albeiro López, and Julián Echeverri, *Universidad Nacional de Colombia, Medellín, Antioquia, Colombia.*
- 12:15 PM 384 **Genome-wide association studies for fertility traits in Brown Swiss cattle using single SNP regression and Bayesian approaches applied to high-density SNP array information.**
Beat Bapst*¹, Christine F. Baes^{1,2}, Franz R. Seefried¹, Marlies A. Dolezal⁵, Christine Flury², Heidi Signer-Hasler², Dorian Garrick³, Christian Stricker⁴, Johann Sölkner⁷, Alessandro Bagnato⁶, Ingolf Russ⁸, Klemen Potocnik⁹, and Birgit Gredler¹, ¹*Qualitas AG, Zug, Switzerland*, ²*Bern University of Applied Sciences, Zollikofen, Bern, Switzerland*, ³*Iowa State University, Ames, IA*, ⁴*agn Genetics, Davos, Graubünden, Switzerland*, ⁵*University of Veterinary Medicine Vienna, Vienna, Austria*, ⁶*Dept. Vespa University of Milan, Milan, Italy*, ⁷*University of Natural Resources and Life Sciences, Vienna, Austria*, ⁸*Tierzuchtforschung e.V. (TZF), Poing, Bavaria, Germany*, ⁹*University of Ljubljana, Ljubljana, Slovenia.*

Cell Biology Symposium
Regulation of growth through amino acid sensing
Chair: Teresa A. Davis, Baylor College of Medicine
Panzacola F-4

- 9:30 AM 385 **Role of amino acid transporters in amino acid sensing.**
Peter M. Taylor*, *College of Life Sciences, University of Dundee, Dundee, UK.*
- 10:15 AM 386 **Integration of amino acid signaling and metabolism in the mTORC1 pathway.**
John Blenis*, Gwen Buel, Anders Mutvei, Alfredo Csibi, Jing Li, Gina Lee, Sang Gyun Kim, and Andy Choo, *Sandra and Edward Meyer Cancer Center, Department of Pharmacology, Weill Cornell Medical College, New York, NY.*
- 11:00 AM 387 **Integration of signals generated from nutrients, hormones, growth factors, and exercise.**
Scot R. Kimball*, *Penn State College of Medicine, Hershey, PA.*
- 11:45 AM 388 **Distributed nutrient sensing in the integrated control of energy balance.**
Gary J. Schwartz*, *Albert Einstein College of Medicine, Bronx, NY.*

Companion Animals Nutrition and Behavior

Chair: **George C. Fahey, University of Illinois**

Sponsor: **ASAS Foundation George C. Fahey Appreciation Club
Suwannee 15**

- 9:30 AM 389 **Evaluation of pelleted diets targeted for grazing ruminants housed in zoological institutions.**
Katherine R. Kerr^{*1,2}, Marcos Zenobi², Rodrigo Gardinal², Jorge Zuniga², Adegbola Adesogan², Charles Staples², and Eduardo Valdes¹, ¹Disney's Animal Kingdom, Lake Buena Vista, FL, ²University of Florida, Gainesville, FL.
- 9:45 AM 390 **Serum metabolite profiling to identify biomarkers and mechanistic insight into the metabolic changes associated with weight loss in overweight cats.**
Marissa R. Pallotto^{*1}, Maria R. C. de Godoy², Kirk L. Pappan³, Preston R. Buff⁴, and Kelly S. Swanson^{1,2}, ¹Division of Nutritional Sciences, University of Illinois, Urbana, IL, ²Department of Animal Sciences, University of Illinois, Urbana, IL, ³Metabolon, Durham, NC, ⁴The Nutro Company, Franklin, TN.
- 10:00 AM 391 **Behavior assessment of dogs fed soybean hulls.**
Mariana Scheraiber^{*1}, Tabyta Tamara Sabchuk¹, Tatiane Ramos¹, Juliana Regina da Silva², Lidiane Priscila Domingues¹, Ana Vitória Fischer da Silva¹, and Ananda Portella Felix¹, ¹Federal University of Paraná, Curitiba, Paraná, Brazil, ²Federal University of Santa Catarina, Florianópolis, Santa Catarina, Brazil.
- 10:15 AM 392 **Evidence for a cat pheromone that modulates kitten scratching.**
John J. McGlone^{*1,2} and Rebekkah R. Plummer², ¹Laboratory of Animal Behavior, Physiology and Welfare, Texas Tech University, Lubbock, TX, ²McGlone Enterprises Inc., Lubbock, TX.
- 10:30 AM 393 **The use of varying strengths of gelatin and the effect on physical properties of extruded pet food.**
Analena E. Manbeck^{*}, C. Greg Aldrich, and Sajid Alavi, Department of Grain Science and Industry, Kansas State University, Manhattan, KS.
- 10:45 AM 394 **Digestibility and palatability of diets containing crude corn oil in dogs.**
Tabyta T. Sabchuk^{*1}, Daniele C. Lima¹, Cleusa B.M. Brito¹, Larissa Barrile², Ananda P. Félix¹, Simone G. Oliveira¹, and Alex Maiorka¹, ¹Federal University of Paraná, Curitiba, Paraná, Brazil, ²Cargil Agricola SA, Uberlândia, Minas Gerais, Brazil.
- 11:00 AM **Break**
- 11:15 AM 395 **Effects of androstenone on reduction of leash pulling in dogs.**
Glenna M. Pirner^{*} and John J. McGlone, Texas Tech University, Lubbock, TX.
- 11:30 AM 396 **Effects of graded dietary HP 300 concentrations on apparent total-tract macronutrient digestibility, fecal characteristics, and fecal fermentative end-products in healthy adult dogs.**
Alison N. Beloshapka^{*1}, Maria R. C. de Godoy¹, Katelyn B. Detweiler¹, Ingmar S. Middelbos³, George C. Fahey^{1,2}, and Kelly S. Swanson^{1,2}, ¹University of Illinois at Urbana-Champaign Department of Animal Sciences, Urbana, IL, ²University of Illinois at Urbana-Champaign Division of Nutritional Sciences, Urbana, IL, ³Hamlet Protein Inc., Findlay, OH.
- 11:45 AM 397 **Characterization of hindgut microbiota during the onset of obesity in adult domestic cats.**
Maria R. C. de Godoy^{*1} and Kelly S. Swanson^{1,2}, ¹Department of Animal Sciences, University of Illinois, Urbana, IL, ²Department of Veterinary Clinical Medicine Sciences, University of Illinois, Urbana, IL.
- 12:00 PM 398 **Evaluation of cat scratcher efficacy.**
John J. McGlone^{*1,2} and Rebekkah R. Plummer², ¹Laboratory of Animal Behavior, Physiology and Welfare, Texas Tech University, Lubbock, TX, ²McGlone Enterprises Inc., Lubbock, TX.
- 12:15 PM 399 **Evaluation of pork and pork by-products in raw meat diets for African wildcats.**
Cayla J. Iske^{*1}, Cheryl L. Morris^{1,2}, and Kelly Kappen², ¹Iowa State University, Ames, IA, ²Omaha's Henry Doorly Zoo and Aquarium, Omaha, NE.

Dairy Foods Microbiology

Chair: Trish Dawson, Chr. Hansen
Wekiwa 7/8

- 9:30 AM 400 **Development of an anaphylactic model of buckwheat using B-type CpG oligodeoxynucleotides from lactic acid bacteria.**
Yoshinari Yamamoto*¹, Suguru Shigemori^{1,2}, Kazushi Oshiro³, Pengfei Wang¹, Yeqin Wang¹, Takashi Sato⁴, and Takeshi Shimosato^{1,5}, ¹*Interdisciplinary Graduate School of Science and Technology, Shinshu University, Kamiina, Nagano, Japan*, ²*Research Fellow of the Japan Society for the Promotion of Science (JSPS), Chiyoda, Tokyo, Japan*, ³*Graduate School of Agriculture, Shinshu University, Kamiina, Nagano, Japan*, ⁴*Graduate School of Medicine, Yokohama City University, Yokohama, Kanagawa, Japan*, ⁵*Institute for Biomedical Sciences, Shinshu University, Kamiina, Nagano, Japan*.
- 9:45 AM 401 **Construction of genetically modified *Lactococcus lactis* expressing buckwheat protein Fagag1 with strong allergenicity.**
Suguru Shigemori*^{1,2}, Yoshinari Yamamoto¹, Kazushi Oshiro³, Pengfei Wang¹, Yeqin Wang¹, Takashi Sato⁴, and Takeshi Shimosato^{1,5}, ¹*Interdisciplinary Graduate School of Science and Technology, Shinshu University, Kamiina, Nagano, Japan*, ²*Research Fellow of the Japan Society for the Promotion of Science (JSPS), Chiyoda, Tokyo, Japan*, ³*Graduate School of Agriculture, Shinshu University, Kamiina, Nagano, Japan*, ⁴*Graduate School of Medicine, Yokohama City University, Yokohama, Kanagawa, Japan*, ⁵*Institute for Biomedical Sciences, Shinshu University, Kamiina, Nagano, Japan*.
- 10:00 AM 402 **Production of recombinant β -lactoglobulin in *Lactococcus lactis* and generation of a bioactive peptide with incretin-inactivation activity.**
Kazushi Oshiro*¹, Suguru Shigemori^{2,3}, Yoshinari Yamamoto², Pengfei Wang², Yeqin Wang², Takashi Sato⁴, and Takeshi Shimosato^{2,5}, ¹*Graduate School of Agriculture, Shinshu University, Kamiina, Nagano, Japan*, ²*Interdisciplinary Graduate School of Science and Technology, Shinshu University, Kamiina, Nagano, Japan*, ³*Research Fellow of the Japan Society for the Promotion of Science (JSPS), Chiyoda, Tokyo, Japan*, ⁴*Graduate School of Medicine, Yokohama City University, Yokohama, Kanagawa, Japan*, ⁵*Institute for Biomedical Sciences, Shinshu University, Kamiina, Nagano, Japan*.
- 10:15 AM 403 **Sodium chloride induced stress responses in dairy probiotic bacteria.**
Akanksha Gandhi* and Nagendra P. Shah, *The University of Hong Kong, Hong Kong*.
- 10:30 AM 404 **Potential role of *Bacillus* strains isolated from the dairy environment as defect-causing organisms in yogurt.**
Dipakkumar Mehta*¹, Ashraf Hassan², Brandon Nelson², and Hasmukh Patel¹, ¹*South Dakota State University, Brookings, SD*, ²*Daisy Brand, Garland, TX*.
- 10:45 AM 405 **Inactivation of thermotolerant sporeformers in milk by combined effect of cavitation and pasteurization.**
Dikshi Bawa*, Sanjeev Anand, Harsh Dahiya, and Hasmukh Patel, *South Dakota State University, Brookings, SD*.

Extension Education

Chair: Joseph Dalton, University of Idaho
Suwannee 11/12

- 9:30 AM 406 **Optimal dairy farm management subject to greenhouse gas emissions constraints.**
Di Liang*, Thomas F. Rutherford, and Victor E. Cabrera, *University of Wisconsin-Madison, Madison, WI*.
- 9:45 AM 407 **A decision support tool for *Escherichia coli* bacterin mastitis vaccine use in dairy cows.**
Amanda E. Stone*, Tyler B. Mark, and Jeffrey M. Bewley, *University of Kentucky, Lexington, KY*.
- 10:00 AM 408 **The Missouri Show-Me-Select Replacement Heifer Program: Improving heifer development practices and increasing technology utilization through economic incentives.**
Jordan M. Thomas*, Brianna E. Bishop, Jillian M. Abel, Jared E. Decker, Scott E. Pooch, Douglas S. Brown, Michael F. Smith, and David J. Patterson, *University of Missouri, Columbia, MO*.
- 10:15 AM 409 **Engaging industry personnel in an agricultural education program.**
Angela R. Mays*, *F.L. Emmert Company, Cincinnati, OH*.

- 10:30 AM 410 **Using video for consumer attitude inoculation about beef animal slaughter.**
Katherine E. Powers and Traci L. Naile*, *Oklahoma State University, Stillwater, OK.*
- 10:45 AM 411 **A high percentage of beef bull pictures in semen catalogs have obscured feet and legs.**
March K. Franks and Temple Grandin*, *Colorado State University, Fort Collins, CO.*

Food Safety

Chair: **Sanjeev Anand, South Dakota State University**
Wekiwa 5

- 9:30 AM 412 **Residue of three fluoroquinolones (ciprofloxacin, norfloxacin, and ofloxacin) in commonly consumed meat products.**
Adekunmbi B. Omotoso and Andrew B. Omojola*, *University of Ibadan, Ibadan, Oyo State, Nigeria.*
- 9:45 AM 413 **Abattoir waste management practices in Ibadan metropolis.**
Olubunmi Olufemi Olusola¹, Adenike Olubunmi Ajanaku*², and Andrew Babatunde Omojola¹, *¹University of Ibadan, Ibadan, Oyo State, Nigeria, ²Federal College of Forestry, Ibadan, Oyo State, Nigeria.*
- 10:00 AM 414 **Bioaccumulation of heavy metals, phenol, and polycyclic aromatic hydrocarbons in differently singed, skin-on, red Sokoto buck goats.**
Andrew B. Omojola*¹, John O. Oluwole¹, Olubunmi O. Olusola¹, and Worlah Y. Akwetey², *¹University of Ibadan, Ibadan, Oyo State, Nigeria, ²Kwame Nkrumah University of Science and Technology, Kumasi, Ghana.*
- 10:15 AM 415 **Antibiotic resistance of bacteria from commercial silages in Israel.**
Zwi Weinberg*, Shlomo Sela, Yaira Chen, Vladislav Volchinski, Judith Kraut-Cohen, and Eddie Cytryn, *ARO, The Volcani Center, Rishon Le Zion, Israel.*

Forages and Pastures Symposium

Implications of climate change on the resiliency of forage and pasture production systems
Chair: **Bradley Heins, University of Minnesota, West Central Research and Outreach Center**
Sponsor: **Sociedade Brasileira de Zootecnia (SBZ)**
Sebastian I-3

- 9:30 AM 416 **Managed grassland resiliency to climate change: Shifting species composition buffers climate change effects on plant production and forage quality.**
Rebecca L. McCulley*¹, A. Elizabeth Carlisle¹, Allison L. Cooke², Matthew M. Conley³, Bruce A. Kimball³, and Jim A. Nelson¹, *¹University of Kentucky, Lexington, KY, ²Metabolic Disease Institute, University of Cincinnati, Cincinnati, OH, ³US Arid-Land Agricultural Research Center, USDA-ARS, Maricopa, AZ.*
- 10:15 AM 417 **Carbon sequestration potential for forage and pasture systems.**
Vern S. Baron*¹, R. Howard Skinner², and Gilles Bélanger³, *¹Agriculture and Agri-Food Canada, Lacombe, AB, Canada, ²USDA-ARS, University Park, PA, ³Agriculture and Agri-Food Canada, Quebec City, QC, Canada.*
- 11:00 AM 418 **Climate-related risk management in agriculture: Its importance for coping with current and future climate changes in the southeastern United States.**
B. V. Ortiz*¹, C. Fraisse², D. Dourte², W. Bartels², D. Zierden³, and P. Knox⁴, *¹Auburn University, Auburn, AL, ²University of Florida, Gainesville, FL, ³Center for Ocean-Atmospheric Prediction Studies, Tallahassee, FL, ⁴University of Georgia, Athens, GA.*
- 11:45 AM 876 **ADSA®-SBZ Speaker Exchange Presentation: Intensive grazing systems can enhance carcass production with the same methane emissions.**
A. Berndt*¹, L. S. Sakamoto², A. P. Lemes³, A. F. Pedroso¹, J. R. M. Pezzopane¹, T. C. Alves¹, D. F. Vilas Boas⁴, R. Ruegger⁵, P. P. A. Oliveira¹, *¹Embrapa Southeast Livestock, Sao Carlos, Brazil, ²Animal Productivity and Quality Program, FZEA/USP, Pirassununga, Brazil, ³Veterinarian Medicine, FCAV/UNESP, Jaboticabal, Brazil, ⁴FAPED, Brazil, ⁵CAPES/EMBRAPA, Brazil.*

Growth and Development I
Chair: Gary Hausman, University of Georgia
Panacola H-1

- 9:30 AM 419 **Growth, intake, and health of Holstein heifer calves fed an enhanced diet pre-weaning with or without exogenous estradiol immediately post-weaning.**
Adam J. Geiger^{*1}, Robert E. James¹, Catherine L. Parsons¹, Anthony V. Capuco², and R. Michael Akers¹, ¹*Department of Dairy Science, Virginia Polytechnic Institute and State University, Blacksburg, VA*, ²*United States Department of Agriculture-Agricultural Research Service, Beltsville, MD*.
- 9:45 AM 420 **Plane of nutrition affects Holstein bull calf growth, bone mineral density and organ size.**
Meghan E. MacGhee^{*}, Sarah R. McCoski, Camilla H. K. Hughes, Sally E. Johnson, and Alan D. Ealy, *Virginia Polytechnic Institute and State University, Blacksburg, VA*.
- 10:00 AM 421 **Daily growth rate in Holstein Friesian heifers is affected by fasting insulin levels as newborn calves.**
M. Van Eetvelde^{*}, M. M. Kamal, H. Bogaert, and G. Opsomer, *Department of Reproduction, Obstetrics and Herd Health, Faculty of Veterinary Medicine, Ghent University, Merelbeke, Belgium*.
- 10:15 AM **Break**
- 10:30 AM 422 **Maternal obesity (MO) during ovine pregnancy leads to increased collagen content and cross-linking in the myocardium of adult F₁ but not F₂ offspring.**
Adel Bashir Ghnenis^{*}, John F. Odhiambo, Richard J. McCormick, and Stephen P. Ford, *Department of Animal Science, University of Wyoming, Laramie, WY*.
- 10:45 AM 423 **Growth and lactation during gestation decrease placental efficiency in cattle.**
M. Van Eetvelde^{*}, M. M. Kamal, H. Bogaert, and G. Opsomer, *Department of Reproduction, Obstetrics and Herd Health, Faculty of Veterinary Medicine, Ghent University, Merelbeke, Belgium*.
- 11:00 AM 424 **Effects of GH and IGF-I on proliferation and apoptosis of bovine mammary epithelial cells.**
Hongrong Wang^{*}, Yun Ji, Xueyan Pang, Qing Tian, Mengzhi Wang, and Lihuai Yu, *College of Animal Science and Technology, Yangzhou University, Yangzhou, Jiangsu Province, China*.
- 11:15 AM 425 **Effects of recombinant bovine somatotropin (bST) administration at breeding on the cow, conceptus, and subsequent offspring performance of beef cattle.**
Vitor R. G. Mercadante^{*}, Francine M. Ciriaco, Darren D. Henry, Pedro L. P. Fontes, Danilo D. Demeterco, Pedro H. S. Pereira, Nicolas DiLorenzo, and G. Cliff Lamb, *North Florida Research and Education Center, University of Florida, Marianna, FL*.

Horse Species Symposium
Exercise physiology of the horse
Chair: Josie A. Coverdale, Texas A&M University
Wekiwa 1/2

- 9:30 AM 426 **The effect of oxidative stress during exercise in the horse.**
Carey A. Williams^{*}, *Rutgers, The State University of New Jersey, New Brunswick, NJ*.
- 10:15 AM 427 **Effects of aging on mitochondrial function in skeletal muscle of Quarter Horses.**
Chengcheng Li^{*1}, Sarah H. White², Lori K. Warren¹, and Stephanie E. Wohlgemuth¹, ¹*Department of Animal Sciences, University of Florida, Gainesville, FL*, ²*College of Health Sciences, University of Kentucky, Lexington, KY*.
- 11:00 AM 428 **Bones and muscles in endurance horses—Physiology, pathology, and clinical issues.**
Katja F. Duesterdieck-Zellmer^{*}, *Oregon State University, Corvallis, OR*.
- 11:45 AM 429 **Biomechanics of the exercising horse.**
Hilary Clayton^{*1,2}, ¹*Sport Horse Science LLC, Mason, MI*, ²*Michigan State University, East Lansing, MI*.

Lactation Biology II

Chairs: Chantal Farmer, Agriculture and Agri-Food Canada, and Juan Loor, University of Illinois
Wekiwa 3/4

- 9:30 AM 430 **Glucose activates translation factors in muscle but not in mammary glands of lactating dairy cows when essential amino acids are in excess supply.**
Kelly Nichols*¹, Michelle Carson², Julie J. M. Kim¹, John A. Metcalfe², John P. Cant¹, and John Doelman^{2,1}, ¹Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada, ²Nutreco Canada Agresearch, Guelph, ON, Canada.
- 9:45 AM 431 **Early postnatal plane of nutrition of Holstein calves has an effect on milk production and feed intake during their first lactation.**
Steffi Wiedemann*¹, Patricia Holz², Hans-Juergen Kunz³, and Martin Kaske⁴, ¹Animal Health, Institute of Animal Breeding and Husbandry, Kiel University, Kiel, Germany, ²Clinic for Cattle, University of Veterinary Medicine Hannover Foundation, Hannover, Germany, ³Chamber of Agriculture of Schleswig-Holstein, Blekendorf, Germany, ⁴Department for Farm Animals, University of Zurich, Zurich, Switzerland.
- 10:00 AM 432 **Interrelation of somatic cell count, lactate dehydrogenase, and immunoglobulin G during mastitis caused by different pathogens.**
Lorenzo E. Hernández-Castellano*¹, Samantha K. Wall¹, Roger Stephan², and Rupert Bruckmaier¹, ¹Veterinary Physiology, Vetsuisse Faculty, University of Bern, Bern, Switzerland, ²Institute for Food Safety and Hygiene, Vetsuisse Faculty, University of Zurich, Zürich, Switzerland.
- 10:15 AM 433 **The innate immune response of bovine mammary epithelial cells to live or heat-inactivated *Mycoplasma bovis*.**
Christina Zbinden*^{1,3}, Paola Pilo², Joachim Frey², Rupert M. Bruckmaier¹, and Olga Wellnitz¹, ¹Veterinary Physiology, Vetsuisse Faculty University of Bern, Bern, Switzerland, ²Institute for Veterinary Bacteriology, Vetsuisse Faculty University of Bern, Bern, Switzerland, ³Graduate School for Cellular and Biomedical Sciences, University of Bern, Bern, Switzerland.
- 10:30 AM 434 **Heat stress and amino acid supplementation affected dramatically the expression of genes related to mammary cell activity and number.**
A. A. K. Salama*¹, M. Duque², K. Shahzad³, and J. J. Loor³, ¹Grup de Recerca en Remugants (G2R), Departament de Ciència Animal i dels Aliments, Universitat Autònoma de Barcelona, Bellaterra, Spain, ²Grupo de Investigación Biogénesis and GRICA. Facultad de Ciencias Agrarias, Universidad de Antioquia, Medellín, Colombia, ³Department of Animal Sciences, University of Illinois, Urbana; IL.
- 10:45 AM 435 **Effects of different lysine/methionine pattern and glucose level on expression of the key genes involved in milk protein transcription and translation in bovine mammary epithelial cells.**
F. Wang¹, J. Q. Wang¹, D. P. Bu*^{1,2}, X. M. Nan^{1,3}, and S. Lian¹, ¹State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ²CAAS-ICRAF Joint Laboratory of Agroforestry and Sustainable Animal Husbandry, World Agroforestry Centre, East and Central Asia, Beijing, China, ³Synergetic Innovation Center of Food Safety and Nutrition, Harbin, China.
- 11:00 AM 436 **Trans-10,cis-12 CLA regulates SREBP1 activation in bovine mammary epithelial cells through proteasomal degradation of Insig1.**
Liang Chen*, Andrea Lengi, and Benjamin Corl, Virginia Tech, Blacksburg, VA.

Milk Protein and Enzymes Symposium

High milk protein foods—Challenges and opportunities in structures and digestion

Chair: Rafael Jimenez-Flores, California Polytechnic State University

Sponsor: Agropur Cooperative

Suwannee 13/14

- 9:30 AM 437 **The role of milk proteins in the development of high protein foods.**
Harjinder Singh*, Riddet Institute, Massey University, Palmerston North, New Zealand.

- 10:15 AM 438 **Structuring food for improving nutrient bioavailability: The case of dairy gels.**
Didier Dupont*¹, Florence Barbe¹, Steven Le Feunteun², Olivia Menard¹, Yann Le Gouar¹, Amelie Deglaire¹, Juliane Floury¹, Didier Remond³, and Beatrice Laroche⁴, ¹INRA-Agrocampus Ouest, Rennes, France, ²INRA-AgroParisTech, Grignon, France, ³INRA-Université Clermont 1, Clermont-Ferrand, France, ⁴INRA, Jouy-en-Josas, France.
- 11:00 AM 439 **Dairy protein and soluble fiber complexation: Effect on digestion and healthfulness of high protein foods.**
Bongkosh Vardhanabhuti*, *University of Missouri, Columbia, MO.*
- 11:30 AM 440 **Milk protein ingredients for controlling hardening of protein bars.**
Thom Huppertz*^{1,2} and Sean Hogan³, ¹NIZO food research, Ede, the Netherlands, ²South Dakota State University, Brookings, SD, ³Teagasc Dairy Products Research Centre, Moorepark, Fermoy, Ireland.
- 12:00 PM 441 **Technological challenges of high milk protein formulations.**
Juan M. Gonzalez*, *Global Technology at Mead Johnson Nutrition, Evansville, IN.*

Physiology and Endocrinology

Reproduction in cattle

Chair: Alexandre Souza, Ceva Saúde Animal Brazil

Panzacola H-4

- 9:30 AM 442 **Comparison of TAI at GnRH injection and delayed insemination of non-estrus beef heifers.**
Hazy R. Nielson*¹, Dan J. Kelly², and Rick N. Funston¹, ¹University of Nebraska, West Central Research and Extension Center, North Platte, NE, ²Kelly Ranch, Sutherland, NE.
- 9:45 AM 443 **Bee Synch for synchronization and fixed-time AI of *Bos indicus*-influenced cows: An update.**
Gary L. Williams*^{1,3}, Randy L. Stanko², and Marcel Amstalden³, ¹Texas A&M AgriLife Research, Beeville, TX, ²Texas A&M University-Kingsville, Kingsville, TX, ³Texas A&M University, College Station, TX.
- 10:00 AM 444 **Effect of MGA versus CIDR estrus synchronization on estrus response and pregnancy rates in 311-d-old beef heifers.**
Hazy R. Nielson*¹, Rosemary V. Anderson², and Rick N. Funston¹, ¹University of Nebraska, West Central Research and Extension Center, North Platte, NE, ²Anderson Ranch, Whitman, NE.
- 10:15 AM 445 **Variation in timed-AI pregnancy rates in beef sires.**
Bo R. Harstine*¹, Rodrigo A. C. Martins², Adnan D. P. Rodrigues⁴, Leandro H. Cruppe^{1,3}, Matthew D. Utt³, Lon D. Peters³, José L. M. Vasconcelos⁴, Mel DeJarnette³, and Michael L. Day¹, ¹The Ohio State University, Department of Animal Sciences, Columbus, OH, ²RM Reprodução Animal, Brasília, Brazil, ³Select Sires Inc., Plain City, OH, ⁴Faculdade de Medicina Veterinária e Zootecnia, UNESP, Botucatu, SP, Brazil.
- 10:30 AM 446 **Effect of decreasing the duration of a PRID-synch protocol and addition of a second prostaglandin F_{2α} treatment on fertility after resynchronization of ovulation in lactating Holstein cows.**
V. G. Santos*^{1,2}, P. D. Carvalho¹, C. Maia³, B. C. Carneiro³, A. Valenza⁴, E. M. Bettencourt², and P. M. Fricke¹, ¹Department of Dairy Science, University of Wisconsin-Madison, Madison, WI, ²Departamento de Medicina Veterinária, Escola de Ciências e Tecnologia, Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Instituto de Investigação e Formação Avançada, Universidade de Évora, Núcleo da Mitra, Évora, Portugal, ³Diessen Servicos Veterinarios Lda, Évora, Portugal, ⁴CEVA Sante Animale, Libourne, France.
- 10:45 AM 447 **Evaluating blood perfusion of the corpus luteum in beef cows during fescue toxicosis.**
Garrett F. Cline*¹, Ashleigh M. Muth-Spurlock¹, Benjamin E. Voelz², Caleb O. Lemley¹, and Jamie E. Larson¹, ¹Mississippi State University, Mississippi State, MS, ²Kansas State University, Manhattan, KS.
- 11:00 AM 448 **Improved fertility of cows failing to respond to resynchronization of ovulation through presynchronization of ovulation or progesterone supplementation.**
Julio O. Giordano*¹, Mark J. Thomas², Grace Cuatucumbamba², Mathew D. Curler², Robert Wijma¹, and Matias L. Stangaferro¹, ¹Department of Animal Science, Cornell University, Ithaca, NY, ²Dairy Health & Management Services, Lowville, NY.

- 11:15 AM 449 **Interferon-tau and progesterone down-regulate cytochrome P450 1A and 2C in bovine endometrial epithelial cells.**
Caleb O. Lemley* and Christa L. Gilfeather, *Mississippi State University, Mississippi State, MS.*
- 11:30 AM 450 **Epidermal growth factor promotes interferon-tau expression in bovine trophectoderm.**
Sarah R. McCoski* and Alan D. Ealy, *Virginia Tech, Blacksburg, VA.*
- 11:45 AM 451 **Effects of label-dose permethrin administration on reproductive function in superstimulated beef heifers.**
Tyler M. Dohlman*^{1,2}, Marianna M. Jahnke¹, James K. West¹, Patrick E. Phillips¹, and Patrick J. Gunn², ¹*Veterinary and Diagnostic Production Animal Medicine, Iowa State University, Ames, IA,* ²*Department of Animal Science, Iowa State University, Ames, IA.*
- 12:00 PM 452 **Effects of tamoxifen on pre-pubertal heifer reproductive tissues: Potential for disruption of tract development through alteration of related signaling pathways.**
Abdullah Al Naib*¹, Ali.Y. Wood¹, Hannah.L. M. Tucker¹, Catherine.L. M. Parsons¹, Victoria.L. McCracken¹, Abigail.L. Zezeski¹, Stacie.E. Deaver², Britni.M. Brown¹, Mike M. Akers¹, and Michelle.L. Rhoads¹, ¹*Virginia Polytechnic Institute and State University, Blacksburg, Virginia,* ²*Virginia Western Community College, Roanoke, Virginia.*
- 12:15 PM 453 **Effects of label-dose permethrin administration on reproductive function and testicular histopathology in yearling bulls.**
Tyler M. Dohlman*^{1,2}, Darin M. Madson¹, Patrick E. Phillips¹, Chris A. Clark³, and Patrick J. Gunn², ¹*Veterinary and Diagnostic Production Animal Medicine, Iowa State University, Ames, IA,* ²*Department of Animal Science, Iowa State University, Ames, IA,* ³*Armstrong Research and Demonstration Farm, Iowa State University, Lewis, IA.*

Ruminant Nutrition
Amino acids and metabolism
Chair: **Mary Drewnoski, University Nebraska**
Panzacola H-3

- 9:30 AM 454 **Energy requirements for pregnant and nonpregnant Nellore cows.**
Mateus P. Gionbelli*¹, Marcio S. Duarte², Sebastiao C. Valadares Filho², Edenio Detmann², Tathyane R. S. Gionbelli¹, Diego Zanetti², and Luiz H. P. Silva², ¹*University of Lavras, Lavras, Minas Gerais, Brazil,* ²*University of Viçosa, Viçosa, Minas Gerais, Brazil.*
- 9:45 AM 455 **Rumen-protected methyl donors during the transition period: 1. Better postpartal performance in dairy cows supplemented with rumen-protected methionine (Smartamine M) than choline (ReaShure).**
Z. Zhou*¹, M. Vailati Riboni¹, E. Trevisi², J. K. Drackley¹, D. N. Luchini³, and J. J. Loor¹, ¹*University of Illinois at Urbana-Champaign, Urbana, IL,* ²*Università Cattolica del Sacro Cuore, Piacenza, Italy,* ³*Adisseo NA, Alpharetta, GA.*
- 10:00 AM 456 **Rumen-protected methyl donors during the transition period. 2. Biomarkers of inflammation and oxidative stress reveal better liver and immune function in cows supplemented with rumen-protected methionine (Smartamine M) than choline (ReaShure).**
Z. Zhou*¹, M. Vailati Riboni¹, E. Trevisi², F. C. Cardoso¹, D. N. Luchini³, and J. J. Loor¹, ¹*University of Illinois at Urbana-Champaign, Urbana, IL,* ²*Università Cattolica del Sacro Cuore, Piacenza, Italy,* ³*Adisseo NA, Alpharetta, GA.*
- 10:15 AM 457 **Rumen-protected methyl donors during the transition period: 3. Hepatic one-carbon metabolism flux in response to supplemental Smartamine M or ReaShure.**
Z. Zhou*¹, T. A. Garrow¹, M. Vailati Riboni¹, F. C. Cardoso¹, D. N. Luchini², and J. J. Loor¹, ¹*University of Illinois at Urbana-Champaign, Urbana, IL,* ²*Adisseo NA, Alpharetta, GA.*
- 10:30 AM 458 **Supplemental Smartamine M in high-energy diets during the peripartal period improves production and hepatic biomarkers of oxidative status in Holstein cows.**
Mario Vailati Riboni*¹, Johan S. Osorio², Erminio Trevisi³, James K. Drackley¹, Daniel Luchini⁴, and Juan J. Loor¹, ¹*University of Illinois at Urbana-Champaign, Urbana, IL,* ²*Oregon State University, Corvallis, OR,* ³*Università Cattolica del Sacro Cuore, Piacenza, Italy,* ⁴*Adisseo S.A.S, Alpharetta, GA.*

- 10:45 AM 459 **Effect of strategic ration balancing with use of Prolak, MetaboLys, and Smartamine M on the efficiency of milk protein production and environmental impact in primiparous cows.**
Yanting Chen*¹, Joe Harrison¹, Pius Ndegwa¹, Deb Wilks², Lynn VanWieringen¹, and John Azzone³, ¹Washington State University, Puyallup, WA, ²EPL Feeds, Lynden, WA, ³H J Baker, Fayetteville, PA.
- 11:00 AM 460 **Sodium salicylate alters ruminal digestion in vitro and in situ.**
Abigail J. Carpenter*, Claudio F. Vargas-Rodriguez, Jacob A. B. Jantz, and Barry J. Bradford, *Kansas State University, Manhattan, KS.*
- 11:15 AM 461 **Effect of rumen acidosis and short-term feed restriction on short-chain fatty acid concentrations and permeability of the bovine gastrointestinal tract.**
Rae-Leigh A. Pederzoli*¹, Steve Hendrick², John Campbell¹, Katie M. Wood¹, and Gregory B. Penner¹, ¹University of Saskatchewan, Saskatoon, Saskatchewan, Canada, ²Coaldale Veterinary Clinic, Lethbridge, Alberta, Canada.
- 11:30 AM 462 **Effect of gluconeogenic precursors on blood metabolites and milk yield in Chilean transition Holstein cattle.**
Pedro Melendez*¹, Katherine Severino², Maria P. Marin², Patrick Pithua¹, and Pablo Pinedo^{4,5}, ¹Department of Veterinary Medicine and Surgery, College of Veterinary Medicine, University of Missouri-Columbia, Columbia, MO, ²College of Veterinary Medicine, University Santo Tomas, Viña del Mar, Chile, ³Department of Animal Sciences, College of Veterinary Medicine, University of Chile, Santiago, Chile, ⁴Texas A&M AgriLife Research, Amarillo, TX, ⁵Department of Veterinary Pathobiology, College of Veterinary Medicine & Biomedical Sciences, Texas A&M University System, College Station, TX.
- 11:45 AM 463 **Expression of G-protein coupled fatty acid receptors during the transition period.**
Alea Agrawal*, Johan S. Osorio, and Juan J. Loor, *University of Illinois at Urbana-Champaign, Urbana, IL.*
- 12:00 PM 464 **Effects of prepartal dietary intake and calving on blood neutrophil transcriptome in Holstein cows.**
Alea Agrawal*, Muhammad J. Khan, Daniel E. Graugnard, Sandra L. Rodriguez-Zas, and Juan J. Loor, *University of Illinois at Urbana-Champaign, Urbana, IL.*
- 12:15 PM 465 **A cow mammary epithelial cell-free system based on crude lysosomes and cytosol proteins: Leucine activating mTOR at Ser2448.**
Wen-ting Dai^{1,2}, Nan Zheng^{1,3}, and Jia-qi Wang*^{1,3}, ¹Ministry of Agriculture Laboratory of Quality & Safety Risk Assessment for Dairy Products, Beijing, China, ²Jilin University, Changchun, China, ³Ministry of Agriculture-Milk and Dairy Product Inspection Center, Beijing, China.

Ruminant Nutrition Dairy

Chair: Kasey Moyes, University of Maryland
Panzacola H-2

- 9:30 AM 466 **Effects of including supplemental fat in low and high starch diets on milk production and energy partitioning.**
Joshua L. Garver*, Jonas De Souza, Michael J. VandeHaar, and Adam L. Lock, *Michigan State University, East Lansing, MI.*
- 9:45 AM 467 **Effect of breed, energy level of diet, and lactation stage on the evolution of milk lipolysis in dairy cow.**
Elise Vanbergue*^{1,2}, Luc Delaby¹, Ségolène Colette³, Yves Gallard³, and Catherine Hurtaud¹, ¹INRA-Agrocampus Ouest UMR1348 Pegase, Saint-Gilles, France, ²Institut de l'Elevage, Le Rheu, France, ³INRA, Domaine du Pin-au-Haras, Exmes, France.
- 10:00 AM 468 **Direct and indirect transfer of omega-3 fatty acids to milk fat in dairy cows.**
Natalie L. Urrutia*, Jackie Y. Ying, Samantha R. McKinney, Michael H. Green, and Kevin J. Harvatine, *The Pennsylvania State University, University Park, PA.*
- 10:15 AM 469 **2-Hydroxy-4-(methylthio)butanoate (HMTBa) supplementation increases milk fat and decreases synthesis of alternate biohydrogenation intermediates in diets with risk for milk fat depression.**
Michel Baldin*¹, Yun Ying¹, Geoff I. Zanton², Heather A. Tucker², Mercedes Vazquez-Anon², and Kevin J. Harvatine¹, ¹Penn State University, University Park, PA, ²Novus International Inc., St. Charles, MO.

- 10:30 AM 470 **Meta-analysis of the effect of plant oils rich in 18:2n-6 on milk fatty acid composition in lactating dairy cows.**
Mina Vazirigohar*, Mehdi Dehghan-Banadaky, Kamran Rezayazdi, and Ardeshir Nejati-Javaremi, *Department of Animal Science, Campus of Agriculture and Natural Resources, University of Tehran, Karaj, Alborz, Iran.*
- 10:45 AM 471 **Prediction of blood nonesterified fatty acid (NEFA) by FTIR analysis of individual cow milk samples.**
David M. Barbano*¹, Patrick Cree³, Tom R. Overton¹, Heather M. Dann², and Rick J. Grant², ¹*Cornell University, Ithaca, NY*, ²*William H. Miner Agricultural Institute, Chazy, NY*, ³*Delta Instruments, Drachten, the Netherlands.*
- 11:00 AM 472 **Increased NEFA availability promotes plasma ceramide accumulation in Holstein cows.**
J. Eduardo Rico¹, Luciano S. Caixeta², Yves R. Boisclair², and Joseph W. McFadden*¹, ¹*West Virginia University, Morgantown, WV*, ²*Cornell University, Ithaca, NY.*
- 11:15 AM 473 **An acute increase in circulating NEFA does not lower total plasma sphingomyelin levels in Holstein cows.**
J. Eduardo Rico*¹, Luciano S. Caixeta², Yves R. Boisclair², and Joseph W. McFadden¹, ¹*West Virginia University, Morgantown, WV*, ²*Cornell University, Ithaca, NY.*
- 11:30 AM 474 **Temporal changes in plasma sphingolipids during the transition from pregnancy to lactation in Holstein cows.**
J. Eduardo Rico*, Sina Saed Samii, Alice T. Mathews, and Joseph W. McFadden, *West Virginia University, Morgantown, WV.*
- 11:45 AM 475 **Elevations in milk yield from palmitic acid feeding are associated with reduced estimated insulin sensitivity and glucose-stimulated NEFA disappearance.**
Alice T. Mathews*, J. Eduardo Rico, Neil T. Sprenkle, and Joseph W. McFadden, *West Virginia University, Morgantown, WV.*
- 12:00 PM 476 **Effects of timing of chromium propionate supplementation on metabolic and production responses of Holstein cows in early lactation.**
Michael S. Allen* and Richard Longuski, *Michigan State University, East Lansing, MI.*
- 12:15 PM 477 **The effects of dietary niacin supplementation on FoxO1 and genes involved in hepatic glucose production in dairy cows during the transition period.**
Asako Kinoshita*¹, Kathrin Hansen³, Lena Locher¹, Ulrich Meyer², Sven Dänicke², Korinna Huber³, and Jürgen Rehage¹, ¹*Clinic for cattle, University of Veterinary Medicine Hannover, Hannover, Lower Saxony, Germany*, ²*Institute of Animal Nutrition, Friedrich-Loeffler-Institute, Braunschweig, Lower Saxony, Germany*, ³*Department of Physiology, University of Veterinary Medicine Hannover, Hannover, Lower Saxony, Germany.*

Teaching/Undergraduate and Graduate Education

Chair: Jodi Sterle, Iowa State University

Sebastian I-1

- 9:30 AM 478 **"Pre-Veterinary Academy" course exposes and inspires.**
Andrew Fidler*, *University of Arkansas, Fayetteville, AR.*
- 9:45 AM 479 **SafeAssign as a tool for student identification of potential plagiarism.**
Sarah A. Reed*, *Department of Animal Science, University of Connecticut, Storrs, CT.*
- 10:00 AM 480 **Using animal sciences courses to teach general university learning goals.**
John P. McNamara and Martin Maquivar*, *Washington State University, Pullman, WA.*
- 10:15 AM 481 **Perceptions and effectiveness of teaching methods and technology in animal sciences classes.**
John P. McNamara* and Martin Maquivar, *Washington State University, Pullman, WA.*
- 10:30 AM 482 **Closing the gap between society and university: Effect of teaching animal welfare and animal rights course to animal sciences students at Washington State University.**
Martin Maquivar*, Kristen Koenig, and John McNamara, *Washington State University, Pullman, WA.*
- 10:45 AM **Break**

- 11:00 AM 483 **The relationship between delivery and discovery skills and student performance in animal science courses.**
A. Ahmadzadeh*, J. M. Falk, D. T. Masser, and M. E. Doumit, *University of Idaho, Moscow, ID.*
- 11:15 AM 484 **Gender differences in species and career interests among students in first-year seminar courses.**
Cody L. Wright, Sara L. Mastellar, Michael G. Gonda*, and Andie B. Vsetecka, *South Dakota State University, Brookings, SD.*
- 11:30 AM 485 **Factors affecting first-year academic success in a large animal science program.**
Amanda L. Robinson*, Heather A. Jennings, Jodi A. Sterle, Cheryl L. Morris, Kenneth J. Stalder, David G. Acker, and Howard D. Tyler, *Iowa State University, Ames, IA.*
- 11:45 AM 486 **Integration of an immersive experience in public policy and governmental affairs into agricultural sciences PhD training programs.**
Catherine W. Ernst*¹, Lowell Randel², Mary Malaspina³, Kaitlyn R. Perry¹, Deborah Velez-Irizarry¹, Camille Scott¹, and Ronald O. Bates¹, ¹*Michigan State University, East Lansing, MI*, ²*The Randel Group LLC, Washington, DC*, ³*Michigan State University, Washington, DC.*
- 12:00 PM 487 **Changes in emotional intelligence scores following a peer mentor experience.**
Amanda L. Robinson*, Heather A. Jennings, Jodi A. Sterle, Cheryl L. Morris, and Howard D. Tyler, *Iowa State University.*

ADSA Production Division Symposium

The rumen and beyond—Nutritional physiology of the modern dairy cow

Chair: Ken McGuffey, McGuffey Dairy Consulting, Indianapolis

Sponsor: Pancosma

Panzacola F-2

- 2:00 PM 488 **Harnessing the physiology of the modern dairy cow to continue improvements in feed efficiency.**
Michael VandeHaar*¹, Diane Spurlock², and Louis Armentano³, ¹*Michigan State University, East Lansing, MI*, ²*Iowa State University, Ames, IA*, ³*University of Wisconsin, Madison, WI.*
- 2:45 PM 489 **Development and physiology of the rumen and the lower gut: Targets for improving production efficiency.**
Michael A. Steele*¹, Greg B. Penner², Frédérique Chaucheyras-Durand³, and Leluo Guan¹, ¹*Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada*, ²*Department of Animal and Poultry Science, University of Saskatchewan, Saskatoon, SK, Canada*, ³*Lallemand Animal Nutrition, Blagnac, France.*
- 3:15 PM 490 **The contribution of the lower gut to altered nutrient partitioning during stress.**
Lance H. Baumgard*¹, Sara K. Stoakes¹, Mohannad Abuajamieh¹, and Robert P. Rhoads², ¹*Iowa State University, Ames, IA*, ²*Virginia Tech University, Blacksburg, VA.*
- 3:45 PM 491 **Nutritional strategies to optimize dairy cattle immunity.**
Lorraine M. Sordillo*, *Michigan State University, East Lansing, MI.*
- 4:15 PM 492 **Managing complexity: Dealing with systemic cross-talk in bovine physiology.**
Barry J. Bradford*, *Kansas State University, Manhattan, KS.*

Animal Behavior and Well-Being I

Chair: Amy Stanton, University of Wisconsin–Madison

Sebastian I-3

- 2:00 PM 493 **Development of a behavior-based screening tool for disease detection in preweaned group-housed dairy calves.**
Mary C. Cramer* and Amy L. Stanton, *University of Wisconsin- Madison, Madison, WI.*

- 2:15 PM 494 **Milk replacer plane of nutrition influences calf nutritive and non-nutritive oral behaviors.**
Lindsey E. Hulbert¹, Sophia C. Trombetta^{*1}, Kate P. Sharon², and Michael A. Ballou², ¹*Department of Animal Sciences and Industry, Kansas State University, Manhattan, KS*, ²*Department of Animal and Food Science, Texas Tech University, Lubbock, TX.*
- 2:30 PM 495 **Evaluation of pelleting a feed-through larvicide on dairy calf behavior and fly control.**
Randi Black^{*1}, Christa Kurman¹, David Paulsen², Rebecca Trout Fryxell², and Peter Krawczel¹, ¹*Department of Animal Science, University of Tennessee, Knoxville, TN*, ²*Department of Entomology and Plant Pathology, University of Tennessee, Knoxville, TN.*
- 2:45 PM 496 **An outdoor method of housing dairy calves in groups using individual calf hutches.**
Lisa M. Wormsbecher^{*1}, Renée Bergeron¹, Derek B. Haley², Anne Marie B. de Passillé³, Jeff Rushen³, and Elsa Vasseur¹, ¹*Organic Dairy Research Centre, University of Guelph, Alfred Campus, Alfred, ON, Canada*, ²*Ontario Veterinary College, University of Guelph, Guelph, ON, Canada*, ³*UBC Dairy Education and Research Centre, University of British Columbia, Agassiz, BC, Canada.*
- 3:00 PM 497 **The use of single measurements to assess growth of dairy calves and the effect of management practices on calf BW variability.**
Guilherme B. Bond^{*1}, Daniel M. Weary², Marina A. G. von Keyserlingk², Lorraine Doepel¹, Karin Orsel¹, Herman W. Barkema¹, and Edmond A. Pajor¹, ¹*University of Calgary, Calgary, AB, Canada*, ²*University of British Columbia, Vancouver, BC, Canada.*
- 3:15 PM 498 **Reflective calf hutch covers improve antibody response and decrease panting, but not gain, during hot conditions.**
Jade Haberman, Theodore Friend^{*}, and Thomas Hairgrove, *Texas A&M University, College Station, TX.*
- 3:30 PM 499 **Lameness score, pain threshold, temperature and type of lesion of severely lame dairy cows before and after trimming.**
Vivian Fischer^{*1}, Lorena Teixeira Passos¹, Eduardo Augusto da Cruz¹, Marcelo Tempel Stumpf², Elissa Forgiarini Vizotto¹, Daise Werncke¹, Mateus Wanderer¹, Andress Sopelsa¹, and Isabella Dias Barbosa da Silveira³, ¹*Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil*, ²*Universidade Federal do Rio Grande, São Lourenço, RS, Brazil*, ³*Universidade Federal de Pelotas, Pelotas, RS, Brazil.*
- 3:45 PM 500 **Assessment of calving personnel performance and stillbirth in dairy herds.**
G. M. Schuenemann^{*}, J. M. Piñeiro, A. A. Barragan, S. Bas, and J. D. Workman, *The Ohio State University, Columbus, OH.*
- 4:00 PM 501 **Do improvements in housing and management voluntarily applied by producers following a cow comfort assessment reduce cow injuries in tie-stall dairies?**
Santiago Palacio^{*1}, Renée Bergeron¹, Jeff Rushen², Anne Marie de Passillé², Doris Pellerin³, Derek Haley⁴, Trevor DeVries⁵, and Elsa Vasseur¹, ¹*University of Guelph- Alfred Campus, Alfred, ON, Canada*, ²*University of British Columbia- Dairy Education and Research Center, Agassiz, BC, Canada*, ³*Université Laval, Quebec, QC, Canada*, ⁴*University of Guelph, Guelph, ON, Canada*, ⁵*University of Guelph-Kemptville, Kemptville, ON, Canada.*
- 4:15 PM 502 **Social dominance affects body growth, follicle development, and age at puberty in dairy heifers.**
Carolina Fiol^{*1,2}, Annie dos Santos^{1,2}, Augusto Lacava^{1,2}, Ana Maverino^{1,2}, Mariana Carriquiry³, and Rodolfo Ungerfeld², ¹*Departamento de Bovinos, Facultad de Veterinaria, Montevideo, Uruguay*, ²*Departamento de Fisiología, Facultad de Veterinaria, Montevideo, Uruguay*, ³*Departamento de Producción Animal y Pasturas, Facultad de Agronomía, Montevideo, Uruguay.*
- 4:30 PM 503 **Association between social ranking and health of transition dairy cows.**
Karen M. Lobeck-Luchterhand^{*}, Paula R. B. Silva, Ricardo C. Chebel, and Marcia I. Endres, *University of Minnesota, St. Paul, MN.*

Animal Health
Beef cattle health, lameness and mastitis
Chair: Michael Ballou, Texas Tech University
Sebastian I-2

- 2:00 PM 504 **Evaluating the metagenome of nasal samples from cattle with bovine respiratory disease complex (BRDC).**
Tara G. McDanel^{*}, Larry A. Kuehn, and John W. Keele, *US Meat Animal Research Center, Clay Center, NE.*
- 2:15 PM 505 **Acute and chronic stress models differentially affect the inflammatory and antibody titer responses to respiratory vaccination in naïve beef steers.**
Nathan D. May^{*1}, Jeff A. Carroll², Nicole C. Burdick Sanchez², Shelby L. Roberts¹, Heather D. Hughes¹, Paul R. Broadway², Kate P. Sharon³, Michael A. Ballou³, and John T. Richeson¹, ¹*West Texas A&M University, Department of Agricultural Sciences, Canyon, TX*, ²*USDA-ARS, Livestock Issues Research Unit, Lubbock, TX*, ³*Texas Tech University, Department of Food and Animal Sciences, Lubbock, TX.*
- 2:30 PM 506 **Effect of injectable trace mineral administration on health, performance and vaccine response of newly received beef cattle.**
Shelby L. Roberts^{*1}, Nathan D. May¹, Casey L. Brauer², Wes W. Gentry², Caleb P. Weiss², Jenny S. Jennings², and John T. Richeson¹, ¹*Department of Agricultural Sciences, West Texas A&M University, Canyon, TX*, ²*Texas A&M AgriLife Research, Amarillo, TX.*
- 2:45 PM 507 **Effect of different combination viral-bacterial respiratory vaccines on serum leukotoxin antibody, acute phase response, and performance in beef heifer calves.**
Heather D. Hughes^{*1}, Sjoert Zuidhof², Shelby L. Roberts¹, Joelle L. Pillen¹, Garrett D. Bigham¹, and John T. Richeson¹, ¹*Department of Agricultural Sciences, West Texas A&M University, Canyon, TX*, ²*Boehringer Ingelheim Vetmedica, St. Joseph, MO.*
- 3:00 PM 508 **Probiotic supplementation improves performance, neutrophil function, and antibody responses of post-weaned Holstein heifers during the commingling phase.**
Caleigh E. Payne^{*}, Luis G. D. Mendonça, Lucas D. S. Rocha, Sophia C. Trombetta, Suzy Q. Fowler, Juan C. Gordienko, Sonia J. Moisés, and Lindsey E. Hulbert, *Kansas State University, Manhattan, KS.*
- 3:15 PM 509 **Shotgun metagenomic analysis of bovine digital dermatitis.**
Martin Zinicola^{*}, Hazel Higgins, Svetlana Lima, Vinicius Machado, Charles Guard, and Rodrigo Bicalho, *Cornell University, Ithaca, NY.*
- 3:30 PM 510 **Comparison of milking and lying behavior between lame and sound cows on dairy farms with automated milking systems.**
Meagan T. M. King^{*1}, Ed A. Pajor², Stephen J. Leblanc³, and Trevor J. DeVries¹, ¹*Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada*, ²*Faculty of Veterinary Medicine, University of Calgary, Calgary, AB, Canada*, ³*Department of Population Medicine, Ontario Veterinary College, University of Guelph, Guelph, ON, Canada.*
- 3:45 PM 511 **Comparing the prevalence of hoof lesions in dairy cattle classified as high, average or low antibody and cell-mediated immune responders.**
Shannon L. Cartwright^{*1}, Kathleen Thompson-Crispi^{1,2}, Marlene Paibomesai¹, Filippo Miglior^{2,3}, and Bonnie Mallard^{1,2}, ¹*Department of Pathobiology, University of Guelph, Guelph, ON, Canada*, ²*Center of Genetic Improvement of Livestock, University of Guelph, Guelph, ON, Canada*, ³*Canadian Dairy Network, Guelph, ON, Canada.*
- 4:00 PM 512 **Calf macrophages exhibit a robust response to LPS which is not affected three weeks after an early life challenge with LPS in vivo.**
Filiz T. Korkmaz^{*}, Aimee L. Benjamin, and David E. Kerr, *University of Vermont, Burlington, VT.*
- 4:15 PM 513 **Dysbiosis of the fecal microbiota in cattle infected with *Mycobacterium avium* ssp. *paratuberculosis*.**
Marie-Eve Fecteau, Raymond Sweeney, Sanjay Kumar, Nagaraju Indugu, Bonnie Vecchiarelli, Bhima Bhukya, and Dipti Pitta^{*}, *Department of Clinical Studies, School of Veterinary Medicine, New Bolton Center, University of Pennsylvania, Kennett Square, PA.*
- 4:30 PM 514 **Use of a novel adjuvant to enhance the protective effect of a commercial vaccine against *Staphylococcus aureus* mastitis in dairy heifers.**
Charles Hall, Stephen Nickerson^{*}, David Hurley, Lane Ely, and Felicia Kautz, *University of Georgia, Athens, GA.*

- 4:45 PM 515 **The efficacy of PlyC endolyisin as an alternative therapy for *Streptococcus uberis* mastitis in vitro.**
Sara Linden¹, Parimala Sharma^{1,2}, Kasey M. Moyes*², and Daniel C. Nelson^{1,3}, ¹University of Maryland, College Park, MD, ²Institute for Bioscience and Biotechnology Research, Rockville, MD, ³Department of Veterinary Medicine, College Park, MD.

Beef Cattle Nutrition Symposium Feeding Holstein steers

Chair: **Steven Zinn, University of Connecticut**

Sponsor: **Merck Animal Health**

Panzacola F-1

- 2:00 PM **Introduction.**
Steven Zinn, *University of Connecticut.*
- 2:00 PM 516 **Neonatal and young (<205 kg) feeding programs in calf-fed Holsteins.**
Luis O. Burciaga-Robles*, *Feedlot Health Management Services, Okotoks, Alberta, Canada.*
- 2:30 PM 517 **Morphological, microbiological, and biochemical development of ruminant gastrointestinal tract.**
Carl J. Yeoman and Glenn C. Duff*, *Department of Animal and Range Sciences, Montana State University, Bozeman, MT.*
- 3:00 PM 518 **Genetic, epigenetic, and management factors contribute to the risk of morbidity and mortality of Holstein feeder calves.**
Michael A. Ballou*¹, David E. Kerr², Kate P. Sharon¹, and Aimee L. Benjamin², ¹Department of Animal and Food Sciences, Texas Tech University, Lubbock, TX, ²Department of Animal Science, The University of Vermont, Burlington, VT.
- 3:30 PM **Discussion**
- 3:30 PM 519 **Nutrition and management of calf-fed Holstein steers.**
Richard Zinn*, *University of California, Davis, CA.*
- 4:00 PM 520 **Feedlot: Liver abscesses.**
T. G. Nagaraja*, *Kansas State University, Manhattan, KS.*
- 4:30 PM 521 **Methods of estimating empty body composition, energy retention, and grading characteristics of calf-fed Holstein steers.**
T. J. McEvers*¹, N. D. May¹, J. A. Reed¹, L. J. Walter¹, J. P. Hutcheson², and T. E. Lawrence¹, ¹West Texas A&M University Beef Carcass Research Center, Canyon, TX, ²Merck Animal Health, Summit, NJ.
- 5:00 PM **Discussion**

Breeding and Genetics

Feed efficiency and methods

Chair: **Hasan Khatib, University of Wisconsin**

Panzacola F-4

- 2:00 PM 522 **Definition and implementation of a breeding value for feed efficiency.**
Jennie E. Pryce*^{1,2}, Oscar Gonzalez-Recio¹, Gert Nieuwhof¹, Bill Wales¹, Michael P. Coffey³, Ben J. Hayes^{1,2}, and Michael E. Goddard^{1,4}, ¹Department of Economic Development, Jobs, Transport and Resources, Bundoora, VIC, Australia, ²La Trobe University, Bundoora, VIC, Australia, ³SRUC, Edinburgh, Midlothian, UK, ⁴The University of Melbourne, Melbourne, VIC, Australia.

- 2:15 PM 523 **Indices to improve feed efficiency.**
Kelli J. Retallick*¹, Jennifer M. Bormann¹, Robert L. Weaber¹, Michael D. MacNeil³, Heather L. Bradford¹, Harvey C. Freetly², Daniel W. Moser¹, Warren M. Snelling², Richard M. Thallman², and Larry A. Kuehn², ¹Kansas State University, Manhattan, KS, ²USDA-ARS Meat Animal Research Center, Clay Center, NE, ³Delta G, Miles City, MT.
- 2:30 PM 524 **Comparison of actual versus predicted feed intake phenotypes for genetic evaluation of feed efficiency in beef cattle.**
Kimberly A. Branham*¹, Jonathan E. Beever², Dan B. Faulkner¹⁰, Holly L. Neibergs³, Kris A. Johnson³, Christopher M. Seabury⁴, Dorian J. Garrick⁵, Daniel D. Loy⁵, Stephanie L. Hansen⁵, Harvey C. Freetly⁶, Matt L. Spangler⁷, Monty S. Kerley⁸, Robert L. Weaber⁹, Daniel W. Shike², Robert D. Schnabel⁸, J. E. Decker⁸, Jerry F. Taylor⁸, and Megan M. Rolf¹, ¹Oklahoma State University, Stillwater, OK, ²University of Illinois, Champaign, IL, ³Washington State University, Pullman, WA, ⁴Texas A&M University, College Station, TX, ⁵Iowa State University, Ames, IA, ⁶USDA-Meat Animal Research Center, Clay Center, NE, ⁷University of Nebraska, Lincoln, NE, ⁸University of Missouri, Columbia, MO, ⁹Kansas State University, Manhattan, KS, ¹⁰University of Arizona, Tucson, AZ.
- 2:45 PM 525 **Hierarchical Bayesian inference on genetic and non-genetic components of partial efficiencies determining feed efficiency in dairy cattle.**
Yongfang Lu*¹, Mike VandeHaar¹, Diane Spurlock², Kent Weigel³, Louis Armentano³, Charles Staples⁴, Erin Connor⁵, Zhiquan Wang⁶, Mike Coffey⁷, Roel Veerkamp⁸, Yvette Haas⁸, Nora Bello⁹, and Robert Tempelman¹, ¹Michigan State University, East Lansing, MI, ²Iowa State University, Ames, IA, ³University of Wisconsin, Madison, WI, ⁴University of Florida, Gainesville, FL, ⁵U.S. Department of Agriculture, Beltsville, MD, ⁶University of Alberta, Edmonton, AB, Canada, ⁷Scottish Agricultural College, Easter Bush, Midlothian, UK, ⁸Animal Breeding and Genomics Centre, Wageningen UR Livestock Research, Lelystad, the Netherlands, ⁹Kansas State University, Manhattan, KS.
- 3:00 PM 526 **Thermal imaging as an indicator of feed efficiency in mid-lactation Holstein cows.**
Lydia C. Hardie* and Diane M. Spurlock, Iowa State University, Ames, IA.
- 3:15 PM 527 **Genetic correlations of lower gastrointestinal tract microflora taxonomic groups with animal intake and gain.**
Larry A. Kuehn*¹, Warren M. Snelling¹, Rohita Sinha², James E. Wells¹, James L. Bono¹, Harvey C. Freetly¹, Min Seok Kim¹, Jennifer Clarke², Stephen D. Kachman², Etsuko Moriyama², Danielle F. Wells², and Andrew K. Benson², ¹USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE, ²University of Nebraska-Lincoln, Lincoln, NE.
- 3:30 PM **Break**
- 3:45 PM 529 **Validating your validation: A consistency check for the R² found in a validation to calculate correct reliabilities for genomic EBV in a multi-trait setting.**
W. Marianne Stoop*, H. Eding, and G. de Jong, CRV, Arnhem, the Netherlands.
- 4:00 PM 530 **Genomic heritabilities and SNP associated with lower gastrointestinal tract microflora taxonomic groups and E. coli O157:H7 shedding.**
Warren M. Snelling*¹, Larry A. Kuehn¹, Rohita Sinha², James E. Wells¹, James L. Bono¹, Elaine D. Berry¹, Min Seok Kim¹, Jennifer Clarke², Stephen D. Kachman², Etsuko Moriyama², Danielle F. Wells², and Andrew K. Benson², ¹USDA-ARS-US Meat Animal Research Center, Clay Center, NE, ²University of Nebraska-Lincoln, Lincoln, NE.
- 4:15 PM 531 **Utilizing cattle genetic trends to evaluate the long-term use of gene bank collections.**
Harvey D. Blackburn*¹, Carrie S. Wilson¹, Samuel Paiva², Scott Spiller¹, and Phil H. Purdy¹, ¹ARS/USDA, Fort Collins, CO, ²EMBRAPA, Brasilia, Brazil.
- 4:30 PM 532 **Estimating the heritability of gene expression profiles using RNAseq data.**
Deborah Velez-Irizarry*¹, Catherine W. Ernst¹, Ronald O. Bates¹, Pablo Reeb¹, Yeni Bernal Rubio², Nancy E. Raney¹, and Juan P. Steibel¹, ¹Michigan State University, East Lansing, MI, ²University of Buenos Aires, Buenos Aires, Argentina.
- 4:45 PM 533 **Exploitation of population-wide whole-genome genotyping to identify the founder of a deleterious mutation in cattle.**
Andreas Kromik¹, Phillip Widmann¹, Frieder Hadlich¹, Dierck Segelke², Rosemarie Weikard¹, and Christa Kühn*^{1,3}, ¹Leibniz Institute for Farm Animal Biology (FBN), Institute for Genome Biology, Dummerstorf, Germany, ²Vereinigte Informationssysteme Tierhaltung w.V. (vit), Verden/Aller, Germany, ³University Rostock, Faculty of Agricultural and Environmental Sciences, Rostock, Germany.

Breeding and Genetics
Genomic methods
 Chair: **Filippo Miglior, University of Guelph**
Panzacola F-3

- 2:00 PM 534 **Use of genomic recursions in single-step genomic BLUP with a large number of genotypes.**
 Breno D. Fragomeni^{*1}, Daniela A. L. Lourenco¹, Shogo Tsuruta¹, Yutaka Masuda¹, Ignacio Aguilar², Andres Legarra³, Thomas J. Lawlor⁴, and Ignacy Misztal¹, ¹*Department of Animal and Dairy Science, University of Georgia, Athens, GA*, ²*Instituto Nacional de Investigacion Agropecuaria, Las Brujas, Canelones, Uruguay*, ³*INRA, UMR1388 GenePhySE, Castanet Tolosan, France*, ⁴*Holstein Association USA Inc., Brattleboro, VT*.
- 2:15 PM 535 **Genomic predictions with approximated G-inverse for a large number of genotyped animals.**
 Yutaka Masuda^{*1}, Ignacy Misztal¹, Shogo Tsuruta¹, Daniela A. L. Lourenco¹, Breno Fragomeni¹, Andres Legarra², Ignacio Aguilar³, and Tom J. Lawlor⁴, ¹*University of Georgia, Athens, GA*, ²*INRA, Castanet-Tolosan Cedex, France*, ³*Instituto Nacional de Investigación Agropecuaria, Canelones, Uruguay*, ⁴*Holstein Association USA Inc., Brattleboro, VT*.
- 2:30 PM 536 **Theoretical aspects of the APY algorithm for inverting a large genomic relationship matrix.**
 Ignacy Misztal^{*}, *University of Georgia, Athens, GA*.
- 2:45 PM 537 **Effect of increasing the number of single nucleotide polymorphisms from 60,000 to 85,000 in genomic evaluation of Holsteins.**
 George R. Wiggans^{*}, Tabatha A. Cooper, Paul M. VanRaden, Curt P. Van Tassell, Derek M. Bickhart, and Tad S. Sonstegard, *Animal Genomics and Improvement Laboratory, Agricultural Research Service, USDA, Beltsville, MD*.
- 3:00 PM 538 **Genome-wide association study of fertility traits in dairy cattle using high-density single nucleotide polymorphism marker panels.**
 Kristen L. Parker Gaddis¹ and John B. Cole^{*2}, ¹*Department of Animal Sciences, University of Florida, Gainesville, FL*, ²*Animal Genomics and Improvement Laboratory, ARS, USDA, Beltsville, MD*.
- 3:15 PM 539 **Segment-based methods to calculate weights for weighted single-step GBLUP.**
 Xinyue Zhang^{*}, Daniela A. L. Lourenco, and Ignacy Misztal, *University of Georgia, Athens, GA*.
- 3:30 PM 540 **Multi-allelic haplotype model based on genetic partition for genomic prediction and variance component estimation.**
 Yang Da^{*}, *Department of Animal Science, University of Minnesota, Saint Paul, MN*.
- 3:45 PM 541 **Revisiting allelic frequencies estimation: A decision theory approach to derive Bayes, minimax, and admissible estimators.**
 Carlos A. Martinez^{*1,2}, Kshitij Khare², and Mauricio A. Elzo¹, ¹*Department of Animal Sciences, University of Florida, Gainesville, FL*, ²*Department of Statistics, University of Florida, Gainesville, FL*.
- 4:00 PM 542 **Strategies for estimating hyperparameters based on single-step Bayesian models.**
 Lei Zhou^{*} and Robert J. Tempelman, *Michigan State University, East Lansing, MI*.
- 4:15 PM 543 **Reassessing hierarchical Bayesian genome-wide association analyses.**
 C. Chen^{*}, J. P. Steibel, and R. J. Tempelman, *Michigan State University, East Lansing, MI*.
- 4:30 PM 544 **Approximating realized additive relationships in absence of genomic information.**
 Romdhane Rekaya^{*}, Sajjad Toghiani, and L. Y. Chang, *The University of Georgia, Athens, GA*.
- 4:45 PM 545 **Imputation using whole-genome sequence data in Brown Swiss and Original Braunvieh.**
 Christine F. Baes^{*1,2}, Beat Bapst², Franz R. Seefried², Heidi Signer-Hasler¹, Christine Flury¹, Dorian Garrick³, Christian Stricker⁴, and Birgit Gredler², ¹*Bern University of Applied Sciences, Zollikofen, Bern, Switzerland*, ²*Qualitas AG, Zug, Zug, Switzerland*, ³*Iowa State University, Ames, IA*, ⁴*agn Genetics, Davos, Grison, Switzerland*.

**Companion Animal Symposium
Bioenergetics of pet food**
Chair: Kelly Swanson, University of Illinois
Sponsor: **ASAS Foundation George C. Fahey Appreciation Club**
Suwannee 15

- 2:00 PM 546 **Pet obesity and bioenergetics of pet food.**
Kelly Swanson*, *University of Illinois at Urbana-Champaign, Urbana, IL.*
- 2:15 PM 547 **ASAS-EAAP Speaker Exchange Presentation: Bioenergetics of pet food.**
Ellen Kienzle* and Britta Dobenecker, *Chair of Animal Nutrition and Dietetics, Ludwig-Maximilians-Universität München, Oberschleissheim Germany.*
- 2:45 PM 548 **Animal and in vitro digestion models for estimates of value of energy and energy-yielding nutrients.**
R. T. Zijlstra* and L. F. Wang, *University of Alberta, Edmonton, AB, Canada.*
- 3:15 PM **Break**
- 3:30 PM 549 **Nature's pet food: Energy of raw meat-based and whole prey diets.**
Katherine Kerr*¹ and Cheryl Morris², ¹*University of Florida, Gainesville, FL,* ²*Iowa State University, Ames, IA.*
- 4:00 PM 550 **Bioenergetics of pet obesity.**
Dennis Jewell*, *Hill's Pet Nutrition Inc., Topeka, KS.*
- 4:30 PM **Roundtable discussion**

**Contemporary and Emerging Issues and International Animal Agriculture Symposium
Ahead to 2050—Global livestock production challenges: Current status, future needs,
production obstacles**

Chair: Jim Neel, GRL-ARS-USDA
Wekiwa 1/2

- 2:00 PM **Introduction.**
Jim Neel, GRL-ARS-USDA.
- 2:00 PM 551 **Global livestock production challenges: Current status, future needs, and production obstacles—North America.**
Michael Galyean*, *Texas Tech University, Lubbock, TX.*
- 2:30 PM 552 **Opportunities and challenges in animal nutrition.**
Leo A. den Hartog*^{1,2}, ¹*Nutreco, Boxmeer, the Netherlands,* ²*Wageningen University, Animal Nutrition Group, Wageningen, the Netherlands.*
- 3:00 PM 553 **The future of feed business and live animal production in Asian and Chinese markets to year 2050.**
Genfeng (Ian) Yi*, *Aquaculture Science & Technology Group of Beijing Dabeinong (DBN) Technology Group Co. Ltd, Beijing, China.*
- 3:30 PM 554 **Ahead to 2050—Latin American livestock production challenges.**
Fernando Rutz*, *Universidade Federal de Pelotas, RS, Brazil.*
- 4:00 PM 555 **Global livestock production challenges: Current status, future needs, production obstacles in Africa—The Uganda example.**
L. Okedi*¹, Y. Baguma², J. M. Kabirizi¹, and J. Kungu¹, ¹*National Livestock Resources Research Institute, Tororo, Uganda,* ²*National Agricultural Research Organization Secretariat, Entebbe, Uganda.*
- 4:30 PM **Discussion.**
Hugo Arelovich, *Universidad Nacional Del Sur.*

Dairy Foods
Cheese and chemistry
 Chair: Rachel Campbell Mertz, Kraft Food Ingredients
 Wekiwa 7/8

- 2:00 PM 556 **Release of bioactive peptides and essential amino acids as affected by sodium chloride reduction and substitution in Akawi cheese.**
 Akanksha Gandhi* and Nagendra P. Shah, *The University of Hong Kong, Hong Kong.*
- 2:15 PM 557 **Generation of highly antioxidative peptides from purified bovine α_{s2} -casein.**
 Zahur Z. Haque* and Xue Zhang, *Department of Food Science, Nutrition and Health Promotion, Mississippi State University, Mississippi State, MS.*
- 2:30 PM 558 **Efficacy of Cheddar whey combined with chitosan in edible coatings to reduce protein-fat oxidation and accumulation of reactive oxygen species in retail-cut catfish fillet.**
 Zahur Z. Haque* and Dipaloke Mukherjee, *Department of Food Science, Nutrition and Health Promotion, Mississippi State University, Mississippi State, MS.*
- 2:45 PM 559 **Influence of fish oil alone or in combination with hydrogenated palm oil on sensory characteristics and fatty acid composition of bovine cheese.**
 Einar Vargas-Bello-Pérez*¹, Gonzalo Íñiguez-González¹, Karen Fehrmann-Cartes¹, Paula Toro-Mujica¹, and Philip C. Garnsworthy², ¹*Pontificia Universidad Católica de Chile, Santiago, Chile*, ²*The University of Nottingham, Loughborough, UK.*
- 3:00 PM 560 **Comparison between whey dilution during cheese-making and standardization of milk lactose by ultrafiltration on the properties of low and reduced fat Gouda cheese.**
 Rodrigo A. Ibáñez*^{1,2}, Selvarani Govindasamy-Lucey³, John J. Jaeggi³, Mark E. Johnson³, Paul L. H. McSweeney¹, and John A. Lucey^{2,3}, ¹*University College Cork, Cork, Ireland*, ²*University of Wisconsin-Madison, Madison, WI*, ³*Wisconsin Center for Dairy Research, Madison, WI.*
- 3:15 PM **Break**
- 3:30 PM 561 **Growth and gas formation by a novel obligatory heterofermentative nonstarter lactic acid bacterium in cheese made using a *Streptococcus thermophilus* starter.**
 Fatih Ortakci*¹, Jeffery Broadbent¹, Craig Oberg^{2,1}, and Donald McMahon¹, ¹*Utah State University, Logan, UT*, ²*Weber State University, Ogden, UT.*
- 3:45 PM 562 **Late blowing of Cheddar cheese induced by accelerated ripening and ribose and galactose supplementation in presence of a novel obligatory heterofermentative nonstarter lactobacilli species.**
 Fatih Ortakci*¹, Jeffery Broadbent¹, Craig Oberg^{2,1}, and Donald McMahon¹, ¹*Utah State University, Logan, UT*, ²*Weber State University, Ogden, UT.*
- 4:00 PM 563 **Demonstration of pH micro-heterogeneity in cheese matrices by fluorescence microscopy.**
 Zuzana Burdikova¹, Zdenek Svindrych², Jan Pala³, Cian D. Hickey^{1,4}, Martin G. Wilkinson⁴, Jiri Panek⁵, Mark A. E. Auty¹, Ammasi Periasamy², and Jeremiah J. Sheehan*¹, ¹*Teagasc Food Research Centre Moorepark, Fermoy, Co. Cork, Ireland*, ²*Department of Biology, University of Virginia, Charlottesville, VA*, ³*Third faculty of Medicine, Charles University, Prague, Czech Republic*, ⁴*Dept of Life Sciences, University of Limerick, Ireland*, ⁵*Institute of Macromolecular Chemistry, Academy of Sciences of the Czech Republic, Prague, Czech Republic.*
- 4:15 PM 564 **Evaluation of X-ray fluorescence spectroscopy for determination of minerals in process cheese.**
 Catherine Shawl*¹, Jordan S. Rose², and David R. McCoy³, ¹*Kraft Foods Group, Glenview, IL*, ²*Oxford Instruments, Concord, MA*, ³*Dairy Management Inc., Rosemont, IL.*
- 4:30 PM 565 **Novel sample preparation for smear ripened cheese rinds evaluated by powder X-ray diffractometry.**
 Gil F. Tansman*¹, Paul S. Kindstedt¹, and John M. Hughes², ¹*Department of Nutrition and Food Sciences, University of Vermont, Burlington, VT*, ²*Department of Geology, University of Vermont, Burlington, VT.*

Dairy Foods Symposium
Recent developments in manufacturing and applications of lactose and lactose derivatives
Chair: Hasmukh Patel, South Dakota State University
Suwannee 13/14

- 2:00 PM 566 **Overview of technological advances in manufacture and applications of lactose and lactose derivatives: Present and future.**
 Shantanu Agarwal*, *Dairy Management Inc., Rosemont, IL.*
- 2:30 PM 567 **Lactose and lactose derivatives: More than prebiotics?**
 Michael Gänzle*, *University of Alberta, Edmonton, AB, Canada.*
- 3:00 PM 568 **Role of lactose in dairy and food products: State of understanding.**
 Tonya C. Schoenfuss*, *University of Minnesota, St. Paul, MN.*
- 3:30 PM **Break**
- 4:00 PM 569 **Industry perspective on managing quality and yield of lactose: From food to pharmaceutical grade.**
 A. Kent Keller*, *Keller Technologies Inc., Mantorville, MN.*
- 4:30 PM 570 **Processing and stability of high lactose powders.**
 Thom Huppertz*^{1,2}, Inge Gazi¹, and Hasmukh Patel², ¹*NIZO food research, Ede, the Netherlands*, ²*South Dakota State University, Brookings, SD.*

Nonruminant Nutrition
Feed ingredients
Chair: Tayo Adedokun, University of Kentucky
Sebastian I-4

- 2:00 PM 571 **Nutrient profile and digestibility of agro-industrial coproducts as determined using an in vitro model of swine.**
 Utsav P. Tiwari*, Halina M. Zaleski, and Rajesh Jha, *University of Hawaii at Manoa, Honolulu, HI.*
- 2:15 PM 572 **Feeding liquid dairy derivatives (whey) to nursery pigs.**
 Laura Eastwood, Mike R. Deibert, Dakota L. Wightman, and Denise Beaulieu*, *Prairie Swine Centre Inc., Saskatoon, SK, Canada.*
- 2:30 PM 573 **Growth performance, serum lipids, and intestinal volatile fatty acids contents in growing pigs fed flaxseed meal- and oat hulls-containing diets.**
 Saymore P. Ndou*¹, Elijah Kiarie^{1,2}, and Charles M. Nyachoti¹, ¹*Department of Animal Science, University of Manitoba, Winnipeg, MB, Canada*, ²*DuPont Industrial Biosciences-Danisco Animal Nutrition, Marlborough, UK.*
- 2:45 PM 574 **Effects of feeding increasing inclusion of canola press-cake on diet nutrient digestibility and growth performance of weaned pigs.**
 X. Zhou*¹, E. Beltranena^{1,2}, and R. T. Zijlstra¹, ¹*University of Alberta, Edmonton, AB, Canada*, ²*Alberta Agriculture and Rural Development, Edmonton, AB, Canada.*
- 3:00 PM 575 **Apparent and true ileal and total-tract digestibility of fat in diets including canola press-cake or canola oil and endogenous fat loss in growing pigs.**
 X. Zhou*¹, E. Beltranena^{1,2}, and R. T. Zijlstra¹, ¹*University of Alberta, Edmonton, AB, Canada*, ²*Alberta Agriculture and Rural Development, Edmonton, AB, Canada.*
- 3:15 PM 576 **Nutrient profile and digestibility of macadamia nut cake as determined using an in vitro model of swine.**
 Utsav P. Tiwari and Rajesh Jha*, *University of Hawaii at Manoa, Honolulu, HI.*
- 3:30 PM 577 **Effect of duck grease on growth performance, carcass characteristics, and meat quality in growing-finishing pigs.**
 Jie Yu*, Li Zhu, Bing Yu, Jun He, Ping Zheng, Xiangbing Mao, Quyuan Wang, Zhiqing Huang, Junqiu Luo, and Daiwen Chen, *Animal Nutrition Institute, Sichuan Agricultural University, Chengdu, Sichuan, China.*

- 3:45 PM 578 **Feeding layer hens with a new type of defatted green microalgae produced dose-dependent enrichments of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) in their egg yolk and tissues.**
Theodore Derksen, Meghan Manor, and Xin Gen Lei*, *Cornell University, Ithaca, NY.*
- 4:00 PM 579 **Moderate levels of supplemental defatted green microalgae in broiler diets had no adverse effect on bone properties.**
Eleanore O'Neil, Stephanie Gatrell, Meghan Manor, and Xin Gen Lei*, *Cornell University, Ithaca, NY.*
- 4:15 PM 580 **Low concentrations of supplemental defatted microalgae affect egg and tissue fatty acid composition differently in layers fed diets containing corn and flaxseed oils.**
Jonggun Kim and Xin Gen Lei*, *Cornell University, Ithaca, NY.*
- 4:30 PM 581 **Supplemental defatted green microalgae and phytase improve hemoglobin repletion in weanling pigs.**
Meghan L. Manor, Theodore J. Derksen, Rebecca L. Schwartz, Carol A. Roneker, and Xin Gen Lei*, *Cornell University, Ithaca, NY.*

Physiology and Endocrinology
Gametes and stress
Chair: **Brian K. Whitlock, University of Tennessee**
Panzacola H-4

- 2:00 PM 582 **The effects of coenzyme Q10 supplementation on in vitro fertilization in porcine oocytes.**
Caitlin A. Streaker* and Brian D. Whitaker, *The University of Findlay, Findlay, OH.*
- 2:15 PM 583 **Melatonin supplementation during oocyte maturation improves embryonic development in pigs.**
Rachel L. Lane* and Brian D. Whitaker, *University of Findlay, Findlay, OH.*
- 2:30 PM 584 **Cumulus-oocyte complex gene expression in bovine preovulatory follicles after administration of porcine luteinizing hormone.**
Amir Behrouzi*¹, Marcos G. Colazo¹, Ana Ruiz-Sanchez², and Divakar J. Ambrose^{1,2}, ¹Alberta Agriculture and Rural Development, Livestock Research Branch, Edmonton, AB, Canada, ²Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada.
- 2:45 PM 585 **α -Lipoic acid improves the post-thaw quality and survival of Nili-Ravi buffalo bull sperm.**
Muhammad Hammad Fayyaz¹, Sajid Iqbal^{1,2}, Muhammad Binyameen³, Nasim Ahmad*¹, and Mushtaq Ahmad¹, ¹Department of Theriogenology, University of Veterinary and Animal Sciences, Lahore, Pakistan, ²Semen Production Unit, Qadirabad, Sahiwal, Pakistan, ³Buffalo Research Institute, Kasur, Pakistan.
- 3:00 PM 586 **Comparison of fertility of liquid and frozen semen when varying the interval from CIDR removal to insemination.**
Brittany N. Richardson*¹, Erin L. Larimore¹, Julie A. Walker¹, Matthew D. Utt², J. Mel DeJarnette², and George A. Perry¹, ¹Department of Animal Sciences, South Dakota State University, Brookings, SD, ²Select Sires Inc., Plains City, OH.
- 3:15 PM 587 **The effects of seasonal heat stress on sperm nuclear shape in boars.**
Teyanna M. Loether, Ricky L. Monson, Cathy Miller-Gaudette, and John J. Parrish*, *University of Wisconsin-Madison, Madison, WI.*
- 3:30 PM 588 **Expressional regulation of chemerin and its receptors in the liver and adipose tissues of young cattle by weaning and nutrition.**
Yutaka Suzuki*¹, Daichi Kato¹, Mitsuhiko Kondo¹, Hizuru Hatanaka¹, Satoshi Haga^{1,2}, Takafumi Gotoh³, and Sanggun Roh¹, ¹Graduate School of Agricultural Science, Tohoku University, Sendai, Miyagi, Japan, ²Grassland Management Research Division, NARO Institute of Livestock and Grassland Science, Nasushiobara, Tochigi, Japan, ³Kuju Agricultural Research Center, Kyushu University, Takeda, Oita, Japan.

- 3:45 PM 589 **Modulation of the metabolic response to vaccination in naïve beef steers using an acute versus chronic stress model.**
Nicole C. Burdick Sanchez*¹, Jeffery A. Carroll¹, Nathan D. May², Shelby L. Roberts², Heather D. Hughes², Paul R. Broadway¹, Kate P. Sharon^{1,3}, Michael A. Ballou³, and John T. Richeson², ¹USDA-ARS, Livestock Issues Research Unit, Lubbock, TX, ²West Texas A&M University, Department of Agricultural Sciences, Canyon, TX, ³Texas Tech University, Department of Animal and Food Sciences, Lubbock, TX.
- 4:00 PM 590 **Mimicking acute and chronic stress exposure in naïve beef steers alters the acute phase response (APR) associated with vaccination.**
Jeffery A. Carroll*¹, Nicole C. Burdick Sanchez¹, Nathan D. May², Shelby L. Roberts², Heather D. Hughes², Paul R. Broadway¹, Kate P. Sharon^{1,3}, Michael A. Ballou³, and John T. Richeson², ¹USDA-ARS, Livestock Issues Research Unit, Lubbock, TX, ²West Texas A&M University, Department of Agricultural Sciences, Canyon, TX, ³Texas Tech University, Department of Animal and Food Sciences, Lubbock, TX.

Production, Management, and the Environment II

Chair: Nicolas DiLorenzo, University of Florida

Panzacola H-1

- 2:00 PM 591 **Global impact of improving feed efficiency and technology transfer efficacy.**
Robin R. White*^{1,3}, Todd J. Applegate², Gary L. Cromwell³, Donald C. Beitz⁴, Michael L. Galyean⁵, Mary Beth Hall⁶, Philip S. Miller⁷, Jack Odle⁸, William P. Weiss⁹, and Mark D. Hanigan¹, ¹National Animal Nutrition Program, Virginia Tech, Blacksburg, VA, ²Purdue University, West Lafayette, IN, ³University of Kentucky, Lexington, KY, ⁴Iowa State University, Ames, IA, ⁵Texas Tech University, Lubbock, TX, ⁶USDA/ARS, Madison, WI, ⁷University of Nebraska, Lincoln, NE, ⁸North Carolina State University, Raleigh, NC, ⁹The Ohio State University, Columbus, OH.
- 2:15 PM 592 **Nutrient cycling on dairy farms: Status and opportunities.**
Andrew Henderson¹, Ying Wang*², Karin Veltmank³, and Olivier Jolliet³, ¹University of Texas, Houston, TX, ²Innovation Center for US Dairy, Rosemont, IL, ³University of Michigan, Ann Arbor, MI.
- 2:30 PM 593 **Comparing climate impacts of grass-finished beef production strategies in the upper Midwest using a partial life cycle analysis.**
Jason E. Rowntree*¹, Rebecca Ryals², Marcia S. DeLonge³, Marilia B. Chiavegato⁴, W. Richard Teague⁵, and Peter Byck⁶, ¹Michigan State University, East Lansing, MI, ²University of Hawaii, Honolulu, HI, ³Union of Concerned Scientists, Washington, DC, ⁴University of São Paulo, Piracicaba, São Paulo, Brazil, ⁵Texas A&M Agrilife Research, Vernon, TX, ⁶Arizona State University, Tempe, AZ.
- 2:45 PM 594 **Predicting methane emission of dairy cows using fatty acids and volatile and non-volatile metabolites in milk.**
Sanne van Gastelen*^{1,2}, Elsa C. Antunes-Fernandes^{1,3}, Kasper A. Hettinga³, and Jan Dijkstra², ¹Top Institute Food and Nutrition, Wageningen, the Netherlands, ²Animal Nutrition Group, Wageningen University, Wageningen, the Netherlands, ³Food Quality Design Group, Wageningen University, Wageningen, the Netherlands.
- 3:00 PM 595 **Methane prediction equations for beef cattle fed low forage diet.**
Paul Escobar-Bahamondes*^{1,2}, Masahito Oba¹, and Karen A. Beauchemin², ¹University of Alberta, Edmonton, AB, Canada, ²Agriculture and Agri-Food Canada, Lethbridge, AB, Canada.
- 3:15 PM 596 **Evaluating extant empirical models for predicting enteric methane emissions from lactating dairy cows.**
J. A. D. R. N. Appuhamy* and E. Kebreab, Department of Animal Science, University of California, Davis, CA.
- 3:30 PM 597 **Comparison between the GreenFeed system and the sulfur hexafluoride tracer technique for measuring enteric methane emissions from dairy cows.**
Joonpyo Oh*¹, Fabio Giallongo¹, Tyler Frederick¹, Mike T. Harper¹, Holley Weeks¹, Antonio F. Branco², Alexander N. Hristov¹, William J. Price³, Peter J. Moate⁴, Matthew H. Deighton⁴, S. Richard O. Williams⁴, Maik Kindermann⁵, and Stephane Duval⁶, ¹The Pennsylvania State University, University Park, PA, ²Universidade Estadual de Maringá, Maringá, Paraná, Brazil, ³University of Idaho, Moscow, ID, ⁴Agriculture Research Division, Ellinbank Centre, Ellinbank, Victoria, Australia, ⁵DSM Nutritional Products, Base, Switzerland, ⁶DSM Nutritional Products France, Saint Louis Cedex, France.

- 3:45 PM 598 **Breed and lactation stage affect rumen methanogens in co-housed primiparous dairy cattle.**
L. M. Cersosimo*¹, M. Bainbridge¹, J. Kraft¹, and A.-D. G. Wright², ¹University of Vermont, Burlington, VT, ²University of Arizona, Tucson, AZ.
- 4:00 PM 599 **Aerodynamic design of a TMR feed bin to measure gaseous emissions from cattle.**
Scott Zimmerman*¹, John Roche², and Pat Zimmerman¹, ¹C-Lock Inc., Rapid City, SD, ²Dairy NZ, Hamilton, New Zealand.
- 4:15 PM 600 **Predicting nitrogen excretion from lactating dairy cattle.**
Kristan F. Reed*¹, Luis E. Moraes¹, Alexa Johnson¹, David P. Casper², and Ermias Kebreab¹, ¹University of California, Davis, Davis, CA, ²South Dakota State University, Brookings, SD.
- 4:30 PM 601 **Checks and balances: Evaluating reliability of dairy nutrient management data to better protect groundwater resources.**
Christine Miller* and Deanne Meyer, University of California, Davis, Davis, CA.
- 4:45 PM 602 **Economic and environmental implications of wheat crop rotations on organic dairy farms.**
D. C. Abreu*^{1,3}, A. K. Hoshide², E. B. Mallory², A. S. Oliveira¹, R. J. Kersbergen², R. P. Lana³, and C. P. Ghedini⁴, ¹Universidade Federal de Mato Grosso, Sinop, MT, Brazil, ²University of Maine, Orono, ME, ³Universidade Federal de Viçosa, Viçosa, MG, Brazil, ⁴University of New Hampshire, Durham, NH.

Ruminant Nutrition
Manipulating rumen function
Chair: Jenny Jennings, Texas A&M Agrilife Research
Panzacola H-2

- 2:00 PM 603 **The effects of Megalac and a fatty acid prill containing high levels of palmitic acid supplementation on milk fatty acid composition with early lactation dairy cows.**
Guiling Ma¹, Elliot Block², Limin Kung³, Joe Harrison*¹, and C. Merrill², ¹Washington State University, Puyallup, WA, ²Arm & Hammer Animal Nutrition, Princeton, NJ, ³University of Delaware, Newark, DE.
- 2:15 PM 604 **Effects of different levels of supplementation of a molasses and crude glycerol mixture on ruminal fermentation parameters of beef steers.**
Francine M. Ciriaco*, Darren D. Henry, Vitor R. G. Mercadante, Tessa M. Schulmeister, Martin Ruiz-Moreno, G. Cliff Lamb, and Nicolas DiLorenzo, North Florida Research and Education Center, University of Florida, Marianna, FL.
- 2:30 PM 605 **Total tract pdNDF digestibility in heifers fed with TMR or pelleted ration.**
Elena Bonfante*, Mattia Fustini, Nicola Negri, Alberto Palmonari, Giorgia Canestrari, and Andrea Formigoni, DIME-VET, University of Bologna, Ozzano Emilia, Italy.
- 2:45 PM 606 **Rumen degradability of wheat straw is related to changes in lignin properties after fungal treatment.**
Sandra J. A. van Kuijk*¹, Anton S. M. Sonnenberg², Johan J. P. Baars², Wouter H. Hendriks¹, and John W. Cone¹, ¹Animal Nutrition Group, Wageningen University, Wageningen, the Netherlands, ²Plant Breeding, Wageningen University, Wageningen, the Netherlands.
- 3:00 PM 607 **Inoculant effects on silage fermentation and aerobic stability of sorghum wet ethanol co-product/roughage blends.**
Pedro R. B. Campanili*, Jhones O. Sarturi, Michael L. Galyean, Sara Trojan, Lauren A. Ovinge, Barbara J. M. Lemos, Alex Thompsom, David Klein, Mendu Venugopal, and Bradley Johnson, Texas Tech University, Lubbock, TX.
- 3:15 PM **Break**
- 3:30 PM 609 **Effects of urea and fibrolytic enzymes on chemical composition, in vitro digestibility, in vitro degradability, and gas production of cotton gin trash.**
Alexandro Pereira Andrade^{1,2}, Mauro Pereira de Figueiredo², Danilo Gusmao de Quadros*¹, Joel Queiroga Ferreira², and Yann Santos Luz², ¹Bahia State University, Barreiras, Bahia, Brazil, ²Southwest Bahia University, Vitoria da Conquista, Bahia, Brazil.

- 3:45 PM 610 **Effects of *Saccharomyces cerevisiae* boulardii supplementation during the receiving period on growth efficiency, and behavioral and health responses in newly weaned beef heifers.**
Monica L. Jenks^{*1}, Gordon E. Carstens¹, Abbey G. Cupples¹, Jason E. Sawyer¹, William E. Pinchak², Kerry S. Barling³, and E. Chevaux³, ¹Department of Animal Science, Texas A&M University, College Station, TX, ²Texas A&M AgriLife, Vernon, TX, ³Lallemand Animal Nutrition, Milwaukee, WI.
- 4:00 PM 611 **Direct addition or pre-incubation of exogenous xylanase affects in vitro gas production kinetics, degradability and ruminal fermentation activities of three fibrous feeds.**
M. M. Y. Elghandour¹, A. E. Kholif², S. Lopez³, A. Z. M. Salem^{*1}, and T. A. Morsy², ¹Facultad de Medicina Veterinaria y Zootecnia, Universidad Autónoma del Estado de México, Toluca, Estado De México, Mexico, ²Dairy Science Department, National Research Centre, Giza, Egypt, ³Instituto de Ganadería de Montaña (IGM) CSIC-Universidad de León, Departamento de Producción Animal, Universidad de León, León, Spain.
- 4:15 PM 612 **Effects of essential oils and exogenous enzymes for finishing Nellore cattle in feedlot.**
Murillo Alves Porto Meschiatti¹, Lucas Agostinho Pellarin¹, João Ricardo Rebouças Dórea², Tiago Sabella Acedo², Luis Fernando Tamassia², Cristina Simões Cortinhas², and Flávio Augusto Portela Santos^{*1}, ¹University of São Paulo, Piracicaba, SP, Brazil, ²DSM Produtos Nutricionais Brasil SA, São Paulo, SP, Brazil.
- 4:30 PM 613 **Effect of supplementing grazing cattle with *Saccharomyces cerevisiae* on fiber digestibility and rumen cellulolytic bacteria population.**
D. O. Sousa^{*1}, M. A. Arcari¹, M. V. Biehl¹, A. V. Pires¹, E. Chevaux², L. J. Mari², and L. F. P. Silva¹, ¹University of São Paulo, Pirassununga, São Paulo, Brazil, ²Lallemand Animal Nutrition, Aparecida de Goiânia, Goiás, Brazil.
- 4:45 PM 614 **Effects of enzymatically hydrolyzed yeast supplementation and supplementation frequency on immune parameters among periparturient beef cows and calves.**
Janine E. Swartz^{*}, Derek W. Brake, Elaine E. Grings, Eric A. Nelson, Cody L. Wright, Julie A. Walker, Ethan J. Blom, and George A. Perry, South Dakota State University, Brookings, SD.

Ruminant Nutrition Protein metabolism

Chair: John McNamara, Washington State University
Panzacola H-3

- 2:00 PM 615 **Water partitioning in lactating Holstein cows fed two levels of dietary forage and crude protein contents.**
J. A. D. R. N. Appuhamy^{*1}, M. Niu¹, A. Leytem², R. Dungan², and E. Kebreab¹, ¹Department of Animal Science, University of California, Davis, CA, ²USDA-ARS, Northwest Irrigation Research Lab, Kimberly, ID.
- 2:15 PM 616 **Milk yield and composition responses to changes in supply of net energy and metabolizable protein: A meta-analysis.**
Jean-Baptiste Daniel^{*1,2}, Nicolas C. Friggens¹, Patrick Chapoutot¹, Harmen Van Laar², and Daniel Sauvant¹, ¹INRA-AgroParisTech UMR791, Paris, Îles-de-France, France, ²Nutreco R&D, Boxmeer, North Brabant, the Netherlands.
- 2:30 PM 617 **Updating protein requirements and responses of metabolizable protein efficiency in dairy cows and goats.**
Daniel Sauvant^{*1}, Gonzalo Cantalapiedra-Hijar², and Pierre Noziere², ¹AgroParisTech-INRA, Paris, France, ²INRA-VetagroSup, Theix, France.
- 2:45 PM 618 **The effect of concentration allocation strategy on the performance, health and fertility of high-genetic-merit dairy cows offered a grass silage-based diet.**
Mark W. Little^{*1,2}, Niamh O'Connell², and Conrad P. Ferris¹, ¹Agri-Food and Biosciences Institute, Hillsborough, UK, ²School of Biological Sciences, Queens University Belfast, Belfast, UK.
- 3:00 PM 619 **How the efficiency of utilization of histidine varies with supply in dairy cows.**
Helene Lapiere^{*} and Daniel R. Ouellet, Agriculture and Agri-Food Canada, Sherbrooke, QC, Canada.

- 3:15 PM 620 **Effects of rumen-protected methionine, lysine, and histidine on lactation performance of dairy cows.**
F. Giallongo^{*1}, J. Oh¹, M. Harper¹, J. Lopes¹, A. N. Hristov¹, H. Lapierre², R. A. Patton³, I. Shinzato⁴, J. Tekippe⁴, and C. Parys⁵, ¹*Department of Animal Science, The Pennsylvania State University, University Park, PA*, ²*Dairy and Swine Research and Development Centre, Agriculture and Agri-Food Canada, Sherbrooke, QC, Canada*, ³*Nittany Dairy Nutrition Inc., Mifflinburg, PA*, ⁴*Ajinomoto Co. Inc., Tokyo, Japan*, ⁵*Evonik Industries AG, Hanau, Germany*.
- 3:30 PM 621 **Evaluation of a rumen-protected methionine product for lactating dairy cows at 2 concentrations of dietary crude protein.**
Shane M. Fredin^{*1}, Heather M. Dann¹, Kurt W. Cotanch¹, Catherine S. Ballard¹, Richard Paratte², Kai Yuan³, and Rick J. Grant¹, ¹*William H. Miner Agricultural Research Institute, Chazy, NY*, ²*Vetagro S.p.A, Reggio Emilia, Italy*, ³*Vetagro Inc., Chicago, IL*.
- 3:45 PM 622 **Milk protein yield and plasma concentration of methionine increase in dairy cows fed field peas supplemented with rumen-protected amino acids.**
Andre B. D. Pereira^{*1}, Andre F. Brito, Kayla M. Aragona, Simone F. Reis, and Kelsey A. Juntwait, *University of New Hampshire, Durham, NH*.
- 4:00 PM 623 **Increased pre-wilting increases metabolizable protein concentration in grass-clover silage.**
Marianne Johansen^{*} and Martin R. Weisbjerg, *Department of Animal Science, AU Foulum, Aarhus University, Tjele, Denmark*.
- 4:15 PM 624 **Precision-feeding dairy heifers different levels of dietary fiber and high rumen undegradable protein.**
Louisa Bowen^{*1}, Ashley Bowyer¹, Sonya Weeks¹, Gustavo Lascano¹, and N. A. Gomez², ¹*Clemson University, Clemson, SC*, ²*The California Polytechnic State University, San Luis Obispo, CA*.
- 4:30 PM 625 **Dietary fiber and crude protein contents can be modified to minimize enteric methane emissions and nitrogen excretions from dairy cows simultaneously.**
M. Niu^{*1}, J. A. D. R. N. Appuhamy¹, A. Leytem², R. Dungan², and E. Kebreab¹, ¹*Department of Animal Science, University of California, Davis, Davis, CA*, ²*USDA-ARS, Northwest Irrigation and Soils Research Lab, Kimberly, ID*.
- 4:45 PM 626 **The effects of substituting true protein with non-protein nitrogen in Holstein dairy heifers precision-fed different forage to concentrate ratios.**
Prabha G. Ranasinghe^{*1}, Noe A. Gomez², Krystina Rowland¹, Ashley Caprio¹, and Gustavo J. Lascano¹, ¹*Clemson University, Clemson, SC*, ²*California Polytechnic State University, San Luis Obispo, CA*.

Small Ruminant General

Chair: Niki Whitley, North Carolina A&T State University
Suwannee 11/12

- 2:00 PM 627 **Use of a staphylococcal vaccine to reduce prevalence of mastitis and lower somatic cell counts in a registered Saanen dairy goat herd.**
Felicia Kautz, Stephen Nickerson^{*}, and Lane Ely, *University of Georgia*.
- 2:15 PM 628 **Keeping trends and practices for various exotic, crossbred, and indigenous sheep breeds in sub-tropical highlands of Pakistan.**
Muhammad Abdullah^{*1}, Muhammad Mudassir¹, Jalees Ahmed Bhatti¹, Abu Saeed Hashmi², Nisar Ahmad¹, and Umair Younas¹, ¹*Department of Livestock Production, University of Veterinary & Animal Sciences, Lahore, Punjab, Pakistan*, ²*Department of Biochemistry, Institute of Biochemistry and Biotechnology, Lahore, Punjab, Pakistan*.
- 2:30 PM 629 **Motility of Boer buck spermatozoa stored fresh for 72 hours.**
Olumide A. Ajao^{*}, Daniel M. Barry, and Kow K. Benyi, *University of Venda, Thohoyandou, Limpopo Province, South Africa*.
- 2:45 PM 630 ***Salix babylonica* as a phytogetic anthelmintic alternative on sheep and goat farms in México.**
A. Z. M. Salem^{*1}, M. M. Y. Elghandour¹, A. E. Kholif², J. C. Vázquez-Chagoyán¹, R. M. de Oca-Jiménez¹, A. B. Pliego¹, and T. A. Morsy², ¹*Facultad de Medicina Veterinaria y Zootecnia, Universidad Autónoma del Estado de México, Toluca, Estado De México, Mexico*, ²*Dairy Science Department, National Research Centre, Giza, Egypt*.

- 3:00 PM 631 **A comparison of ewe colostrum and a colostrum alternative (Volostrum) as a colostrum source for artificially reared triplet lambs.**
Tommy M. Boland*¹, Fiona M. McGovern¹, Francis P. Champion¹, and Jessica Cooke², ¹*School of Agriculture and Food Science, University College Dublin, Dublin, Ireland*, ²*Volac International Ltd, Orwell, Royston, UK*.
- 3:15 PM 632 **The relationship of body linear measurements and body weight with real-time ultrasound body composition measurements in Boer x Spanish yearling goats.**
Flavio R. B. Ribeiro*, Louis C. Nuti, Shaye K. Lewis, William B. Foxworth, Yoonsung Jung, Bianca Garza, Brandi Owens, Rosemarie Somers, and Gary R. Newton, *Cooperative Agricultural Research Center, Prairie View A&M University, Prairie View, TX*.
- 3:30 PM 633 **An investigation in to the interaction between ewe BCS and litter weights at key times of the production cycle.**
Francis P. Champion*¹, Fiona M. McGovern¹, Philip Creighton², Alan G. Fahey¹, and Tommy M. Boland¹, ¹*University College Dublin, Dublin, Ireland*, ²*Teagasc Athenry, Co. Galway, Ireland*.
- 3:45 PM 634 **Development of a low-density single nucleotide polymorphism panel for prolificacy in sheep.**
Thaisa Lacerda¹, Harvey Blackburn², Michel Yamagishi³, Concepta McManus¹, Alexandre Caetano⁴, and Samuel Paiva*^{5,2}, ¹*Universidade de Brasilia, Brasilia, DF, Brazil*, ²*USDA-ARS National Center Genetic Resources Preservation, Fort Collins, CO*, ³*Embrapa Informatica Agropecuaria, Campinas, SP, Brazil*, ⁴*Embrapa Recursos Geneticos e Biotecnologia, Brasilia, DF, Brazil*, ⁵*Embrapa Secretaria de Relacoes Internacionais, Brasilia, DF, Brazil*.
- 4:00 PM 635 **Influence of surgical castration on biochemical profile of rams.**
V. M. Storillo¹, M. B. R. Alves¹, E. C. C. Celeghini¹, B. Barcelos*², D. B. Birgel², V. F. P. Rispoli², W. C. Garcia², P. S. Silva², and E. H. Birgel Junior², ¹*Faculdade de Medicina Veterinária e Zootecnia da Universidade de São Paulo, São Paulo, São Paulo, Brazil*, ²*Faculdade de Zootecnia e Engenharia de Alimentos da Universidade de São Paulo, Pirassununga, São Paulo, Brazil*.
- 4:15 PM 636 **Effects of dairy slurry application and bale moisture concentration on voluntary intake and digestibility of alfalfa silage by sheep.**
Jessica K. Clark*^{1,2}, Bruce C. Shanks¹, James D. Caldwell⁶, Ken P. Coffey², Wayne K. Coblenz³, R. E. Muck⁴, Dirk Phillip², M. A. Borchart³, Robert T. Rhein², Ashley N. Young², Marshal D. Basham², W. E. Jokela³, Elizabeth A. Backes², Keith A. Center², M. G. Bertram⁵, ¹*Lincoln University, Jefferson City, MO*, ²*University of Arkansas, Fayetteville, AR*, ³*USDA-ARS, Marshfield, WI*, ⁴*USDA-ARS, Madison, WI*, ⁵*University of Wisconsin, Arlington, WI*, ⁶*Land O' Lakes*.
- 4:30 PM 637 **Comparison of delayed weaning and mineral form on lamb growth and parasitism.**
Jefferson McCutcheon*, David Clevenger, Gary Lowe, and Francis Fluharty, *The Ohio State University, Columbus, OH*.

Teaching/Undergraduate and Graduate Education Symposium
Teaching graduate students to teach and be successful at teaching
Chair: **Antonio Faciola, University of Nevada**
Sebastian I-1

- 2:00 PM 638 **Engaging introductory animal science students through free-range learning.**
Frank E. Robinson*, Dana C. Penrice, and Martin J. Zuidhof, *University of Alberta, Edmonton, Alberta, Canada*.
- 2:30 PM 639 **Teaching graduate students to teach: An integrated approach.**
Donald L. Gillian-Daniel*, *University of Wisconsin-Madison, Madison, WI*.
- 3:00 PM 640 **Assessing teaching skills when hiring new faculty members, and rewarding faculty and graduate students for teaching well.**
Kenneth G. Odde*, *Kansas State University, Manhattan, KS*.
- 3:30 PM 641 **Scholarship of teaching: What are the best methods of conducting research in teaching?**
Michel A. Wattiaux*, *University of Wisconsin, Madison, WI*.
- 4:00 PM 642 **Is *Natural Sciences Education* the journal for you?**
Ken Barbarick*, *Colorado State University, Fort Collins, CO*.

Wednesday, July 15

POSTER PRESENTATIONS

Animal Behavior and Well-Being II

- W1 **The relationship between equine temperament and behavior as affected over time by the skill level of the rider.**
Taylor Huffman and Katherine Koudele*, *Andrews University, Berrien Springs, MI.*
- W2 **Better welfare outcomes in lambs subjected to gradual weaning when compared with abrupt weaning.**
Cristiane G. Titto*¹, Fábio L. Henrique¹, Evaldo A. L. Titto¹, Adroaldo J. Zanella², Henrique B. Hooper¹, Lina F. P. Rodriguez¹, Ana Luisa S. Longo¹, Thays M. C. Leme-dos Santos¹, Raquel F. Calviello¹, Jessica C. Veronezi¹, and Alfredo M. F. Pereira³, ¹*Faculdade de Zootecnia e Engenharia de Alimentos, Universidade de São Paulo, Pirassununga, São Paulo, Brazil*, ²*Faculdade de Medicina Veterinária e Zootecnia, Universidade de São Paulo, Pirassununga, São Paulo, Brazil*, ³*Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora, Évora, Alentejo, Portugal.*
- W3 **Assessing cow-calf welfare.**
Gabrielle E. Simon*¹, Bruce R. Hoar², and Cassandra B. Tucker¹, ¹*University of California, Davis, Davis, CA*, ²*University of Wyoming, Laramie, WY.*
- W4 **Identifying the principal problems of animal welfare on intensive dairy farms in the central zone of Chile.**
Maria Sol Morales*, Lorena Carmona, Tamara Tadich, and Carlos Alvear, *Facultad de Ciencias Veterinarias y Pecuarias, Universidad de Chile, Santiago, RM, Chile.*
- W5 **Identifying farm-level factors affecting milking attendance and productivity in automated milking systems.**
Meagan T. M. King*¹, Ed A. Pajor², Stephen J. Leblanc³, and Trevor J. DeVries¹, ¹*Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada*, ²*Faculty of Veterinary Medicine, University of Calgary, Calgary, AB, Canada*, ³*Department of Population Medicine, Ontario Veterinary College, University of Guelph, Guelph, ON, Canada.*
- W6 **Differences in cow comfort between traditional bedded pack and compost bedded pack for dairy housing systems.**
Anna Fernández, Eva Mainau, Xavier Manteca, Cinta Sol*, and Lorena Castillejos, *Animal Nutrition and Welfare Service, Animal and Food Science Department, Universitat Autònoma de Barcelona, Bellaterra, Spain.*
- W7 **Behaviors of Holstein heifers associated with large follicles during the estrous cycle.**
Cassandra S. Skenandore* and Felipe C. Cardoso, *University of Illinois, Urbana, IL.*
- W8 **Behavioral responses of periparturient Jersey cows treated with recombinant bovine somatotropin during the periparturient period.**
Henrique F. Soares¹, Daniela N. Liboreiro*¹, Gabriel D. Bombardelli¹, Paula R. B. Silva¹, and Ricardo C. Chebel^{1,2}, ¹*University of Minnesota, St Paul, MN*, ²*University of Florida, Gainesville, FL.*
- W9 **Preference of flavored concentrate premixes by dairy cows.**
Michael T. Harper*¹, Joonpyo Oh¹, Fabio Giallongo¹, Juliana C. Lopes¹, Alexander N. Hristov¹, and Joelle Faugeron², ¹*The Pennsylvania State University, University Park, PA*, ²*Pancosma, Geneva, Switzerland.*
- W10 **Sorting of TMR by dairy calves is affected by availability of an alternative source of grain.**
Joao H. C. Costa*, Nicola A. Adderley, Daniel M. Weary, and Marina A. G. von Keyserlingk, *Animal Welfare Program, University of British Columbia, Vancouver, BC, Canada.*
- W11 **Predicting filching: A logistical approach.**
Kristina A. Weld*, Louis E. Armentano, and Amy L. Stanton, *University of Wisconsin, Madison, WI.*
- W12 **Validation of methodology for assessing heat abatement strategies in dry-lot cattle.**
Grazyna Tresoldi*¹, Karin Schütz², and Cassandra Tucker¹, ¹*Center for Animal Welfare, Department of Animal Science, University of California, Davis, Davis, CA*, ²*Farm Systems North, AgResearch Ltd., Ruakura Research Centre, Hamilton, New Zealand.*
- W13 **Infrared thermography as a tool to diagnose foot rot and digital dermatitis in feedlot cattle.**
Sonia Marti¹, Randy E. Wilde¹, Diego Moya*^{1,2}, Eugene D. Janzen², Michael J. Jelinski³, Craig L. Dorin³, Karin Orsel², Ed Pajor², Jan Shearer⁴, Suzanne T. Millman⁴, Johann F. Coetzee⁴, Dan Thomson⁵, and Karen S. Schwartzkopf-Genswein¹, ¹*Agriculture and Agri-Food Canada, Lethbridge, AB, Canada*, ²*University of Calgary, Faculty of Veterinary Medicine, Calgary, AB, Canada*, ³*Veterinary Agri-Health Services Ltd, Airdrie, AB, Canada*, ⁴*Iowa State University, College of Veterinary Medicine, Ames, IA*, ⁵*Kansas State University, College of Veterinary Medicine, Manhattan, KS.*

- W14 **Continuous recording versus scan-sampling in behavioral studies with growing heifers fed high-concentrate diets.**
Ana Madruga*¹, Alfred Ferret¹, María Rodríguez¹, Eva Mainau¹, Jose Luis Ruiz de la Torre¹, Luciano Gonzalez², and Xavier Manteca¹, ¹*Animal Nutrition and Welfare Service (SNIBA), Universitat Autònoma de Barcelona, Bellaterra, Spain*, ²*Centre for Carbon, Water and Food, The University of Sydney, Camden, NSW, Australia*.
- W15 **Evaluation of technologies to predict the onset of calving in Holstein dairy cows.**
Véronique Ouellet*¹, Elsa Vasseur², Wolfgang Heuwieser³, Onno Burfeind³, Xavier Maldague⁴, and Édith Charbonneau¹, ¹*Département des Sciences Animales, Université Laval, Québec, QC, Canada*, ²*Organic Dairy Research Center, University of Guelph, Alfred, ON, Canada*, ³*Clinic for Animal Reproduction, Faculty of Veterinary Medicine, Freie Universität Berlin, Berlin, Germany*, ⁴*Département de Génie électrique et de Génie Informatique, Université Laval, Québec, QC, Canada*.
- W16 **Barrow behavioral reactivity to a human or novel object when fed low versus high fiber diets.**
Jessica D. Colpoys*¹, Nicholas K. Gabler¹, Caitlyn E. Abell², Aileen F. Keating¹, Suzanne T. Millman¹, Janice M. Siegford³, and Anna K. Johnson¹, ¹*Iowa State University, Ames, IA*, ²*DNA Genetics, Columbus, NE*, ³*Michigan State University, East Lansing, MI*.
- W17 **A novel objective chute score interacts with monensin to affect growth of receiving cattle.**
Kelsey A. Bruno*, Eric S. Vanzant, Alex W. Altman, Monoj Kudupoje, and Kyle R. McLeod, *University of Kentucky, Lexington, KY*.
- W18 **Could forming uniform body weight groups at entrance result in improved performance, behavior, health and carcass in fattening Holstein bulls?**
Marçal Verdú*¹, Alex Bach^{2,1}, Armando Pérez³, and Maria Devant¹, ¹*IRTA-Ruminant Production, Animal Nutrition, Management, and Welfare Research Group, Caldes Montbui, Spain*, ²*ICREA, Barcelona, Spain*, ³*Grup Alimentari Guissona, Guissona, Spain*.

Animal Health

Dairy calves and heifers

- W19 **Effect of housing on the leukocyte transcriptome of beef calves.**
Robmay Garcia*, Dianelys Gonzalez-Pena, and Sandra L. Rodriguez-Zas, *University of Illinois at Urbana-Champaign, Urbana IL*.
- W20 **Short-term α -tocopherol treatment during neonatal period modulates pro-inflammatory response to endotoxin (LPS) challenge in the same calves several months later.**
S. Kahl* and T. H. Elsasser, *USDA, ARS, Animal Biosciences and Biotechnology Laboratory, Beltsville, MD*.
- W21 **Influence of a feed additive on support of calves during initial growth phase.**
Jorge A. Saltijeral Oaxaca¹, Luis Galicia¹, Juan E. Guerra², and H. I. Rogge*³, ¹*Universidad Autónoma Metropolitana, Mexico, DF, Mexico*, ²*Universidad Autónoma de Sinaloa, Culiacan, Sinaloa Mexico*, ³*Phytobiotics Futterzusatzstoffe GmbH, Eltville, Germany*.
- W22 **Influence of sex and temperament on response to *Salmonella* Newport extract vaccine in crossbred beef calves.**
Anita M. Snell*^{1,2}, Jason P. Banta², Brittini P. Littlejohn^{1,2}, Sara D. Lawhon³, Tom H. Welsh¹, Ron D. Randel², and Rhonda C. Vann⁴, ¹*Department of Animal Science, Texas A&M, College Station, TX*, ²*AgriLife Research and Extension Center, Texas A&M, Overton, TX*, ³*Department of Veterinary Pathobiology, Texas A&M, College Station, TX*, ⁴*MAFES-E.G. Morrison Brown Loam Exp. Station, Mississippi State University, Raymond, MS*.
- W23 **Passive transfer of immunity in dairy heifer calves on Costa Rican dairy farms.**
J. A. Elizondo-Salazar*¹, D. Benavides-Varela², A. Vargas-Ramírez¹, and C. M. Campos-Granados³, ¹*Estación Experimental Alfredo Volio Mata, Facultad de Ciencias Agroalimentarias, Universidad de Costa Rica, San José, Costa Rica*, ²*Alimentos del Norte S.A-DIPCR, Costa Rica*, ³*Centro de Investigación en Nutrición Animal, Facultad de Ciencias Agroalimentarias, Universidad de Costa Rica, San José, Costa Rica*.
- W24 **Prevalence of bovine respiratory disease in pre-weaned dairy calves in Northern California.**
Betsy M. Karle*¹, Sasha A. Dubrovsky², William J. Love³, Deniece R. Williams³, Jeffery W. Stackhouse⁴, Randall J. Anderson⁵, Alison L. Van Eenennaam², Terry W. Lehenbauer^{3,5}, and Sharif S. Aly^{3,5}, ¹*University of California Cooperative Extension, Orland, CA*, ²*University of California Department of Animal Science, Davis, CA*, ³*UC Davis Veterinary Medicine Teaching and Research Center, Tulare, CA*, ⁴*University of California Cooperative Extension, Eureka, CA*, ⁵*California Department of Food and Agriculture, Animal Health Branch, Sacramento, CA*, ⁶*Department of Population Health and Reproduction, School of Veterinary Medicine, University of California, Davis, Davis, CA*.

- W25 **Risk factors for diarrhea and pneumonia in Holstein calves offered colostrum of different quality in a hot environment.**
Edir Torres-Rodriguez*¹, Miguel A. Mellado-Bosque², Jose E. Garcia-Martinez², and Francisco G. Veliz-Deras¹, ¹Universidad Autonoma Agraria Antonio Narro, Torreon, Coahuila, Mexico, ²Universidad Autonoma Agraria Antonio Narro, Saltillo, Coahuila, Mexico.
- W26 **Preweaning plane of nutrition and *Mannheimia haemolytica* dose influence metabolic responses to a combined bovine herpesvirus-1 and *Mannheimia haemolytica* challenge in post-weaned Holstein calves.**
K. P. Sharon*^{1,2}, Y. L. Liang¹, N. C. Burdick Sanchez², J. A. Carroll², P. R. Broadway², and M. A. Ballou¹, ¹Texas Tech University, Department of Animal and Food Sciences, Lubbock, TX, ²USDA-ARS, Livestock Issues Research Unit, Lubbock, TX.
- W27 **Effect of repeated intravenous LPS infusions in endometrium gene expression and inflammatory response in Holstein heifers.**
Artur C. C. Fernandes*^{1,2}, Juliana S. Souza¹, Douglas Veira¹, Audrey Nadalin¹, Lúcio E. H. Melo², and Ronaldo L. A. Cerri¹, ¹Faculty of Land and Food Systems, University of British Columbia, Vancouver, BC, Canada, ²Federal Rural University of Pernambuco, Recife, Pernambuco, Brazil.
- W28 **Performance of Jersey calves born from dams treated with recombinant bovine somatotropin during the periparturient period.**
Paula R. B. Silva*¹, Henrique F. Soares¹, Gabriel D. Bombardelli¹, and Ricardo C. Chebel^{1,2}, ¹University of Minnesota, St Paul, MN, ²University of Florida, Gainesville, FL.
- W29 **Supplementation of *Saccharomyces cerevisiae* fermentation products for the prevention of geophagia in Holstein female calves fed milk in buckets.**
Sonia Vazquez-Flores*¹, Stephany Barrera-Almanza¹, María de Jesús Guerrero², Kristy Dorton³, Mark Scott³, and William Sanchez³, ¹Tecnológico de Monterrey, Querétaro, Querétaro, México, ²Universidad Autónoma de Querétaro, Querétaro, Querétaro, México, ³Diamond V, Cedar Rapids, IA.
- W30 **Comparison of the effect of LongRange (eprinomectin) versus Dectomax (doramectin) and fly tags on growth of post-weaned grazing dairy heifers.**
M. W. Sahar*^{1,2}, J. E. Tower¹, T. S. Dennis¹, A. M. Mosiman¹, H. F. P. Schmitz¹, R. K. Tessman³, and T. D. Nennich*^{1,4}, ¹Purdue University, West Lafayette, IN, ²Kabul University, Kabul, Afghanistan, ³Merial, Hallsville, MO, ⁴Famo Feeds, Freeport, MN.
- W31 **Associations between fecal pathogens, growth, and clinical signs of diarrhea in dairy heifer calves.**
Elizabeth S. Binversie*, Melissa C. Cornett, Catie C. Cramer, and Amy L. Stanton, University of Wisconsin-Madison, Department of Dairy Science, Madison, WI.
- W32 **Efficacy of feeding First Day Formula CR versus maternal colostrum on calf serum immunological parameters.**
Alfonso Lago*¹, Claudia Leonardi¹, Cedric Blanc², David Cook³, Michael Socha⁴, and Humberto Rivera⁵, ¹DairyExperts Inc., Tulare, CA, ²Pacific Rim Dairy, Corcoran, CA, ³Milk Products Inc., Chilton, WI, ⁴Zinpro Corporation, Eden Prairie, MN, ⁵Accelerated Genetics, Baraboo, WI.
- W33 **Relationship between serum total proteins and immunoglobulin G for calves fed either First Day Formula CR or maternal colostrum.**
Alfonso Lago*¹, Claudia Leonardi¹, Cedric Blanc², David Cook³, Michael Socha⁴, and Humberto Rivera⁵, ¹DairyExperts Inc., Tulare, CA, ²Pacific Rim Dairy, Corcoran, CA, ³Milk Products Inc., Chilton, WI, ⁴Zinpro Corporation, Eden Prairie, MN, ⁵Accelerated Genetics, Baraboo, WI.
- W34 **Prophylactic efficacy of an engineered biotherapeutic fusion protein against *Cryptosporidium parvum* in experimentally challenged neonatal calves.**
Travis J. De Wolfe*¹, Sheila M. McGuirk¹, Nicholas S. Keuler¹, Robert D. Bremel², Jane Homan², Michael Imboden², Deborah A. Schaefer³, and Benjamin J. Darien¹, ¹University of Wisconsin-Madison, Madison, WI, ²ioGenetics, Inc., Madison, WI, ³University of Arizona, Tucson, AZ.
- W35 **Association between plasma haptoglobin concentration and bovine respiratory disease status in preweaned dairy calves.**
Sonia J. Moisa*¹, Sharif S. Aly², William J. Love², Terry W. Lehenbauer², Alison L. Van Eenennaam³, and Lindsey E. Hulbert¹, ¹Department of Animal Sciences and Industry, Kansas State University, Manhattan, KS, ²School of Veterinary Medicine, University of California, Davis, Tulare, CA, ³Department of Animal Sciences, University of California, Davis, Davis, CA.
- W36 **Cosinor analysis of CRT in heifers.**
Alexander W. Altman*¹, Nicole C. Burdick-Sanchez², Jeffery A. Carroll², Ty B. Schmidt³, Kyle R. McLeod¹, Glen E. Aiken⁴, and Eric S. Vanzant¹, ¹Department of Animal and Food Sciences, University of Kentucky, Lexington, KY, ²Livestock Issues Research Unit, USDA-ARS, Lubbock, TX, ³Department of Animal Science, University of Nebraska-Lincoln, Lincoln, NE, ⁴Forage Animal Production Research Unit, USDA-ARS, Lexington, KY.

- W37 **Effect of bovine genotype on heifer response to repeated lipopolysaccharide (LPS) administration.**
Georgina Cousillas*¹, Aimee Benjamin², Wanda J. Weber¹, David Kerr², Theodore H. Elsasser³, Stanislaw Kahl³, and Brian A. Crooker¹, ¹University of Minnesota, St. Paul, MN, ²University of Vermont, Burlington, VT, ³USDA-ARS, Beltsville, MD.
- W38 **The effects of plane of milk replacer nutrition on the health and performance of high-risk Holstein bull calves from a commercial calf ranch.**
K. P. Sharon*^{1,3}, L. E. Hulbert², J. A. Carroll³, and M. A. Ballou¹, ¹Department of Animal and Food Sciences, Texas Tech University, Lubbock, TX, ²Department of Animal Sciences and Industry, Kansas State University, Manhattan, KS, ³Livestock Issues Research Unit, USDA-ARS, Lubbock, TX.
- W39 **The effect of diarrhea, fever, and respiratory disease on post-weaning weight of Holstein dairy heifers in an automated feeding system.**
Gabriela A. Zaldumbide*, Melissa C. Cornett, and Amy L. Stanton, University of Wisconsin-Madison, Madison, WI.

Animal Health

Monogastric health

- W40 **Changes in liver and white adipose tissue metabolism induced by postnatal nutritional restriction in piglets with intrauterine growth restriction.**
Liang Hu*, Xie Peng, Fali Wu, Chuan Yan, Qin Xu, Yan Liu, De Wu, Shengyu Xu, Yan Lin, Zhengfeng Fang, and Lianqiang Che, Institute of Animal Nutrition, Sichuan Agricultural University, Chengdu, Sichuan, China.
- W41 **MicroRNA expression profile of the mouse lung infected with a virulent avian H5N2 virus.**
M. K. Shim*¹, E. J. Choi², S. H. Hong¹, Y. K. Choi², and H. B. Kim¹, ¹Dankook University, Cheonan, Chungnam, Republic of Korea, ²Chungbuk National University, Cheongju, Chungbuk, Republic of Korea.
- W42 **Relationship between *Salmonella* translocation patterns and immune responses in orally inoculated pigs.**
Paul R. Broadway*¹, Jeffery A. Carroll¹, Nicole C. Burdick Sanchez¹, E. V. Gart², L. K. Bryan², R. M. Gold², C. Yang², and Sara D. Lawhon², ¹Livestock Issues Research Unit, USDA-ARS, Lubbock, TX, ²Department of Veterinary Pathobiology, College of Veterinary Medicine and Biomedical Sciences, Texas A&M University, College Station, TX.
- W43 **Isolation and characterization of *Clostridium tertium* in poultry feces.**
S. H. Hong*, S. A. Seok, M. K. Shim, and H. B. Kim, Dankook University, Cheonan, Chungnam, Republic of Korea.
- W44 **Antimicrobial resistance strategy and effect on the veterinary feed directive regulation.**
David B. Edwards*, Dragan Momcilovic, Sharon A. Benz, and Jo W. Gulley, Division of Animal Feeds, Center for Veterinary Medicine, Rockville, MD.
- W45 **Estimating glucose requirements of an activated immune system in growing pigs.**
Sara K. Stoakes*, Erin A. Nolan, Mohannad Abuajamieh, Maria V. Sanz Fernandez, and Lance H. Baumgard, Iowa State University, Ames, IA.
- W46 **The influence of sodium alendronate on performance and bone densitometry of broilers at 42 days of age.**
Thays Cristina Oliveira Quadros*¹, Sarah Sgavioli¹, Giuliana Milan de Andrade Rocha Garcia¹, Liliana Longo Borges¹, Elaine Talita Santos¹, Diana M. Correa Castiblanco¹, Albaraa Hisham Sarsour², Lizandra Amoroso¹, Joao Batista Matos Junior¹, Joao Paulo M. Chiquini¹, Otto Mack Junqueira¹, and Silvana Martinez Baraldi Artoni¹, ¹Paulista State University Julio de Mesquita Filho, Jaboticabal, Sao Paulo, Brazil, ²North Carolina State University, Raleigh, NC.
- W47 **Potential of a new probiotic strain, *Bifidobacterium longum* ssp. *infantis* CECT 7210, to improve health status of weaning piglets orally inoculated with *Salmonella* Typhimurium or ETEC K88.**
E. Barba-Vidal¹, L. Castillejos¹, C. Sol*¹, M. Rivero², JA Moreno², and SM Martín-Orúe¹, ¹Animal Nutrition and Welfare Service, Animal and Food Science Department, Universitat Autònoma de Barcelona, Bellaterra, Spain, ²Laboratorios Ordesa S. L., Parc Científic de Barcelona, Barcelona, Spain.
- W48 **A comparison for IgG absorption between Minpig and Landrace piglets.**
Shiquan Cui*^{1,2}, Yuan Xu¹, Xuankai Huang¹, Xibiao Wang¹, and Yuzhi Li², ¹Northeast Agricultural University, Harbin, Heilongjiang, China, ²West Central Research and Outreach Center, Morris, MN.

Beef Species

- W49 **Characterization of growth traits of Senepol heifers and bulls from birth through a year of age in the tropics.**
Robert W. Godfrey* and Henry C. Nelthropp, *Agricultural Experiment Station, University of the Virgin Islands, St Croix, VI.*
- W50 **Association of skin thickness and resistance to *Rhipicephalus microplus* in Simmental heifers.**
J. A. Il V. Silva*¹, A. M. Maiorano², A. C. Verdugo³, Rogerio A. Curi¹, and L. A. L. Chardulo¹, ¹*Universidade Estadual Paulista, Botucatu, SP, Brazil*, ²*Universidade Estadual Paulista, Jaboticabal, SP, Brazil*, ³*University of Saskatchewan, Saskatchewan, Canada.*
- W51 **The effect of selection using residual average daily gain and marbling EPD on growth performance and carcass traits in Angus steers.**
J. B. Wells*, J. R. Segers, J. Duggin, J. K. Bertrand, R. Rekaya, and T. D. Pringle, *University of Georgia, Athens, GA.*
- W52 **Relationship of grazing activities with residual feed intake measured in female Angus cattle carrying different genetic marker.**
Ana Ines Trujillo*, Alberto Casal, Mariana Carriquiry, and Pablo Chilbroste, *Facultad de Agronomia, Universidad de la Republica, Montevideo, Uruguay.*
- W53 **Reproducibility of estimators and validity of feed efficiency models.**
Carl A. Old*¹, Heidi A. Rossow², and Thomas R. Famula², ¹*A3 Cattle Co, LeGrand, CA*, ²*University of California, Davis, Davis, CA.*
- W54 **The effect of selection using residual average daily gain EPD on growth and reproductive performance in Angus heifers.**
J. B. Wells*, J. R. Segers, J. Duggin, J. K. Bertrand, R. Rekaya, and T. D. Pringle, *University of Georgia, Athens, GA.*
- W55 **Evaluation of serum 25-hydroxyvitamin D concentrations of beef calves during the spring and summer seasons.**
Jessica L. Powell*¹, Deborah M. Price¹, Matthew J. Hersom¹, Joel V. Yelich¹, G. Allen Bridges², Scott Bird², Mary E. Drenowski³, and Wade A. Sutton⁴, ¹*University of Florida, Gainesville, FL*, ²*University of Minnesota, Grand Rapids, MN*, ³*University of Nebraska, Lincoln, NE*, ⁴*University of Idaho, Moscow, ID.*
- W56 **Equations to predict chemical body composition in Nelore cattle.**
A. M. Castilhos¹, R. H. Branco², C. L. Francisco*¹, M. E. Z. Mercadante², S. F. M. Bonilha², C. M. Pariz¹, M. B. Silva¹, and A. M. Jorge¹, ¹*Universidade Estadual Paulista-FMVZ, Botucatu, SP, Brazil*, ²*Centro APTA Bovinos de Corte, Instituto de Zootecnia, Sertãozinho, SP, Brazil.*
- W57 **Effect of maternal body weight gain during mid-gestation on progeny skeletal muscle microRNA.**
J. C. McCann*, T. B. Wilson, D. W. Shike, and J. J. Loor, *University of Illinois at Urbana-Champaign, Urbana, IL.*
- W58 **Physical and chemical analysis of the longissimus thoracis muscle of Nelore cattle selected for production.**
Jessica Moraes Malheiros*¹, Rogério Abdallah Curi², Josineudson Augusto Vasconcelos Silva², Henrique Nunes de Oliveira¹, Lúcia Galvão Albuquerque¹, and Luis Artur Loyola Chardulo², ¹*College of Agriculture and Veterinary Science, São Paulo State University (UNESP), Jaboticabal, São Paulo, Brazil*, ²*College of Veterinary and Animal Science, São Paulo State University (UNESP), Botucatu, São Paulo, Brazil.*
- W59 **Characterization and identification of MyHC and their association with quality beef cattle Nelore.**
Jessica Moraes Malheiros*¹, Ivan José Vechetti-Junior², Maeli Dal-Pai-Silva², Henrique Nunes de Oliveira¹, Lúcia Galvão Albuquerque¹, and Luis Artur Loyola Chardulo³, ¹*College of Agriculture and Veterinary Science, São Paulo State University (UNESP), Jaboticabal, São Paulo, Brazil*, ²*Institute of Biosciences, São Paulo State University (UNESP), Botucatu, São Paulo, Brazil*, ³*College of Veterinary and Animal Science, São Paulo State University (UNESP), Botucatu, São Paulo, Brazil.*
- W60 **Effects of pre- and post-breeding supplementation of a ruminally protected lipid on subsequent beef cow performance.**
Darren D. Henry*¹, Francine M. Ciriaco¹, Vitor R. G. Mercadante¹, Danilo D. Demeterco¹, Pedro L. P. Fontes¹, Elliot Block², Neil Michael², Nicolas DiLorenzo¹, and G. Cliff Lamb¹, ¹*North Florida Research and Education Center, University of Florida, Marianna, FL*, ²*Arm & Hammer Animal Nutrition, Princeton, NJ.*
- W61 **Effects of prepartum supplementation of a rumen fermentation enhancer on subsequent beef cow performance.**
Darren D. Henry*¹, Francine M. Ciriaco¹, Vitor R. G. Mercadante¹, Danilo D. Demeterco¹, Pedro L. P. Fontes¹, Elliot Block², Neil Michael², Nicolas DiLorenzo¹, and G. Cliff Lamb¹, ¹*North Florida Research and Education Center, University of Florida, Marianna, FL*, ²*Arm & Hammer Animal Nutrition, Princeton, NJ.*
- W62 **Performance effects related to administration of long-acting eprinomectin or oxfendazole near calving in spring-calving cows over a 230-d grazing period.**
Elizabeth A. Backes*¹, Jeremy G. Powell¹, Donald S. Hubbell², John D. Tucker², William L. Galyen¹, and Laura R. Meyer¹, ¹*Department of Animal Science, Division of Agriculture, University of Arkansas, Fayetteville, AR*, ²*Livestock and Forestry Research Station, Batesville, AR.*

- W63 **The effects of weight gain, carcass characteristics, temperament, and Brahman influence on estrus behavior and conception rate in heifers.**
Brittney L. Ivey*, Allison C. Vail, William A. Storer, and C. Edward Ferguson, *McNeese State University, Lake Charles, LA.*
- W64 **Effect of breed on the sale price of beef calves sold through video auctions from 2010 through 2014.**
Michael E. King¹, Kevin L. Hill², Glenn M. Rogers³, and Kenneth G. Odde*¹, ¹*Kansas State University, Manhattan, KS*, ²*Merck Animal Health, Kaysville, UT*, ³*Grassy Ridge Consulting, Aledo, TX.*
- W65 **Economic aspects of rebreeding non-pregnant cows.**
Aline Gomes da Silva*^{1,2} and Rick N. Funston¹, ¹*University of Nebraska-Lincoln, West Central Research and Extension Center, North Platte, NE*, ²*Universidade Federal de Viçosa, Viçosa, MG, Brazil.*

Breeding and Genetics

Genomic methods and application—Beef

- W66 **GWAS between single nucleotide polymorphisms with beef fatty acid profile in Nellore cattle using the single-step procedure.**
Marcos V. A. Lemos*¹, Hermenegildo L. J. Chiaia¹, Mariana P. Berton¹, Fabiele L. B. Feitosa¹, Carolyn Aboujaoude¹, Adrielle M. Ferrinho², Lenise F. Mueller², Joyce J. M. Furlan², Angelica S. C. Pereira², Lucia G. Albuquerque¹, and Fernando Baldi¹, ¹*State University of São Paulo, Jaboticabal, São Paulo, Brazil*, ²*University of São Paulo, Pirassununga, São Paulo, Brazil.*
- W67 **Genotype imputation and haplotype-phase inference using trio based reference panel in Hanwoo (Korean cattle).**
Dajeong Lim*, Jung-Woo Choi, Hyung-Chul Kim, Han-Ha Chai, and Yong-Min Cho, *National Institute of Animal Science, Suwon, South Korea.*
- W68 **Genome-wide association study analysis for meat traits of beef cattle.**
Hoyoung Chung*, *National Institute of Animal Science, Suwon, KY, Korea.*
- W69 **Admixture analysis in Brazilian synthetic cattle.**
Marcos E. Buzanskas*¹, Ricardo V. Ventura², Tatiane C. S. Chud¹, Daniel J. A. Santos¹, Priscila A. Bernardes¹, Thiago B. R. Silva¹, Mauricio A. Mudadu³, Luciana C. A. Regitano³, Marcos V. G. Barbosa da Silva⁴, Changxi Li⁵, Flavio S. Schenkel², Mauricio M. Alencar³, and Danísio P. Munari¹, ¹*UNESP – Univ Estadual Paulista, Faculdade de Ciências Agrárias e Veterinárias, Jaboticabal, SP, Brazil*, ²*University of Guelph, Guelph, ON, Canada*, ³*Embrapa Southeast Livestock, São Carlos, SP, Brazil*, ⁴*Embrapa Dairy Cattle, Juiz de Fora, MG, Brazil*, ⁵*University of Alberta, Edmonton, AB, Canada.*
- W70 **Genome-wide association analysis and gene ontology enrichment of meat tenderness in Polled Nellore cattle in Brazil.**
Leticia M. Castro^{1,4}, Claudio U. Magnabosco^{2,3}, Fernando B. Lopes^{2,4}, Roberto D. Sainz*^{2,5}, and Guilherme J. M. Rosa⁶, ¹*Federal University of Goiás, Goiania, GO, Brazil*, ²*Embrapa-Brazilian Agricultural Research Corporation, Brasilia, DF, Brazil*, ³*CNPq-National Council for Scientific and Technological Development, Brasilia, DF, Brazil*, ⁴*Capes-Coordination for the Improvement of Higher Education Personnel, Brasilia, DF, Brazil*, ⁵*University of California, Davis, CA*, ⁶*University of Wisconsin, Madison, WI.*
- W71 **Genomic-polygenic and genomic predictions of direct and maternal effects for growth traits in a multibreed Angus-Brahman cattle population.**
Mauricio Elzo*¹, Milton Thomas², Dwain Johnson¹, Carlos Martinez¹, Cliff Lamb¹, Owen Rae¹, Jerry Wasdin¹, and Joseph Driver¹, ¹*University of Florida, Gainesville, FL*, ²*Colorado State University, Fort Collins, CO.*
- W72 **Genomic regions associated with beef fatty acid profile in Nellore cattle.**
R. Espigolan*¹, M. V. A. Lemos¹, H. L. J. Chiaia¹, M. P. Berton¹, F. L. B. Feitosa¹, D. G. M. Gordo¹, R. L. Tonussi¹, A. F. B. Magalhães¹, A. M. Ferrinho³, L. F. Mueller³, M. R. Mazalli³, J. J. M. Furlan³, A. S. C. Pereira³, L. G. Albuquerque^{1,2}, F. Baldi¹, ¹*Universidade Estadual Paulista, Faculdade de Ciências Agrárias e Veterinárias, Jaboticabal, SP, Brazil*, ²*Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq), Brasilia, DF, Brazil*, ³*Universidade de São Paulo, Faculdade de Zootecnia e Engenharia de Alimentos, Pirassununga, SP, Brazil.*
- W73 **An SNP association study evaluating Brahman and Brahman-influenced steers for growth and carcass traits.**
Amanda Royer¹, Chris Shivers³, David Riley⁴, Mauricio Elzo⁵, and Matthew Garcia*^{1,2}, ¹*Louisiana State University School of Animal Sciences, Baton Rouge, LA*, ²*LSU AgCenter, Baton Rouge, LA*, ³*American Brahman Breeders Association, Houston, TX*, ⁴*Department of Animal Science, Texas A&M University, College Station TX*, ⁵*Department of Animal Science, University of Florida, Gainesville, FL.*

- W74 **Major loci associated with growth traits on BTA14 in Hanwoo (Korean cattle).**
Seung Hwan Lee*^{1,3}, Ki Yong Chung¹, Cedric Gondro², Chang Gwan Dang¹, Hyeong Cheul Kim¹, Sidong Kim¹, and Hee Ceol Kang¹,
¹National Institute of Animal Science, Pyeongchang, Gangwon, Korea, ²University of New England, Armidale, NSW, Australia,
³Chungnam National University, Daejeon, Chungnam, Korea.
- W75 **Identification of shared copy number variation among Spanish beef cattle.**
T. B. R. da Silva*¹, A. González-Rodríguez², E. Moursan³, J. J. Cañas-Álvarez⁵, L. Varona³, D. P. Munari¹, M. J. Carabaño², C.
Avilés⁴, P. Martínez-Cambor⁶, and C. Díaz², ¹Univ Estadual Paulista, Jaboticabal, SP, Brazil, ²Instituto Nacional de Investigación y
Tecnología Agraria y Alimentaria, Madrid, MD, Spain, ³Univ de Zaragoza, Zaragoza, AR, Spain, ⁴Univ de Cordoba, Córdoba, AN,
Spain, ⁵Univ Autonoma de Barcelona, Barcelona, CT, Spain, ⁶Univ De Valladolid, Valladolid, CL, Spain.
- W76 **Whole-genome resequencing analysis for identifying genome-wide SNPs and signatures of selection.**
Dajeong Lim*, Jung-Woo Choi, Bong-Hwan Choi, Won-Hyong Chung, and Seung-Soo Lee, *National Institute of Animal Science,
Suwon, South Korea.*
- W77 **Genome-wide association on growth traits in Nellore Cattle.**
Rafael M. O. Silva*¹, Daniela A. L. Lourenco², Breno O. Fragomeni², Luciana Takada¹, Rafael Espigolan¹, Maria E. Z. Mercadante³,
Fernando Baldi¹, Guilherme C. Venturini¹, Joslaine N. S. G. Cyrillo³, and Lucia G. Albuquerque¹, ¹Univ Est Paulista Julio de Mes-
quita Filho—FCAV-UNESP, Jaboticabal, SP, Brazil, ²The University of Georgia, Athens, GA, ³APTA Center for Beef Cattle, Animal
Science Institute, Sertãozinho, SP, Brazil.
- W78 **Genome-wide association study for flight speed in Nellore cattle.**
Tiago S. Valente*, Fernando Baldi, Aline C. Sant'Anna, Lucia G. Albuquerque, and Mateus J. R. Paranhos Da Costa, *São Paulo
State University, Faculty of Agriculture and Veterinary Sciences, Jaboticabal, São Paulo, Brazil.*

Breeding and Genetics

Genomic methods and application—Dairy

- W79 **Common copy number variation regions affecting dairy traits in Gyr cattle.**
Gerson A. Oliveira Junior*¹, Adriana S. Carmo², Adam T. H. Utsunomiya³, Tatiane C. S. Chud³, Fernando S. B. Rey³, Jose Bento S.
Ferraz¹, and Marcos Vinicius G. B. da Silva², ¹University of São Paulo, Pirassununga, São Paulo, Brazil, ²Embrapa Dairy Cattle,
Juiz de Fora, Minas Gerais, Brazil, ³São Paulo State University, Jaboticabal, São Paulo, Brazil.
- W80 **Genome-wide association study on conception rate, milk production, and SCS in different stages of lactation for first three
parities in US Holsteins.**
Shogo Tsuruta*¹, Daniela A. L. Lourenco¹, Ignacio Aguilar², and Ignacy Misztal¹, ¹University of Georgia, Athens, GA, ²INIA, Las
Brujas, Canelones, Uruguay.
- W81 **Single nucleotide polymorphisms associated with thermoregulation in lactating dairy cows exposed to heat stress.**
Serdal Dikmen*^{1,3}, Xian-zhong Wang^{2,3}, and Peter J. Hansen³, ¹Department of Animal Science, Faculty of Veterinary Medicine,
University of Uludag, Bursa, Turkey, ²College of Animal Science and Technology, Southwest University, Chongqing, China, ³De-
partment of Animal Sciences, University of Florida, Gainesville, FL.
- W82 **Multi-generational imputation of SNP genotypes and accuracy of genomic selection.**
Sajjad Toghiani* and Romdhane Rekaya, *The University of Georgia, Athens, GA.*
- W83 **Genome-wide association study for milk production traits in Russian dairy cattle.**
Alexander A. Sermyagin*¹, Elena A. Gladyr¹, Sergei N. Kharitonov¹, Alexander N. Ermilov^{1,2}, Ivan N. Yanchukov², Nikolai I. Streko-
zov¹, and Natalia A. Zinovieva¹, ¹L.K.Ernst Institute of Animal Husbandry, Dubrovitsy, Moscow, Russia, ²Regional Information
Selection Center, Noginsk, Moscow, Russia.
- W84 **Identification of copy number variable gene families in Holstein and Jersey cattle.**
Derek M. Bickhart*¹, Lingyang Xu^{2,1}, Jana L. Hutchison¹, Harris A. Lewin³, and George E. Liu¹, ¹United States Department of Agri-
culture, Agricultural Research Service, Animal Genomics and Improvement Laboratory, Beltsville, MD, ²University of Maryland,
Department of Animal and Avian Sciences, College Park, MD, ³University of California, Department of Evolution and Ecology,
Davis, CA.

- W85 **Single nucleotide polymorphisms in specific candidate genes are associated with phenotypic differences in days open for first lactation in Holstein cows.**
M. Sofia Ortega*¹, Anna C. Denicol¹, Daniel J. Null², John B. Cole², and Peter J. Hansen¹, ¹Department of Animal Sciences, University of Florida, Gainesville, FL, ²Animal Genomics and Improvement Laboratory, Agriculture Research Service, United States Department of Agriculture, Beltsville, MD.
- W86 **Animal selection for whole-genome sequencing by quantifying the unique contribution of homozygous haplotypes sequenced.**
Jana L. Hutchison*, John B. Cole, and Derek M. Bickhart, *United States Department of Agriculture, Agricultural Research Service, Animal Genomics and Improvement Laboratory, Beltsville, MD.*
- W87 **A GWAS on heat tolerance phenotypes for Italian Holstein bulls.**
Stefano Biffani¹, Umberto Bernabucci², Nicola Lacetera², Andrea Vitali², Paolo Ajmone Marsan³, Nicolo PP Macciotta*⁴, and Alessandro Nardone², ¹IBBA-CNR, Lodi, Italy, ²Dipartimento di Scienze e Tecnologie per l'Agricoltura, le Foreste, la Natura e l'Energia Università degli Studi della Tuscia, Viterbo, Italy, ³Istituto di Zootecnica, Università Cattolica del Sacro Cuore, Piacenza, Italy, ⁴Dipartimento di Agraria, Università di Sassari, Sassari, Italy.
- W88 **A genome-wide association study of mastitis in US Holstein and the relationship to mammary microbiome profile identifies novel QTL.**
Heather Huson*¹ and Rodrigo Bicalho², ¹College of Agriculture and Life Sciences, Cornell University, Ithaca, NY, ²College of Veterinary Medicine, Cornell University, Ithaca, NY.
- W89 **The accuracy of genomic predictions for Japanese Holsteins using by GBLUP and ssGBLUP methods.**
Yusaku Gotoh*¹, Toshimi Baba¹, Satoshi Yamaguchi², and Takayoshi Kawahara¹, ¹Holstein Cattle Association of Japan, Hokkaido Branch, Sapporo, Japan, ²Hokkaido Dairy Milk Recording and Testing Association, Sapporo, Japan.
- W90 **Identification of loci associated with fertility in Holstein heifers.**
Joao G. N. Moraes*¹, Joseph Dalton², Thomas E. Spencer¹, Jennifer N. Kiser¹, Gregory W. Burns¹, Andrzej Wojtowicz¹, Mahesh Neupane¹, and Holly L. Neibergs¹, ¹Department of Animal Science, Washington State University, Pullman, WA, ²Department of Animal and Veterinary Sciences, University of Idaho, Caldwell, ID.
- W91 **Accuracy of genomic imputation in a Thai multibreed dairy cattle population.**
Danai Jattawa*^{1,2}, Skorn Koonawootrittriron¹, Mauricio A. Elzo², and Thanathip Suwanasopee¹, ¹Kasetsart University, Chatuchak, Bangkok, Thailand, ²University of Florida, Gainesville, FL.
- W92 **Identification of copy number variation in Brazilian synthetic dairy cattle breed.**
T. C. S. Chud¹, M. V. G. B. da Silva², A. S. Carmo², T. B. R. Silva*¹, G. A. Oliveira Junior³, F. S. Baldi Rey¹, and D. P. Munari¹, ¹Univ Estadual Paulista "Júlio de Mesquita Filho," Jaboticabal, SP, Brazil, ²Embrapa - Brazilian Corporation of Agricultural Research, Juiz de Fora, MG, Brazil, ³Universidade de São Paulo, Pirassununga, SP, Brazil.
- W93 **Linkage disequilibrium in a Thai dairy cattle population with different Holstein fractions.**
Thawee Laodim¹, Skorn Koonawootrittriron*¹, Mauricio A. Elzo², and Thanathip Suwanasopee¹, ¹Kasetsart University, Bangkok, Thailand, ²University of Florida, Gainesville, FL.
- W94 **Improving the genotyping-by-sequencing (GBS) approach for the identification of SNPs associated with Johne's disease.**
Émilie Constant^{1,2}, Eveline M. Ibeagha-Awemu¹, Filippo Miglior^{3,4}, Gilles Robitaille⁵, and Nathalie Bissonnette*^{1,2}, ¹Dairy & Swine Research and Development Centre Agriculture and Agri-Food Canada, Sherbrooke, Quebec, Canada, ²Department of Biology, Université de Sherbrooke, Sherbrooke, Quebec, Canada, ³Canadian Dairy Network, Guelph, Ontario, Canada, ⁴CGIL, University of Guelph, Guelph, Ontario, Canada, ⁵Food Research and Development Centre, Agriculture and Agri-Food Canada, Saint-Hyacinthe, Québec, Canada.

Companion Animals Nutrition

Sponsor: **ASAS Foundation George C. Fahey Appreciation Club**

- W95 **Identifying sources of *Salmonella* contamination in animal feed and pet food facilities.**
Andrea M. Jeffrey*¹, Cassandra K. Jones¹, Greg Aldrich¹, Anne R. Huss¹, and Carl Knueven², ¹Kansas State University, Manhattan, KS, ²Jones-Hamilton, Walbridge, OH.

- W96 **Dog ownership increases the richness of the cutaneous microbiome.**
Celia S. Sobelman*¹, Jessica K. Suagee², and Cristina Caldari¹, ¹*Centenary College of Louisiana, Shreveport, LA*, ²*The Ohio State University, Wooster, OH*.
- W97 **Effects of thiamine type, species meat versus livers, and sulfite addition on water-soluble B-vitamins in a canned cat diet.**
Shelby D. Tribble*, Charles G. Aldrich, and Cassandra K. Jones, *Kansas State University, Manhattan, KS*.
- W98 **Chemical composition, nutrient digestibility, and true metabolizable energy of commercially available protein sources using the precision-fed cecectomized rooster assay.**
Ping Deng*¹, Pamela Utterback¹, Carl Parsons¹, and Kelly Swanson^{1,2}, ¹*Department of Animal Sciences, University of Illinois, Urbana, IL*, ²*Department of Veterinary Clinical Medicine, University of Illinois, Urbana, IL*, ³*Division of Nutritional Sciences, University of Illinois, Urbana, IL*.
- W99 **The effect of low-bloom gelatin on physical properties of extruded pet food.**
Analena E. Manbeck*, C. Greg Aldrich, and Sajid Alavi, *Department of Grain Science and Industry, Kansas State University, Manhattan, KS*.
- W100 **Effects of age and diet on colonic mucosa microbiota of dogs.**
Ana Paula J. Maria*¹, Ping Deng², Hannah D. Holscher², Franz N. Yoshitoshi³, Thaila C. Putarov¹, Kelly S. Swanson², and Aulus C. Carciofi¹, ¹*São Paulo State University (UNESP), Jaboticabal, SP, Brazil*, ²*University of Illinois at Urbana-Champaign, Urbana, IL*, ³*Endoscopy-Endoscopy and Surgery, São Paulo, SP, Brazil*.
- W101 **Digestibility of the crude corn oil in dogs.**
Tabyta T. Sabchuk*¹, Karoline Vanelli¹, Larissa Barrile², Fabiane Y. Murakami¹, Alex Maiorka¹, Simone G. Oliveira¹, and Ananda P. Félix¹, ¹*Federal University of Paraná, Curitiba, Paraná, Brazil*, ²*Cargil Agricola SA, Uberlândia, Minas Gerais, Brazil*.
- W102 **A high protein intake allows the preservation of lean mass and prevents the increase of fat mass, compared with a moderate protein intake, in neutered cats.**
Agnès André¹, Isabelle Leriche², Gwendoline Chaix³, and Patrick Nguyen*¹, ¹*Nutrition & Endocrinology Unit, National College of Veterinary Medicine, Nantes, France*, ²*Virbac Nutrition, Vauvert, France*, ³*Virbac Medical Department, Carros, France*.
- W103 **The effect of processing and elevated storage temperatures on omega-3 fatty acid stability in pet food.**
Alaina K. Mooney*, C. G. Aldrich, C. K. Jones, and S. Alavi, *Kansas State University, Manhattan, KS*.
- W105 **The impact of rendered protein meal level of oxidation on shelf life and acceptability in extruded pet foods.**
Morgan N. Gray*, Charles G. Aldrich, Cassandra K. Jones, and Michael W. Gibson, *Kansas State University, Manhattan, KS*.

Comparative Gut Physiology

- W106 **Effect of complex and prebiotic diets on intestinal health of nursery pigs inoculated to porcine circovirus 2 (PCV2).**
Marco M. Lima*^{1,2}, Dana M. van Sambeek², Huyen Tran², Daniel C. Ciobanu², Phillip S. Miller², and Thomas E. Burkey², ¹*Univesidade Estadual Paulista, Jaboticabal, Sao Paulo, Brazil*, ²*University of Nebraska, Lincoln, NE*.
- W107 **Mitotic and apoptosis rate of intestinal cells of nursery pigs fed with a blend of organic acids and medium chain fatty acids.**
Marco M. Lima*¹, Maria C. Thomaz¹, Fabricio F. Castro¹, Rosemeire S. Filardi², Daniela J. Rodrigues¹, Maryane S. F. Oliveira¹, Manuela V. Marujo¹, Everton Daniel¹, Antonio C. Laurentiz², and Thomas E. Burkey³, ¹*Univesidade Estadual Paulista, Jaboticabal, Sao Paulo, Brazil*, ²*Univ Estadual Paulista, Ilha Solteira, Sao Paulo, Brazil*, ³*University of Nebraska, Lincoln, NE*.
- W108 **Effects of organic acids and medium-chain fatty acids on gut health of nursery pigs.**
Marco M. Lima*¹, Maria C. Thomaz¹, Fabricio F. Castro¹, Rosemeire S. Filardi³, Daniela J. Rodrigues¹, Maryane S. F. Oliveira¹, Manuela V. Marujo¹, Dana M. van Sambeek², and Thomas E. Burkey², ¹*Univesidade Estadual Paulista, Jaboticabal, Sao Paulo, Brazil*, ²*University of Nebraska-Lincoln, Lincoln, NE*, ³*Univesidade Estadual Paulista, Ilha Solteira, Sao Paulo, Brazil*.
- W109 **Effect of turmeric, ginger and garlic extracts on performance, microbial load, and gut morphology of weaned pigs.**
Olufemi A. Adebisi*¹, Isaac A. Adejumo², Oluremi A. Adeniji¹, Olusegun D. Oshibanjo¹, and Muiyiwa B. Falana-Williams¹, ¹*Department of Animal Science, University of Ibadan, Ibadan, Nigeria*, ²*Department of Animal Science, Landmark University, Omu Aran, Kwara state, Nigeria*.

- W110 **Effect of heat stress on endogenous intestinal loss of amino acids in growing pigs.**
Adriana Morales¹, Lorenzo Buenabad¹, Lisbeth Hernández¹, Misael Pérez¹, Pedro Castro¹, Gilberto Castillo¹, Lance Baumgard², and Miguel Cervantes*¹, ¹ICA, Universidad Autónoma de Baja California, Mexicali, BC, México, ²Department of Animal Science, Iowa State University, Ames, IA.
- W111 **Effect of dietary fiber and a multicarbohydrase enzyme blend on net glucose and lactate fluxes, insulin production, and oxygen consumption by the portal-drained viscera and by the whole animal in growing pigs.**
Atta K. Agyekum*¹, Elijah Kiarie^{2,1}, and Charles M. Nyachoti¹, ¹Department of Animal Science, University of Manitoba, Winnipeg, MB, Canada, ²DuPont Industrial Biosciences, Marlborough, Wiltshire, UK.
- W112 **Effect of a post-weaning diet supplemented with gut health-enhancing feed additives on ileum transcriptome activity and serum cytokines in piglets challenged with lipopolysaccharides (LPS).**
Nathalie Bissonnette*¹, Xian-Ren Jiang^{1,4}, Jacques J. Matte¹, Guylaine Talbot¹, Frédéric Guay², Joshua Gong³, Qi Wang³, Valentino Bontempo⁴, and Martin Lessard¹, ¹Dairy & Swine Research and Development Centre Agriculture and Agri-Food Canada, Sherbrooke, Quebec, Canada, ²Département des Sciences Animales, Université Laval, Québec, Québec, Canada, ³Guelph Food Research Centre, Agriculture and Agri-Food Canada, Guelph, Ontario, Canada, ⁴Department of Health, Animal Science and Food Safety, University of Milan, Milan, Italy.
- W113 **Chitooligosaccharide improves intestinal barrier function in the jejunum of weaning piglets.**
Y. Yao*, G. Tian, D. W. Chen, B. Yu, X. H. Song, J. Yu, P. Zheng, X. B. Mao, J. He, and Z. Q. Huang, Animal Nutrition Institute, Sichuan Agricultural University, Chengdu, Sichuan, China.
- W114 **Exogenous enzymes blend (DigeGrain Delta) improve growth performance and gut health of weaning pigs fed corn-soybean based diet in absence of antibiotic growth promoters.**
Y. H. Kim¹, S. L. Ingale*², P. C. Rathi², S. H. Lee¹, and B. J. Chae¹, ¹College of Animal Life Sciences, Kangwon National University, Chuncheon, Gangwon-do, Republic of Korea, ²Advanced Enzyme Technologies Ltd, Thane, Maharashtra, India.
- W115 **Endoplasmic reticulum stress pathway is involved in weaning stress induced jejunum cell apoptosis in piglets.**
Y. Yao*, G. Tian, D. W. Chen, B. Yu, X. H. Song, J. Yu, P. Zheng, X. B. Mao, J. He, and Z. Q. Huang, Animal Nutrition Institute, Sichuan Agricultural University, Chengdu, Sichuan, China.
- W116 **The expression of genes encoding gastrointestinal enzymes, microbial populations, and volatile fatty acids in pigs differing in feed efficiency.**
Stafford Vigors*, Torres Sweeney, Cormac J. O'Shea, and John V. O'Doherty, College of Agriculture, Food Science and Veterinary Medicine, Dublin, Ireland.
- W117 **Diets containing flaxseed-meal and oat hulls modulate fat digestibility, production, and excretion of bile acids and neutral sterols in growing pigs.**
Saymore P. Ndou*¹, Elijah Kiarie^{1,2}, Sijo J. Thandapilly³, Nancy Ames³, and Charles M. Nyachoti¹, ¹Department of Animal Science, University of Manitoba, Winnipeg, MB, Canada, ²DuPont Industrial Biosciences-Danisco Animal Nutrition, Marlborough, Wiltshire, United Kingdom, ³Richardson Centre for Functional Foods and Nutraceuticals, Agriculture and Agri-Food Canada, Winnipeg, MB, Canada.
- W118 **The gut and vaginal microbiota profile of pregnant sows and their contribution to neonatal piglet gut microbiota development.**
Alessi A. Kwawukume*, Hein M. Tun, Martin C. Nyachoti, and Ehsan Khafipour, University of Manitoba, Winnipeg, Manitoba, Canada.
- W119 **Enteral bile acids modulate intestinal immune response and gut microbiota in early-weaned piglets challenged with LPS.**
Alessandro Mereu*¹, Nuria de Diego-Cabero², Jose Javier Pastor Porras¹, David Menoyo², and Ignacio Ipharraguerre^{3,1}, ¹Lucta SA, Montornés del Valles, Barcelona, Spain, ²Departamento de Producción Animal, Universidad Politécnica de Madrid, ETS Ingenieros Agrónomos, Madrid, Spain, ³Institute of Human Nutrition and Food Science, University of Kiel, Kiel, Germany.
- W120 **Impact of xylanases on gut microbiome of growing pigs fed with corn-based and wheat-based diets.**
H. M. Tun*¹, R. Li¹, E. Kiarie^{1,2}, M. Nyachoti¹, and E. Khafipour¹, ¹University of Manitoba, Winnipeg, MB, Canada, ²DuPont Industrial Biosciences-Danisco Animal Nutrition, Marlborough, Wiltshire, UK.
- W121 **Effects of sulfur amino acids to lysine ratio on the expression of selected genes from piglets challenged with enterotoxigenic *Escherichia coli* K88.**
Roseline Kahindi*¹, Alemu Regassa¹, John Htoo², and Martin Nyachoti¹, ¹University of Manitoba, Winnipeg, MB, Canada, ²Evonik Industries AG.

- W122 **Messenger ribonucleic acid abundance of intestinal enzymes and nutrient transporters in chickens fed with vitamin D₃ and 1,25-dihydroxycholecalciferol.**
Cristiane R. A. Duarte*, Alice E. Murakami, Ana F. Q. M. Guerra, and Iván C. Ospina-Rojas, *Departamento de Zootecnia, Universidade Estadual de Maringá, Maringá, Paraná, Brazil.*
- W123 **Early supplementation of alfalfa to starter diets altered electrophysiological properties and permeability of the gastrointestinal tracts in growing lambs.**
Bin Yang*¹, Shan-shan Wang¹, Bo He¹, Jian-xin Liu^{1,2}, and Jia-kun Wang¹, ¹*Institute of Dairy Science, Hangzhou, Zhejiang, China,* ²*Zhejiang University, Hangzhou, Zhejiang, China.*
- W124 **Heat-treated colostrum feeding promotes beneficial bacteria colonization in the small intestine of neonatal calves.**
Nilusha Malmuthuge*, Guanxiang Liang, Yanhong Chen, Laksiri Goonewardene, and Le L. Guan, *University of Alberta, Edmonton, AB, Canada.*

Dairy Foods Cheese

- W125 **Determining economic feasibility for artisan cheese companies.**
Cathy Durham², Andrea Bouma¹, and Lisbeth Goddik*¹, ¹*Department of Food Science, Oregon State University, Corvallis, OR,* ²*Food Innovation Center, Oregon State University, Portland, OR.*
- W126 **Effect of *terroir* for raw and pasteurized milk Cheddar on nonstarter lactic acid bacteria.**
Christopher Baird, Lisbeth Goddik*, Gregory Turbes, Elizabeth Tomasino, Juyun Lim, and Joy Waite-Cusic, *Department of Food Science, Oregon State University, Corvallis, OR 97331.*
- W127 **Effect of *terroir* on flavor for raw and pasteurized milk Cheddar.**
Gregory Turbes, Lisbeth Goddik*, Christopher Baird, Juyun Lim, Joy Waite-Cusic, and Elizabeth Tomasino, *Department of Food Science, Oregon State University, Corvallis, OR.*
- W128 **The effects of *terroir* and heat treatment on consumers' perception of Cheddar cheese flavor.**
Gregory Turbes, Lisbeth Goddik*, Tyler Linscott, Elizabeth Tomasino, Joy Waite-Cusic, and Juyun Lim, *Department of Food Science, Oregon State University, Corvallis, OR.*
- W129 **Sensory and functional properties of cheese across three storage temperatures.**
Ni Cheng*¹, P. D. Gerard², and M. A. Drake¹, ¹*Southeast Dairy Foods Research Center, North Carolina State University, Raleigh, NC,* ²*Dept. Mathematical Sciences, Clemson University, Clemson, SC.*
- W130 **Microstructural arrangements observed using electron microscopy during the manufacture of cheese and the influence of cheese pH.**
Almut H. Vollmer*, Nabil N. Youssef, and Donald J. McMahon, *Western Dairy Center, Utah State University, Logan, UT.*
- W131 **Effect of salting pH, salting rate, and stretching temperature on proteolysis in Mozzarella cheese.**
Ananya C. Biswas*¹, Anil Kommineni¹, Praveen Upreti², and Lloyd E. Metzger¹, ¹*Dairy Science Department, South Dakota State University, Brookings, SD,* ²*Nestle R&D Center Inc., Solon, OH.*
- W132 **Effect of selenium supplementation on Se status and Mozzarella quality in dairy cattle feed.**
Weizheng Zhu, Hongyun Liu*, Daxi Ren, and Jianxin Liu, *Institute of Dairy Science, College of Animal Science, Zhejiang University, Hangzhou, Zhejiang, China.*
- W133 **Microbiological characteristics and mineral content of probiotic low sodium Minas cheese with added arginine.**
Taissa Felicio, Marcia Cristina, Renata Raices, Luciana Nogueira, and Adriano Cruz*, *Federal Institute of Science and Technology of Rio de Janeiro (IFRJ), Rio de Janeiro, Brazil.*
- W134 **Probiotic Minas Frescal cheese with *Lactobacillus casei* Zhang.**
Ramon Silva, Marcia Cristina, Luciana Nogueira, Renata Raices, and Adriano Cruz*, *Federal Institute of Science and Technology of Rio de Janeiro (IFRJ), Rio de Janeiro, Brazil.*

- W135 **Effect of inulin and lactulose on characteristics of Iranian probiotic ultrafiltration feta cheese.**
Maryam Enteshari¹, Mahshid Azizi², Bahram Jirsaraei³, and Mohammadreza Dolatkahnejad⁴, ¹*Department of Food Science and Technology, Shahid Beheshti University of Medical Sciences, Tehran, Iran*, ²*Islamic Azad University of Birjand, Chemical Engineering and Food Industries Department, Tehran, Iran*, ³*Azad University of Varamin, Faculty of Agriculture, Department of Food Science and Technology, Tehran, Iran*, ⁴*Islamic Azad University of Ayatollah Amoli, Food Industries and Scientific Engineering Department, Tehran, Iran*.
- W136 **Volatile compounds formation in Prato cheese.**
Lígia Dozena Domingos, Lilian Regina Barros Mariutti, Neura Bragagnolo, and Walkiria Hanada Viotto*, *University of Campinas (UNICAMP), Campinas, São Paulo, Brazil*.
- W137 **Consumer perception of reduced-fat fresh cheese in Brazil.**
Juliana Zara Brondi Mendes, Jorge Herman Behrens, and Walkiria Hanada Viotto*, *University of Campinas (UNICAMP), Campinas, São Paulo, Brazil*.
- W138 **Effect of myrrh essential oil as a highly effective antimicrobial agent in processed cheese spreads.**
A. G. Mohamed*, J. M. Kassem, and H. M. Abbas, *National Research Centre, Dokki, Giza, Egypt*.
- W139 **Effects of storage temperature and period on textural properties of cholesterol reduced and control Cheddar-type goat milk cheeses.**
Binod P. Gupta, Brittany I. Davis, Krishna P. Bastola*, Jolethia O. Jones, and Young W. Park, *Fort Valley State University, Fort Valley, GA*.
- W140 **Identification of crystalline entities in the rinds of white mold ripened cheese and smear ripened cheese with powder X-ray diffractometry.**
Gil F. Tansman*¹, Paul S. Kindstedt¹, and John M. Hughes², ¹*Department of Nutrition and Food Sciences, University of Vermont, Burlington, VT*, ²*Department of Geology, University of Vermont, Burlington, VT*.
- W141 **Characterization of single crystals in the rinds of white mold and smear ripened cheeses with single crystal X-ray diffractometry.**
Gil F. Tansman*¹, Paul S. Kindstedt¹, and John M. Hughes², ¹*Department of Nutrition and Food Sciences, University of Vermont, Burlington, VT*, ²*Department of Geology, University of Vermont, Burlington, VT*.

Dairy Foods Processing

- W142 **Improved heat stability of whey protein isolate by dry-heating with inulin.**
Yue He and Bongkosh Vardhanabhuti*, *University of Missouri, Columbia, MO*.
- W143 **Heat treatment effect on hydrolysis of sodium tripolyphosphate in milk.**
Diogo Maus, Alvielér Magalhães, and Walkiria Hanada Viotto*, *University of Campinas (UNICAMP), Campinas, São Paulo, Brazil*.
- W144 **Inactivation of thermoduric sporeformers in milk by continuous ultrasonication.**
Dikshi Bawa*, Sanjeev Anand, and Steve Beckman, *South Dakota State University, Brookings, SD*.
- W145 **Effect of ultrasound treatment on reconstituted deproteinized whey prior to lactose crystallization.**
Steve Beckman, Lee Alexander*, Sanjeev Anand, and Lloyd Metzger, *South Dakota State University, Brookings, SD*.
- W146 **Evaluation of a Centritherm evaporator for concentrating micellar casein.**
Anil Kommineni, Dustin Grossbier*, Steven Beckman, Ananya C. Biswas, and Lloyd E. Metzger, *Midwest Dairy Foods Research Center, Dairy Science Department, South Dakota State University, Brookings, SD*.
- W147 **Novel microfiltration process for the manufacture of soluble casein isolate from acidified milk.**
Yanjie Lu*, Michael Molitor, and John Lucey, *Wisconsin Center for Dairy Research, University of Wisconsin-Madison, Madison, WI*.

- W148 **Effect of some operating parameters on the hydraulic resistance developed during milk protein concentration by ultrafiltration.**
Stephanie Methot-Hains*, Alain Doyen, Laurent Bazinet, and Yves Pouliot, *STELA Dairy Research Center, Institute of Nutrition and Functional Foods, Université Laval, Québec, Canada.*
- W149 **Comparative performance of two membrane configurations for the separation of casein from bovine milk by microfiltration.**
Daniel Tremblay-Marchand¹, Alain Doyen¹, Michel Britten², and Yves Pouliot*¹, ¹*STELA Dairy Research Center, INAF, Université Laval, Québec, QC, Canada,* ²*Agriculture & Agri-Food Canada, FDRC, St-Hyacinthe, QC, Canada.*
- W150 **Characterization of the early stages of biofouling during ultrafiltration of dairy fluids using polyethersulfone membranes in a model system.**
Julien Chamberland*, Marie-Hélène Lessard, Steve Labrie, and Yves Pouliot, *STELA Dairy Research Center, Institute of Nutrition and Functional Foods, Université Laval, Québec, QC, Canada.*
- W151 **In situ monitoring of lactose crystallization using focused beam reflectance measurement (FBRM).**
Karthik Pandalaneni* and Jayendra Kumar Amamcharla, *Kansas State University, Manhattan, Kansas.*
- W152 **Influence of magnetic field exposure and clay mineral addition on the fractionation of Greek yogurt whey components.**
Clinton R. Kyle* and Jayendra K. Amamcharla, *Kansas State University, Manhattan, KS.*
- W153 **Characterization and oxidative stability of oleic acid-modified chitosan/milk protein nanoparticle containing docosahexaenoic acid.**
Ho-Kyung Ha*¹, Ji-Young Hong¹, Jae-Young Hwang¹, Won-Jae Lee¹, and Mee-Ryung Lee², ¹*Department of Animal Bioscience (Institute of Agriculture and Life Science), Gyeongsang National University, Jinju, Gyeongnam, Republic of Korea,* ²*Department of Food and Nutrition, Daegu University, Gyeongsan, Gyeongbuk, Republic of Korea.*
- W154 **Electrospinning casein-based fibrous mats for food applications.**
Peggy M. Tomasula*¹, Shih-Chuan Liou², Ran Li³, Laetitia M. Bonnaille¹, and LinShu Liu¹, ¹*USDA/Agricultural Research Service, Eastern Regional Research Service, Dairy and Functional Foods Research Unit, Wyndmoor, PA,* ²*Chung Shan Medical University, Taichung City, Taiwan,* ³*State Key Laboratory of Hollow Fiber Materials and Processes, School of Materials Science and Engineering, Tianjin Polytechnic University, Tianjin, China.*
- W155 **Isolation of milk fat globule membrane (MFGM) from buttermilk.**
Liza Ivanov*¹, Vladimir Shritz^{1,2}, and Vitaly L. Spitsberg^{1,3}, ¹*Astrazemcal, Raanana, Israel,* ²*Baemek Advanced Technology, Afula, Israel,* ³*Biovita Technologies, Bat Yam, Israel.*
- W156 **Effects of surface modification on bacterial and spore adhesion in dairy handling materials.**
Garrett T. Walsh* and Rafael Jimenez-Flores, *California Polytechnic State University, San Luis Obispo, CA.*
- W157 **The impact of milk hauling practices on overall raw milk quality.**
Emily Darchuk, Joy Waite-Cusic, and Lisbeth Goddik*, *Department of Food Science, Oregon State University, Corvallis, OR.*

Forages and Pastures

General forages and forage systems

- W158 **Chemical composition, digestibility and fermentation characteristics of sorghum ensiled with soybean crop residue.**
Larissa de A. Lima, Marcia Dias, Nayara D. de Carvalho, Vinicio A. Nascimento, Vera L. Banys, and Edgar A. Collao-Saenz*, *Universidade Federal de Goiás, Jataí, GO, Brazil.*
- W159 **Effect of reduced lignin alfalfa on forage quality at three harvest intervals.**
Zhiqiang Li*², Zhenzhen Li², David Combs¹, and Daniel Undersander¹, ¹*University of Wisconsin, Madison, WI,* ²*China Agricultural University, Beijing, China.*
- W160 **Characterization of novel polymers for alkaloid adsorption.**
Manoj B. Kudupoje*^{1,2}, Eric S. Vanzant¹, Alexandros Yiannikouris², Karl A. Dawson², and Kyle R. McLeod¹, ¹*University of Kentucky, Alltech-University of Kentucky Research Alliance, Lexington, KY,* ²*Center for Animal Nutrigenomics & Applied Animal Nutrition, Alltech Inc., Nicholasville, KY.*

- W161 **Nutritive value and in vitro degradability of Marandu palisade grass at different locations within the pasture in silvopastoral systems with different babassu palm densities.**
Rosane Cláudia Rodrigues, Michelle de Oliveira Maia Parente, Xerxes de Moraes Tosta, Ana Paula Ribeiro de Jesus, Henrique Nunes Parente, Jocélio dos Santos Araújo, Sâmara Stainy Cardoso Sanchês*, Ivone Rodrigues Araújo, Clésio dos Santos Costa, and Ivo Guilherme Ribeiro Araújo, *Universidade Federal do Maranhão, Chapadinha, Maranhão, Brazil.*
- W162 **Effect of the cytokinin BAP on growth, senescence and in vitro degradation of *Lolium perenne* L.**
Hilda A. Zavaleta-Mancera*, Sergio S. González-Muñoz, Ángel H. Soto-Urano, and Omar Hernández-Mendo, *Colegio de Post-graduados, Montecillo, Estado de México, México.*
- W163 **Effect of supplementation strategy and forage quality on in vitro digestibility of Kentucky 31 tall fescue and Tifton 85 bermudagrass.**
Jeferson M. Lourenço*¹, Matthew W. Studstill¹, Cathy A. Bandyk², Dennis W. Hancock¹, and Robert L. Stewart¹, ¹*The University of Georgia, Athens, GA*, ²*Westway Feed Products.*
- W164 **Herbage accumulation of palisadegrass with variable heights in beginning of deferment period.**
Manoel Eduardo Rozalino Santos*¹, Laryssa Avelino Luz¹, Pedro Henrique Marçal Rodrigues¹, Lucas Coelho Alves¹, Wirley Duarte de Souza¹, Simone Pedro da Silva², and Dilermando Miranda da Fonseca³, ¹*Universidade Federal de Uberlândia, Uberlândia, Minas Gerais, Brazil*, ²*Instituto Federal Goiano, Hidrolândia, Goiás, Brazil*, ³*Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.*
- W165 **Balance between the emergence and mortality of tiller in *Brachiaria brizantha* under variable heights in winter.**
Manoel Eduardo Rozalino Santos*¹, Ludiêmilem Keith Parreira da Costa¹, Bruno Humberto Rezende Carvalho¹, Denis Douglas Pessoa¹, Heron Alves de Oliveira¹, Roger Carvalho Cardoso¹, Miriã Gonçalves Simplício¹, Simone Pedro da Silva², and Dilermando Miranda Fonseca³, ¹*Universidade Federal de Uberlândia, Uberlândia, Minas Gerais, Brazil*, ²*Instituto Federal Goiano, Hidrolândia, Goiás, Brazil*, ³*Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.*
- W166 **Effects of exogenous fibrolytic enzymes on in vitro digestibility and gas and methane production of corn silage.**
Vania R. Vasconcelos*^{1,2}, Kathy G. Arriola², Andressa Campos², Felix X. Amaro², Rafael M. Martins², Musibau A. Bamikole^{2,3}, and Adegbola T. Adesogan², ¹*Universidade Federal do Piauí, Campus Agrícola da Socopo, Teresina, Piauí, Brazil*, ²*Department of Animal Sciences, University of Florida, Gainesville, FL*, ³*Department of Animal Science, University of Benin, Benin City, Nigeria.*
- W167 **Use of two natural antimicrobial additives in solid-state fermentation of apple bagasse.**
J. L. Guevara-Valdez*, C. Rodriguez-Muela, L. A. Duran-Melendez, D. Diaz-Plascencia, E. Santellano-Estrada, and R. Marquez-Melendez, *Universidad Autonoma de Chihuahua, Chihuahua, Chihuahua, Mexico.*
- W168 **In vitro fermentation and digestion characteristics of shrubs *Crotton cortesianus* and *Leucophyllum frutescens* browsed by white-tailed deer (*Odocoileus virginianus*).**
M. S. Alvarado¹, M. A. Cerrillo-Soto¹, M. Guerrero-Cervantes*¹, A. S. Juárez-Reyes¹, R. G. Ramírez², H. Rodríguez², and T. G. Dominguez¹, ¹*Universidad Juárez del Estado de Durango, Durango, Mexico*, ²*Universidad Autónoma de Nuevo León, San Nicolás de los Garza, Nuevo León, México*, ³*Universidad Autónoma de Nuevo León, Linares, Nuevo León, México.*
- W169 **Effect of lactic acid bacteria with bacteriocinogenic activity on the microbial populations and fermentation of alfalfa silage in tropical conditions.**
V. P. Silva, O. G. Pereira*, K. G. Ribeiro, T. C. Da Silva, M. C. N. Agarussi, L. D. A. Rufino, R. M. Martins, F. X. Amaro, and A. M. Corrêa, *Universidade Federal de Vicosa, Vicosa, Minas Gerais, Brazil.*
- W170 **Effect of wilting and inoculant on microbial populations and fermentation profile of alfalfa silage in tropical conditions.**
M. C. N. Agarussi, O. G. Pereira*, A. M. Corrêa, V. P. Silva, A. N. Rodrigues, T. C. Silva, L. D. A. Rufino, and K. G. Ribeiro, *Universidade Federal de Vicosa, Vicosa, Minas Gerais, Brazil.*
- W171 **Seeding rate affects performance of ball clover mixed with annual ryegrass in North Florida.**
Hiran M. S. Silva*, Jose C. B. Dubeux, Ann Blount, Cheryl Mackowiak, Erick R. S. Santos, Nicolas DiLorenzo, and Martin R. Moreno, *University of Florida, North Florida Research and Education Center (NFREC), Marianna, FL.*
- W172 **Effects of hybrid and inoculant application on chemical composition and fermentation indices of barley silage.**
Dong Hyeon Kim*^{1,3}, Hyuk Jun Lee¹, Sardar M. Amanullah¹, Young Ho Joo¹, Hee Yoon¹, In Hag Choi², Adegbola T. Adesogan³, and Sam Churl Kim¹, ¹*Division of Applied Life Science (BK 21Plus, Inst. Agric. & Life Sci.), Gyeongsang National University, Jinju, Gyeongsangnam-do, South Korea*, ²*Department of Companion Animal & Animal Resources Sciences, Joongbu University, Gyeongsangnam-do, South Korea*, ³*Department of Animal Sciences, University of Florida, Gainesville, FL.*
- W173 **Comparison of in situ digestion of corn stover treated by two alkali methods to untreated corn stover and soyhulls.**
Derek M. Donnelly*, David E. Cook, and David K. Combs, *University of Wisconsin-Madison, Madison, WI.*

- W174 **Effects of different source additive and wilt condition on the pH value, aerobic stability, and carbohydrate and protein fractions of alfalfa silage.**
Lian Tao¹, He Zhou², Nai-feng Zhang¹, Bing-wen Si¹, Yan Tu¹, Tao Ma¹, and Qi-yu Diao^{*1}, ¹Feed Research Institute, Chinese Academy of Agricultural Sciences, Key Laboratory of Feed Biotechnology of the Ministry of Agriculture, Beijing, China, ²Institute of Grassland Science, College of Animal Science and Technology, China Agricultural University, Beijing, China.
- W175 **Yield and nutritive value for ruminants of organic winter cereals–bard vetch intercrops.**
Alexey Díaz^{1,4}, María Dolores Carro², Carlos Palacios³, Cristina Saro¹, Iván Mateos¹, María Luisa Tejido⁴, and María José Ranilla^{*1,4}, ¹Animal Production Department, University of León, León Spain, ²Agriculture Production Department, Technical University of Madrid, Madrid, Spain, ³Construction and Agronomy Department, University of Salamanca, Salamanca, Spain, ⁴IGM (CSIC-ULE), Finca Marzanas s/n, Grulleros, León, Spain.
- W176 **Comparison of total tract neutral detergent fiber digestibility of different varieties of barley silage selected on the basis of in vitro NDF degradability.**
Natalie G. Preston^{*1,2}, Jayakrishnan Nair¹, Peiqiang Yu¹, David A. Christensen¹, John J. McKinnon¹, and Timothy A. McAllister², ¹University of Saskatchewan, Saskatoon, SK, Canada, ²Agriculture and Agri-Food Canada, Lethbridge, AB, Canada.
- W177 **Effect of reduced lignin alfalfa on forage quality at 3 harvest intervals.**
Zhiqiang Li^{*1,2}, Dan J. Undersander¹, David K. Combs¹, and Zhenzhen Li^{1,2}, ¹University of Wisconsin, Madison, WI, ²Department of Grassland Science, China Agricultural University, Beijing, China.
- W178 **Microbial counts, fermentation, and aerobic stability of oats with and without combo inoculant ensiled in vacuum bags and plastic bucket silos.**
Juan J. Romero^{*1}, Jinwoo Park², Youngho Joo², Yuchen Zhao³, Axel Gonzalez¹, Marco A. Balseca-Paredes¹, and Miguel S. Castillo¹, ¹Department of Crop Science, North Carolina State University, Raleigh, NC, ²Department of Animal Science, Gyeongsang National University, Jinju, Korea, ³Department of Animal Nutrition and Feed Science, China Agricultural University, Beijing, China.
- W179 **Change in chemical and microbial composition during aerobic challenge of maize silage with and without *L. buchneri* inoculation.**
Ida K. Hindrichsen^{*}, Nina Milora, Marianne Richelieu, and Asger Geppel, Chr. Hansen A/S, Hørsholm, Denmark.
- W180 **Biological N₂ fixation and performance of cool-season legumes mixed with annual ryegrass.**
Jose C. B. Dubeux^{*1}, Lynn E. Sollenberger², Ann R. S. Blount¹, Cheryl Mackowiak¹, Erick R. S. Santos¹, Hiran M. S. Silva¹, and Martin Ruiz-Moreno¹, ¹North Florida Research and Education Center, University of Florida, Marianna, FL, ²Agronomy Department, University of Florida, Gainesville, FL.
- W181 **Rumen papillae size and blood serum enzymatic cofactors concentration of bulls fattened under two feeding systems at the Mexican dry tropic.**
Carlos Rodríguez-Muela^{*}, Nilda E. Ruiz-Holguin, Gabriela Corral-Flores, José A. Ramírez-Godínez, Alberto Flores-Mariñelarena, Pablo F. Mancillas-Flores, and Claudio Arzola-Alvarez, Universidad Autónoma de Chihuahua, Chihuahua, México.
- W182 **Effect of kernel processor and theoretical length of cut on physical characteristics of forage corn harvested with one row harvester.**
Gilson S. Dias Júnior^{*1}, Nilson N. Morais Júnior¹, Ronaldo F. Lima¹, Fabiana F. Cardoso¹, Ozana F. Zacaroni¹, Renata A. N. Pereira^{3,2}, and Marcos N. Pereira^{1,2}, ¹Universidade Federal de Lavras, Lavras, MG, Brazil, ²Better Nature Research Center, Ijaci, MG, Brazil, ³Empresa de Pesquisa Agropecuária de Minas Gerais, Lavras, MG, Brazil.
- W183 **The relative effects of external factors on variability of in situ fiber digestion.**
Abebe T. Hassen, Fredric Owens^{*}, Lesa Nuzback, Chris Iiams, and Mark Hinds, DuPont Pioneer, Johnston, IA.
- W184 **Characterizing corn silage in Brazil.**
M. Pinho¹, M. Martins¹, D. Combs², J. Goeser³, D. Meyer³, L. Meyer³, Z. Meyer³, F. Lopes⁴, and M. H. Ramos^{*1}, ¹3rlab, Belo Horizonte, Minas Gerais, Brazil, ²University of Wisconsin, Madison, WI, ³Rock River Laboratory, Watertown, WI, ⁴Kemin Industries, Indaiatuba, São Paulo, Brazil.
- W185 **Effect of light intensity and wavelength on concentration of antiherbivory compounds in *Flourensia cernua* leaves.**
Rick E. Estell^{*1}, Ed L. Fredrickson², and Darren K. James¹, ¹USDA-ARS Jornada Experimental Range, Las Cruces, NM, ²Eastern Kentucky University, Richmond, KY.
- W186 **In situ ruminal degradability of diets based on passion fruit (*Passiflora edulis*) flour substituting maize.**
Adolfo Sánchez^{*1}, Emma Torres¹, Leon Montenegro¹, Italo Espinoza¹, and Daniela Sanchez², ¹Universidad Técnica Estatal de Quevedo, Quevedo Los Rios, Ecuador, ²Universidad Estatal Amazonica, Puyo Pastaza, Ecuador.

- W187 **Dry matter production of four *Brachiaria* grasses.**
Virginia L. N. Brandão, Gabriel C. B. Oliveira, Bruno P. Ignacchiti, Kaik Faria, Marcos Rosa, Guilherme D. Castro, Marcos I. Marcondes*, and Fernanda H. M. Chizzotti, *Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.*
- W188 **Forage yield of four maize cultivars sown in single and double rows.**
Marco A. Ramírez*¹, Pedro A. Martínez², Jesús Jarillo³, Francisco A. Castrejón¹, and Luis Corona¹, ¹*Departamento de Nutrición Animal, Universidad Nacional Autónoma de México, FMVZ, México City, México*, ²*Departamento de Zootecnia, Universidad Autónoma Chapingo, Texcoco, México*, ³*CEIEGT, Universidad Nacional Autónoma de México, Veracruz, México.*
- W190 **Effects of maturity at harvest on the nutritional value, yield and milk production potential of corn hybrids planted under tropical/subtropical conditions.**
Kathy G. Arriola*¹, Rafael M. Martins¹, Thiago F. Bernardes¹, Fabiola M. da Silva¹, Felipe X. Amaro¹, Bibiana Coy¹, Enrique Alias², Ernesto Marin², Ludwig Leyton², Zhengxin X. Ma¹, Ibukun M. Ogunade¹, Yun Jiang¹, Musibau A. Bamikole¹, and Adegbola T. Adesogan¹, ¹*University of Florida, Gainesville, FL*, ²*University of El Salvador, San Salvador, El Salvador.*
- W191 **Application of *Pediococcus pentosaceus*, *Pichia anomala*, and chitinase to high moisture alfalfa hay at baling: effects on ruminal digestibility.**
Long Jin¹, Lysiane Dunière¹, Joseph.P. Lynch¹, Eric Chevaux², Tim.A. McAllister¹, John Baah³, and Yuxi Wang*¹, ¹*Agriculture and Agri-Food Canada, Lethbridge, AB, Canada*, ²*Lallemand animal nutrition, Blagnac, France*, ³*Best Environmental Technologies Inc., Edmonton, AB, Canada.*
- W192 ***Malva sylvestris* extract affected kinetics of fermentation, methane production, and protozoa population of barley grain incubated with rumen fluid.**
Saba Khamooshi¹, Farokh Kafilzadeh¹, Hossein Jahani Aziz Abadi², and Golnaz Taasoli*¹, ¹*Razi University, Kermanshah, Iran*, ²*Kurdistan University, Kurdistan, Iran.*
- W193 **Effect of a protease enzyme (papain) on in vitro NDF digestibility of alfalfa hay stem.**
Shahab Payandeh, Farokh Kafilzadeh, and Golnaz Taasoli*, *Razi University, Kermanshah, Iran.*
- W194 **Effect of bacterial additives on fermentation quality and aerobic stability of rye silage harvested at dough stage.**
Young Ho Joo*¹, Seong Shin Lee¹, Dong Hyeon Kim¹, Hyuk Jun Lee¹, Sardar M. Amanullah^{1,3}, Ouk Kyu Han², and Sam Churl Kim¹, ¹*Division of Applied Life Science (BK21Plus, Inst. Agric. & Life Sci.), Gyeongsang National University, Jinju, Gyeongsangnam-do, South Korea*, ²*National Institute of Crop Science, RDA, Suwon, South Korea*, ³*Bangladesh Livestock Research Institute, Dhaka, Bangladesh.*
- W195 **Fermentation quality and chemical composition of mixed silage with shrub and corn.**
Bing-wen Si*¹, Zong-li Wang², Qi-zhong Sun², Hong-mei Wang¹, and Qi-yu Diao¹, ¹*Feed Research Institute, Chinese Academy of Agricultural Sciences, Key Laboratory of Feed Biotechnology of the Ministry of Agriculture, Beijing, China*, ²*Grassland Research Institute, Chinese Academy of Agricultural Sciences, Hohhot, Inner Mongolia, China.*
- W196 **Late season forage yield, quality, and digestibility from mixed cropping of organic certified corn and soybean hybrids at different seeding rates.**
Ishwary Acharya* and David Casper, *Dairy Science Department, South Dakota State University, Brookings, SD.*
- W197 **Climatic and management factors affecting the forage yield and quality of a high density mulberry forage bank established under low input tropical farming conditions.**
Elieel González-García*² and Giraldo Martín-Martín¹, ¹*Estación Experimental de Pastos y Forrajes "Indio Hatuey," Matanzas, Cuba*, ²*INRA UMR868, Systèmes d'Élevage Méditerranéens et Tropicaux (SELMET), Montpellier Cedex 2, France.*
- W198 **Response to using rumen inoculum from high and low feed efficient cows on in vitro fermentation of alfalfa ensiled with different additives.**
Francisco E. Contreras-Govea*¹, Richard E. Muck², Paul J. Weimer², and Ursula C. Hymes-Fecht², ¹*Department of Dairy Science, University of Wisconsin-Madison, Madison, WI*, ²*USDA-Dairy Forage Research Center, Madison, WI.*
- W199 **Ruminal degradability of a *Musa* sp. fodder bank located in the central part of Costa Rica.**
Pablo Chacón Hernández*, Carlos Boschini Figueroa, and Ricardo Russo Andrade, *Universidad de Costa Rica, San Pedro, San José, Costa Rica.*

- W200 **Purple prairie clover (*Dalea purpurea* Vent) reduces fecal shedding of *Escherichia coli* in pastured cattle.**
Yuxi Wang*¹, Long Jin^{1,2}, Alan Iwaasa³, Yuanheng Li^{3,5}, Zhong Xu¹, Mike Schellenberg³, Xiuli Liu^{1,6}, Tim McAllister¹, and Kim Stanford⁴, ¹Lethbridge Research Centre, Agriculture and Agri-Food Canada, Lethbridge, AB, Canada, ²Department of Animal Science, Northeast Agricultural University, Harbin, China, ³Semi-arid Prairie Agricultural Research Centre, Agriculture & Agri-Food Canada, Swift Current, SK, Canada, ⁴Alberta Agriculture and Rural Development, Lethbridge Agriculture Centre, Lethbridge, AB, Canada, ⁵Institute of Grassland Research, Chinese Academy of Agricultural Sciences, Hohhot, China, ⁶Inner Mongolia Academy of Agricultural and Animal Husbandry Sciences, Hohhot, China.
- W201 **Yield, chemical composition, and efficiency of use of nitrogen by Marandu grass.**
Tadeu Silva de Oliveira*¹, Ricardo Augusto Mendonça Vieira¹, Alberto Magno Fernandes¹, Danielle Ferreira Baffa², and José Carlos Pereira², ¹Universidade Estadual do Norte Fluminense-Darcy Ribeiro, Campos dos Goytacazes, Rio de Janeiro, Brazil, ²Universidade Federal de Viçosa, Campus Universitário, Viçosa, Minas Gerais, Brazil.
- W202 **Effect of ensiling on kernel processing score in whole-plant corn silage harvested with varied processors and settings.**
Luiz F. Ferraretto*¹, Gilson S. Dias Junior^{1,2}, Lucas C. de Resende^{1,2}, and Randy D. Shaver¹, ¹University of Wisconsin, Madison, WI, ²Universidade Federal de Lavras, Lavras, MG, Brazil.
- W203 **Morphological responses and chemical composition of Tanzania grass subjected to two pasture-management strategies.**
Alberto Magno Fernandes*¹, Ricardo Augusto Mendonça Vieira¹, Tadeu Silva de Oliveira¹, and Fermino Deresz², ¹Universidade Estadual do Norte Fluminense, Campos dos Goytacazes, Rio de Janeiro, Brazil, ²EMBRAPA-Gado de Leite, Juiz de Fora, Minas Gerais, Brazil.
- W204 **How does the chemical additive calcium oxide affect the in vitro growth of lactic acid bacteria and yeast?**
R. A. de Paula, O. G. Pereira*, T. C. da Silva, K. G. Ribeiro, and H. C. Mantovani, Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.
- W205 **Application of *Pediococcus pentosaceus*, *Pichia anomala*, and chitinase to high moisture alfalfa hay at baling: Effects on chemical composition and conservation characteristics.**
Long Jin¹, Lysiane Dunière¹, Joseph P. Lynch¹, Eric Chevaux², Tim A. McAllister¹, John Baah³, and Yuxi Wang*¹, ¹Agriculture and Agri-Food Canada, Lethbridge, AB, Canada, ²Lallemand animal nutrition, Blagnac, France, ³Best Environmental Technologies Inc., Edmonton, AB, Canada.
- W206 **Nitrogenous compounds and fermentation characteristics of king grass-cassava tops silages.**
Tyrone Clavero*, Universidad del Zulia, Maracaibo, Estado Zulia, Venezuela.
- W207 **Relationship between grinding energy and chemical composition and NDF digestibility in forages.**
E. Prinsloo¹, C. Anelich¹, E. Raffrenato*², W. A. van Niekerk¹, and L. J. Erasmus¹, ¹Department of Animal & Wildlife Sciences, University of Pretoria, Pretoria, South Africa, ²Department of Animal Sciences, Stellenbosch University, Stellenbosch, South Africa.
- W208 **The effect of a bacteria inoculant on fermentation and aerobic stability of a brown-midrib and conventional corn silage.**
Zhenzhen Li*^{2,1}, Daniel Undersander¹, and David Combs¹, ¹University of Wisconsin, Madison, WI, ²China Agricultural University, Beijing, China.
- W209 **Nutritional evaluation of leaves, twigs, and fruits of *Gmelina arborea* as feed resource for ruminants.**
Ronke Y. Aderinboye*, Olukayode O. Showunmi, Chryss F. I. Onwuka, and Victoria O. A. Ojo, Federal University of Agriculture, Abeokuta, Ogun, Nigeria.
- W210 **Comparison of Ankom filter bag types for the determination of acid and neutral detergent fibers.**
Chris D. Teutsch, Brian T. Campbell*, and W. Mac Tilson, Virginia Tech, Blacksburg, VA.
- W211 **Effect of corn planting density on yield and nutritional quality of corn silage when planted after ryegrass harvested for silage.**
Gonzalo Ferreira*¹, Paul Hammock², Mary Hammock², Issac Hammock², and Nathan Hammock², ¹Department of Dairy Science, Virginia Polytechnic Institute and State University, Blacksburg, VA, ²Hammock Dairy Inc., Museville, VA.

Growth and Development II

- W212 **Sodium butyrate induces adipocytic differentiation of porcine mesenchymal stem cells.**
Benedetta Tugnoli¹, Chiara Bernardini¹, Monica Forni¹, Andrea Piva¹, Chad H. Stahl², and Ester Grilli^{*1}, ¹DIMEVET, University of Bologna, Ozzano Emilia, Bologna, Italy, ²Laboratory of Developmental Nutrition, College of Agriculture and Life Sciences, North Carolina State University, Raleigh, NC.
- W214 **Effect of butyrate on inflammatory and oxidative gene markers in porcine IPEC-J2 intestinal epithelial cells.**
Hui Yan* and Kolapo Ajuwon, *Purdue University, West Lafayette, IN.*
- W215 **MicroRNA exert a role in the process of arginine promoting rat mammary gland development.**
Lianmin Chen^{*1}, Liangyu Hu¹, Mengzhi Wang¹, J. J. Loo², Hongrong Wang¹, and Lihuai Yu¹, ¹College of Animal Science and Technology, Yangzhou University, Yangzhou, Jiangsu Province, China, ²University of Illinois, Urbana, IL.
- W216 **Poor maternal nutrition decreases longissimus dorsi cross sectional area of fetal offspring at d 45 of gestation.**
Joseline S. Raja*, Sambhu M. Pillai, Amanda K. Jones, Maria L. Hoffman, Katelyn K. McFadden, Kristen E. Govoni, Steven A. Zinn, and Sarah A. Reed, *Department of Animal Science, University of Connecticut, Storrs, CT.*
- W217 **The effects of maternal under- and over-feeding on muscle development of lambs as determined by RNA-Seq analysis.**
Maria L. Hoffman*, Kristen N. Peck, Jill L. Wegryzn, Sarah A. Reed, Steven A. Zinn, and Kristen E. Govoni, *University of Connecticut, Storrs, CT.*
- W218 **Muscle fiber hypertrophy is associated with increased expression of key transcriptional and epigenome regulatory genes.**
Yue Lu, Jennifer S. Bradley, Sarah R. McCoski, Adam J. Geiger, R. Michael Akers, Alan D. Ealy, and Sally E. Johnson*, *Virginia Polytechnic Institute and State University, Blacksburg, VA.*
- W219 **Myogenic regulatory factors are increased in bovine satellite cells by polyamines and their precursor amino acid ornithine.**
Kara J. Thornton², Stephen C. Tamm^{*1}, Samantha L. Faulkner¹, and Gordon M. Murdoch¹, ¹University of Idaho, Moscow, ID, ²University of Minnesota, Minneapolis, MN.
- W220 **Muscle gene expression patterns in finishing steers supplemented with dietary Amaize (*Aspergillus oryzae* extract).**
Daniel E. Graugnard^{*1}, Kristen M. Brennan¹, Allison C. Smith¹, Sonia J. Moisés², and Juan J. Loo², ¹Alltech Center for Animal Nutrigenomics and Applied Animal Nutrition, Nicholasville, KY, ²Department of Animal Sciences, University of Illinois, Urbana, IL.
- W221 **Investigation of effects of maternal nutrition intensification and fetal sex on development of skeletal muscle of bovine fetuses.**
Tathiane RS Gionbelli^{*1,2}, Polyana P. Rotta², Cristina M. Veloso², Marcos I. Marcondes², Sebastiao C. Valadares Filho², Bruno C. Carvalho³, Joao V. R. Lovatti², Camila S. Cunha², Marco A. S. Novais², Marcio S. Duarte², and Mateus P. Gionbelli¹, ¹University of Lavras, Lavras, Minas Gerais, Brazil, ²University of Viçosa, Viçosa, Minas Gerais, Brazil, ³Embrapa Dairy Cattle, Brazilian Corporation of Agricultural Research, Coronel Pacheco, Minas Gerais, Brazil.
- W222 **High-energy diet reduced myogenic gene expression of Hanwoo steers fed to three different endpoints.**
K. Y. Chung*, S. S. Chang, H. S. Kim, E. M. Lee, H. J. Kim, and H. S. Kang, *Hanwoo Research Institute, NIAS, Pyeongchang, Korea.*
- W223 **α -Solanine induces myogenesis of bovine satellite cells isolated from semimembranosus and longissimus muscle tissue.**
K. Y. Chung¹, J. K. Kim^{*2}, H. S. Kim¹, E. M. Lee¹, H. J. Kim¹, S. S. Chang¹, and H. S. Kang¹, ¹Hanwoo Research Institute, NIAS, Pyeongchang, Korea, ²Animal and Food Science, Texas Tech University, Lubbock, TX.
- W224 **Role of epidermal growth factor receptor and erbB2 in trenbolone acetate mediated increases in bovine satellite cell proliferation and protein synthesis and decreases in protein degradation.**
Kara J. Thornton*, Ernest Kamanga-Sollo, Michael E. White, and William R. Dayton, *University of Minnesota, St. Paul, MN.*

Nonruminant Nutrition Energy and fiber

- W225 **Fitting and validating prediction equations of metabolizable energy of meat and bone meal for pigs.**
R. A. Castilho¹, P. C. Pozza^{*2}, N. T. E. Oliveira³, C. P. Sangali², C. N. Langer⁴, and R. V. Nunes³, ¹Safeeds Nutrição Animal, Cascavel, Paraná, Brazil, ²Universidade Estadual de Maringá, Maringá, Paraná, Brazil, ³Universidade Estadual do Oeste do Paraná, Mchal Candido Rondon, Paraná, Brazil, ⁴Swine Production System, Quatro Pontes, Paraná, Brazil.

- W226 **Effects of different net energy concentrations of diets on the growth performance of growing or finishing pigs housed individually.**
Gang Il Lee¹, Kwang-sik Kim², Jun Cheol Park², and Dong Yong Kil^{*1}, ¹*Chung-Ang University, Anseong-si, Gyeonggi-do, Republic of Korea*, ²*Rural Development Administration, Cheonan-si, Chungnam, Republic of Korea*.
- W227 **Effects of dietary metabolizable energy levels on performance and energetic metabolism of broiler chickens.**
M. P. F. Teixeira, N. C. Baiao, L. J. C. Lara, M. A. Pompeu*, L. F. P. Pereira, C. W. R. Gondim, K. R. Soares, and W. L. S. Climaco, *Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brazil*.
- W228 **Effects of dietary metabolizable energy levels on performance and energetic metabolism of broiler chickens under cyclic heat stress condition.**
M. P. F. Teixeira, N. C. Baiao, L. J. C. Lara, M. A. Pompeu*, L. F. P. Pereira, K. R. Soares, A. F. Silva, J. F. V. Braga, and A. R. C. Abreu, *Universidade Federal de Minas Gerais, Belo Horizonte, MG, Brazil*.
- W229 **Determination of apparent digestibility of fibrous sources for finishing pigs.**
Bernardo Berencheim^{*1}, Evelyn Brito¹, Adibe Abdalla², Helder Louvandini², Dineshkumar Danashekar², Adibe Abdalla Filho², Paulo Lima², and Patrícia Righetto², ¹*Laboratory of Studies and Researches of Production and Nutrition of Poultry and Swine; Federal University of Amazonas, Parintins, AM, Brazil*, ²*Center of Nuclear Energy in Agriculture, Piracicaba, SP, Brazil*.
- W230 **Feeding diets containing low-protein or rapidly fermentable carbohydrate to weanling pigs does not affect growth performance.**
Vivian V. Almeida^{*1}, Amoracyr J. C. Nuñez¹, Patrícia V. A. Alvarenga², Fabrício R. Castellini², Ysenia V. Silva-Guillen², and Maria Cristina Thomaz², ¹*Department of Animal Sciences, Purdue University, West Lafayette, Indiana*, ²*Department of Animal Science, São Paulo State University, Jaboticabal, São Paulo, Brazil*.
- W231 **Effects of dietary protein and rapidly fermentable carbohydrate contents on cecal microbial fermentation profile of weanling pigs.**
Vivian V. Almeida^{*1}, Amoracyr J. C. Nuñez¹, Patrícia V. A. Alvarenga², Fabrício R. Castellini², Ysenia V. Silva-Guillen², and Maria Cristina Thomaz², ¹*Department of Animal Sciences, Purdue University, West Lafayette, Indiana*, ²*Department of Animal Science, São Paulo State University, Jaboticabal, São Paulo, Brazil*.
- W232 **Effect of feeding wheat- or barley-based diets with high- or low- nutrient density on diet nutrient digestibility and growth performance in weaned pigs.**
X. Zhou^{*1}, M. G. Young², M. L. Swift^{1,3}, E. Beltranena^{1,4}, and R. T. Zijlstra¹, ¹*University of Alberta, Edmonton, AB, Canada*, ²*Gowans Feed Consulting, Wainwright, AB, Canada*, ³*Alberta Agriculture and Rural Development, Lethbridge, AB, Canada*, ⁴*Alberta Agriculture and Rural Development, Edmonton, AB, Canada*.
- W233 **Graded concentrations of dietary wheat bran reduce ileal and total tract digestibility of nutrients but increase hindgut digestibility of dry matter and organic matter in pigs.**
A. R. Son*, W. B. Kwon, and B. G. Kim, *Konkuk University, Seoul, Republic of Korea*.
- W234 **Up to 30% insoluble dietary fiber reduces carcass fat content of heavy pigs.**
Daniela Junqueira Rodrigues¹, Maria Cristina Thomaz¹, Urbano dos Santos Ruiz², Maryane Sespere Oliveira^{*1}, Everton Daniel¹, Fabrício Rogério Castellini¹, Ysenia Victoria da Silva Guillen¹, Vivian Vezioni Almeida¹, and Sarah Sgavioli¹, ¹*Universidade Estadual Paulista, Jaboticabal, Sao Paulo, Brazil*, ²*Universidade de São Paulo, Piracicaba, Sao Paulo Brazil*.
- W235 **Effect of dietary inclusion of insoluble fiber from sugar cane on meat quality of finishing swine.**
Maryane Sespere Oliveira*, Maria Cristina Thomaz, Marco Monteiro Lima, Fabricio Faleiros Castro, Patricia Versuti Arantes Alvarenga, Manuela Vantini Marujo, and Daniela Junqueira Rodrigues, *Universidade Estadual Paulista, Jaboticabal, Sao Paulo, Brazil*.
- W236 **Mannans and glucans in diets for weanling pigs and their effects on the diarrhea incidence and pH of the digestive tract.**
Patrícia V. A. Alvarenga, Maria C. Thomaz, Marco M. Lima*, Daniela J. Rodrigues, Manuela V. Marujo, Fabricio F. Castro, and Maryane S. F. Oliveira, *Universidade Estadual Paulista, Jaboticabal, Sao Paulo, Brazil*.
- W237 **Influence of hydrolysable tannin extract supplementation on performance of growing-finishing pig.**
Rubén Aguirre¹, Javier A. Romo¹, Rubén Barajas^{*1}, Juan M. Romo¹, and Héctor R. Güémez^{1,2}, ¹*FMVZ-Universidad Autónoma de Sinaloa, Culiacán, Sinaloa, México*, ²*Granja Porcina La Huerta, Culiacán, Sinaloa, México*.

Physiology and Endocrinology

Male reproduction, deer and poultry

- W238 **The effect of moringa oleifera leaf meal on follicle stimulating hormone, luteinizing hormone and testosterone of wad goat bucks serum.**
Abimbola O. Ladokun*, Khadeejah Kareem-Ibrahim, Bukola D. Adenaike, Oladimeji M. Abioja, and John A. Abiona, *Federal University of Agriculture, Abeokuta, Ogun, Nigeria.*
- W239 **Proteomic analysis of testicular proteins between yak and its sterile hybrid by iTRAQ labeling mass spectrometry.**
Wei Fu¹, Wenlin Bai², Lin Huang¹, Wenjing Liu³, Caixia Li¹, Suyu Jin¹, Xiang Qiu¹, Liang Ren¹, and Yucai Zheng*¹, ¹Southwest University for Nationalities, Chengdu, Sichuan Province, China, ²Shenyang Agricultural University, Shenyang, Liaoning Province, China, ³Southwest University of Science and Technology, Mianyang, Sichuan Province, China.
- W240 **Effect of androstenone level on the boar testis transcriptome.**
Dianelys Gonzalez-Pena*, Robmay Garcia, Robert V. Knox, and Sandra L. Rodriguez-Zas, *University of Illinois at Urbana-Champaign, Urbana, IL.*
- W241 **Gonadal sperm characteristics of growing boars fed varying levels of raw or fermented cottonseed cake.**
Mayowa Mojeed Oguntunde* and Olajide Abraham Amao, *Ladoke Akintola University of Technology, Ogbomosho, Oyo, Nigeria.*
- W242 **GameteGuard treatment improves post-thaw sperm quality and pregnancy per insemination in dairy cows.**
Lisa Herickhoff*¹, Allison Lindsey¹, Amanda Fritts¹, and Patrick Burns², ¹Membrane Protective Technologies Inc., Fort Collins, CO, ²School of Biological Sciences, University of Northern Colorado, Greeley, CO.
- W243 **Evaluation of factors affecting pregnancy rate to AI in pen-raised white-tailed deer.**
Kyle J. Stutts*, Jessica L. Leatherwood, Christopher R. Stewart, Mark J. Anderson, Marcy M. Beverly, and Stanley F. Kelley, *Sam Houston State University, Huntsville, TX.*
- W244 **Blood profiles of Ross 308 broiler and indigenous Venda chickens aged 42 and 90 days fed a similar diet.**
Monnye Mabelebele*, David Norris, Jones Ng'ambi, and John Alabi, *University of Limpopo, Polokwane, Limpopo, South Africa.*

Physiology and Endocrinology

Metabolism, health, and physiological processes

- W245 **Transition period concentrations of nonesterified fatty acids and β -hydroxybutyrate in dairy cows are not well correlated.**
Maris M. McCarthy*¹, Sabine Mann², Daryl V. Nydam², Thomas R. Overton¹, and Jessica A. A. McArt², ¹Department of Animal Science, Cornell University, Ithaca, NY, ²Department of Population Medicine and Diagnostic Sciences, Cornell University, Ithaca, NY.
- W246 **Associations of circulating haptoglobin with performance and metabolism in dairy cows during early lactation.**
Maris M. McCarthy*, Takashi Yasui, and Thomas R. Overton, *Department of Animal Science, Cornell University, Ithaca, NY.*
- W247 **Intestinal permeability and incidence of diarrhea in Holstein calves.**
Gemma Araujo¹, Cristina Yunta¹, Marta Terré¹, Alessandro Mereu², Ignacio Ipharraguerre², and Alex Bach*^{3,1}, ¹Department of Ruminant Production, IRTA (Institut de Recerca i Tecnologia Agroalimentàries), Caldes de Montbui, Spain, ²Lucta S.A, Montornès del Vallès, Spain, ³ICREA (Institució Catalana de Recerca i Estudis Avançats), Barcelona, Spain.
- W248 **Effects of realimentation on umbilical blood flow, fetal and placental measurements, and birth weight in nutrient-restricted pregnant ewes.**
Manuel Vasquez*, Kendall Swanson, and Kimberley Vonnahme, *North Dakota State University, Fargo, ND.*
- W249 **Changes in insulin-like growth factor I and II profiles following anti-bPL antibodies infusions in six long-term-cannulated bovine fetuses at late gestation.**
Andrea Alvarez-Oxiley*¹, Noelita Melo de Sousa², Jean L. Hornick², Kamal Touati², and Jean F. Beckers², ¹Facultad de Agronomía, Universidad de la República, Montevideo, Uruguay, ²Faculty of Veterinary Medicine, University of Liege, Liege, Belgium.

- W250 **Effects of different feeding intensities during the first weeks of rearing on the metabolic status and on the circulating concentrations of adiponectin in dairy calves until 110 days of age.**
Julia Kesser¹, Miriam Hill^{1,2}, Christian Koch², Marion Piechotta³, Jürgen Rehage³, Klaus Eder⁴, Hassan Sadri¹, Ute Müller¹, and Helga Sauerwein*¹, ¹Physiology and Hygiene Group, Institute for Animal Science, University of Bonn, Bonn, Germany, ²Lehr- und Versuchsanstalt Neumühle, Münchweiler an der Alsenz, Germany, ³Clinic for Cattle, University of Veterinary Medicine Hannover, Hannover, Germany, ⁴Animal Nutrition, University of Giessen, Gießen, Germany.
- W251 **Mitochondrial DNA copy numbers in blood cells during early and late lactation in dairy cows.**
Lilian Laubenthal, Michael Hölker, Karl-Heinz Südekum, Helga Sauerwein, and Susanne Häussler*, University of Bonn, Institute of Animal Science, Bonn, Germany.
- W252 **Mitochondrial DNA copy number in liver, mammary gland, and adipose tissue of early lactating dairy cows.**
Lilian Laubenthal, Michael Hölker, Karl-Heinz Südekum, Helga Sauerwein, and Susanne Häussler*, University of Bonn, Institute of Animal Science, Bonn, Germany.
- W253 **Lipolysis induces adipose tissue macrophage infiltration in lactating dairy cows.**
G. Andres Contreras*¹, Kyan Thelen², Courtney L. Preseault², Sarah E. Schmidt², and Adam L. Lock², ¹Department of Large Animal Clinical Sciences, Michigan State University, East Lansing, MI, ²Department of Animal Science, Michigan State University, East Lansing, MI.
- W254 **Longitudinal characterization of the gene expression of key components of the mTOR signaling and ubiquitin proteasome system in skeletal muscle of dairy cows during the periparturient period and subsequent lactation.**
Yi Yang¹, Helga Sauerwein*¹, Sven Dänicke², Jürgen Rehage³, and Hassan Sadri¹, ¹Institute of Animal Science, Physiology and Hygiene Group, University of Bonn, Bonn, North Rhine-Westphalia, Germany, ²Institute of Animal Nutrition, Friedrich-Loeffler-Institute (FLI), Braunschweig, Lower Saxony, Germany, ³Clinic for Cattle, University for Veterinary Medicine, Foundation, Hannover, Lower Saxony, Germany.
- W255 **Comparison of fractional gluconeogenesis estimates in sheep determined with D₂O administered via vein or rumen and by intravenous infusion of ¹³C₆-glucose.**
Cornelia C. Metges*¹, Solvig Görs¹, Gürbüz Das¹, Umang Agarwal², and Brian J. Bequette², ¹Institute of Nutritional Physiology, Leibniz Institute for Farm Animal Biology, Dummerstorf, Germany, ²Dpt. Animal and Avian Sciences, University of Maryland, College Park, MD.
- W256 **Propionate and cyclic AMP induced bovine PCK1 gene transcription is concurrently mediated by CRE and HNF4α binding elements.**
Qian Zhang, Stephanie L. Koser, and Shawn S. Donkin*, Purdue University, West Lafayette, IN.
- W257 **Hepatic mRNA expression of genes related to somatotropic axis and metabolism of dairy cows treated with recombinant bovine somatotropin during the periparturient period.**
Paula R. B. Silva*¹, Wanda Weber¹, Brian Crooker¹, and Ricardo C. Chebel^{1,2}, ¹University of Minnesota, St Paul, MN, ²University of Florida, Gainesville, FL.
- W258 **A direct method is not as effective as an indirect method for determination of fatty acids from bovine placental tissue.**
Patricia A. Dutra^{1,2}, Mohanathas Gobikrushanth*², Reza Salehi², Ana Ruiz-Sanchez², Marcos G. Colazo³, and Divakar J. Ambrose^{3,2}, ¹Departamento de Zootecnia, Universidade Federal da Bahia, Salvador, Bahia, Brazil, ²Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, Alberta, Canada, ³Livestock Research Branch, Alberta Agriculture and Rural Development, Edmonton, Alberta, Canada.
- W259 **The effect of prepartum diets supplemented with oilseeds on maternal and newborn calf plasma fatty acid profile.**
R. Salehi*¹, M. G. Colazo², M. Oba¹, and D. J. Ambrose^{1,2}, ¹University of Alberta, Edmonton, Alberta, Canada, ²Alberta Agriculture and Rural Development, Edmonton, Alberta, Canada.
- W260 **Examining peripheral activity of catechol-O-methyltransferase (COMT) in Holstein cows following artificial insemination.**
Rachel M. Wilson*, Christa L. Gilfeather, Caitlin G. Hart, and Caleb O. Lemley, Mississippi State University, Mississippi State, MS.
- W261 **IGF-1 concentrations during early pregnancy in suckled Nellore beef cows.**
Rogerio F. G. Peres*¹, Ky G. Pohler³, Hugo B. Graff², Adnan D. P. Rodrigues¹, Michael F. Smith³, Duane H. Keisler³, and Jose L. M. Vasconcelos¹, ¹Departamento de Produção Animal, Faculdade de Medicina Veterinária e Zootecnia-UNESP, Botucatu, São Paulo, Brazil, ²Agropecuária Fazenda Brasil, Barra do Garças, Mato Grosso, Brazil, ³Department of Animal Sciences, University of Missouri, Columbia, MO.

- W262 **Circulating anti-Müllerian hormone (AMH) in Holstein and Jersey breeds, at different physiological states and in dam-daughter pairs.**
E. O. S. Batista*^{1,2}, C. Collar¹, N. Silva-Del-Rio¹, P. D. Carvalho⁴, J. P. Verstegen³, P. S. Baruselli², M. C. Wiltbank⁴, and A. H. Souza¹,
¹University of California, Tulare, CA, ²University of Sao Paulo, Sao Paulo, SP, Brazil, ³Mofa Global, International Center for Biotechnology, Wisconsin, WI, ⁴University of Wisconsin, Wisconsin, WI.

Production, Management, and the Environment III

- W263 **Technical and economic performance on beef cattle in the Livestock Low Carbon Integrated Project-ICV.**
Fabiano Alvim Barbosa*¹, Vando Telles Oliveira², Filipe Lage Bicalho³, Luciano Bastos Lopes⁴, Juliana Mergh Leão¹, and Lucas Luz Emerick¹, ¹Universidade Federal de Minas Gerais, UFMG, Belo Horizonte, Minas Gerais, Brazil, ²Instituto Centro de Vida, ICV, Alta Floresta, Mato Grosso, Brazil, ³Soluções Integradas ao Agronegócio, SIGA, Alta Floresta, Mato Grosso, Brazil, ⁴Empresa Brasileira de Pesquisa Agropecuária, Embrapa, Sinop, Mato Grosso, Brazil.
- W264 **Lactation and immune responses of lactating dairy cows vary with different environmental stressors.**
Ricardo O. Rodrigues*¹, Ann L. Kenny¹, Matthew R. Waldron^{1,2}, and Thomas B. McFadden¹, ¹Division of Animal Sciences, University of Missouri, Columbia, MO, ²Nutrition Professionals Inc., Chilton, WI.
- W265 **A descriptive analysis of how dairy cows convert feed into food in the United States.**
Juan M. Tricarico*, Innovation Center for U.S. Dairy, Rosemont, IL.
- W266 **Study of ethyl-2-nitropropionate, ethyl nitroacetate, nitroethane, and 2-nitroethanol as alternatives to reduce ruminal methane production.**
Pedro A. Ochoa*¹, Agustín Corral¹, Michael Hume², Oscar Ruiz¹, Claudio Arzola¹, and Robin C. Anderson², ¹Facultad de Zootecnia y Ecología. Universidad Autónoma de Chihuahua, Chihuahua, Chihuahua, México, ²U.S. Department of Agriculture, College Station, TX.
- W267 **Use of udder skin temperature as a heat stress indicator in lactating dairy cattle.**
Kristen M. Perano* and Kifle G. Gebremedhin, Cornell University, Ithaca, NY.
- W268 **Maternal heat stress affects calf passive immunity: Effects on intestinal cell apoptosis.**
Bahroz M. S. Ahmed*¹, Ana Paula A. Monteiro¹, Umair Younas¹, Turkey O. Asar¹, J-D. Liu², Joyce Hayen¹, Sha Tao², and Geoffrey E. Dahl¹, ¹University of Florida, Gainesville, FL, ²University of Georgia, Tifton, GA.
- W269 **Methane emissions from Holstein cows in a tropical environment.**
Camila S. Cunha*¹, Marcos I. Marcondes¹, Cristina M. Veloso¹, Maria I. B. Brandão¹, Elvies C. Godinho¹, Marcelo M. D. Castro¹, Aline S. Trece¹, Luisa F. L. Salazar², Erick Iglesias¹, Otávio H. G. B. D. Siqueira¹, Diego Zanetti¹, and Tadeu E. Silva¹, ¹Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil, ²Universidad de Antioquia, Medellín, Colombia.
- W270 **Effects of condensed tannin extract supplementation on beef cattle performance and nitrogen balance: I. Growing phase.**
Landon G. Canterbury*, Lee-Anne J. Walter, Brandon M. Koch, David G. Lust, and Eric A. Bailey, West Texas A&M University, Canyon, TX.
- W271 **Tannin extract supplementation on gas production in feces of receiving bull-calves.**
Eva X. Murillo¹, Ernesto A. Velázquez¹, Melissa B. Corona¹, Idalia Enríquez¹, Billy J. Cervantes², Javier A. Romo¹, and Rubén Barajas*¹, ¹FMVZ-Universidad Autónoma de Sinaloa, Culiacán, Sinaloa, México, ²Ganadera Los Migueles, S.A. de C.V, Culiacán, Sinaloa, México.
- W272 **Composting of dairy manure and grape vine prunings as a tool to reduce both industries' environmental impact.**
Mario E. de Haro-Martí*¹, Mireille Chahine², Ariel Agenbroad³, and Tony McCammon², ¹University of Idaho, Gooding, ID, ²University of Idaho, Twin Falls, ID, ³University of Idaho, Caldwell, ID.
- W273 **Effect of floating islands on parlor wastewater multi-stage treatment system effectiveness.**
Vinicius R. Moreira*¹, Brian D. LeBlanc², Eric Achberger³, and Laura Zeringue¹, ¹LSU AgCenter Southeast Research Station, Franklinton, LA, ²LSU AgCenter School of Plant, Environmental and Soil Sciences, Baton Rouge, LA, ³LSU AgCenter, Baton Rouge, LA.
- W274 **Cross-species intake responses to temperature stress.**
Robin R. White*^{1,2} and Mark D. Hanigan¹, ¹Department of Dairy Science, Virginia Tech, Blacksburg, VA, ²National Animal Nutrition Program, University of Kentucky, Lexington, KY.

- W275 **Comparative feedlot response of Angus-cross and Brahman bull-calves to pen-shade under hot weather conditions.**
Ruben Barajas*¹, Billy J. Cervantes², Alejandro Camacho², Leopoldo R. Flores¹, Juan J. Lomeli¹, and Javier A. Romo¹, ¹FMVZ-Universidad Autónoma de Sinaloa, Culiacán, Sinaloa, México, ²Ganadera Los Migueles, S.A. de C.V, Culiacán, Sinaloa, México.
- W276 **A multi-objective diet optimization to reduce land, water, and greenhouse gas emissions from US dairy production.**
Robin R. White* and Mark D. Hanigan, *Department of Dairy Science, Virginia Tech, Blacksburg, VA.*
- W277 **Effect of temperature humidity index patterns on fertility, postpartum disease and culling risk in New York dairy farms.**
Benjamin D. Scott* and Julio O. Giordano, *Department of Animal Science, Cornell University, Ithaca, NY.*
- W278 **Methane and carbon dioxide emissions from manure of dairy cows fed regular or brown midrib corn silage-based diets.**
Fadi Hassanat* and Chaouki Benchaar, *Agriculture and Agri-Food Canada, Dairy and Swine Research and Development Centre, Sherbrooke, QC, Canada.*
- W279 **Determination of climatologically suitable places in Turkey for feedlot cattle production by using comprehensive climate index model.**
Hayati Koknaroglu*¹, John A. Harrington², and Terry L. Mader³, ¹Suleyman Demirel University, Isparta, Turkey, ²Kansas State University, Manhattan, KS, ³University Nebraska, Lincoln, NE.
- W280 **Methane prediction equations for beef cattle fed high forage diet.**
Paul Escobar-Bahamondes*^{1,2}, Masahito Oba¹, and Karen A. Beauchemin², ¹University of Alberta, Edmonton, AB, Canada, ²Agriculture and Agri-Food Canada, Lethbridge, AB, Canada.
- W281 **Mathematical models to predict phosphorus output in manure and milk from lactating dairy cows.**
G. Alvarez^{1,2}, J. A. D. R.N. Appuhamy*², and E. Kebreab², ¹Universidad Autonoma de San Luis Potosi, San Luis Potosi, Mexico, ²Department of Animal Science, University of California, Davis, CA.
- W282 **Enteric methane mitigation and evaluation ruminal parameters of cattle fed cottonseed and vitamin E.**
Ricardo Galbiatti Sandoval Nogueira*, Flavio Perna, Eduardo Cuellar Orlandi Cassiano, Lizbeth Collazo Paucar, Mariane Cheschin Ernandes, Diana Carolina Zapata Vasquez, Adrielle Matias Ferrinho, Romulo Germano de Resende, Felipe Bispo Mendonça, Renata Gardenalli, Angélica Simone Cravo Pereira, and Paulo Henrique Mazza Rodrigues, *University of São Paulo, Pirassununga, São Paulo, Brazil.*
- W283 **The effect of temperature, pH, total solids and type of shape of goat manure for biogas production.**
Bruno Biagioli*¹, Kleber T. Resende¹, Izabelle A. M. A. Teixeira¹, Normand St-Pierre², Carla J. Härter¹, and Márcia H. M. R. Fernandes¹, ¹Univ. Estadual Paulista, Department of Animal Sciences, Jaboticabal, SP, Brazil, ²The Ohio State University, Department of Animal Sciences, Columbus, OH.
- W284 **Idle cattle, water buffalo, and swine consume 44% of global feed resources.**
J. R. Knapp*¹ and R. A. Cady², ¹Fox Hollow Consulting LLC, Columbus, OH, ²Elanco Animal Health, Greenfield, IN.
- W285 **Crop and grazing land requirements to meet consumer demand for animal products in 2050.**
J. R. Knapp*¹ and R. A. Cady², ¹Fox Hollow Consulting LLC, Columbus, OH, ²Elanco Animal Health, Greenfield, IN.
- W286 **Climatic factors associated with abortion occurrences in Japanese commercial pig herds.**
Ryosuke Iida, Satomi Tani*, and Yuzo Koketsu, *Meiji University, Kawasaki, Kanagawa, Japan.*
- W287 **Estimated feed and water requirements to meet global 2050 demand for animal proteins.**
J. R. Knapp*¹ and R. A. Cady², ¹Fox Hollow Consulting LLC, Columbus, OH, ²Elanco Animal Health, Greenfield, IN.
- W288 **Climatic factors associated with reproductive performance in English Berkshire pigs raised in a subtropical climate region of Japan.**
Shiho Usui, Satomi Tani*, and Yuzo Koketsu, *Meiji University, Kawasaki, Kanagawa, Japan.*

Ruminant Nutrition

Beef III

- W289 **Effect of increasing levels of alfalfa hay on ruminal fermentation in growing Simmental heifers fed high-concentrate diets.**
Ana Madruga*¹, Alfred Ferret¹, María Rodríguez¹, Eva Mainau¹, Jose Luis Ruiz de la Torre¹, Xavier Manteca¹, and Luciano Adrian Gonzalez², ¹*Animal Nutrition and Welfare Service (SNIBA), Universitat Autònoma de Barcelona, 08193 Bellaterra, Spain*, ²*Centre for Carbon, Water and Food, The University of Sydney, Camden, Australia*.
- W290 **Protein requirements of Nellore and Angus young bulls.**
Rafael A. Gomes*^{1,3}, Mario L. Chizzotti², Karina C. Busato¹, Marcio M. Ladeira¹, Aline C. Rodrigues¹, Matheus C. Galvão¹, José Rodolfo R. Carvalho¹, and Maria Helena Oliveira¹, ¹*Universidade Federal de Lavras, Lavras, Minas Gerais, Brazil*, ²*Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil*, ³*Washington State University, Pullman, WA*.
- W291 **Intake and digestibility of Nellore steers fed different sources of forage in diets with crude glycerin in feedlot.**
Andressa F. Ribeiro, Antonio Jose Neto*, Luis G. Rossi, Erick E. Dallantonia, Monaliza O. Santana, Ana Laura E. G. F. Carvalho, Gabriela Dellamagna, Juliana D. Messana, and Telma T. Berchielli, *Sao Paulo State University, Jaboticabal, Sao Paulo, Brazil*.
- W292 **Effect of glycerol supplementation and ambient temperature on growth and metabolic and immunological responses in Korean cattle steers.**
Hyeok Joong Kang, Min Yu Piao, Hyun Jin Kim, In Kyu Lee, Min Jeong Gu, Cheol Hee Yun, and Myunggi Baik*, *Seoul National University, Seoul, Republic of Korea*.
- W293 **Comparison of fatty acid profiles and volatile compounds among quality grades and their association with carcass and sensory traits in loin and rump of Korean cattle steer.**
MinYu Piao, Hyun Jin Kim, Cheorun Jo, Hyun Joo Kim, and Myunggi Baik*, *Department of Agricultural Biotechnology, College of Agriculture and Life Science, Seoul National University, Seoul, Republic of Korea*.
- W294 **Effects of essential oils and exogenous enzymes on in vitro ruminal fermentation.**
Fabiola A. Lino¹, Lidiamar L. R. Vieira¹, Andrea M. Mobiglia¹, Débora G. Sousa¹, Fernando R. Camilo¹, José Tiago Neves Neto¹, Tiago S. Acedo², Cristina S. Cortinhas², João Ricardo R. Dórea², Luis Fernando M. Tamassia², and Juliano J. R. Fernandes*¹, ¹*Universidade Federal de Goiás, Goiânia, Goiás, Brazil*, ²*DSM Nutritional Products, São Paulo, São Paulo, Brazil*.
- W295 **Effect of steam-flaking on in situ degradability and PDI values of maize, wheat and rice.**
Fei Wang*, Yunlong Huo, and Qingxiang Meng, *China Agricultural University, Beijing, China*.
- W296 **Effects of conventional dietary adaptation over periods of 6, 9, 14, and 21 days on feedlot performance and carcass traits of Nellore cattle.**
Daniela Dutra Estevam¹, Danilo Domingues Millen*², Ismael de Castro Pereira¹, Ramon Argentini Rizzieri¹, Gabriel Fernandes Melo¹, Alexandre Perdigão¹, Cyntia Ludovico Martins¹, and Mario De Beni Arrigoni¹, ¹*São Paulo State University (UNESP), Botucatu, São Paulo, Brazil*, ²*São Paulo State University (UNESP), Dracena, São Paulo, Brazil*.
- W297 **The effect of crude glycerin concentration on fiber digestion in beef calves.**
Robert G. Bondurant*, Jana Harding, Melissa Jolly-Breithaupt, James C. MacDonald, Andrea R. McCain, and Samodha C. Fernando, *University of Nebraska-Lincoln, Lincoln, NE*.
- W298 **Effect of supplementing feedlot cattle with live *Saccharomyces cerevisiae* on feed intake and rumen parameters.**
D. O. Sousa*¹, C. A. Oliveira¹, J. M. Souza¹, J. A. Marques¹, A. V. Velasquez¹, E. Chevaux², L. J. Mari², and L. F. P. Silva¹, ¹*University of São Paulo, Pirassununga, São Paulo, Brazil*, ²*Lallemand Animal Nutrition, Aparecida de Goiânia, Goiás, Brazil*.
- W299 **Effect of adding virginiamycin in combination with different doses of monensin on feedlot performance.**
Raul Lizarraga¹, Juan Pablo Russi¹, Luis Casares², Milton Gorocica², and Alejandro Relling*^{1,3}, ¹*Fac Cs Veterinarias, UNLP, Argentina*, ²*Phibro Animal Health, Argentina*, ³*IGEVEV, CCT La Plata, CONICET, Argentina*.
- W300 **Evaluation of rumen microbiota in sugarcane silage based diet with different sources of nonfibrous carbohydrates.**
J. M. Souza, D. O. Sousa*, L. G. Mesquita, N. R. B. Cônsolo, M. O. Frasseto, C. A. Oliveira, and L. F. P. Silva, *University of São Paulo, Pirassununga, São Paulo, Brazil*.
- W301 **Effects of rotating antibiotic and ionophore feed additives on enteric methane and volatile fatty acid production of steers consuming a high forage diet.**
Whitney Crossland*¹, Luis Tedeschi¹, Todd Callaway², Mike Miller¹, Brandon Smith¹, and Matt Cravey³, ¹*Texas A&M University, College Station, TX*, ²*USDA-ARS Southern Plain Region, College Station, TX*, ³*Huvepharma Inc., Amarillo, TX*.

- W302 **Flint corn processing methods and dietary concentrations of roughage NDF for finishing cattle: 1. Intake and digestibility of nutrients.**
Antonio Humberto Fleury de Melo¹, Murillo Alves Porto Meschiatti¹, João Meneghel de Moraes¹, Camila Delveaux Araujo Batalha¹, Lucas Jado Chagas¹, Débora de Carvalho Basto¹, Jonas de Souza¹, Nayana Carla Gonçalves Barbosa², and Flávio Augusto Portela Santos^{*1}, ¹University of São Paulo, Piracicaba, São Paulo, Brazil, ²Federal University of Goiás, Jataí, Goiás, Brazil.
- W303 **Effect of excess MP supplementation from corn gluten meal or soybean meal on plasma amino acid concentrations of beef cows consuming low quality forage.**
Taylor C. Geppert^{*1}, Allison M. Meyer², and Patrick J. Gunn¹, ¹Department of Animal Science, Iowa State University, Ames, IA, ²Division of Animal Sciences, University of Missouri, Columbia, MO.
- W304 **Flint corn processing methods and dietary concentrations of roughage NDF for finishing cattle: 2. Rumen fermentation, N metabolism, and ingestive behavior.**
Antonio Humberto Fleury de Melo¹, Murillo Alves Porto Meschiatti¹, Camila Delveaux Araujo Batalha¹, Jonas de Souza¹, João Meneghel de Moraes¹, Débora de Carvalho Basto¹, Lucas Jado Chagas¹, Nayana Carla Gonçalves Barbosa², and Flávio Augusto Portela Santos^{*1}, ¹University of São Paulo, Piracicaba, São Paulo, Brazil, ²Federal University of Goiás, Jataí, Goiás, Brazil.
- W305 **Carcass traits of Nelore cows finished in different times of high intake supplementation in pasture.**
Flavio Dutra de Resende^{*1,2}, Ana Paula Reiff Janini², Ivanna Moraes de Oliveira¹, Aline Domingues Moreira², Fernanda Diamantino dos Santos³, Paloma Helena Gonçalves³, Michele Aparecida Prado Alves³, and Gustavo Rezende Siqueira^{1,2}, ¹Agência Paulista de Tecnologia dos Agronegócios, Colina, São Paulo, Brazil, ²UNESP, Jaboticabal, São Paulo, Brazil, ³UNIFEB, Barretos, São Paulo, Brazil.
- W306 **Sugar cane straw replacing whole corn on growth and intake of feedlot finishing bulls.**
Barbara J. M. Lemos^{*1}, Flavio G. F. Castro², Bruno P. C. Mendonça², Dheividy B. Fernandes², and Juliano J. R. Fernandes¹, ¹Universidade Federal de Goiás, Goiânia, Goiás, Brazil, ²AgroCria, Goiânia, Goiás, Brazil.
- W307 **Impact of a molasses-based liquid feed supplement on the diet selection behavior and growth of fattening calves.**
Lisa J. Gordon and Trevor J. DeVries^{*}, Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada.
- W308 **Feedlot performance and carcass traits of Nelore and ½ Angus x Nelore cattle adapted either for 9 or 14 days.**
Daniel Hideki Mariano Watanabe^{*1}, Murillo Ceola Stefano Pereira², Ana Carolina Janssen Pinto¹, Wilson Inácio Silva Filho¹, Gustavo Perina Bertoldi¹, André Luiz Nagatani Rigueiro¹, Anderson Augusto Santos¹, Paulo César da Silva Santos¹, Luis Felipe Rebeschini Oliveira¹, Pedro Fernando Santi¹, João Victor Tino Dellaqua¹, Mário De Beni Arrigoni², and Danilo Domingues Millen¹, ¹São Paulo State University (UNESP), Dracena, São Paulo, Brazil, ²São Paulo State University (UNESP), Botucatu, São Paulo, Brazil.
- W309 **Rumen morphometrics of Nelore and ½ Nelore x Angus cattle adapted either for 9 or 14 days to high-concentrate diets.**
André Luiz Nagatani Rigueiro^{*1}, Daniel Hideki Mariano Watanabe¹, Murillo Ceola Stefano Pereira², Wilson Inácio Silva Filho¹, Gustavo Perina Bertoldi¹, Ana Carolina Janssen Pinto¹, Anderson Augusto Santos¹, Mariana Squizzatti¹, Daniela Dutra Estevam², Lais Aquino Tomaz¹, Osvaldo Alex Souza¹, and Danilo Domingues Millen¹, ¹São Paulo State University (UNESP), Dracena, São Paulo, Brazil, ²São Paulo State University (UNESP), Botucatu, São Paulo, Brazil.
- W310 **Relationships of feedlot performance and rumen morphometrics of Nelore cattle differing in phenotypic residual feed intake.**
Murillo Ceola Stefano Pereira², Gustavo Durante Cruz³, Mario De Beni Arrigoni², Juliana Silva¹, Tássia Veluma Barbosa Carrara², and Danilo Domingues Millen^{*1}, ¹São Paulo State University (UNESP), Dracena, São Paulo, Brazil, ²São Paulo State University (UNESP), Botucatu, São Paulo, Brazil, ³Cargill Animal Nutrition, Elk River, MN.
- W311 **Effects of crude glycerin on feed intake and apparent total-tract digestibility of finishing diets in crossbred heifers.**
E. H. C. B. van Cleef^{*1,3}, S. Uwituzé², C. A. Gilis², C. L. Van Bibber-Krueger², K. A. Miller², C. C. Apercé², and J. S. Drouillard², ¹São Paulo State University, Jaboticabal, São Paulo, Brazil, ²Kansas State University, Manhattan, KS, ³FAPESP, São Paulo, Brazil.
- W312 **Impact of the nutritional plan in the growing phase on performance of Nelore cattle during the finishing phase.**
Ivanna Moraes de Oliveira^{*1}, Matheus Henrique Moretti², João Alexandrino Alves Neto³, Aline Domingues Moreira⁴, Rodolfo Maciel Fernandes⁴, João Marcos Beltrame Benatti⁵, Gustavo Rezende Siqueira^{1,4}, and Flávio Dutra de Resende^{1,4}, ¹Agência Paulista de Tecnologia dos Agronegócios, Colina, São Paulo, Brazil, ²Agroceres Multimix, Rio Claro, São Paulo, Brazil, ³Campos Rações e Minerais, Acreúna, Goiás, Brazil, ⁴UNESP, Jaboticabal, São Paulo, Brazil, ⁵Trouw Nutrition/Bellman, Mirassol, São Paulo, Brazil.

- W313 **Performance of grazing Nellore cattle finished with high-intake supplementation.**
Flavio Dutra de Resende*^{1,3}, Beatriz Lima Vellini¹, Ivanna Moraes de Oliveira¹, João Marcos Beltrame Benatti², Matheus Henrique Moretti², Rodolfo Maciel Fernandes³, Aline Domingues Moreira³, and Gustavo Rezende Siqueira^{1,3}, ¹*Agência Paulista de Tecnologia dos Agronegócios, Colina, São Paulo, Brazil*, ²*Trouw Nutrition/Bellman, Mirassol, São Paulo, Brazil*, ³*UNESP, Jaboticabal, São Paulo, Brazil*.
- W314 **Different supplementation strategies to grazing beef cattle in tropical conditions.**
Bruna B. Menezes², Henrique J. Fernandes*¹, Maria G. Moraes², Marina N. Bonin³, Gelson L. D. Feijó³, Ednéia P. Rosa¹, Lucy M. Surita^{1,3}, Yasmin S. Falcão¹, and Amanda A. Perestrelo¹, ¹*State University of Mato Grosso do Sul, Aquidauana, MS, Brazil*, ²*Federal University of Mato Grosso do Sul, Campo Grande, MS, Brazil*, ³*EMBRAPA Beef Cattle, Campo Grande, MS, Brazil*.
- W315 **Effect of high-fiber concentrate diets on intake, performance, carcass traits and meat quality of feedlot Nellore heifers.**
J. M. B. Ezequiel*¹, P. S. N. Oliveira¹, R. L. Galati², D. S. Ferreira¹, V. C. Santos¹, A. C. Homem Junior¹, and E. H. C. B. van Cleef¹, ¹*São Paulo State University, Jaboticabal, São Paulo, Brazil*, ²*Federal University of Mato Grosso, Cuiabá, Mato Grosso, Brazil*.
- W316 **Use of virginiamycin in Nellore cattle fed mineral supplement or protein supplement.**
Gustavo Rezende Siqueira*^{1,3}, Michele Aparecida Prado Alves², Paloma Helena Gonçalves², Ivanna Moraes de Oliveira¹, Rodolfo Maciel Fernandes³, Guilherme Felipe Berti², Fernanda Diamantino dos Santos², and Flávio Dutra de Resende^{1,3}, ¹*Agência Paulista de Tecnologia dos Agronegócios, Colina, São Paulo, Brazil*, ²*UNIFEB, Barretos, São Paulo, Brazil*, ³*UNESP, Jaboticabal, São Paulo, Brazil*.
- W317 **Finishing strategies for grazing Nellore cattle in the wet season.**
Gustavo Rezende Siqueira*^{1,3}, Paloma Helena Gonçalves², Michele Aparecida Prado Alves², Ivanna Moraes de Oliveira¹, Rodolfo Maciel Fernandes³, Carlos Carvalho Marcolino², Fernanda Diamantino dos Santos², and Flavio Dutra de Resende^{1,3}, ¹*Agência Paulista de Tecnologia dos Agronegócios, Colina, São Paulo, Brazil*, ²*UNIFEB, Barretos, São Paulo, Brazil*, ³*UNESP, Jaboticabal, São Paulo, Brazil*.

Ruminant Nutrition Dairy III

- W318 **Milk yield and composition of Holstein cows fed increasing levels of amylolytic enzyme.**
Caio Seiti Takiya*¹, Gustavo Delfino Calomeni¹, Thiago Henrique Annibale Vendramini¹, Thiago Henrique Silva¹, Guilherme Gomes Silva¹, Jessica Cristiane Bertoni¹, Carlos Eduardo Cardoso Consentini¹, Rodrigo Gardinal¹, Jefferson Rodrigues Gandra², José Esler Freitas³, and Francisco Palma Rennó¹, ¹*Departamento de Nutrição e Produção Animal da Universidade de São Paulo, Pirassununga, São Paulo, Brazil*, ²*Faculdade de Ciências Agrárias da Universidade de Grande Dourados, Itahum, Mato Grosso do Sul, Brazil*, ³*Departamento de Zootecnia da Universidade Federal da Bahia, Ondina, Bahia, Brazil*.
- W319 **Biofortified milk: Selenium and vitamin E in cow's diet to improve nutritional components in milk.**
Marcia S. V. Salles*¹, Arlindo Saran Netto², Luiz C. Roma Junior¹, Marcus A. Zanetti², Karina Pfrimer³, and Fernando A. Salles¹, ¹*APTA, Ribeirão Preto, SP, Brazil*, ²*FZEA/USP, Pirassununga, SP, Brazil*, ³*FMRP/USP, Ribeirão Preto, SP, Brazil*.
- W320 **Effect of fermented corn silage density and gas filled porosity on corn silage pH and fermentation end-products.**
William L. Braman*, John E. Kurtz, and Keith A. Bryan, *Chr. Hansen Inc., Milwaukee, WI*.
- W321 **Productive performance of dairy cows fed saturated and unsaturated fatty acids sources in the transition period and early lactation.**
Gustavo D. Calomeni*¹, Rodrigo Gardinal¹, Jose Esler Freitas Junior², Cybele E. Araújo¹, Filipe Zanferari¹, Caio S. Takiya¹, Thiago H. A. Vendramini¹, Victor C. Galvão¹, and Francisco P. Renno¹, ¹*Department of Nutrition and Animal Production, School of Veterinary Medicine and Animal Science, University of São Paulo, Pirassununga, São Paulo, Brazil*, ²*School of Veterinary Medicine, Federal University of Bahia, Ondina, Bahia, Brazil*.
- W322 **Embryo production and oocyte quality of dairy cows fed saturated and unsaturated fatty acids in transition period and early lactation.**
Gustavo D. Calomeni*¹, Rodrigo Gardinal¹, Filipe Zanferari¹, Caio S. Takiya¹, Thiago H. A. Vendramini¹, Jose Esler Freitas Junior², Cybele E. Araújo¹, Victor C. Galvão¹, and Francisco P. Renno¹, ¹*Department of Nutrition and Animal Production, School of Veterinary Medicine and Animal Science, University of São Paulo, Pirassununga, São Paulo, Brazil*, ²*School of Veterinary Medicine, Federal University of Bahia, Ondina, Bahia, Brazil*.

- W323 **Effect of supplemental OmniGen AF and either a negative or positive DCAD prepartum on intake and blood and urine metabolites from dry off through 10 week postpartum.**
J. K. Bernard*¹, Z. Wu⁴, D. J. Hurley², A. L. Jones³, K. P. Zanzalari⁴, J. D. Chapman⁴, and D. J. McLean⁴, ¹*Animal and Dairy Science, University of Georgia, Tifton, GA*, ²*College of Veterinary Medicine, University of Georgia, Athens, GA*, ³*College of Veterinary Medicine, University of Georgia, Tifton, GA*, ⁴*Philbro Animal Health Corp, Quincy, IL*.
- W324 **Characterization of ingredient loading accuracy on commercial dairy farms in North America and Europe feeding total mixed rations.**
Michael C. Barry*, *AgModels LLC, Tully, NY*.
- W325 **Effects of hydroxy versus sulfate forms of trace minerals in milk replacer or starter on dairy calves through weaning.**
Paul A. LaPierre*¹, Sarah Y. Morrison¹, Kevin Perryman², Terri Parr², and James K. Drackley¹, ¹*University of Illinois at Urbana-Champaign, Urbana, IL*, ²*Micronutrients, Indianapolis, IN*.
- W326 **Effects of different forage supplement patterns on the growth of Holstein calves.**
Zhaohai Wu, Shengli Li, and Zhijun Cao*, *State Key Laboratory of Animal Nutrition, College of Animal Science and Technology, China Agricultural University, Beijing, Beijing, China*.
- W327 **Effects of acidified and pasteurized waste milk on calf diarrhea occurrence.**
J. Y. Ma*¹, X. X. Ren¹, H. T. Shi¹, G. Guo², X. Z. Li², and Z. J. Cao¹, ¹*State Key Laboratory of Animal Nutrition, China Agricultural University, Beijing, China*, ²*Beijing Capital Agribusiness Group Co., Ltd, Beijing, China*.
- W328 **Investigating the impact of dietary changes on rumen microbial community during the transition period in Holstein dairy cows using high-throughput sequencing.**
Ousama AlZahal*¹, Suzanne L. Ishaq², Benoit St-Pierre³, Andre-Denis G. Wright⁴, and Brian W. McBride¹, ¹*University of Guelph, Guelph, Ontario, Canada*, ²*University of Vermont, Burlington, VT*, ³*South Dakota State University, Brookings, SD*, ⁴*The University of Arizona, Tucson, AZ*.
- W329 **Metabolic profile and onset of puberty in dairy heifers fed reduced-fat distillers grains in replacement of forage.**
Angela K. Manthey*¹, Jill L. Anderson¹, George A. Perry², and Duane H. Keisler³, ¹*Dairy Science Department, South Dakota State University, Brookings, SD*, ²*Department of Animal Science, South Dakota State University, Brookings, SD*, ³*Division of Animal Science, University of Missouri, Columbia, MO*.
- W330 **Gastrointestinal tract of healthy 1-week-old Jersey calves is well suited to digest, absorb, and incorporate nutrients into lean tissue even when fed a high plane of milk replacer.**
Yu Liang*¹, Tyler L. Harris¹, Jeff A. Carroll², and Michael A. Ballou¹, ¹*Texas Tech University, Department of Animal and Food Sciences, Lubbock, TX*, ²*USDA-ARS, Lubbock, TX*.
- W331 **Effects of glucose and propionate infusions on milk fat yield: A meta-analysis.**
Sarah E. Schmidt* and Adam L. Lock, *Michigan State University, East Lansing, MI*.
- W332 **Effect of the starch level in diets with soybean or canola meal on the performance of lactating dairy cows.**
Juan I. Sanchez-Durte*¹, Kenneth F. Kalscheur², and David P. Casper¹, ¹*Dairy Science Department, South Dakota State University, Brookings, SD*, ²*US Dairy Forage Research Center, USDA, ARS, Madison, WI*.
- W333 **The effect of the supplementation of virginiamycin plus monensin on milk performance under grazing conditions in dairy cattle.**
Ramiro Desantadina¹, Luis Casares², Matias Bailleres³, Milton Gorocica², and Alejandro Relling*^{1,4}, ¹*Fac Cs Veterinarias, UNLP, Argentina*, ²*Phibro Animal Health, Argentina*, ³*Ministerio de Asuntos Agrarios, Buenos Aires, Argentina*, ⁴*IGEVET, CCT La Plata, CONICET, Argentina*.
- W334 **Undegradable aNDFom in non-forage feeds.**
Alessandro Maria Zontini*, Andreas Foskolos, Deborah Ross, and Michael Van Amburgh, *Cornell University, Ithaca, NY*.
- W335 **Effect of two fat supplements differing in saturation on milk production and energy partitioning.**
Enhong Liu*, Courtney L. Preseault, Michael J. VandeHaar, and Adam L. Lock, *Michigan State University, East Lansing, MI*.
- W336 **Nutrient intake and blood parameters of dairy cows fed sugarcane in different ways of storage.**
Viviane B. Ferrari*¹, Mauro D. S. Oliveira², and Francisco P. Rennó¹, ¹*University of São Paulo, Pirassununga, São Paulo, Brazil*, ²*São Paulo State University, Jaboticabal, São Paulo, Brazil*.

- W337 **The effect of increasing concentrations of DL-methionine and HMB on hepatic genes controlling methionine and glucose metabolism.**
Dean A. Bowen^{*1}, Nestor D. Luchini², and Heather M. White¹, ¹University of Wisconsin-Madison, Madison, WI, ²Adisseo, Alpharetta, GA.
- W338 **aNDFom degradation behavior in nonforage feeds.**
Alessandro Maria Zontini^{*}, Andreas Foskolos, Deborah A. Ross, and Michael E. Van Amburgh, Cornell University, Ithaca, NY.
- W339 **Can potential digestible fiber affect dietary crude protein level in lactating dairy cows? Milk production and feeding behavior.**
H. R. Mirzaei Alamouti^{*} and B. Mohtashami, Department of Animal Science, University of Zanjan, Zanjan, Iran.
- W340 **Effects of prill size of a palmitic acid-enriched fat supplement on yield of milk and milk components and nutrient digestibility of dairy cows.**
Jonas De Souza^{*}, Joshua L. Garver, Courtney L. Preseault, and Adam L. Lock, Michigan State University, East Lansing, MI.
- W341 **Changes in dairy cattle performance due to addition of a live yeast product.**
Heidi A. Rossow^{*1}, Tim Riordan², Andy Riordan², Dennis Ervin³, and Dari Brown³, ¹University of California, Davis, Davis, CA, ²Nutri-Systems Inc., Clovis, CA, ³Phileo Lesaffre Animal Care, Milwaukee, WI.
- W342 **Effects of feeding frequency and adding plant oil to diet on performance and feeding behavior of lactating Holstein dairy cows.**
H. R. Mirzaei Alamouti^{*} and K. Akbari, Department of Animal Science, University of Zanjan, Zanjan, Iran.
- W343 **Effect of feeding hay during the nursery phase of calf rearing.**
F. Xavier Suarez-Mena^{*}, James D. Quigley, T. Mark Hill, and Rick L. Schlotterbeck, Nurture Research Center, Proximi North America, Brookville, OH.
- W344 **Effects of non-fiber carbohydrate level in low energy diets on production and health responses in peripartum Holstein cows.**
H. R. Mirzaei Alamouti^{*} and P. Panahiha, Department of Animal Science, University of Zanjan, Zanjan, Iran.
- W345 **Increase in total solids of whole milk and its effects on development of dairy calves.**
Rafael Alves de Azevedo^{*1}, Sâmara Raiany de Almeida Rufino¹, Pâmela Michéli Furini¹, Fernanda Samarini Machado², Mariana Magalhães Campos², Paulo Campos Martins¹, Aloma Eitere Leão¹, Ângela Maria Quintão Lana¹, and Sandra Gesteira Coelho¹, ¹Federal University of Minas Gerais, Belo Horizonte, Minas Gerais, Brazil, ²EMBRAPA Dairy Cattle, Coronel Pacheco, Minas Gerais, Brazil.
- W346 **Increase in total solids of whole milk and its effects on development in postweaning calves.**
Rafael Alves de Azevedo^{*1}, Pâmela Michéli Furini¹, Sâmara Raiany de Almeida Rufino¹, Fernanda Samarini Machado², Mariana Magalhães Campos², Aloma Eitere Leão¹, Paulo Campos Martins¹, Ângela Maria Quintão Lana¹, and Sandra Gesteira Coelho¹, ¹Federal University of Minas Gerais, Belo Horizonte, Minas Gerais, Brazil, ²EMBRAPA Dairy Cattle, Coronel Pacheco, Minas Gerais, Brazil.
- W347 **Effect of dietary starch content on the occurrence of subacute ruminal acidosis (SARA) and inflammation in fresh dairy cows.**
Sarah E. Williams^{*1}, Heather A. Tucker¹, Yoritaka Koba², Ryo Suzuki², and Heather M. Dann¹, ¹William H. Miner Agricultural Research Institute, Chazy, NY, ²ZEN-NOH National Federation of Agricultural Cooperative Associations, Tokyo, Japan.
- W348 **Physical and enzymatic hydrolysis characteristics of ruminal protozoal glycogen.**
Mary Beth Hall^{*}, US Dairy Forage Research Center, USDA-ARS, Madison, WI.
- W349 **The determination of the concentrations of isoforms of vitamin E in tissues, milk and blood via HPLC after short-term feeding in dairy cows.**
Y. Qu^{*1}, T. H. Elsasser², J. R. Newbold³, E. E. Connor², and K. M. Moyes¹, ¹University of Maryland, College Park, MD, ²Agricultural Research Service, US Department of Agriculture, Beltsville, MD, ³Cargill Innovation Center, Veldriel, the Netherlands.
- W350 **Total replacement with organic minerals regulates endometrial gene expression patterns that improve reproductive performance status in dairy heifers.**
Daniel E. Graugnard^{*}, Allison C. Smith, Sylvie Andrieu, and Kristen M. Brennan, Alltech Center for Animal Nutrigenomics and Applied Animal Nutrition, Nicholasville, KY.

- W351 **Comparative bioavailability of lysine in three commercial rumen-protected lysine products using the in vivo plasma lysine response method.**
Heather A. Tucker¹, Makoto Miura², Izuru Shinzato³, and Catherine S. Ballard*¹, ¹William H. Miner Agricultural Research Institute, Chazy, NY, ²Ajinomoto Co., Inc., Kawasaki-ku, Kawasaki-shi, Japan, ³Ajinomoto Heartland Inc., Chicago, IL.
- W352 **Plane of milk replacer nutrition influences the resistance to an oral *Citrobacter freundii* opportunistic infection in Jersey calves at 10 days of age.**
Yu Liang*¹, Jeff A. Carroll², and Michael A. Ballou¹, ¹Texas Tech University, Department of Animal and Food Sciences, Lubbock, TX, ²USDA-ARS, Lubbock, TX.
- W353 **Pre-weaning calf responses to lysine: I. Development and evaluation of functions explaining nitrogen retention responses to dietary lysine and body weight.**
Juan J. Castro Marquez*, Robin R. White, and Mark D. Hanigan, Department of Dairy Science, Virginia Tech, Blacksburg, VA.
- W354 **Saliva sodium, potassium, and phosphorus concentrations of post-peak lactating Holstein cows are not affected by dietary fiber or protein content.**
J. A. D. R. N. Appuhamy*¹, M. Niu¹, T. Tewoldebrhan¹, A. Leytem², R. Dungan², and E. Kebreab¹, ¹Department of Animal Science, University of California, Davis, CA, ²USDA-ARS, Northwest Irrigation Research Lab, Kimberly, ID.
- W355 **Do the viability and dose of *Saccharomyces cerevisiae* affect the digestibility, ruminal fermentation, and performance of lactating dairy cattle?**
Y. Jiang*¹, R. M. Martins², I. M. Ogunade¹, M. A. Bamikole³, F. Amaro², W. Rutherford⁴, S. Qi⁴, F. Owens⁴, B. Smiley⁴, K. G. Arriola¹, C. Staples¹, and A. T. Adesogan¹, ¹Department of Animal Science, University of Florida, Gainesville, ²Animal Science Department, Federal University of Vicosa, Vicosa, Minas Gerais, Brazil, ³Department of Animal Science, University of Benin, Benin City, Nigeria, ⁴DuPont Pioneer, Johnston, IA.
- W356 **Pre-weaning calf responses to lysine: II. Sensitivity and optimization of nitrogen retention responses to dietary lysine and body weight.**
Robin R. White*, Juan J. Castro Marquez, and Mark D. Hanigan, Department of Dairy Science, Virginia Tech, Blacksburg, VA.
- W357 **Effects of corn treated with foliar fungicide at various times of application on in situ ruminal digestibility of corn silage in Holstein cows.**
Katie J. Haerr*¹, Naina M. Lopes², Japheth D. Weems¹, Carl A. Bradley¹, Marcos N. Pereira², Michael R. Murphy¹, Gary M. Fellows³, and Felipe C. Cardoso¹, ¹University of Illinois, Urbana, IL, ²Universidade Federal De Lavras, Lavras, MG, Brazil, ³B.A.S.F. Corporation, Research Triangle Park, NC.
- W358 **A multivariate mixed effects model to estimate the energetic efficiencies of synthesizing milk components.**
Luis E. Moraes*¹, James G. Fadel¹, David P. Casper², and Ermias Kebreab¹, ¹University of California-Davis, Davis, CA, ²South Dakota State University, Brookings, SD.
- W359 **Effects of feeding slow-release NPN and microbial fermentation extracts on ruminal pH, ammonia and volatile fatty acids.**
Fernando Díaz-Royón*¹, Alvaro D. Garcia¹, Kenneth F. Kalscheur², and Kamal Mjoun³, ¹Dairy Science Department, South Dakota State University, Brookings, SD, ²U.S. Dairy Forage Research Center, USDA-ARS, Madison, WI, ³Alltech, Brookings, SD.
- W360 **Relationship between total-tract starch digestibility and fecal starch content in dairy cows.**
Marcos N. Pereira*^{1,2}, Eugenio F. Barbosa¹, and Renata A. N. Pereira^{3,2}, ¹Universidade Federal de Lavras, Lavras, MG, Brazil, ²Better Nature Research Center, Ijaci, MG, Brazil, ³Empresa de Pesquisa Agropecuária de Minas Gerais, Lavras, MG, Brazil.
- W361 **Relationship between milk urea nitrogen and milk protein ratio with dietary and non-dietary variables in commercial dairy herds.**
Liliana Fadul-Pacheco*¹, Doris Pellerin¹, P. Yvan Chouinard¹, Michel A. Wattiaux², and Edith Charbonneau¹, ¹Université Laval, Quebec, Quebec, Canada, ²University of Wisconsin-Madison, Madison, WI.
- W362 **Effects of corn treated with foliar fungicide at various times of applications on milk production of Holstein cows.**
Katie J. Haerr*¹, Naina M. Lopes², Marcos N. Pereira², Gary M. Fellows³, and Felipe C. Cardoso¹, ¹University of Illinois, Urbana, IL, ²Universidade Federal De Lavras, Lavras, MG, Brazil, ³B.A.S.F. Corporation, Research Triangle Park, NC.
- W363 **Increased plasma NEFA lowers the ratio of sphingomyelin to ceramide in Holstein cows.**
J. Eduardo Rico¹, Luciano S. Caixeta², Yves R. Boisclair², and Joseph W. McFadden*¹, ¹West Virginia University, Morgantown, WV, ²Cornell University, Ithaca, NY.
- W364 **Effects of clay (EcoMix) after an aflatoxin challenge on milk production and blood metabolism of Holstein cows.**
Saige A. Sulzberger*¹, Sergey Melnichenko², and Felipe C. Cardoso¹, ¹University of Illinois, Urbana, IL, ²United Minerals Group, Kyiv, Ukraine.

- W365 **Discrepancies in milk urea nitrogen analysis among milk processing laboratories in Pennsylvania.**
Holley L. Weeks* and Alexander N. Hristov, *Department of Animal Science, The Pennsylvania State University, University Park, PA.*
- W366 **Plasma long-chain acylcarnitines are elevated in overweight dairy cows experiencing greater lipolysis and insulin resistance during late pregnancy.**
J. Eduardo Rico*, Rachel E. Cokeley, and Joseph W. McFadden, *West Virginia University, Morgantown, WV.*
- W367 **Effects of the dose and viability of *Saccharomyces cerevisiae* yeast on the diversity of ruminal microbes as analyzed by Illumina MiSeq sequencing and qPCR.**
Y. Jiang*¹, I. M. Ogunade¹, S. Qi², F. Owens², B. Smiley², W. Rutherford², C. Staples¹, and A. T. Adesogan¹, ¹*Department of Animal Science, University of Florida, Gainesville, FL*, ²*DuPont Pioneer, Johnston, IA.*
- W368 **Effects of direct-fed *Bacillus pumilus* 8G-134 during the transition period on health of Holstein cows.**
Shaoyu Luan¹, Elizabeth Galbraith², Megan Duersteler², and Felipe C. Cardoso*¹, ¹*University of Illinois, Urbana, IL*, ²*Dupont Nutrition and Health, Waukesha, WI.*
- W369 **Bacterial communities in rumen fluid from lactating Holstein cows from Washington dairies.**
Elizabeth D. Benda*¹, Nicola F. Beatty¹, Janet E. Williams¹, Matthew L. Settles¹, John P. McNamara², and Mark A. McGuire¹, ¹*University of Idaho, Moscow, ID*, ²*Washington State University, Pullman, WA.*
- W370 **Effects cobalt source on rate and extent of DM and NDF degradation *in vitro*.**
Claudio F. Vargas-Rodriguez*¹, Abigail J. Carpenter¹, Jeffrey DeFrain², and Barry Bradford¹, ¹*Kansas State University, Manhattan, KS*, ²*Zinpro Corp, Eden Prairie, MN.*
- W371 **Effects of long-term omega 6 fatty acid supplementation on blood metabolites of Holstein cows during transition period and early lactation.**
Rodrigo Gardinal*^{1,3}, Gustavo Delfino Calomeni¹, Filipe Zanferari¹, Caio Seiti Takiya¹, Thiago Henrique Aniballi Vendramini¹, Jose Esler Freitas Junior², Jose Eduardo Portela Santos³, and Francisco Palma Renno¹, ¹*University of Sao Paulo, Sao Paulo, SP, Brazil*, ²*Federal University of Bahia, Salvador, BA, Brazil*, ³*University of Florida, Gainesville, FL.*
- W372 **Organic trace minerals during the transition period: 1. Supplementing Zn, Mn and Cu from AvailaMins and Co from CoPro improves postpartal performance of dairy cows.**
J. S. Osorio*¹, E. Trevisi², J. K. Drackley¹, M. T. Socha³, and J. J. Loor¹, ¹*University of Illinois at Urbana-Champaign, Urbana, IL*, ²*Università Cattolica del Sacro Cuore, Piacenza, Italy*, ³*Zinpro Corporation, Eden Prairie, MN.*
- W373 **Evolution of milk freezing point depression during the year in Holstein and Normande dairy cows.**
Catherine Hurtaud*¹, Elise Vanbergue^{1,2}, Sophie Lemosquet¹, Ségolène Colette³, Yves Gallard³, and Luc Delaby¹, ¹*INRA-Agro-campus Ouest UMR1348 Pegase, Saint-Gilles, France*, ²*Institut de l'Elevage, F-35650 Le Rheu, France*, ³*INRA, Domaine du Pin-au-Haras, Exmes, France.*
- W374 **Influence of calcified seaweed supplementation on rumen pH, digestive efficiency, and health in lactating dairy cows fed an acidosis inducing diet.**
B. P. Molloy*¹, E. W. Neville², S. J. Taylor¹, A. W. Fahey², and F. J. Mulligan², ¹*Celtic Sea Minerals Ltd, Carrigaline, Cork, Ireland*, ²*College of Food Science, Veterinary Medicine and Agriculture. University College Dublin, Dublin, Ireland.*
- W375 **Evaluation of an on-farm tool to estimate physically effective neutral detergent fiber of forages and total mixed rations.**
Sarah E. Schuling*¹, Eric J. Staudinger¹, Jeff A. Rortved¹, Paul M. Windschitl¹, Greg L. Golombeski¹, and Kurt W. Cotanch², ¹*Hubbard Feeds Inc., Mankato, MN*, ²*William H. Miner Agricultural Research Institute, Chazy, NY.*
- W376 **The effects of choice feeding during preweaning period on preweaning and postweaning growth performance of dairy calves.**
Mohammad Wakil Hassani and Murat Gorgulu*, *Cukurova University Agriculture Faculty Department of Animal Science, Adana, Turkey.*
- W377 **Effects of day of gestation and feeding regimen in Holstein × Gyr cows on apparent total-tract digestibility, nitrogen balance, and fat deposition.**
Polyana P. Rotta*^{1,2}, Sebastiao C. Valadares Filho¹, Terry E. Engle², Luiz Fernando Costa e Silva^{1,2}, Marcos I. Marcondes¹, Fernanda S. Machado³, Tathyane R. S. Gionbelli¹, Breno C. Silva¹, and Marcos V. C. Pacheco¹, ¹*Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil*, ²*Colorado State University, Fort Collins, CO*, ³*Embrapa Gado de Leite, Juiz de Fora, Minas Gerais, Brazil.*

- W378 **Effects of day of gestation and feeding regimen in Holstein × Gyr cows on maternal and fetal visceral organ mass.**
Polyana P. Rotta*^{1,2}, Sebastiao C. Valadares Filho¹, Terry E. Engle², Luiz Fernando Costa e Silva^{1,2}, Marcos I. Marcondes¹, Mariana M. Campos³, Tathiane R. S. Gionbelli¹, Luis H. R. Silva¹, Edilane C. Martins¹, Flavia A. S. Silva¹, and Faider A. C. Villadiego¹, ¹Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil, ²Colorado State University, Fort Collins, Colorado, ³Embrapa Gado de Leite, Juiz de Fora, Minas Gerais, Brazil.
- W379 **Dietary supplementation of palm- versus high-linoleic safflower oil to mid-lactating Holstein cows: Intake and milk fat yield.**
Shahryar Kargar¹, Clayton M. Stoffel², Lou E. Armentano³, and Francisco E. Contreras-Govea*³, ¹Department of Animal Sciences, College of Agriculture, Shiraz University, Shiraz, Iran, ²Papillon Agricultural Co., Easton, MD, ³Department of Dairy Science, University of Wisconsin-Madison, Madison, WI.
- W380 **Short- and medium-term changes in glucose metabolism and insulin sensitivity of dairy calves offered different amounts of milk replacer early in life.**
Cristina Yunta¹, Marta Terré¹, and Alex Bach*^{2,1}, ¹Department of Ruminant Production, IRTA (Institut de Recerca i Tecnologia Agroalimentàries), Caldes de Montbui, Spain, ²ICREA (Institut Català de Recerca i Estudis Avançats), Barcelona, Spain.
- W381 **Energy expenditure in crossbred (Holstein x Gyr) calves differing in phenotypic residual feed intake.**
Juliana Mergh Leão*¹, Fernanda Samarini Machado², Alexandre Lima Ferreira², Mariana Magalhães Campos², Juliana Campos Carneiro³, Paulo Campos Martins¹, Juliana Aparecida Mello Lima², Thierry Ribeiro Tomich², Luiz Gustavo Ribeiro Pereira², Rayanne Soalheiro de Souza¹, and Sandra Gesteira Coelho¹, ¹Universidade Federal de Minas Gerais-UFMG, Belo Horizonte, Minas Gerais, Brazil, ²Embrapa Dairy Cattle, Juiz de Fora, Minas Gerais, Brazil, ³Instituto de Ciências Agrárias da UFMG, Montes Claros, Minas Gerais, Brazil.
- W382 **The effect of different energy and nitrogen sources on in vitro fiber digestion of high and low quality roughages.**
Christian W. Cruywagen* and Mari Strauss, Stellenbosch University, Stellenbosch, South Africa.
- W383 **Milk fatty acid profile of dairy cows fed omega 3 and 6 fatty acid sources during transition period and early lactation.**
Caio Seiti Takiya*¹, Jefferson Rodrigues Gandra², Lenita Carmago Verdurico¹, Rodolfo Daniel Mingoti¹, Rafael Villela Barletta¹, Jose Esler de Freitas³, Gustavo Delfino Calomeni¹, Elmeson Ferreira de Jesus¹, Thiago Henrique Annibale Vendramini¹, and Francisco Palma Rennó¹, ¹Departamento de Nutrição e Produção Animal da Universidade de São Paulo, Pirassununga, São Paulo, Brazil, ²Faculdade de Ciências Agrárias da Universidade de Grande Dourados, Itahum, Mato Grosso do Sul, Brazil, ³Departamento de Zootecnia da Universidade Federal da Bahia, Ondina, Bahia, Brazil.
- W384 **The effect of feeding nucleotides on milk production, reproductive performance and immunity in lactating Holstein dairy cows.**
Maria Rodriguez-Prado¹, Elisabet Borda*², Miquel Nofrarias³, Carlos Sanchez⁴, and Sergio Calsamiglia¹, ¹Animal Nutrition and Welfare Service, Universitat Autònoma de Barcelona, Bellaterra, Spain, ²R&D Animal Nutrition, Bioiberica SA, Palafolls, Spain, ³CreSA-IRTA, Bellaterra Spain, ⁴Tauste Ganadera, Tauste, Spain.
- W385 **Evaluation of a proprietary blend of essential oil and cobalt on a commercial dairy.**
Olivia Kuester* and David Casper, South Dakota State University, Brookings, SD.
- W386 **Evaluation of rumen undegradable protein sources on lactational performance of Holstein dairy cows.**
Heather A. Tucker¹, Shane M. Fredin*¹, Heather M. Dann¹, Kurt W. Cotanch¹, Catherine S. Ballard¹, Les W. Berghorn², and Rick J. Grant¹, ¹William H. Miner Agricultural Research Institute, Chazy, NY, ²Afgritech LLC, Watertown, NY.
- W387 **Evaluation of industry growth chart equations from birth until first calving of Holstein heifers fed a high plane of nutrition.**
Marie E. Iwaniuk*¹, Jill A. Davidson², Catherine M. Bradley², and Tom J. Earleywine³, ¹University of Maryland, College Park, MD, ²Purina Animal Nutrition, Gray Summit, MO, ³Land O'Lakes Animal Milk Products, Shoreview, MN.
- W388 **Milk urea nitrogen as a predictor of urinary nitrogen excretion in late lactation dairy cows fed four levels of dietary crude protein.**
Tiago Barros* and Michel A. Wattiaux, Department of Dairy Science, University of Wisconsin-Madison, Madison, WI.
- W389 **Phosphorous excretion and digestibility in Jersey and Holstein consuming corn milling co-products.**
Gabriel Garcia Gomez*, Alison Foth, and Paulk Kononoff, University of Nebraska-Lincoln, Lincoln, NE.
- W390 **Relationship between protein molecular structure and protein metabolic characteristics of co-products from bio-oil processing (rapeseed meal, canola meal and soybean meal) in dairy cattle.**
Xinxin Li*^{1,2}, Yonggen Zhang², and Peiqiang Yu^{1,2}, ¹Department of Animal and Poultry Science, University of Saskatchewan, Saskatoon, Saskatchewan, Canada, ²College of Animal Science and Technology, Northeast Agricultural University, Harbin, China.

- W391 **The effect of decreasing dietary cation-anion difference in the prepartum diet on dry matter intake, milk production and milk composition in multiparous Holstein cows.**
B. M. Sweeney*¹, C. M. Ryan¹, K. Zanzalari², D. Kirk², and T. R. Overton¹, ¹Department of Animal Science, Cornell University, Ithaca, NY, ²Prince Agri Products Inc., Quincy, IL.
- W392 **Effect of *Bacillus pumilus* on performance of primiparous dairy cows fed low or high starch diets.**
D. N. Lobão da Silva*¹, Z. Sawall¹, J. Guillen¹, E. Galbraith², T. Parrott³, M. Endres¹, and N. B. Litherland¹, ¹University of Minnesota, Saint Paul, MN, ²DuPont Nutrition and Health, Waukesha, WI, ³DuPont Industrial Biosciences, Waukesha, WI.
- W393 **Balancing dairy cattle diets for methionine or all essential amino acids relative to energy at negative and adequate levels of rumen nitrogen.**
Ryan J. Higgs¹, Brian K. Sloan², Larry E. Chase¹, Charles G. Schwab³, and Michael E. Van Amburgh*¹, ¹Cornell University, Ithaca, NY, ²Adisseo, Alpharetta, GA, ³Schwab Consulting LLC, Boscobel, WI.

Ruminant Nutrition General III

- W394 **Effect of heat-treated field beans (*Vicia faba*) on lactation performance of dairy cows.**
Mohammad Ramin*, Annika Höjer, Mårten Hetta, and Pekka Huhtanen, Department of Agricultural Research for Northern Sweden, Swedish University of Agricultural Sciences (SLU), Umeå, Västerbotten, Sweden.
- W395 **Pre- and post-weaning performance of dairy calves fed a milk-wheat-plasma protein milk replacer.**
Max Thornsberry¹, Steve Younker*¹, Dave Ziegler², Hugh Chester-Jones², and Jim Linn¹, ¹Milk Specialties Global, Eden Prairie, MN, ²University of Minnesota, Southern Research and Outreach Center, Waseca, MN.
- W396 **Effects of ruminal dosing of dairy cows with *Megasphaera elsdenii* on milk fat depression and strain persistence.**
Paul J. Weimer*¹, Luciano da Silva Cabral², and Felipe Cacite², ¹USDA-ARS, Madison, WI, ²Federal University of Mato Grosso, Cuiabá, MT, Brazil.
- W397 **Effects of Cerrado plant extracts on in vitro rumen microbial fermentation in high inclusion concentrate diets.**
Flavia Martins de Souza*, Barbara Juliana Martins Lemos, Fabiola Alves Lino, Kiria Karolline Gomes Moreira, José Realino de Paula, Victor Rezende Moreira Couto, and Juliano José de Resende Fernandes, Universidade Federal de Goiás, Goiânia, Goiás, Brazil.
- W398 **Effect of fibrolytic and aminolytic enzymes in ruminal metabolism and methane production in cattle.**
Ricardo Galbiatti Sandoval Nogueira, Lizbeth Lourdes Collazos Paucar*, Flavio Perna, Eduardo Cuellar Orlandi Cassiano, Diana Carolina Zapata Vasquez, Lerner Arevalo Pinedo, and Paulo Henrique Mazza Rodrigues, University of São Paulo, Pirassununga, São Paulo, Brazil.
- W399 **Effects of diets containing glycerin, derived from biodiesel production, on instrumental meat quality characteristics of lambs.**
Rebeca D. X. Ribeiro*¹, Ronaldo L. Oliveira¹, Gleidson G. P. Carvalho¹, Thadeu M. Silva¹, André G. Leão², Jonival B. Costa¹, Sara M. Ribeiro¹, Elisiane S. Santos¹, and Abraão S. Nunes¹, ¹University of Bahia, Salvador City, Bahia State, Brazil, ²Federal University of Mato Grosso, Rondonópolis City, Mato Grosso State, Brazil.
- W400 **Effects of salinomycin and virginiamycin supplementation on ruminal microbial population in Nellore steers fed a high concentrate diet.**
Amoracyr J. C. Nuñez*^{1,2}, Vivian V. Almeida¹, Italo E. Borges², Fabio Pinese², Fernando T. Mercado², Ligia G. Mesquita², Juliane Diniz-Magalhães², Luis Felipe P. Silva², Paulo R. Leme², and José Carlos M. Nogueira Filho², ¹Purdue University, West Lafayette, IN, ²University of São Paulo, Pirassununga, SP, Brazil.
- W401 **Productive performance of lambs fed diets containing glycerin from biodiesel production.**
Ronaldo L. Oliveira*¹, Rebeca D. X. Ribeiro¹, Gleidson G. P. Carvalho¹, Thadeu M. Silva¹, André G. Leão², Jonival B. Costa¹, Sara M. Ribeiro¹, Elisiane S. Santos¹, and Abraão S. Nunes¹, ¹University of Bahia, Salvador City, Bahia State, Brazil, ²Federal University of Mato Grosso, Rondonópolis City, Mato Grosso State, Brazil.

- W402 **Ruminal hydrogen sulfide concentrations on low-quality grass hay by lambs drinking saline water.**
Agustín López*^{1,3}, José I. Arroquy^{1,2}, Ana V. Juárez Sequeira^{2,3}, Nicolás DiLorenzo⁴, Héctor Fissolo¹, and María C. Barrionuevo³,
¹INTA EEA Santiago del Estero, Santiago del Estero, Argentina, ²CONICET, Santiago del Estero, Argentina, ³FAYA - Univ. Nac. Santiago del Estero, Santiago del Estero, Argentina, ⁴University of Florida, NFREC, Marianna, FL.
- W403 **Effects of Cerrado plant oils on in vitro rumen microbial fermentation in high inclusion concentrate diets.**
Flavia Martins de Souza*, Barbara Juliana Martins Lemos, Fabiola Alves Lino, Kiria Karolline Gomes Moreira, Edemilson Cardoso da Conceição, Victor Rezende Moreira Couto, and Juliano José de Resende Fernandes, *Universidade Federal de Goiás, Goiânia, Goiás, Brazil.*
- W404 **Effects of the combined use of virginiamycin and salinomycin on ruminal microbial population in Nelore steers fed diets with two concentrate levels.**
Amoracyr J. C. Nuñez*^{1,2}, Vivian V. Almeida¹, Fabio Pinese², Italo E. Borges², Fernando T. Mercado², Ligia G. Mesquita², Juliane Diniz-Magalhães², Luis Felipe P. Silva², Paulo R. Leme², and José Carlos M. Nogueira Filho², ¹Purdue University, West Lafayette, IN, ²University of São Paulo, Pirassununga, SP, Brazil.
- W405 **Ruminal fermentation of dairy cows supplemented with crude glycerin.**
Pablo G. Paiva*¹, Carlos E. C. Consentini², Fernanda C. R. Santos², Arthur G. B. V. B. Costa², Victor C. Galvao², Guilherme F. Cabral³, Elmeson F. Jesus¹, Tiago A. Del Valle², Thiago H. Silva², Caio S. Takiya², and Franciso P. Renno², ¹Animal Science Department, Universidade Estadual Paulista, UNESP/Jaboticabal-SP, ²School of Veterinary Medicine and Animal Science, Universidade de São Paulo, USP, ³School of Animal Science and Food Engineering, Universidade São Paulo, USP/Pirassununga-SP.
- W406 **Dry matter intake and nutrient digestibility of dairy cows supplemented with crude glycerin.**
Pablo G. Paiva*¹, Fernanda C. R. Santos², Arthur G. B. V. B. Costa², Victor C. Galvao², Guilherme F. Cabral³, Carlos E. C. Consentini², Elmeson F. Jesus¹, Tiago A. Del Valle², Thiago H. Silva², Caio S. Takiya², and Francisco P. Renno², ¹Animal Science Department, Universidade Estadual Paulista, UNESP/Jaboticabal-SP, ²School of Veterinary Medicine and Animal Science, Universidade de São Paulo, USP, ³School of Animal Science and Food Engineering, Universidade São Paulo, USP/Pirassununga-SP.
- W407 **Nitrogen utilization of Nelore bulls supplemented with energy sources associated crude glycerin on finishing phase.**
Antônio José Neto*¹, Joanis Tilemahos Zervoudakis², Pedro Veiga Rodrigues Paulino², Luciana Keiko Hatamoto-Zervoudakis², Luciano da Silva Cabral², Juliane Quenoizoré Soares², Rosemary Lais Galati², Renata Pereira da Silva-Marques², and Lilian Chambó Rondena Pesqueira Silva², ¹Department of Animal Science; São Paulo State University-UNESP, Jaboticabal, SP, Brazil, ²Department of Basic Sciences and Animal Production; Federal University of Mato Grosso-UFMT, Cuiabá, MT, Brazil.
- W408 **In vitro production of gas in diets containing different levels of ethanolic extract of propolis.**
Sandra M. Yamamoto*, Cintia M. Araujo, Fernanda G. da Silva, Marcela A. Formiga, Layse A. Gordiano, and Daniel R. Menezes, *Federal University of Vale do São Francisco, Petrolina, Pernambuco, Brazil.*
- W409 **Influences of SmartCare in milk replacer and XPC in calf starter on the performance and health of pre-weaning Holstein calves challenged orally with an opportunistic infection with *Citrobacter freundii*.**
Tyler L. Harris*¹, Yu Liang¹, Matt D. Sellers¹, Cameron R. Nightingale¹, Kate P. Sharon^{1,2}, Jeff A. Carroll², Ilkyu Yoon³, Mark F. Scott³, and Michael A. Ballou¹, ¹Department of Animal and Food Sciences, Texas Tech University, Lubbock, TX, ²USDA-ARS, Lubbock, TX, ³Diamond V, Cedar Rapids, IA.
- W410 **Effect of adding *Enterococcus faecalis* on in vitro ruminal fermentation profiles.**
Lovelia L. Mamuad, Ashraf A. Biswas, and Sang Suk Lee*, *Sunchon National University, Suncheon, Jeonnam, South Korea.*
- W411 **Acetohydroxamic acid did not influenced ruminal microbiota but altered urea metabolism.**
P. P. Wang¹, J. Q. Wang¹, D. P. Bu*^{1,2}, D. Jin¹, J. Zhang¹, and X. M. Nan^{1,3}, ¹State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ²World Agroforestry Centre, East and Central Asia, Beijing, China, ³Synergetic Innovation Center Of Food Safety and Nutrition, Harbin, China.
- W412 **Effect of interaction of cereal and forage on rumen fermentation characteristics in the diet of cattle.**
S. Y. Cao¹, C. W. Yang², Z. B. Yang*¹, and Y. Wang³, ¹College of Animal science, Shandong Agricultural University, Tai-an, Shandong, China, ²College of Life Science, Shandong Agricultural University, Tai-an, Shandong, China, ³Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, AB, Canada.
- W413 **Effect of dietary energy source and level on nutrient digestibility, rumen microbial protein synthesis, and milk performance in lactating dairy cows.**
X. Q. Zhou^{1,2}, J. Q. Wang¹, D. P. Bu*^{1,3}, Y. D. Zhang¹, M. Zhao¹, P. Sun^{1,4}, and T. Zhang¹, ¹State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ²College of Animal Science and Technology, Northeast Agricultural University, Harbin, China, ³Synergetic Innovation Center of Food Safety and Nutrition, Harbin, China, ⁴CAAS-ICRAF Joint Lab on Agroforestry and Sustainable Animal Husbandry, Beijing, China.

- W414 **Physico-molecular structures and metabolic characteristics of protein in brown and yellow flaxseed with altered nutrient traits for dairy cattle.**
Nazir A. Khan¹, Helen Booker², Yajing Ban¹, and Peiqiang Yu*¹, ¹Department of Animal and Poultry Science, University of Saskatchewan, Saskatoon, SK, Canada, ²Department of Plant Sciences, University of Saskatchewan, Saskatoon, SK, Canada.
- W415 **Effect of rubber seed oil and flaxseed oil on milk performance, fatty acid composition and oxidative stability of milk fat.**
Y. Pi¹, J. Q. Wang¹, D. P. Bu*^{1,3}, L. Ma^{1,2}, Y. X. Zhu⁴, and J. C. Xu⁴, ¹Institute of Animal Science, State Key Laboratory of Animal Nutrition, Chinese Academy of Agricultural Sciences, Beijing, China, ²CAAS-ICRAF Joint Lab on Agroforestry and Sustainable Animal Husbandry, World Agroforestry Centre, East and Central Asia, Beijing, China, ³Synergetic Innovation Center of Food Safety and Nutrition, Harbin, China, ⁴Kunming Institute of Botany, Chinese Academy of Sciences, Kunming, Kunming, China.
- W416 **Varying the degrees of synchrony of energy and nitrogen release in rumen affect the synthesis of microbial protein in continuous culture system.**
J. Zhang¹, J. Q. Wang¹, D. P. Bu*^{1,2}, S. G. Zhao¹, P. P. Wang¹, and X. M. Nan^{1,3}, ¹State Key Laboratory of Animal Nutrition, Institute of Animal Sciences, Chinese Academy of Agricultural Sciences, Beijing, China, ²World Agroforestry Centre, East and Central Asia, Beijing, China, ³Synergetic Innovation Center of Food Safety and Nutrition, Harbin, China.
- W417 **Effects of wilting and additives on fermentation quality of alfalfa (*Medicago sativa* L.) silage.**
H. Liu^{1,2}, J. Q. Wang², D. P. Bu*^{2,4}, Z. W. Lv², and P. Sun^{2,3}, ¹College of Animal Science and Veterinary Medicine, Heilongjiang Bayi Agricultural University, Daqing, Heilongjiang, China, ²State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ³Synergetic Innovation Center Of Food Safety and Nutrition, Harbin, China, ⁴CAAS-ICRAF Joint Lab on Agroforestry and Sustainable Animal Husbandry, Beijing, China.
- W418 **Effect of choline inclusion on lamb performance and meat characteristics.**
Julio Godinez-Cruz¹, Oswaldo Cifuentes-Lopez¹, Jorge Cayetano¹, Hector Lee-Rangel*¹, German Mendoza², Anayeli Vazquez¹, and Alejandro Roque¹, ¹Universidad Autónoma de San Luis Potosí, Facultad de Agronomía y Veterinaria, San Luis Potosí, San Luis Potosí, Mexico, ²Universidad Autónoma Metropolitana, Departamento de Producción Animal, Distrito Federal, Mexico.
- W419 **Effects of *Yucca schidigera* extract on Rumen Fermentation Parameters in vitro.**
J. L. Niu¹, L. Ma^{1,2}, D. P. Bu*^{1,3}, J. N. Li¹, L. Pan¹, and J. C. Xu⁴, ¹State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ²CAAS-ICRAF Joint Laboratory of Agroforestry and Sustainable Animal Husbandry, World Agroforestry Centre, East and Central Asia, Beijing, China, ³Synergetic Innovation Center of Food Safety and Nutrition, Harbin, China, ⁴Kunming Institute of Botany, Chinese Academy of Sciences, Kunming, Kunming, Yunnan, China.
- W420 **Influence of Indian odd fruit oil and combination with yucca saponin or rubber seed oil on in vitro rumen fermentation parameters.**
J. L. Niu¹, L. Ma^{1,2}, D. P. Bu*^{1,3}, L. Pan¹, and J. C. Xu⁴, ¹State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ²CAAS-ICRAF Joint Laboratory of Agroforestry and Sustainable Animal Husbandry, World Agroforestry Centre, East and Central Asia, Beijing, China, ³Synergetic Innovation Center of Food Safety and Nutrition, Harbin, China, ⁴Kunming Institute of Botany, Chinese Academy of Sciences, Kunming, Yunnan, China.
- W421 **Influence of rubber seed oil on in vitro rumen fermentation parameters, fatty acid composition and methane production.**
J. L. Niu¹, L. Ma^{1,2}, D. P. Bu*^{1,3}, L. Pan¹, and J. C. Xu⁴, ¹State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ²CAAS-ICRAF Joint Laboratory of Agroforestry and Sustainable Animal Husbandry, World Agroforestry Centre, East and Central Asia, Beijing, China, ³Synergetic Innovation Center of Food Safety and Nutrition, Harbin, China, ⁴Kunming Institute of Botany, Chinese Academy of Sciences, Kunming, Yunnan, China.
- W422 **Changes of the rumen microbial profiles as affected by urea and acetohydroxamic acid addition in vitro.**
D. Jin^{1,4}, J. Q. Wang¹, D. P. Bu*^{1,2}, P. P. Wang¹, S. G. Zhao¹, and X. M. Nan^{1,3}, ¹State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ²CAAS-ICRAF Joint Laboratory of Agroforestry and Sustainable Animal Husbandry, World Agroforestry Centre, East and Central Asia, Beijing, China, ³Synergetic Innovation Center of Food Safety and Nutrition, Harbin, China, ⁴Gembloux Agro-Bio Tech, University of Liège, Gembloux, Belgium.
- W423 **Milk production and composition responds to dietary neutral detergent fiber and starch ratio in dairy cows.**
M. Zhao¹, J. Q. Wang¹, D. P. Bu*^{1,3}, X. Q. Zhou¹, D. Zhu¹, and P. Sun^{1,2}, ¹State Key Laboratory of Animal Nutrition, Institute of Animal Science, Chinese Academy of Agricultural Sciences, Beijing, China, ²CAAS-ICRAF Joint Laboratory of Agroforestry and Sustainable Animal Husbandry, World Agroforestry Centre, East and Central Asia, Beijing, China, ³Synergetic Innovation Center of Food Safety and Nutrition, Harbin, China.
- W424 **Evaluation of enhanced mineral block on in vitro rumen microbial fermentation.**
Chang Dae Jeong, Lovelia L. Mamuad, Catherine G. Avedoza, Sang Suk Lee*, Bang Geul Kim, and Maro Lee, Suncheon National University, Suncheon, Jeonnam, South Korea.

- W425 **Effects of cassava peel as a replacement for corn on nutrient digestibility and lactating performance of dairy cows.**
Viviany Lúcia Fernandes dos Santos¹, Marcelo de Andrade Ferreira², Geraldo Tadeu dos Santos³, Raphael Eduardo Moretti³, Tobias Tobit de Barros Melo², Leônia Régia Costa da Silva¹, Thaynah Vasconcelos Gracindo¹, Michelle de Oliveira Maia Parente⁴, and Valdi de Lima Júnior*¹, ¹Universidade Federal do Rio Grande do Norte, Natal, Rio Grande do Norte, Brazil, ²Universidade Federal Rural de Pernambuco, Recife, Pernambuco, Brazil, ³Universidade Estadual de Maringá, Maringá, Paraná, Brazil, ⁴Universidade Federal do Maranhão, Chapadinha, Maranhão, Brazil.
- W426 **Creatinine excretion in Nelore heifers grazing during dry season.**
Jarbas Miguel da Silva Junior*, Luciana Navajas Rennó, Sebastião de Campos Valadares Filho, Edenio Detmann, Mario Fonseca Paulino, Rilene Ferreira Diniz Valadares, Taiane da Silva Martins, Lyvian Cardoso Alves, and Ricardo Marostegan de Paula, *Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.*
- W427 **Influence of varying level of fibrolytic enzyme on nutritive value of oat grass silage in cannulated buffalo bulls.**
Mahr Un Nisa*¹, Osman Ahmad Khan², Sarwar Muhammad³, and Muhammad Sharif³, ¹Institute of Home and Food Science, Govt. College University, Faisalabad, Punjab, Pakistan, ²Livestock and Dairy Development, Lahore, Punjab, Pakistan, ³Institute of Animal Nutrition and Feed Technology, University of Agriculture, Faisalabad, Punjab, Pakistan.
- W428 **Adaptation of dairy cows to grazing after TMR feeding during early lactation: I. Effects on endocrine profile and hepatic expression of IGF system genes.**
Ana L. Astessiano*¹, Pablo Chilibroste², Diego A. Mattiauda², Ana Meikle³, and Mariana Carriquiry¹, ¹School of Agronomy, UDELAR, Montevideo, Uruguay, ²School of Veterinary Medicine, UDELAR, Paysandú (EEMAC), Uruguay, ³School of Veterinary Medicine, UDELAR, Montevideo, Uruguay.
- W429 **Effects of feeding 3-nitrooxypropanol (NOP) on rumen microbial profiles in lactating dairy cows and beef cattle.**
Mi Zhou*¹, Yanhong Chen¹, Jennifer Haisan¹, Atmir Romero-Perez^{1,2}, Karen A. Beauchemin², Masahito Oba¹, Maik Kindermann³, Stephane Duval⁴, and Le Luo Guan¹, ¹Department of Agricultural, Food, and Nutritional Science, University of Alberta, Edmonton, Alberta, Canada, ²Agriculture and Agri-Food Canada, Lethbridge, Alberta, Canada, ³DSM Nutritional Products, Animal Nutrition & Health, Basel, Switzerland, ⁴DSM Nutritional Products France, Research Centre for Animal Nutrition and Health, Saint Louis Cedex, France.
- W430 **Effect of protein supplementation to low-quality forage diets on enteric methane production and ruminal microbial community structure of beef steers.**
Adam L. Shreck*¹, Nirosh D. Aluthge³, Jenny S. Jennings², Samodha C. Fernando³, and N. Andy Cole¹, ¹USDA-ARS, Bushland, TX, ²Texas Agrilife Research, Amarillo, TX, ³University of Nebraska-Lincoln, Lincoln, NE.
- W431 **Effect of a *Saccharomyces cerevisiae* preparation on in vitro ruminal fermentation of four fibrous substrates.**
Karla Y. Valdés¹, Iván Mateos¹, Cristina Saro¹, Alexey Díaz^{1,4}, María Dolores Carro², Abdelfattah Z. M. Salem³, and María José Ranilla*^{1,4}, ¹Animal Production Department, University of León, León, Spain, ²Agriculture Production Department, Technical University of Madrid, Madrid, Spain, ³Faculty of Veterinary Medicine and Animal Science, Autonomous University of the State of Mexico, Mexico, ⁴IGM (CSIC-ULE). Finca Marzanas s/n, Grulleros, León, Spain.
- W432 **Nutritional evaluation of corn wet feed in cannulated Nili-Ravi buffalo bulls.**
M. Nisa*¹, M. Osman³, S. Najeed⁴, and M. Sarwar², ¹Department of Food Science, Nutrition and Home Economics, Govt. College University, Faisalabad, Pakistan, ²Institute of Animal Sciences, University of Agriculture, Faisalabad, Pakistan, ³Livestock and Dairy Development Board, Lahore, Pakistan, ⁴Star Farm Pvt Ltd, Sargodha, Pakistan.
- W433 **Effect of direct-fed microbial supplementation and different diets on performance and carcass characteristics in beef feedlot heifers.**
Laura F. Prados*^{2,1}, Galen E. Erickson¹, Nirosh Aluthge¹, Samodha C. Fernando¹, Curtis J. Bittner¹, and Fred H. Hilscher¹, ¹University of Nebraska-Lincoln, Lincoln, NE, ²Universidade Federal de Viçosa-MG, Viçosa, Minas Gerais, Brazil.
- W434 **Effect of Econase on rumen fermentation patterns, diet digestibility and performance pre-and postpartum of primiparous dairy cows.**
D. N. Lobão da Silva*¹, R. Riewer², A. Gander¹, N. Walker², B. Ellison², M. Endres¹, and N. B. Litherland¹, ¹University of Minnesota, Saint Paul, MN, USA, ²AB Vista, Marlborough, UK.
- W435 **Effect of supplementation of rumen-protected vitamins (choline, riboflavin, and folic acid) in heat-stressed dairy cows in northern Mexico (La Laguna Region).**
Pedro A. Robles-Trillo*¹, Janet Garcia¹, Francisco G. Veliz-Deras¹, Carlos Arechiga-Flores², Rafael Rodriguez-Martinez¹, and Karla Fernandez¹, ¹Universidad Autonoma Agraria Antonio Narro, Torreon, Coahuila, Mexico, ²Universidad Autonoma de Zacatecas, Calera, Zacatecas, Mexico.

- W436 **Effect of reducing dietary calcium, phosphorus and trace minerals on intake and performance of finishing Nellore bulls.**
Laura F. Prados*^{2,1}, Breno Silva², Herlon M. Alhadad², Marcos P. Rodrigues², Ana C. O. Lopes², Danillo F. T. Sathler², Paloma M. Amaral², Lays D. S. Mariz², Sebastião C. Valadares Filho², and Galen E. Erickson¹, ¹University of Nebraska-Lincoln, Lincoln, Nebraska, ²Universidade Federal de Viçosa-MG, Viçosa, Minas Gerais, Brazil.
- W437 **Overfeeding energy alters visceral fat miRNA profiles in Holstein cow.**
Afshin Hosseini¹, Hua Bao², Khuram Shahzad*¹, James K. Drackley¹, Leluo Guan², and Juan J. Loor¹, ¹University of Illinois, Urbana, IL, ²University of Alberta, Edmonton, AB, Canada.
- W438 **Microbial protein yield of Nellore bulls supplemented with protein sources associated with crude glycerin on finishing phase.**
Antonio Jose Neto*¹, Joanis Tilemahos Zervoudakis², Luciana Keiko Hatamoto-Zervoudakis², Luciano da Silva Cabral², Juliane Quenoizoré Soares², Rosemary Lais Galati², Renata Pereira da Silva-Marques², Everton Riva Donida², and Lilian Chambó Rondena Pesqueira Silva², ¹Department of Animal Science; São Paulo State University-UNESP, Jaboticabal, SP, Brazil, ²Department of Basic Sciences and Animal Production; Federal University of Mato Grosso-UFMT, Cuiabá, MT, Brazil.
- W439 **Effects of supplemental protein sources associated with crude glycerin in Nellore bulls finished on pasture on apparent digestibility.**
Antonio Jose Neto*¹, Joanis Tilemahos Zervoudakis², Luciana Keiko Hatamoto-Zervoudakis², Luciano da Silva Cabral², Renata Pereira da Silva-Marques², Rosemary Lais Galati², Juliane Quenoizoré Soares², Everton Riva Donida², and Felipe Cacite², ¹Department of Animal Science; São Paulo State University-UNESP, Jaboticabal, SP, Brazil, ²Department of Basic Sciences and Animal Production; Federal University of Mato Grosso-UFMT, Cuiabá, MT, Brazil.
- W440 **Nutrient intake of Nellore bulls in tropical pasture supplemented with crude glycerin and different sources of protein.**
Antonio Jose Neto*¹, Joanis Tilemahos Zervoudakis², Pedro Veiga Rodrigues Paulino², Luciana Keiko Hatamoto-Zervoudakis², Renata Pereira da Silva-Marques², Luciano da Silva Cabral², Juliane Quenoizoré Soares², Everton Riva Donida², and Felipe Cacite², ¹Department of Animal Science; São Paulo State University-UNESP, Jaboticabal, SP, Brazil, ²Department of Basic Sciences and Animal Production; Federal University of Mato Grosso-UFMT, Cuiabá, MT, Brazil.
- W441 **Protein molecular structure and nutritive value of yellow and black canola seed.**
Katerina Theodoridou^{1,2}, Ban Yajing*², and Peiqiang Yu², ¹University of Saskatchewan, Saskatoon, SK, Canada, ²Queen's University, Belfast, UK.
- W442 **Effect of supplementation of two sources and two levels of copper on performance, copper status and ruminal fermentation in Nellore bulls.**
Lisia Bertonha Correa, Marcus Antônio Zanetti, Janaína Silveira Silva, Brenda Barcelos*, and Arlindo Saran Netto, University of Animal Science and Food Engineering, Pirassununga, São Paulo, Brazil.
- W443 **Effects of dietary tannin extracts levels during a thirteen-week period on lactating cow performance and N use efficiency.**
Matias J. Aguerre*¹, Benjamin D. Duval², Mark Powell¹, Peter Vadas¹, and Michel A. Wattiaux¹, ¹Department of Dairy Science, University of Wisconsin-Madison, Madison, WI, ²Department of Biological Systems Engineering, University of Wisconsin-Madison, Madison, WI.
- W444 **Evaluation of inoculation method on rumen in vitro gas production kinetics.**
F. O. Scarpino-van Cleef*¹ and J. P. Keim², ¹São Paulo State University, Jaboticabal, São Paulo, Brazil, ²Universidad Austral de Chile, Valdivia, Región Los Rios, Chile.
- W445 **In vitro evaluation of a treatment to flaxseed for reducing bio-hydrogenation of the n-3 fatty acid α -linolenic.**
Scott L. Kronberg*¹ and Eric J. Scholljegerdes², ¹USDA-ARS, Northern Great Plains Research Laboratory, Mandan, North Dakota, ²Department of Animal and Range Sciences, New Mexico State University, Las Cruces, New Mexico.
- W446 **Evaluation of botanical extracts supplemented or not with live yeast compared with monensin supplementation on rumen fermentation in lactating Jersey cows.**
Bertrand Medina*¹, Phillip Meiring², Bruno Ghilardi¹, and Lourens Erasmus², ¹Laboratoires Phodé, France, ²Dept of Animal & Wildlife Sciences, University of Pretoria, South Africa.
- W447 **Fertilization and dried distillers grains supplementation effects on performance and nitrogen recovery by stocker cattle grazing old world bluestem.**
Phillip A. Gunter*, Brody D. Wallis, Phillip A. Lancaster, and Gerald W. Horn, Oklahoma Agricultural Experiment Station, Stillwater, OK.
- W448 **Effect of altered nitrogen excretion by condensed tannin supplementation on steer energy losses.**
Adam L. Shreck*¹, Pake J. Ebert³, Eric A. Bailey³, Jenny S. Jennings², and N. Andy Cole¹, ¹USDA-ARS, Bushland, TX, ²Texas Agrilife Research, Amarillo, TX, ³West Texas A&M University, Canyon, TX.

- W449 **Organ mass in pure and crossbred mature beef cows grazing different herbage allowances of grasslands.**
Alberto Casal*¹, Ana L. Astesiano¹, Ana I. Trujillo¹, Ana C. Espasandin², Pablo Soca², and Mariana Carriquiry¹, ¹*Facultad de Agronomía, Universidad de la República, Montevideo, Uruguay*, ²*Facultad de Agronomía EEMAC, Universidad de la República, Paysandu, Uruguay.*
- W450 **Effect of cow parameters on enteric methane production in dairy cows: an individual variation approach.**
Edward H. Cabezas-García*¹, Sophie J. Krizsan¹, Kevin J. Shingfield², and Pekka Huhtanen¹, ¹*Swedish University of Agricultural Sciences, Department of Agricultural Research for Northern Sweden, Umeå, Vasterbotten, Sweden*, ²*Aberystwyth University, Institute of Biological, Environmental and Rural Sciences, Aberystwyth, Ceredigion, UK.*
- W451 **Rumen fermentation responses to plant extracts rich in tannins.**
Barbara J. M. Lemos*, Flavia M. Souza, Fabiola A. Lino, Victor R. M. Couto, and Juliano J. R. Fernandes, *Universidade Federal de Goiás, Goiânia, Goiás, Brazil.*
- W452 **Carcass characteristics of Nellore beef cattle fed with whole corn diet.**
Andrea M. Mobiglia*¹, Fernando R. Camilo¹, Victor R. M. Couto¹, Wallace V. S. Santos¹, Lucas D. Silva¹, Bruno P. C. Mendonça², Flávio G. F. Castro², and Juliano J. R. Fernandes¹, ¹*Escola de Veterinária e Zootecnia da Universidade Federal de Goiás, Goiânia, Goiás, Brazil*, ²*Agrocricia Nutrição Animal e Sementes, Goiânia, Goiás, Brazil.*
- W453 **Effect of the use of virginiamycin and monensin sodium in high concentrate diet on carcass characteristics of beef cattle feedlot.**
Fernando R. Camilo*¹, Andrea M. Mobiglia¹, Gustavo R. Siqueira², Flávio D. Resende², Regina K. Grizotto², Victor R. M. Couto¹, and Juliano J. R. Fernandes¹, ¹*Escola de Veterinária e Zootecnia da UFG, Goiânia, Goiás, Brazil*, ²*APTA - Agência Paulista de Tecnologia dos Agronegócios, Colina, São Paulo, Brazil.*
- W454 **Effect of supplementation with different levels and rates of protein degradation on performance of Nellore calves.**
Gustavo Rezende Siqueira*¹, Lais Atayde dos Santos², Rodolfo Maciel Fernandes³, Chafic Mustafé de Almeida⁴, Fernanda Diamantino Santos², Guilherme Felipe Berti², Verônica Aparecida Costa Mota³, and Flávio Dutra de Resende¹, ¹*Agência Paulista de Tecnologia dos Agronegócios, Colina, São Paulo, Brazil*, ²*Centro Universitário da Fundação Educacional de Barretos, Barretos, São Paulo, Brazil*, ³*Universidade Estadual Paulista "Júlio de Mesquita Filho" /UNESP-Jaboticabal, Jaboticabal, São Paulo, Brazil*, ⁴*Universidade Federal do Mato Grosso/UFMT-Sinop, Sinop, Mato Grosso, Brazil.*
- W455 **Ruminal parameters of Nellore steers fed with high grain diet containing virginiamycin or monensin sodium.**
Andrea M. Mobiglia*¹, Fernando R. Camilo¹, Alexandre A. Miszura¹, Ricardo A. Souza¹, Victor R. M. Couto¹, Flávio G. F. Castro², Bruno P. C. Mendonça², and Juliano J. R. Fernandes¹, ¹*Escola de Veterinária e Zootecnia da Universidade Federal de Goiás, Goiânia, Goiás, Brazil*, ²*Agrocricia Nutrição Animal e Sementes, Goiânia, Goiás, Brazil.*
- W456 **Characterization of the variation in linoleic acid (18:2) in corn silage and grain hybrids in test plots.**
Michel Baldin*, Yun Ying, Gregory Roth, and Kevin J. Harvatine, *Penn State University, University Park, PA.*
- W457 **Performance of beef cattle fed with different levels of roughage in high whole grain diet during the adaptation period.**
Andrea M. Mobiglia¹, Fernando R. Camilo*¹, Flávio G. F. Castro², Bruno P. C. Mendonça², Mohana D. Neves², Victor R. M. Couto¹, and Juliano J. R. Fernandes¹, ¹*Escola de Veterinária e Zootecnia da UFG, Goiânia, Goiás, Brazil*, ²*Agrocricia Nutrição Animal e Sementes, Goiânia, Goiás, Brazil.*
- W458 **Microalgae meal affects heifer performance and plasma fatty acids.**
Justin E. Axman*¹, Cadra L. Van Bibber-Krueger¹, Caleb P. Weiss¹, Christian A. Alvarado-Gilis¹, Jake D. Thieszen¹, Kelsey J. Phelps¹, John M. Gonzalez¹, Kate A. Jacques², and James S. Drouillard¹, ¹*Kansas State University, Manhattan, KS*, ²*Alltech, Inc., Nicholasville, KY.*
- W459 **Effect of concentrate supplementation on milk yield and fatty acid profile of crossbred dairy cows on tropical pasture.**
Arni Xochitemol-Hernández¹, Epigmenio Castillo-Gallegos², Manuel González-Ronquillo³, Miguel Blanco-Ochoa¹, and Luis Corona*¹, ¹*Universidad Nacional Autónoma de México, FMVZ. Departamento de Nutrición Animal. Cd. Universitaria, DF, México*, ²*Universidad Nacional Autónoma de México, FMVZ. CEIEGT, Veracruz, México*, ³*Universidad Autónoma del Estado de México, FMVZ, Estado de México, México.*
- W460 **Composition and nutritive value of palm kernel meal for ruminants.**
Jennifer K. Cuenca¹, Diego A. Vela¹, Darren D. Henry², Nicolas DiLorenzo², and Christian H. Ponce*¹, ¹*Departamento de Ciencias de la Vida y Agricultura, Universidad de las Fuerzas Armadas ESPE, Sangolquí, Ecuador*, ²*North Florida Research and Education Center, Department of Animal Sciences, University of Florida, Marianna, FL.*
- W461 **Effects of β -acid extract of hops on heifer performance and ruminal fermentation.**
Justin E. Axman*, Cadra L. Van Bibber-Krueger, Christian A. Alvarado-Gilis, Jake D. Thieszen, and James S. Drouillard, *Kansas State University, Manhattan, KS.*

- W462 **Effect of a ruminal acidosis challenge on methane emission rate in lactating cows.**
Matias J. Aguerre*, Fei Sun, Shayna Welch, and Michel A. Wattiaux, *Department of Dairy Science, University of Wisconsin-Madison, Madison, WI.*
- W463 **Co-products (Micelio and Raffinate) from the corn processing industry for finishing cattle.**
Murillo Alves Porto Meschiatti*¹, Maria Erika Picharillo¹, Camila Delveaux Batalha¹, Julia Silveira Pereira², and Flavio Augusto Portela Santos¹, ¹*University of São Paulo, São Paulo, Brazil*, ²*Cargill.*
- W464 **The effect of heating temperature on ruminal protein digestion kinetics and estimated intestinal digestibility of canola meal.**
Katarzyna Burakowska*¹, Pawel Górka², and Gregory B. Penner¹, ¹*University of Saskatchewan, Saskatoon, Canada*, ²*University of Agriculture, Kraków, Poland.*
- W465 **Effects of postruminal AA supply and roughage removal on growth performance during growing phase of beef calves.**
Mariana M. Masiero*, Ryan L. Barnett, and Monty S. Kerley, *University of Missouri, Columbia, MO.*

Ruminant Nutrition

Other ruminants

- W466 **Dynamic changes of main rumen microflora and ruminal fermentation in sheep supplemented with molasses-urea.**
Alatengdalai, Shuyuan Xue, Ming Hu, and Changqing Li*, *Inner Mongolia Academy of Agricultural and Animal Husbandry Sciences, Huhhot, Inner Mongolia, China.*
- W467 **Effects of corn levels on TMR on growth performance and economic efficiency in growing Korean black goats.**
S. U. Kim*, M. J. Ku, Y. S. Choi, S. K. Lee, D. H. Park, and S. G. Park, *Jeollanam-do Livestock Research Institute, Gangjin-gun, Jeollanam-do, Republic of Korea.*
- W468 **Effects of water restriction following feeding on microbial N supply and excretion of urinary purine derivatives in Corriedale ewes under heat stress condition.**
J. Ghassemi Nejad, B. W. Kim*, B. H. Lee, J. L. Peng, D. H. Ji, and K. I. Sung, *College of Animal Life Sciences, Kangwon National University, Chuncheon, Kangwon, South Korea.*
- W469 **Comparative study between two traditional camel rearing systems effects on milk fat and its fatty acids profile.**
Amir Ahmadpour¹, Abdol Hamid Karimi², Rupert Bruckmaier³, and Mousa Zarrin*⁴, ¹*Department of Animal Science, Bu-Ali Sina University, Hamadan, Iran*, ²*Department of Animal Science, Fars Agricultural and Natural Resources Research Center, Shiraz, Fars, Iran*, ³*Vetsuisse Faculty, University of Bern, Bern, Switzerland*, ⁴*Department of Animal Science, Yasouj University, Yasouj, Iran.*
- W470 **Influence of zilpaterol hydrochloride and enriched-Cr yeast supplementation on feedlot performance lambs.**
Miguel A. Rodríguez^{1,2}, Ignacio A. Domínguez-Vara¹, Ernesto Morales-Almaráz¹, and Rubén Barajas*², ¹*Universidad Autónoma del Estado de México, FMVZ, Toluca, Estado de México, México*, ²*FMVZ-Universidad Autónoma de Sinaloa, Culiacán, Sinaloa, México.*
- W471 **Influence of zilpaterol hydrochloride and enriched-Cr yeast supplementation on carcass characteristics and meat composition of feedlot lambs.**
Miguel A. Rodríguez^{1,2}, Ignacio A. Domínguez-Vara¹, María A. Mariezcurrena-Berasain¹, Juan E. Sánchez-Torres¹, and Rubén Barajas*², ¹*Universidad Autónoma del Estado de México, FMVZ, Toluca, Estado de México, México*, ²*FMVZ-Universidad Autónoma de Sinaloa, Culiacán, Sinaloa, México.*
- W472 **The nutritional value of confectionary sunflower hulls as forage source for finishing lambs.**
Rae-Leigh A. Pederzoli* and Gregory B. Penner, *University of Saskatchewan, Saskatoon, Saskatchewan, Canada.*

Small Ruminant III

- W473 **Effects of the level of fish oil in the diet on lamb performance, ruminal fermentation and leptin gene expression.**
Pedro Hernandez¹, German Mendoza^{*2}, Nallely Sanchez², Jose Martinez², and Fernando Plata², ¹Universidad Autonoma del Estado de Mexico, Amecameca, Mexico, Mexico, ²Universidad Autonoma Metropolitana Unidad Xochimilco, Mexico, D.F., Mexico.
- W474 **Growth rates of females from a Romane sheep breed flock reared in rangelands and effects of an early or late first mating regime on their offspring.**
Eliel González-García^{*1}, Didier Foulquié², François Bocquier¹, Dominique François³, and Dominique Hazard³, ¹INRA UMR Systèmes d'élevage Méditerranéens et Tropicaux (SELMET), Montpellier Cedex 1, France, ²INRA UE0321, Domaine de La Fage, Roquefort-sur-Soulzon, France, ³INRA UMR1388 Génétique, Physiologie et Systèmes d'Élevage (GenPhySE), Castanet-Tolosan Cedex, France.
- W475 **Effects of maternal lines and mating systems on susceptibility to parasitism in a pasture-lambing, low-input production system.**
Shuna A. Jones^{*1}, Chadwick C. Chase¹, Michael Heaton¹, Karen K. Shuck², Kreg Leymaster¹, and John Keele¹, ¹US Meat Animal Research Center, Clay Center, NE, ²Great Plains Veterinary Educational Center, Clay Center, NE.
- W476 **GnRH at moment or 24 hours after hCG treatment upon reproductive outcomes in anestrus goats.**
VH Gonzalez-Alvarez¹, CA Meza-Herrera², AS Alvarado-Espino¹, JM Gillen-Muñoz¹, R. Rodriguez-Martinez¹, G. Arellano-Rodriguez¹, PA Robles-Trillo¹, and FG Veliz^{*1}, ¹Antonio Narro Autonomous Agricultural University, Torreon, Coahuila, Mexico, ²Chapingo Autonomous University, Regional University Unit on Arid Lands, Bermejillo, Durango, Mexico.
- W477 **Application of 40 mg progesterone prior to the ram effect induces estrus response and ovulatory activity in Dorper sheep.**
LM Tejada^{*1}, CA Meza², O. Angel¹, R. Rodríguez-Martínez¹, MV Perales¹, E. Carrillo³, G. Arellano¹, and FG Veliz¹, ¹Universidad Autónoma Agraria Antonio Narro, Torreon, Coahuila, México, ²Universidad Autónoma Chapingo Unidad Regional Universitaria de Zonas Áridas, Bermejillo, Durango, México, ³Instituto Tecnológico de Torreón, Torreón, Coahuila, México.
- W478 **Evaluation of the use of hCG to promote the induction of reproductive activity in anovulatory Alpine goats.**
Alan S. Alvarado-Espino¹, Cesar A. Meza-Herrera², Vicente H. Gonzalez-Alvarez¹, Juan M. Guillen-Muñoz¹, Martha V. Perales-Garcia¹, Raymundo Rivas-Muñoz³, Evaristo Carrillo³, and Francisco G. Veliz^{*1}, ¹Universidad Autonoma Agraria Antonio Narro, Torreón, Coahuila, Mexico, ²Universidad Autonoma Chapingo-Unidad Regional Universitaria en Zonas Aridas, Bermejillo, Durango, Mexico, ³Instituto Tecnológico de Torreón, Torreón, Coahuila, Mexico.
- W479 **Effects of mixing two different tannin-containing diets to evaluate rumen fermentation and microbial population changes in goats.**
D. Perkins^{*1}, B. R. Min¹, C. Wright¹, N. Gurung¹, T. Terrill², J.-S. Eun³, W. H. McElhenney¹, R. Shange¹, and Y. Uyeno⁴, ¹Tuskegee University, Tuskegee, AL, ²Fort-Valley State University, Fort Valley, GA, ³Utah State University, Logan, UT, ⁴Shinshu University, Minamiminowa, Japan.
- W480 **Reproductive efficiency of anovulatory goats through bucks treated with testosterone and (or) estrogenized females in northern México.**
Juan M. Guillén-Muñoz¹, César A. Meza-Herrera², Rafael Rodríguez-Martínez¹, Pedro A. Robles-Trillo¹, Carlos Leyva-Orasma¹, Evaristo Carrillo³, Francisco Gerardo Veliz¹, and Gerardo Arellano-Rodríguez^{*1}, ¹Universidad Autónoma Agraria Antonio Narro, Torreón, Coahuila, México, ²Universidad Autónoma de Chapingo, Bermejillo, Durango, México, ³Instituto Tecnológico de Torreón, Torreón, Coahuila, México.
- W481 **Impact of adequate or reduced mineral supplementation on rumen function and growth in lambs.**
Abrigail M. Temple^{*1}, Gbenga A. Ayangbile¹, Dustin R. Vandermyde¹, Calvin R. Vandermyde², and Dan J. Schauff¹, ¹Agri-King Inc., Fulton, IL, ²Morrison Veterinary Clinic, Morrison, IL.
- W482 **Tissue mineral deposition in growing lambs fed adequate or reduced levels of mineral supplements.**
Abrigail M. Temple¹, Gbenga A. Ayangbile^{*1}, Dustin R. Vandermyde¹, Calvin R. Vandermyde², Dan J. Schauff¹, and Jeff G. Horst¹, ¹Agri-King Inc., Fulton, IL, ²Morrison Veterinary Clinic, Morrison, IL.
- W483 **Nutrient digestibility in growing lambs fed adequate or reduced levels of mineral supplements.**
Abrigail M. Temple, Gbenga A. Ayangbile, Dustin R. Vandermyde, Dan J. Schauff*, and David A. Spangler, Agri-King Inc., Fulton, IL.
- W484 **Adipocyte differentiation-related protein promotes lipid accumulation in goat mammary epithelial cells.**
Hengbo Shi, Kang Yu, and Jun Luo*, College of Animal Science and Technology, Northwest A&F University, Yangling, Shaanxi, China.

- W485 **Activation of liver X receptor α and SREBP-1 promotes fatty acid synthesis in goat mammary epithelial cells.**
Huifeng Xu and Jun Luo*, *College of Animal Science and Technology, Northwest A&F University, Yangling, Shaanxi, China.*
- W486 **Evaluation of different doses of intramuscular progesterone to induce reproductive activity in anestrus goats.**
Viridiana Contreras*¹, Cesar Meza², Gerardo Arellano¹, Rafael Rodriguez¹, Ma de los Angeles De Santiago¹, Miguel Mellado¹, Raymundo Rivaz³, and Francisco G. Veliz¹, ¹Universidad Autonoma Agraria Antonio Narro, Torreon, Coahuila, Mexico, ²URUZA-UACH, Bermejillo, Durango, Mexico, ³Instituto Tecnológico de Torreon, Torreon, Coahuila, Mexico.
- W487 **Induction of sexual behavior in Dorper rams treated with glutamate and/or testosterone during the natural sexual resting season at 26°N.**
Ma. Guadalupe Calderón-Leyva*¹, Cesar A. Meza-Herrera², Oscar Ángel-García¹, Juan Ramón Luna-Orozco³, Raymundo Rivas-Muñoz⁴, Gerardo Arellano-Rodríguez¹, F. Gerardo Veliz-Deras¹, and Rafael Rodríguez-Martínez¹, ¹Universidad Autónoma Agraria Antonio Narro, Torreón, Coahuila, México, ²Universidad Autónoma Chapingo, Unidad Regional Universitaria de Zonas Áridas, Bermejillo, Durango, México, ³Centro de Bachillerato Tecnológico Agropecuario No. 1, Torreón, Coahuila, México, ⁴Instituto Tecnológico de Torreón, Torreón, Coahuila, México.
- W488 **Reproductive outcomes in nulliparous ewes exposed to dorper rams treated with glutamate and/or testosterone during increased photoperiods.**
Ma. Guadalupe Calderón-Leyva¹, Cesar A. Meza Herrera², Oscar Angel-Garcia¹, Juan Ramon Luna-Orozco³, Raymundo Rivas-Muñoz⁴, Gerardo Arellano-Rodríguez¹, F. Gerardo Veliz-Deras¹, and Rafael Rodriguez-Martinez*¹, ¹Universidad Autonoma Agraria Antonio Narr, Unidad Laguna, Torreon, Coahuila, Mexico, ²Universidad Autonoma Chapingo, Unidad Regional de Zonas Aridas, Bermejillo, Durango, Mexico, ³Centro de Bachillerato Tecnológico Agropecuario No 1, Torreon, Coahuila, Mexico, ⁴Instituto Tecnológico de Torreon, Torreon, Coahuila, Mexico.
- W489 **Quality parameters of goat meat as influenced by dietary condensed tannins from pine bark.**
Jolethia O. Jones*¹, Jung Hoon Lee¹, Byeng R. Min², Govind Kannan¹, and Brou Kouakou¹, ¹Fort Valley State University, Fort Valley, GA, ²Tuskegee University, Tuskegee, AL.
- W490 **Fatty acid composition of different fat depots from hair and wool x hair sheep supplemented with soy hull on pasture.**
Beruk B. Lemma¹, Jung Hoon Lee*¹, Stephan A. Wildeus², Brou Kouakou¹, and Govind Kannan¹, ¹Fort Valley State University, Fort Valley, GA, ²Virginia State University, Petersburg, VA.
- W491 **Relationship among somatic measurements, body condition score, live weight and internal fat depots in Sarda ewes and Saanen goats in early lactation.**
Leonardo S. Knupp¹, Sheila N. R. Knupp¹, Mauro Ledda², Davide Rondina¹, Marco Acciaro³, Carla Manca³, Gesumino Spanu¹, Mondina F. Lunesu¹, and Antonello Cannas*¹, ¹Dipartimento di Agraria, University of Sassari, Sardinia, Italy, ²Dipartimento di Medicina Veterinaria, University of Sassari, Sardinia, Italy, ³Agris Sardegna, Dipartimento di Ricerca nelle Produzioni Animali, Sardinia, Italy.
- W492 **Assessment of RNA stability within six ovine tissues postmortem.**
Fiona M. McGovern¹, Tommy M. Boland*¹, Francis P. Champion¹, Marion T. Ryan¹, and Torres Sweeney², ¹School of Agriculture and Food Science, University College Dublin, Dublin, Ireland, ²School of Veterinary Medicine, University College Dublin, Dublin, Ireland.
- W493 **A meta-analysis of net protein and energy requirements for growth of dairy goats.**
Anaiane Souza*¹, Normand St-Pierre², Marcia Fernandes¹, Amélia Almeida¹, Julián Vargas¹, and Izabelle Teixeira¹, ¹Universidade Estadual Paulista, Jaboticabal, Sao Paulo, Brazil, ²The Ohio State University, Columbus, OH.
- W494 **Effect of selenium supplementation on reproductive activity of Saanen bucks.**
Khoboso C. Lehloenyha*, Mamokou M. Mojapelo, and Jannes B. van Ryssen, *University of Pretoria, Pretoria, Gauteng, South Africa.*
- W495 **Fatty acid profile of the meat of goats fed diets with soybean meals substituted with peanut cake.**
Thadeu M. Silva*¹, Ariosvaldo N. Medeiros², Ronaldo L. Oliveira¹, Severino Gonzaga Neto², Rita C. R. E. Queiroga³, and Rebeca D. X. Ribeiro¹, ¹Federal University of Bahia, Salvador, Bahia, Brazil, ²Federal University of Paraíba, Areia, Paraíba, Brazil, ³Federal University of Paraíba, João Pessoa, Paraíba, Brazil.
- W496 **Digestibility of nutrients in rams diets feed with fruit residue.**
Elenice Conceição dos Santos¹, Darcilene Maria Figueiredo*¹, Dorismar David Alves², Aldrin Vieira Pires¹, Paulo Gustavo Macedo de Almeida Martins¹, Janaina Leite Barbosa¹, Mônica Lopes Paixão³, Cassiane Gomes dos Santos¹, and Marianne Schorer¹, ¹Universidade Federal dos Vales do Jequitinhonha e Mucuri, Diamantina, MG, Brazil, ²UNIMONTES, Montes Claros, MG, Brazil, ³Universidade Federal de Viçosa, Viçosa, MG, Brazil.

- W497 **Nitrogen balance in sheep fed with fruit residue.**
Elenice Conceição dos Santos¹, Darcilene Maria Figueiredo*¹, Paulo Gustavo Macedo de Almeida Martins¹, Aldrin Vieira Pires¹, Dorismar David Alves², Mônica Lopes Paixão³, Janaína Leite Barbosa¹, and Marianne Schorer¹, ¹*Universidade Federal dos Vales do Jequitinhonha e Mucuri, Diamantina, MG, Brazil*, ²*UNIMONTES, Montes Claros, MG, Brazil*, ³*Universidade Federal de Viçosa, Viçosa, MG, Brazil*.
- W498 **Ruminal parameters of sheep fed with fruit residue.**
Elenice Conceição dos Santos¹, Darcilene Maria Figueiredo*¹, Dorismar David Alves², Aldrin Vieira Pires¹, Paulo Gustavo Macedo de Almeida Martins¹, Janaína Leite Barbosa¹, Mônica Lopes Paixão^{3,1}, Adriano Cardoso dos Reis³, and Marianne Schorer¹, ¹*Universidade Federal dos Vales do Jequitinhonha e Mucuri, Diamantina, MG, Brazil*, ²*UNIMONTES, Montes Claros, MG, Brazil*, ³*Universidade Federal de Viçosa, Viçosa, MG, Brazil*.
- W499 **Effects of increasing dried distillers grains with solubles on intake, digestibility, blood and rumen metabolites of sheep consuming bermudagrass or eastern gamagrass hay.**
Lamin Touray^{1,2}, Brou Kouakou*¹, and Jung H. Lee¹, ¹*Fort Valley State University, Fort Valley, GA*, ²*University of Alabama at Birmingham, Birmingham, AL*.
- W500 **Performance and feed efficiency of feedlot lambs fed different sources of non-protein nitrogen and carbohydrate.**
Larissa Goltz, Ricardo D. Kliemann, Jean C. S. Lourenço, Eduardo M. Nascimento, Dayanna Pastal, Tiago M. Santos, Sergio R. Fernandes, and Américo F. Garcez Neto*, *Federal University of Paraná, Palotina, Paraná, Brazil*.
- W501 **The use of Chambourcin grape extract as a natural anthelmintic in goat kids.**
Kimberly A. Cash*¹, James D. Caldwell¹, Bruce C. Shanks¹, Amy L. Bax¹, Luke S. Wilbers¹, Heather L. Hilsenbeck¹, Andrea T. McNelly¹, Taylor N. Drane¹, Kelsey L. Basinger¹, Jessica K. Clark¹, Haley L. Bartimus¹, and Harley D. Naumann², ¹*Lincoln University, Jefferson City, MO*, ²*University of Missouri Columbia, Columbia, MO*.
- W502 **Urushiol is not detected in blood or milk of Saanen dairy goats fed poison oak.**
Massimo Bionaz*, Claudia Ingham, Jennifer Belveal, Kristine Gomez, and Mark Keller, *Oregon State University, Corvallis, OR*.
- W503 **Performance and carcass parameters of lambs fed high grain diets with different fiber contents.**
T. Brochado*, S. B. Gallo, M. C. Freua, P. R. Leme, and R. A. Brandi, *Faculty of Animal Science and Food Engineering, University of Sao Paulo, Pirassununga, SP, Brazil*.
- W504 **Sheep performance under grazing supplemented with lime-hydrolyzed feather meal as a source of protein in their diet during the dry season in Mexico's Central Highlands.**
Francisca Avilés Nova*¹, José M. Castro Salas³, Octavio A. Castelan Ortega², Luis M. Ríos García¹, and Anastacio García Martínez¹, ¹*Centro Universitario Temascaltepec. Universidad Autónoma del Estado de México, Temascaltepec, Estado de México, México*, ²*Facultad de Medicina Veterinaria y Zootecnia de la Universidad Autónoma del Estado de México, Toluca, Estado de México, México*, ³*Unidad académica de Ciencias Agropecuarias y Ambientales. Universidad Autónoma de Guerrero, Iguala de la Independencia, Estado de Guerrero, México*.
- W505 **Replacing corn with different levels of passion fruit by-product and its effects on feed intake, performance and digestibility in crossbred feedlot lambs.**
Josemir S. Gonçalves*¹, Raimundo Neilson L. Amorim², Raquel L. Salgado², and Eric H. C. B. Van Cleef¹, ¹*UNESP-Univ Estadual Paulista, Faculdade de Ciências Agrárias e Veterinárias, Jaboticabal, São Paulo, Brazil*, ²*UFERSA-Federal University of Semi-arid, Mossoró, Rio Grande do Norte, Brazil*.
- W506 **Effects of the utilization of increasing doses of aromatic plants on ruminal metabolism in Sarda dairy lactating ewes.**
Roberta Boe, Oscar Boaventura Neto, Roberto Rubattu, Antonio Fenu, Antonio Mazza, and Antonello Cannas*, *Dipartimento di Agraria, Sezione di Scienze Zootecniche, Università di Sassari, Sassari, Italy*.
- W507 **Effect of crude glycerin on in situ dry matter and neutral detergent fiber degradability in sheep.**
E. H. C. B. van Cleef*^{1,2}, M. T. C. Almeida¹, H. L. Perez¹, H. B. Bussoli¹, I. Monsignati¹, J. R. Paschoaloto¹, E. S. Castro Filho¹, and J. M. B. Ezequiel¹, ¹*São Paulo State University, Jaboticabal, São Paulo, Brazil*, ²*FAPESP, São Paulo, Brazil*.
- W508 **Effect of increasing concentration of babassu meal in diets for feedlot crossbred lambs on apparent total-tract digestibility of dry matter and nutrients.**
J. M. B. Ezequiel*¹, O. R. Serra^{1,2}, J. R. S. T. Souza², A. L. Lima², and E. H. C. B. van Cleef¹, ¹*São Paulo State University, Jaboticabal, São Paulo, Brazil*, ²*Maranhão State University, São Luiz, Maranhão, Brazil*.

WORKSHOP

Mixed Models Workshop

Gatlin A-3

8:00 AM to 5:00 PM (continues on Thursday)

The Mixed Models Workshop provides a comprehensive exposition of proper statistical data analysis and power determinations of commonly used experimental designs in the animal sciences; our approach is example-driven and primarily based on the various mixed model analysis procedures available in SAS software.

Instructors: **Nora Bello, Ken Koehler, and Kevin McCarter**

SYMPOSIA AND ORAL SESSIONS

ADSA Foundation Scholar Lectures

Chair: **Mike Socha, Zinpro Corporation**

Wekiwa 3/4

- 10:30 AM **ADSA Foundation Scholar Lecture—Dairy Foods: Building a new dairy foods extension program.**
Kerry Kaylegian*, *Penn State University, State College, PA.*
- 11:15 AM **ADSA Foundation Scholar Lecture—Production: Precision dairy monitoring applications, opportunities, and realities.**
Jeffrey Bewley*, *University of Kentucky, Lexington, KY.*

ASAS Early Career Award Presentations

Chair: **Todd Armstrong, Elanco Animal Health**

Sebastian I-2

- 10:30 AM 874 **ASAS Early Career Award Presentation: Understanding the signaling pathways that regulate muscle mass in horses throughout the lifespan.**
K. L. Urschel*¹, A. L. Wagner¹, L. M. Mastro¹, C. M. M. Loos¹, A. A. Adams², K. M. Brennan³, ¹*Department of Animal and Food Sciences, University of Kentucky, Lexington, KY*, ²*Department of Veterinary Science, University of Kentucky, Lexington, KY*, and ³*Alltech Inc., Nicholasville, KY.*
- 11:15 AM 875 **ASAS Early Career Award Presentation: The unexplored part of the rumen microbiome: Exploring the adaptive roles of bacteriophage auxiliary metabolism genes during dietary intervention in the rumen.**
Christopher L. Anderson^{1,2}, Galen Erickson¹, and Samodha C. Fernando*¹, ¹*Department of Animal Science, University of Nebraska-Lincoln, Lincoln, NE*, and ²*School of Biological Science, University of Nebraska-Lincoln, Lincoln, NE.*

ASAS Graduate Student Symposium

Networking to achieve interdisciplinary research

Chair: **W. Brandon Smith, Texas A&M AgriLife Research, Overton, TX**

Sebastian I-1

- 10:30 AM **Introduction and Welcome.**
W. Brandon Smith.
- 10:30 AM 643 **Networking beyond the animal sciences to facilitate interdisciplinary research.**
Russell B. Muntifering*, *Auburn University, Auburn, AL.*

- 11:00 AM 644 **Effect of interdisciplinary research to animal science.**
Janet R. Donaldson*, *Mississippi State University, Mississippi State, MS.*
- 11:30 AM 645 **Breaking the boundaries of animal science research through internationalization programs.**
Luis O. Tedeschi*¹ and James. P. Muir², ¹*Texas A&M University, College Station, TX*, ²*Texas A&M AgriLife Research, Stephenville, TX.*
- 12:00 PM **Discussion**

Breeding and Genetics
Beef and meat species
Chair: **Jennifer M. Bormann, Kansas State University**
Panzacola F-3

- 10:30 AM 646 **Large-scale single-step genomic BLUP evaluation for American Angus.**
Daniela A. L. Lourenco*¹, Shogo Tsuruta¹, Breno O. Fragomeni¹, Yutaka Masuda¹, Ignacio Aguilar², Andres Legarra³, Joseph K. Bertrand¹, Tonya S. Amen⁴, Lizhen Wang⁴, Dan W. Moser⁴, and Ignacy Misztal¹, ¹*University of Georgia, Athens, GA*, ²*INIA, Las Brujas, Uruguay*, ³*INRA, Castanet-Tolosan, France*, ⁴*Angus Genetics Inc., St. Joseph, MO.*
- 10:45 AM 647 **Assignment of polled status using single nucleotide polymorphism genotypes and predicted gene content.**
John B. Cole¹, Daniel J. Null*¹, Chuanyu Sun², and Paul M. VanRaden¹, ¹*Animal Genomics and Improvement Laboratory, ARS, USDA, Beltsville, MD*, ²*Sexing Technologies, Navasota, TX.*
- 11:00 AM 648 **Genetic analysis of hair coat shedding in beef cattle with data collection using a practical strategy.**
Trent Smith*¹, Michael D. MacNeil², and Joseph P. Cassady³, ¹*Mississippi State University, Mississippi State, MS*, ²*Delta G, Miles City, MT*, ³*South Dakota State University, Brookings, SD.*
- 11:15 AM 649 **An application of MeSH enrichment analysis in livestock.**
Gota Morota*¹, Francisco Peñagaricano^{2,3}, Jessica L. Petersen¹, Daniel C. Ciobanu¹, Koki Tsuyuzaki^{4,5}, and Itoshi Nikaido⁵, ¹*University of Nebraska-Lincoln, Lincoln, NE*, ²*University of Florida, Gainesville, FL*, ³*University of Florida Genetics Institute, Gainesville, FL*, ⁴*Tokyo University of Science, Noda, Chiba, Japan*, ⁵*RIKEN, 2-1 Hirosawa, Wako, Saitama, Japan.*
- 11:30 AM 650 **Use of partial least squares regression to predict individual milk coagulation properties and cheese yield from Fourier transform infrared spectra in Sarda dairy sheep.**
Maria Grazia Manca¹, Jessica Serdino¹, Massimo Cellesi¹, Paolo Urgeghe¹, Ignazio Ibba², Marino Contu², and Nicolo P. P. Macciotta*¹, ¹*Dipartimento di Agraria, Università di Sassari, Sassari, Italy*, ²*Associazione Regionale Allevatori della Sardegna, Cagliari, Italy.*
- 11:45 AM 651 **MUC1 gene polymorphism in Murrah water buffaloes and its association with milk production traits.**
Fernanda da Rosa*¹, Carla Moreira², Marina Mortati³, Gregorio M. Camargo³, Henrique Oliveira³, Rusbel Borquis³, Arione Boligon², Humberto Tonhati³, Heden Moreira², and Fabio Souza², ¹*Oregon State University, Corvallis, OR*, ²*Universidade Federal de Pelotas, Pelotas, RS, Brazil*, ³*Universidade Estadual Paulista "Júlio de Mesquita Filho," UNESP, Jaboticabal, SP, Brazil.*
- 12:00 PM 652 **The effects of sire breed on reproductive and progeny performance in Kiko meat goats.**
Henry J. Henderson* and Chukwuemeka Okere, *Tuskegee University, Tuskegee Institute, AL.*
- 12:15 PM 653 **Comparison of zinc finger sequences of hybrid sterility gene *Prdm9* between yaks, cattle, and their sterile hybrids.**
Xiaoqin Ma¹, Qin Zeng¹, Juming Zhong², Wenjing Liu³, Lin Huang¹, Suyu Jin¹, and Yucai Zheng*¹, ¹*Southwest University for Nationalities, Chengdu, Sichuan Province, China*, ²*Auburn University, Auburn, AL*, ³*Southwest University of Science and Technology, Mianyang, Sichuan Province, China.*

Dairy Foods
Processing and chemistry
Chair: Kerry Kaylegian, Penn State University
Wekiwa 7/8

- 10:30 AM 654 **Effect of hydrodynamic cavitation on particle size of casein micelles, protein interactions and heat stability of skim milk.**
Harsh Dahiya^{*1}, Hasmukh A. Patel¹, and Thom Huppertz^{1,2}, ¹South Dakota State University, Brookings, SD, ²NIZO Food Research, Ede, the Netherlands.
- 10:45 AM 655 **Optimization of milk atomization by viscosity measurement.**
Luc K. Belliere, Corentin Thierry^{*}, Valerie Lefevre, and Philippe Burg, *Sofraser, Villemandeur, France.*
- 11:00 AM 656 **Effect of membrane channel geometry on limiting flux and serum protein removal during skim milk microfiltration.**
Michael C. Adams, Emily E. Hurt, and David M. Barbano^{*}, *Cornell University, Ithaca, NY.*
- 11:15 AM 657 **Effect of soluble milk components on limiting flux and serum protein removal during skim milk microfiltration.**
Michael C. Adams, Emily E. Hurt, and David M. Barbano^{*}, *Cornell University, Ithaca, NY.*
- 11:30 AM 658 **ADSA[®]-EAAP Speaker Exchange Presentation: Comparison of 3 different variable selection strategies to improve the predictions of fatty acid profile in bovine milk by mid-infrared spectrometry.**
Hélène Soyeurt^{*1}, Yves Brostaux¹, Frédéric Dehareng², Nicolas Gengler¹, and Pierre Dardenne², ¹University of Liège-Gembloux Agro-Bio Tech, Gembloux, Belgium, ²Walloon Agricultural Research Centre, Gembloux, Belgium.
- 11:45 AM 659 **Factors influencing laboratory performance of oven drying total solids on whole milk.**
David M. Barbano^{*} and Chassidy Coon, *Cornell University, Ithaca, NY.*
- 12:00 PM 660 **Greek-style yogurt manufacture: A case study for eco-efficiency assessment in dairy processing.**
Yves Pouliot^{*1}, Alain Doyen¹, Catherine Houssard², Adriana Paredes Valencia¹, Scott Benoit¹, Dominique Maxime², and Manuele Margni², ¹STELA Dairy Research Center, Université Laval, Québec, QC, Canada, ²CIRAIG, CIRODD, École Polytechnique de Montréal, Montréal, QC, Canada.

Dairy Foods Symposium
Advances in bacterial exopolysaccharides—From production to applications in dairy foods and health
Chair: Nagendra Shah, University of Hong Kong
Suwannee 13/14

- 10:30 AM 661 **Advances in production of exopolysaccharides and simplified methods for their recovery and quantification.**
Luc De Vuyst^{*} and Frédéric Leroy, *Vrije Universiteit Brussel.*
- 11:00 AM 662 **Chemical modification of EPS to improve its health functionalities.**
Siqian Li and Nagendra Shah^{*}, *The University of Hong Kong, Pokfulam Road, Hong Kong.*
- 11:30 AM 663 **Advances in application of EPS in dairy foods, particularly in low-fat or fat-free yogurt, and low-fat mozzarella cheese.**
Donald J. McMahon^{*}, *Western Dairy Center, Utah State University, Logan, UT.*
- 12:00 PM 664 **Beneficial effects of EPS on human health and gut microbiota.**
Hua Wei^{*1,2}, Zhihong Zhang¹, Xueying Tao^{1,2}, Feng Xu², Hengyi Xu¹, Cuixiang Wan², Qinglong Wu³, and Nagendra P. Shah³, ¹State Key Laboratory of Food Science and Technology, Nanchang, Jiangxi, China, ²Jiangxi-OAI Joint Research Institute, Nanchang, Jiangxi, China, ³The University of Hong Kong, Hong Kong, China.

Growth and Development Symposium
The mitochondrion—A powerhouse for the cell or a key to animal productivity?
 Chair: David Gerrard, Virginia Tech
 Sponsor: Elanco Animal Health
Panzacola H-1

- 10:30 AM 665 **Mitochondrial bioenergetics—Bringing the cell to life.**
 Darrell Neuffer*, *East Carolina Diabetes and Obesity Institute, East Carolina University, Greenville, NC.*
- 11:15 AM 666 **Mitochondrial bioenergetics and aging.**
 Hazel H. Szeto*, *Research Program in Mitochondrial Therapeutics, Department of Pharmacology, Weill Cornell Medical College, New York, NY.*
- 12:00 PM **Lunch (on your own)**
- 2:00 PM 667 **Mitochondria function in Rendement Napole pig growth.**
 David E. Gerrard¹, Samer W. El-Kadi¹, and Tracy L. Scheffler*², ¹*Virginia Tech, Blacksburg, VA*, ²*University of Florida, Gainesville, FL.*
- 2:45 PM 668 **Mitochondrial and cellular metabolism in response to selection for residual feed intake in pigs.**
 S. M. Lonergan*, S. M. Cruzen, J. K. Grubbs, E. Huff Lonergan, J. C. M. Dekkers, and N. K. Gabler, *Iowa State University.*
- 3:30 PM 669 **Browning of adipose tissue.**
 Shihuan Kuang*, Pengpeng Bi, and Tizhong Shan, *Department of Animal Sciences, Purdue University, West Lafayette, IN.*
- 4:15 PM 670 **Mitochondrial adaptations to physiological states in bovine adipose tissue.**
 Susanne Häussler*, *University of Bonn, Institute of Animal Science, Physiology & Hygiene Group, Bonn, Germany.*

Horse Species Symposium
Recent advances in the microbiome and physiology of the hind-gut of the horse and dog
 Chair: Fernada Camargo, University of Kentucky
Wekiwa 5

- 10:30 AM 671 **Canine intestinal microbiology and metagenomics.**
 Jan S. Suchodolski*, *Gastrointestinal Laboratory, Texas A&M University, College Station, TX.*
- 11:00 AM 672 **ASAS-EAAP Speaker Exchange Presentation: The microbiome of the horse hindgut.**
 Véronique Julliard*, *AgroSup Dijon, Dijon, France.*
- 11:30 AM 673 **Evaluation of the effectiveness of the establishment of an equine research herd with dual cannulation at the ileum and cecum.**
 Toree L. Bova*, Cate Mochal-King, Brian J. Rude, Ben C. Weed, Lauren B. Hodge, and Molly Nicodemus, *Mississippi State University, Mississippi State University, MS.*
- 12:00 PM 674 **Can the microbiome of the horse be altered to improve digestion?**
 Josie A. Coverdale*, *Texas A&M University, College Station, TX.*

Physiology and Endocrinology
Estrous synchronization and metabolism
Chair: José E. Santos, University of Florida
Panzacola H-4

- 10:30 AM 675 **Hormonal manipulation of progesterone before initiation of an Ovsynch protocol to increase ovulatory response to the first GnRH treatment in Holstein cows.**
P. D. Carvalho*, M. C. Wiltbank, and P. M. Fricke, *Department of Dairy Science, University of Wisconsin-Madison, Madison, WI.*
- 10:45 AM 676 **Progesterone concentration at initiation of Ovsynch and a second prostaglandin F_{2α} treatment affect luteal regression and fertility to timed AI in lactating Holstein cows.**
P. D. Carvalho*, M. J. Fuenzalida, V. G. Santos, A. Ricci, M. C. Wiltbank, and P. M. Fricke, *Department of Dairy Science, University of Wisconsin-Madison, Madison, WI.*
- 11:00 AM 677 **Effect of high or low P4 during ovulatory follicle development on fertility of dairy cows.**
Joao Paulo N. Martins*¹, Dongliang Wang², Nanheng Mu², Guilherme F. Rossi³, Vinicius R. Martins¹, Ana Paula Martini⁴, Gilson A. Pessoa⁴, and J. Richard Pursley¹, ¹*Department of Animal Science, Michigan State University, East Lansing, MI*, ²*Shuozhou Vocational and Technical College, Shuozhou City, Shanxi, China*, ³*Department of Preventive Veterinary Medicine and Animal Reproduction, FCAV-UNESP, Jaboticabal, SP, Brazil*, ⁴*Department of Large Animal Clinical Science, Universidad Federal de Santa Maria, Santa Maria, RS, Brazil.*
- 11:15 AM 678 **Effect of a second dose of prostaglandin F_{2α} during Double-Ovsynch on successful luteolysis and fertility.**
Giovanni M. Baez*¹, Rafael V. Barletta¹, Alessandro Ricci¹, Eduardo Trevisol¹, Jerry N. Guenther¹, Alvaro Garcia-Guerra¹, Beatriz O. Cardoso¹, Mateus Z. Toledo¹, João P. Ferreira², and Milo C. Wiltbank¹, ¹*University of Wisconsin-Madison, Madison, WI*, ²*São Paulo State University, Botucatu, SP, Brazil.*
- 11:30 AM 679 **Differentially expressed genes in endometrium and corpus luteum of Holstein cows selected for high and low fertility are enriched for sequence variants associated with fertility.**
Stephen G. Moore*^{1,2}, Jennie E. Pryce³, Ben J. Hayes³, Amanda J. Chamberlain³, Kathryn E. Kemper³, Donagh P. Berry¹, Matthew McCabe⁴, Paul Cormican⁴, Patrick Lonergan², Trudee Fair², and Stephen T. Butler¹, ¹*Teagasc, Animal and Grassland Research and Innovation Centre, Moorepark, Fermoy, Co. Cork, Ireland*, ²*University College Dublin, School of Agriculture and Food Science, Dublin, Ireland*, ³*Department of Economic Development, Jobs, Transport and Resources & Dairy Futures Cooperative Research Centre (CRC), Agribio, La Trobe University, Bundoora, Australia*, ⁴*Teagasc, Animal and Grassland Research and Innovation Centre, Grange, Dunsany, Co. Meath, Ireland.*
- 11:45 AM 680 **Liver metabolism in dairy cows during repeated short-term feed-restrictions and LPS induced systemic inflammation.**
Josef J. Gross*¹, Emmanouil Kalaitzakis², Olga Wellnitz¹, Heiner Bollwein², and Rupert M. Bruckmaier¹, ¹*Veterinary Physiology, Vetsuisse Faculty University of Bern, Bern, Switzerland*, ²*Clinic of Reproductive Medicine, Vetsuisse Faculty University of Zurich, Zurich, Switzerland.*
- 12:00 PM 681 **Prediction of portal and hepatic blood flow in cattle.**
Jennifer L. Ellis*^{1,2}, Christopher K. Reynolds³, Les A. Crompton³, Mark Hanigan⁴, Andre Bannink⁵, James France², and Jan Dijkstra¹, ¹*Animal Nutrition Group, Wageningen University, Wageningen, the Netherlands*, ²*Centre for Nutrition Modelling, Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada*, ³*School of Agriculture, Policy and Development, University of Reading, Reading, UK*, ⁴*College of Agriculture and Life Science, Virginia Tech University, Blacksburg, VA*, ⁵*Animal Nutrition, Wageningen UR Livestock Research, Wageningen, the Netherlands.*
- 12:15 PM 682 **Effects of reducing dietary cation-anion difference level on plasma Ca concentration and VDR expression level in gastrointestinal tract of transition mice.**
Wen-xuan Wu*, Hai-liang Xin, Yi Yang, and Ruo-yu Liu, *College of Animal Science, Guizhou Province, Guiyang, Guizhou Province, China.*

Production, Management, and the Environment III

Chair: Corwin Nelson, University of Florida

Panzacola F-2

- 10:30 AM 683 **ADSA®-EAAP PhD Student Travel Award Presentation: Analyzing the rear shape of dairy cows in 3D to better assess body condition score.**
Amélie Fischer^{*1,2}, Thibault Luginbühl³, Laurent Delattre³, Jean-Michel Delouard³, and Philippe Faverdin¹, ¹INRA/Agrocampus-Ouest UMR 1348 Pegase, St-Gilles, France, ²Institut de l'élevage, Le Rheu, France, ³D'Ouest, Lannion, France.
- 11:00 AM 684 **Modelling performance consequences on the probability of reproducing, and thereby on productive lifespan in dairy cows.**
Ho N. Phuong^{1,3}, Pierre Blavy^{1,3}, Olivier Martin^{1,3}, Luc Delaby^{2,4}, Philippe Schmidely^{1,3}, and Nic C. Friggens^{*1,3}, ¹INRA UMR MoSAR, Paris, France, ²INRA UMR PEGASE, Rennes, France, ³AgroParisTech, Paris, France, ⁴AgroCampusOuest, Rennes, France.
- 11:15 AM 685 **Modeling the effect of forage allowance, forage mass, and body condition on calf weaning weight and calving conception interval of primiparous cows grazing Campos grasslands.**
Martín Claramunt^{*1}, Mariana Carriquiry², and Pablo Soca³, ¹Facultad de Veterinaria, Universidad de la República, Paysandú, Paysandú, Uruguay, ²Facultad de Agronomía, Universidad de la República, Montevideo, Montevideo, Uruguay, ³Facultad de Agronomía, Universidad de la República, Paysandú, Paysandú, Uruguay.
- 11:30 AM 686 **Associations between milk quality, type of bedding, and milking management on large Wisconsin dairy farms.**
Robert F. Rowbotham^{*1,2} and Pamela L. Ruegg¹, ¹University of Wisconsin-Madison, Madison, WI, ²Grande Cheese Company, Brownsville, WI.
- 11:45 AM 687 **Using routinely recorded herd data to predict and benchmark herd and cow health status.**
Kristen L. Parker Gaddis^{*1}, John B. Cole², John S. Clay³, and Christian Maltecca⁴, ¹Department of Animal Sciences, University of Florida, Gainesville, FL, ²Animal Genomics and Improvement Laboratory, ARS, USDA, Beltsville, MD, ³Dairy Records Management Systems, Raleigh, NC, ⁴Department of Animal Science, North Carolina State University, Raleigh, NC.
- 12:00 PM 688 **Using parlor data to map liner performance.**
John F. Penry^{*1}, Stefania Leonardi², John Upton^{3,1}, Paul D. Thompson¹, and Douglas J. Reinemann¹, ¹University of Wisconsin-Madison, Madison, WI, ²Università delgi Studi di Milano, Milan, Lombardia, Italy, ³Animal & Grassland Research & Innovation Centre, Teagasc, Moorepark, Co. Cork, Ireland.
- 12:15 PM 689 **A survey of management practices adopted by goat breeders in Azad Jammu and Kashmir (AJK), Pakistan.**
Ghulam Bilal^{*1}, Muhammad Moaeen-ud-Din¹, Muhammad Waseem¹, Naveed Ullah¹, James Reecy², Muhammad Khan³, and Muhammad Yaqoob¹, ¹Laboratories of Animal Breeding and Genetics, Faculty of Veterinary and Animal Sciences, PMAS-Arid Agriculture University, Rawalpindi, Pakistan, ²Department of Animal Science, Iowa State University, Ames, IA, ³Institute of Animal Sciences, Faculty of Animal Husbandry, University of Agriculture, Faisalabad, Pakistan.

Production, Management, and the Environment IV

Chair: Emily Miller-Cushon, University of Florida

Panzacola F-4

- 10:30 AM 690 **Comparison of four beef production systems on carcass characteristics.**
Jefferson McCutcheon^{*}, Steven Moeller, Henry Zerby, and Francis Fluharty, *The Ohio State University, Columbus, OH.*
- 10:45 AM 691 **BeefTracker mobile app for tracking and analysis of beef herd pasture use and location.**
James W. Oltjen^{*}, Larry C. Forero, and Jeffrey W. Stackhouse, *University of California, Davis, CA.*

- 11:00 AM 692 **Effect of yearling beef steer frame score, grazing sequence, and delayed feedlot entry on steer performance, carcass measurements, and system economics.**
Songul Senturklu*^{1,2}, Douglas G. Landblom¹, Robert J. Maddock³, and Steve I. Paisley⁴, ¹North Dakota State University, Dickinson Research Extension Center, Dickinson, ND, ²Canakkale Onsekiz Mart Universitesi, Animal Science Department, Canakkale, Turkey, ³North Dakota State University, Animal Science Department, Fargo, ND, ⁴University of Wyoming, Animal Science Department, Laramie, WY.
- 11:15 AM 693 **Housing and management practices on farms using automated calf feeders in the Midwestern United States.**
Matthew Jorgensen*¹, Amber Adams Progar¹, Kevin Janni¹, Hugh Chester-Jones², Jim Salfer³, and Marcia Endres¹, ¹University of Minnesota, Saint Paul, MN, ²University of Minnesota Southern Research and Outreach Center, Waseca, MN, ³University of Minnesota Extension, Saint Cloud, MN.
- 11:30 AM 694 **Effect of calving interval on the economic results of dairy farms based on their typology.**
Anne-Catherine Dalca*¹, Yves Beckers¹, Patrick Mayeres², Benoit Wyzen², and H el ene Soyeurt¹, ¹Universit e de Li ege-Gembloux Agro-Bio Tech, Gembloux, Belgium, ²Walloon Breeders Association, Ciney, Belgium.
- 11:45 AM 695 **Evaluation of winter housing systems for effects on production, udder health, BCS, hygiene, frostbite, and rumination of organic dairy cows.**
Lucas S. Sjostrom*¹, Bradley J. Heins¹, Marcia I. Endres², Roger D. Moon², and Ulrike S. Sorge², ¹University of Minnesota, West Central Research and Outreach Center, Morris, MN, ²University of Minnesota, Saint Paul, MN.
- 12:00 PM 696 **Risk factors for abnormal calf health scores on farms using automated feeders in the Midwest USA.**
Matthew Jorgensen*¹, Amber Adams Progar¹, Sandra Godden¹, Hugh Chester-Jones², Anne Marie de Passill e³, Jeff Rushen³, and Marcia Endres¹, ¹University of Minnesota, Saint Paul, MN, ²University of Minnesota Southern Research and Outreach Center, Waseca, MN, ³University of British Columbia, Vancouver, BC, Canada.
- 12:15 PM 697 **Management characteristics of cow-calf, stocker, and finishing operations in the North and South Plains.**
Senorpe Asem-Hiablie*¹, C. Alan Rotz¹, Robert C. Stout¹, Jasmine A. Dillon², and Kimberly R. Stackhouse-Lawson³, ¹USDA-ARS PSWMRU, University Park, PA, ²The Pennsylvania State University, University Park, PA, ³National Cattlemen's Beef Association, Centennial, CO.

Ruminant Nutrition

Lactation responses

Chair: Jill Anderson, Dairy Science Department, South Dakota State University

Sponsor: DuPont

Panzacola H-2

- 10:30 AM 698 **Effect of a phytogetic feed additive on feed intake and milk production in dairy cows.**
Carina Schieder*¹, Annamaria Boczonadi¹, and Bryan Miller², ¹BiomIn Holding GmbH, Herzogenburg, Austria, ²BIO-MIN USA Inc., San Antonio, TX.
- 10:45 AM 699 **Fractionated harvest and alkali treatment of whole-plant corn silage fed to lactating dairy cattle can increase intake and production.**
David E. Cook, Robb W. Bender*, Kevin J. Shinnors, and David K. Combs, Department of Dairy Science, University of Wisconsin-Madison, Madison, WI.
- 11:00 AM 700 **Effect of abomasal infusions of saturated fatty acids differing in chain length on milk production, composition, and fatty acid profile in Holstein dairy cows.**
Daniel E. Rico*¹, Jair E. Parales², Ben A. Corl³, Andrea Lengi³, P. Yvan Chouinard¹, and Rachel Gervais¹, ¹Universit e Laval, Quebec, QC, Canada, ²Universidad Nacional de Colombia, Bogot a, DC, Colombia, ³Virginia Polytechnic Institute and State University, Blacksburg, VA.
- 11:15 AM 701 **Effect of *Bacillus pumilus* on early lactation performance of dairy cows fed low or high starch diets postpartum.**
D. N. Lob o da Silva*¹, Z. Sawall¹, K. Froehlich¹, E. Galbraith², T. Parrott³, M. Endres¹, and N. B. Litherland¹, ¹University of Minnesota, Saint Paul, MN, ²DuPont Nutrition and Health, Waukesha, WI, ³DuPont Industrial Biosciences, Waukesha, WI.

- 11:30 AM 702 **Effects of direct-fed *Bacillus pumilus* 8G-134 fed pre- and postpartum on feed intake, milk yield, milk composition, and feed efficiency of Holstein cows.**
Shaoyu Luan¹, Elizabeth Galbraith², Megan Duersteler², and Felipe C. Cardoso*¹, ¹University of Illinois, Urbana, IL, ²Dupont Nutrition and Health, Waukesha, WI.
- 11:45 AM 703 **Effects of fecal contents of aluminum (Al), iron (Fe), and manganese (Mn) on the apparent digestibility of phosphorus in dairy cows.**
Jan Plaizier*, Emma McGeough, and Kim Ominski, University of Manitoba, Winnipeg, MB, Canada.
- 12:00 PM 704 **Effects of feeding diets differing in dietary cation-anion difference (DCAD) and source of vitamin D on Ca status, health, and lactation performance in Holstein cows.**
N. Martinez*¹, R. Rodney², R. M. Santos¹, L. F. Greco¹, R. S. Bisinotto¹, E. S. Ribeiro¹, L. L. Hernandez³, C. D. Nelson¹, E. Block⁴, I. J. Lean², and J. E. P. Santos¹, ¹University of Florida, Gainesville, FL, ²SBSibus, Camden, NSW, Australia, ³University of Wisconsin, Madison, WI, ⁴Arm and Hammer Animal Nutrition, Princeton, NJ.
- 12:15 PM 705 **Effects of the interaction between photoperiod and nutritional management on milk yield for dairy cows.**
Oswaldo S. Espinoza* and Masahito Oba, University of Alberta, Edmonton, Alberta, Canada.

Ruminant Nutrition

Mineral nutrition

Chair: **Stephanie Hansen, Iowa State University**
Panzacola H-3

- 10:30 AM 706 **Organic trace minerals during the transition period: 2. Supplemental Zn, Mn, and Cu from Availa Mins and Co from CoPro have a positive effect on systemic and hepatic indicators of inflammation and oxidative stress in Holstein cows.**
Fernanda Batistel*¹, Johan S. Osorio¹, Jin Ji¹, Erminio Trevisi², James K. Drackley¹, Michael T. Socha³, and Juan J. Loor¹, ¹University of Illinois, Urbana, IL, ²Università Cattolica del Sacro Cuore, Piacenza, Italy, ³Zinpro Corporation, Eden Prairie, MN.
- 10:45 AM 707 **Organic trace minerals during the transition period: 3. Favorable alterations in blood neutrophil (PMN) and endometrial inflammatory and oxidative status in Holstein cows supplemented with Zn, Mn, and Cu from Availa Mins and Co from CoPro.**
Fernanda Batistel*¹, Johan S. Osorio¹, Cong Li², Ed F. Garrett¹, Mohamed M. Elhanafy¹, Jessica Caputo³, James K. Drackley¹, Michael T. Socha⁴, and Juan J. Loor¹, ¹University of Illinois, Urbana, IL, ²China Agricultural University, Beijing, China, ³University of Milan, Milan, Italy, ⁴Zinpro Corporation, Eden Prairie, MN.
- 11:00 AM 708 **Parameterization of a ruminant model of phosphorus digestion and metabolism.**
Xin Feng*, Katharine F. Knowlton, and Mark D. Hanigan, Department of Dairy Science, Virginia Polytechnic Institute and State University, Blacksburg, VA.
- 11:15 AM 709 **Comparison of predicted ration phosphorus balance using bioavailabilities from the NRC (2001) and Virginia Tech models.**
Xin Feng*, Katharine F. Knowlton, Mark D. Hanigan, Jamie Jarrett, and Robert James, Department of Dairy Science, Virginia Polytechnic Institute and State University, Blacksburg, VA.
- 11:30 AM 710 **Effects of Se-fertilization on forage Se concentration and Se status of growing calves consuming these forages.**
Juliana Ranches*, Joao M. Vendramini, and John D. Arthington, UF/IFAS Range Cattle Research and Education Center, Ona, FL.
- 11:45 AM 711 **Effect of Cu, Zn, and Mn source on preferential free-choice intake of salt-based supplements by beef calves and precipitation-induced metal loss.**
Aline T. Wiebusch², Maria L. Silveira¹, Luana S. Caramalac², Henrique J. Fernandes², and John D. Arthington*¹, ¹UF/IFAS Range Cattle Research and Education Center, Ona, FL, ²Graduate Program in Animal Sciences, State University of Mato Grosso do Sul, Aquidauana, Brazil.

- 12:00 PM 712 **Effects of trace mineral source on cow performance and mineral status during a production cycle.**
Deborah M. Price*¹, Kaitlyn M. Havill¹, Alex F. Swain¹, Joseph M. Guevera², Carley R. Trcalek², Max Irsik², Owen Rae², Matthew J. Hersom¹, and Joel V. Yelich¹, ¹*Department of Animal Sciences, University of Florida, Gainesville, FL*, ²*College of Veterinary Medicine, University of Florida, Gainesville, FL*.
- 12:15 PM 713 **Effect of prenatal trace mineral source on preweaning and weaning calf liver and serum mineral status.**
Deborah M. Price*¹, Alex F. Swain¹, Meaghan M. O'Neil¹, Joseph M. Guevera², Carley R. Trcalek², Max Irsik², Owen Rae², Matthew J. Hersom¹, and Joel V. Yelich¹, ¹*Department of Animal Sciences, University of Florida, Gainesville, FL*, ²*College of Veterinary Medicine, University of Florida, Gainesville, FL*.

Small Ruminant Symposium
Genetic improvement in small ruminants for the future
Chair: **Uma Karki, Tuskegee University**
Suwannee 11/12

- 10:30 AM 714 **National Sheep Improvement Program.**
David Notter*, *Virginia Tech, Blacksburg, VA*.
- 11:00 AM 715 **Genomics and marker-assisted selection in small ruminants.**
Brian L. Sayre*, *Virginia State University, Petersburg, VA*.
- 11:30 AM 716 **Genetic improvement for internal parasite resistance.**
Daniel J. Brown*, *Animal Genetics and Breeding Unit, University of New England, Armidale, NSW Australia*.
- 12:00 PM 717 **Breeding strategies in sheep for low-input management systems.**
Ronald M. Lewis*¹, Napoleón Vargas Jurado¹, and Kreg A. Leymaster², ¹*Department of Animal Science, University of Nebraska, Lincoln, NE*, ²*Roman L. Hruska US Meat Animal Research Center, USDA-ARS, Clay Center, NE*.

ADSA-ASAS Northeast Section Symposium
Bridging the gap between animal protein production and consumers, current and future
Chair: **Ken Griswold, Kemin Animal Nutrition and Health**
Wekiwa 1/2

- 2:00 PM **Introduction.**
Ken Griswold, Kemin Animal Nutrition & Health.
- 2:15 PM 718 **University efforts to generate community support for a university farm.**
Joe Hogan*, *The Ohio State University, Wooster, OH*.
- 3:00 PM 719 **The New York State Junior DAIRY LEADER Program.**
Deborah J. Grusenmeyer*, *Cornell University, Ithaca, NY*.
- 3:45 PM 720 **Using social media to increase consumer acceptance of animal agriculture.**
Janeal W. Yancey*, *University of Arkansas Division of Agriculture, Fayetteville, AR*.
- 4:30 PM **Speaker panel.**

Animal Behavior and Well-Being II
Chair: Heather Dann, W. H. Miner Institute
Sebastian I-3

- 2:00 PM 721 **Effects of dietary fiber on the welfare of submissive multiparous sows.**
 Eridia Pacheco*, Mayra Lopez, and Janeen Salak-Johnson, *University of Illinois at Urbana-Champaign, Urbana, IL.*
- 2:15 PM 722 **Behavioral changes in steers supplemented with tryptophan and vitamin E.**
 Paula R. Huenchullán² and Rafael E. Larraín*, ¹*Facultad de Agronomía e Ingeniería Forestal, Pontificia Universidad Católica de Chile, Santiago, Chile,* ²*Facultad de Ciencias Veterinarias y Pecuarias, Universidad de Chile, Santiago, Chile.*
- 2:30 PM 723 **Rumen and cecum expression of genes related to inflammation and behavior in Holstein bulls fed high-concentrate diets with different concentrate presentation forms and with or without straw supplementation.**
 Maria Devant*, Greg Penner², Bruna Quintana¹, Francesc Fábregas¹, Alex Bach^{3,1}, and Anna Arís¹, ¹*IRTA-Ruminant Production, Animal Nutrition, Management, and Welfare Research Group, Caldes Montbui, Spain,* ²*University of Saskatchewan, Saskatoon, Saskatchewan, Canada,* ³*ICREA, Barcelona, Spain.*
- 2:45 PM 724 **Immunological castration of gilts changes behavior, weight gain, and reproductive development.**
 Guilherme Picinin* and John J. McGlone, *Texas Tech University, Lubbock, TX.*
- 3:00 PM 725 **Behavioral responses of livestock exposed to unmanned aerial systems.**
 Phil Urso, Marcy Beverly*, Stanley Kelley, John Wilson, Jessica Leatherwood, Mark Anderson, and Kyle Stutts, *Sam Houston State University, Huntsville, TX.*
- 3:15 PM 726 **ADSA®-EAAP Speaker Exchange Presentation: REM sleep time varies during the lactation cycle.**
 Emma Ternman¹, Emma Nilsson¹, Per Peetz Nielsen^{1,2}, Laura Hänninen³, and Sigrid Agenäs*, ¹*Department of Animal Nutrition and Management, Swedish University of Agricultural Sciences, Uppsala, Sweden,* ²*Department of Large Animal Sciences, University of Copenhagen, Copenhagen, Denmark,* ³*Department of Production Animal Medicine and Research Centre for Animal Welfare, University of Helsinki, Helsinki, Finland.*
- 3:30 PM 727 **Assessment of cognitive ability and memory retention in neonatal goats.**
 Isabelle C. Withrock*, Paul J. Plummer, Timothy A. Shephard, John Stinn, Hongwei Xin, Johann F. Coetzee, and Suzanne T. Millman, *Iowa State University, Ames, IA.*
- 3:45 PM 728 **Development of a novel automated method of measuring tail-flick behavior in beef cattle.**
 Diego Moya*,^{1,3} Carollyne E. J. Kehler², Sonia Marti³, Kim H. Ominski², Christy Goldhawk¹, and Karen S. Schwartzkopf-Genswein³, ¹*University of Calgary, Calgary, AB, Canada,* ²*University of Manitoba, Winnipeg, MB, Canada,* ³*Agriculture and Agri-Food Canada, Lethbridge, AB, Canada.*
- 4:00 PM 729 **Relationships between maternal defensiveness behavior and pre-calving flight speed in primiparous Nellore cows.**
 Mateus J. R. Paranhos da Costa*,^{1,2} Tiago S. Valente², and Aline C. Sant'Anna¹, ¹*Departamento de Zootecnia, Faculdade de Ciências Agrárias e Veterinárias, UNESP, Jaboticabal-SP, Brazil,* ²*Programa de Pós-Graduação em Genética e Melhoramento Animal, Faculdade de Ciências Agrárias e Veterinárias, UNESP, Jaboticabal-SP, Brazil.*
- 4:15 PM 730 **Relationship between quantitative measures of temperament and observed behaviors in receiving cattle.**
 Kelsey A. Bruno*, Eric S. Vanzant, Alex W. Altman, Monoj Kudupoje, and Kyle R. McLeod, *University of Kentucky, Lexington, KY.*

Animal Health Symposium
Maintaining animal health in organic dairy herds
Chair: Jeffrey Carroll, USDA-ARS
Sebastian I-2

- 2:00 PM 731 **Understanding animal welfare on organic dairy farms.**
 Kathryn Proudfoot*, *The Ohio State University College of Veterinary Medicine, Columbus, OH.*

- 2:30 PM 732 **Nutrition and performance of lactating dairy cows in organic dairy herds.**
Andre F. Brito*, *University of New Hampshire, Durham, NH.*
- 3:00 PM 733 **Managing transition cows and reproduction in certified organic dairy herds.**
G. M. Schuenemann*¹, M. G. Maquivar², A. Hunter¹, A. A. Barragan¹, J. M. Piñeiro¹, J. S. Velez³, H. Bothe³, and S. Bas¹, ¹*The Ohio State University, Columbus, OH*, ²*Washington State University, Pullman, WA*, ³*Aurora Organic Farms, Boulder, CO.*
- 3:30 PM **Break**
- 3:45 PM 734 **Mastitis and milk quality in organic dairy herds.**
Pamela Ruegg*, *University of Wisconsin, Madison, WI.*
- 4:15 PM 735 **Panel discussion: Best management practices to maintain animal health in organic dairy herds.**
J. S. Velez*¹, P. Clutts², G. Jodarski³, and G. M. Schuenemann⁴, ¹*Aurora Organic Farms, Boulder, CO*, ²*Pleasantview Farm, Circleville, OH*, ³*CROOP Cooperative/Organic Valley, La Farge, WI*, ⁴*The Ohio State University, Columbus, OH.*

Beef Species I

Chair: Allison Meyer, University of Missouri
Panzacola F-1

- 2:00 PM 736 **Relationships between feed efficiency traits and indicators of energy expenditure in growing cattle.**
Phillip A. Lancaster*¹, Gordon E. Carstens², Luis O. Tedeschi², Timothy P. Vining¹, Nicolas DiLorenzo³, and G. Cliff Lamb³, ¹*Range Cattle Research and Education Center, University of Florida, Ona, FL*, ²*Department of Animal Science, Texas A&M University, College Station, TX*, ³*North Florida Research and Education Center, University of Florida, Marianna, FL.*
- 2:15 PM 737 **Effect of post-weaning heifer development on pregnancy rates and subsequent feed efficiency as a pregnant first calf heifer.**
Hazy R. Nielson*, T. L. Meyer, and Rick N. Funston, *University of Nebraska, West Central Research and Extension Center, North Platte, NE.*
- 2:30 PM 738 **Effects of prepartum supplement level on growth performance, feed efficiency, and reproductive performance of female progeny.**
Lindsay M. Shoup*, Thomas B. Wilson, Dianelys González-Peña, Frank A. Ireland, Sandra Rodriguez-Zas, Tara L. Felix, and Daniel W. Shike, *University of Illinois, Urbana, IL.*
- 2:45 PM 739 **Stocking rate and feeder design affects hay waste.**
Dexter J. Tomczak*, Nick E. Mertz, Dylan L. Hamlin, and William J. Sexten, *University of Missouri-Columbia, Columbia, MO.*
- 3:00 PM 740 **Effects of feeding stockpiled tall fescue versus tall fescue hay to late gestation beef cows on circulating blood urea nitrogen and glucose concentrations.**
Jill M. Larson*, Katlyn N. Niederecker, and Allison M. Meyer, *Division of Animal Sciences, University of Missouri, Columbia, MO.*
- 3:15 PM 741 **Prewaning calf circulating blood urea nitrogen and glucose concentrations in a tall fescue forage system model of developmental programming.**
Katlyn N. Niederecker*¹, Jill M. Larson¹, Brian L. Vander Ley², and Allison M. Meyer¹, ¹*Division of Animal Sciences, University of Missouri, Columbia, MO*, ²*Department of Veterinary Medicine and Surgery, University of Missouri, Columbia, MO.*
- 3:30 PM 742 **Effect of supplementing heifers on pasture with bambermycin or monensin on growth and development.**
Paul Beck*¹, John Tucker², William Galyen³, Shane Gadberry⁴, Don Hubbell², Tom Hess², Doug Galloway³, Michael Sims¹, Beth Kegley³, and Matt Cravey⁵, ¹*University of Arkansas SWREC, Hope, AR*, ²*University of Arkansas LFRS, Batesville, AR*, ³*University of Arkansas Department of Animal Science, Fayetteville, AR*, ⁴*University of Arkansas Cooperative Extension Service, Little Rock, AR*, ⁵*Huvepharma Inc., Amarillo, TX.*

- 3:45 PM 743 **Effect of pre and postpartum herbage allowances of grasslands on metabolic and endocrine parameters of primiparous beef cows.**
Alberto Casal*¹, Martin Clatamunt², Ana L. Astessiano¹, Pablo Soca³, and Mariana Carriquiry¹, ¹Facultad de Agronomía, Universidad de la República, Montevideo, Uruguay, ²Facultad de Veterinaria, Universidad de la República, Paysandu, Uruguay, ³Facultad de Agronomía EEMAC, Universidad de la República, Paysandu, Uruguay.
- 4:00 PM 744 **The influence of tick loads of Senepol cows on calf tick loads and production traits in the tropics.**
Robert W. Godfrey*, Adam J. Weis, and Henry C. Nelthropp, Agricultural Experiment Station, University of the Virgin Islands, St Croix, VI.
- 4:15 PM 745 **Comparison of the growth of F₁ Senepol x Brahman and Brahman steers in an Indonesian feedlot.**
Tim J. Schatz*, Northern Territory Department of Primary Industry and Fisheries, Darwin, Northern Territory, Australia.
- 4:30 PM 746 **Alternative weaning and finishing strategies affect finishing residual feed intake of beef steers.**
Jason K. Smith*¹, Deidre D. Harmon¹, Mark D. Hanigan², Samer W. El-Kadi¹, Sally E. Johnson¹, Scott P. Greiner¹, and Mark A. McCann¹, ¹Department of Animal and Poultry Sciences, Virginia Tech, Blacksburg, VA, ²Department of Dairy Science, Virginia Tech, Blacksburg, VA.
- 4:45 PM 747 **Alternative weaning and finishing strategies affect beef carcass marbling score.**
Jason K. Smith*¹, Hailey S. Cassell¹, Deidre D. Harmon¹, Mark D. Hanigan², Samer W. El-Kadi¹, Sally E. Johnson¹, Scott P. Greiner¹, and Mark A. McCann¹, ¹Department of Animal and Poultry Sciences, Virginia Tech, Blacksburg, VA, ²Department of Dairy Science, Virginia Tech, Blacksburg, VA.

Breeding and Genetics
Application and methods—Dairy II
Chair: Ignacy Misztal, University of Georgia
Panzacola F-4

- 2:00 PM 748 **The “it factor” for long-lived, high-producing dairy cows.**
Roger D. Shanks*^{1,2} and Robert Miller³, ¹Holstein Association USA, Brattleboro, VT, ²University of Illinois, Urbana, IL, ³Mil-R-Mor Dairy, Orangeville, IL.
- 2:15 PM 749 **Identification of gene networks underlying dystocia in dairy cattle.**
Maria Arceo*¹, Francesco Tiezzi¹, John Cole², and Christian Maltecca¹, ¹North Carolina State University, Raleigh, NC, ²Animal Genomics and Improvement Laboratory, ARS, USDA, Beltsville, MD.
- 2:30 PM 750 **Distribution of runs of homozygosity and its association with inbreeding depression in United States and Australia Jersey cattle.**
Jeremy T. Howard*¹, Christian Maltecca¹, Mekonnen Haile-Mariam^{2,3}, Ben J. Hayes^{2,3}, and Jennie E. Pryce^{2,3}, ¹North Carolina State University, Raleigh, NC, ²Dairy Futures Cooperative Research Centre, Bundoora, Victoria, Australia, ³La Trobe University, Bundoora, Victoria, Australia, ⁴Biosciences Research Division, Bundoora, Victoria, Australia.
- 2:45 PM 751 **The effect of DGAT1 polymorphism on milk production and fat, protein, and mineral composition of dairy cattle.**
Henk Bovenhuis*¹, Marleen Vikser¹, Nina Poulsen², Jakob Sehested³, Hein van Valenberg⁴, Johan van Arendonk¹, Lotte Bach Larsen², and Bart Buitenhuis⁵, ¹Animal Breeding and Genomics Centre, Wageningen University, Wageningen, the Netherlands, ²Department of Food Science, Aarhus University, Tjele, Denmark, ³Department of Animal Science, Aarhus University, Tjele, Denmark, ⁴Dairy Science and Technology Group, Wageningen University, Wageningen, the Netherlands, ⁵Center for Quantitative Genetics and Genomics, Department of Molecular Biology and Genetics, Aarhus University, Tjele, Denmark.
- 3:00 PM 752 **Variation in milk fat globule size in Canadian dairy cattle and its prediction using mid-infrared spectroscopy.**
Allison Fleming*¹, Astrid Koeck¹, Flavio Schenkel¹, Milena Corredig^{2,3}, Mehdi Sargolzaei^{1,4}, Bonnie Mallard⁵, R. Ayesha Ali⁶, Saranya Gunasegaram¹, and Filippo Miglior^{1,7}, ¹CGIL, University of Guelph, Guelph, ON, Canada, ²Gay Lea Foods, Mississauga ON, Canada, ³Dept of Food Science, University of Guelph, Guelph, ON, Canada, ⁴Semex, Guelph, ON, Canada, ⁵Dept of Pathobiology, OVC, University of Guelph, Guelph, ON, Canada, ⁶Dept of Mathematics and Statistics, University of Guelph, Guelph, ON, Canada, ⁷Canadian Dairy Network, Guelph, ON, Canada.

- 3:15 PM 753 **Including different groups of genotyped females for genomic prediction in the Nordic Jersey population.**
Hongding Gao*¹, Per Madsen¹, Ulrik S. Nielsen², Gert P. Aamand³, and Just Jensen¹, ¹*Center for Quantitative Genetics and Genomics, Department of Molecular Biology and Genetics, Aarhus University, Tjele, Denmark*, ²*Knowledge Centre For Agriculture, Aarhus N, Denmark*, ³*Nordic Cattle Genetic Evaluation, Aarhus N, Denmark*.
- 3:30 PM 754 **Estimation of genetic parameters for metabolic disease traits and their predictors in Canadian Holsteins.**
Astrid Koeck*¹, Janusz Jamrozik^{1,2}, Gerrit J. Kistemaker², Flavio S. Schenkel¹, Robert K. Moore⁴, Daniel M. Lefebvre⁴, David F. Kelton³, and Filippo Miglior^{1,2}, ¹*CGIL, Dept. of Animal and Poultry Science, Guelph, ON, Canada*, ²*Canadian Dairy Network, Guelph, ON, Canada*, ³*Department of Population Medicine, Ontario Veterinary College, Guelph, ON, Canada*, ⁴*Valacta, Québec, QC, Canada*.
- 3:45 PM 755 **A genomic-wide association study on development of hyperketonemia in periparturient Holstein dairy cows.**
Francisco A. Leal Yepes*¹, Heather J. Huson¹, Sabine Mann², Jessica A. A. McArt², Luciano Caixeta¹, Thomas R. Overton¹, Joseph J. Wakshlag², and Daryl V. Nisdam², ¹*College of Agriculture and Life Sciences, Cornell University, Ithaca, NY*, ²*College of Veterinary Medicine, Cornell University, Ithaca, NY*.
- 4:00 PM 756 **Evaluation of survival in the first year after calving across years and seasons.**
Mathijs L. van Pelt*^{1,2} and Roel F. Veerkamp¹, ¹*Wageningen UR Livestock Research, Animal Breeding and Genomics Centre, Wageningen, the Netherlands*, ²*CRV BV, Arnhem, the Netherlands*.
- 4:15 PM 757 **Genetic and genomic analysis of superovulatory response in Canadian Holsteins.**
Cindy Jatou*^{1,2}, Astrid Koeck¹, Mehdi Sargolzaei^{1,3}, Christopher A. Price⁴, Flavio S. Schenkel¹, and Filippo Miglior^{1,5}, ¹*Centre for Genetic Improvement of Livestock, University of Guelph, Guelph, ON, Canada*, ²*Centre d'insémination artificielle du Québec, St-Hyacinthe, QC, Canada*, ³*Semex Alliance, Guelph, ON, Canada*, ⁴*Université de Montréal, Faculté de Médecine Vétérinaire, St-Hyacinthe, QC, Canada*, ⁵*Canadian Dairy Network, Guelph, ON, Canada*.
- 4:30 PM 759 **Genetic parameters of individual hoof lesions in Canadian Holsteins.**
Francesca Malchiodi*¹, Astrid Koeck¹, Núria Chapinal², Mehdi Sargolzaei^{1,3}, Allison Fleming¹, David F. Kelton⁴, Flavio S. Schenkel¹, and Filippo Miglior^{1,5}, ¹*Centre for Genetic Improvement of Livestock, University of Guelph, Guelph, ON, Canada*, ²*Animal Welfare Group, University of British Columbia, Vancouver, BC, Canada*, ³*Semex Alliance, Guelph, ON, Canada*, ⁴*Department of Population Medicine, Ontario Veterinary College, Guelph, ON, Canada*, ⁵*Canadian Dairy Network, Guelph, ON, Canada*.

Breeding and Genetics
Poultry and swine
Chair: Alan G. Fahey, University College Dublin
Panzacola F-3

- 2:00 PM 760 **Comparison of traditional vs. genomic, and single vs. multiple trait analyses of broiler chicken mortality.**
Xinyue Zhang*¹, Shogo Tsuruta¹, Daniela A. L. Lourenco¹, Robyn L. Sapp², and Rachel J. Hawken², ¹*University of Georgia, Athens, GA*, ²*Cobb-Vantress Inc., Siloam Springs, GA*.
- 2:15 PM 761 **Polymorphisms in CAST, TNNI1, and MYOG genes and their relationship with pig carcass traits at different weight groups.**
Andrea Nyisalovits*¹, János Posta², Levente Czeglédi², Márta Horváth¹, and László Babinszky¹, ¹*Department of Feed and Food Biotechnology, University of Debrecen, Debrecen, Hungary*, ²*Department of Animal Breeding, University of Debrecen, Debrecen, Hungary*.
- 2:30 PM 762 **Estimates of variance components for gilt retention traits.**
Matthew D. A. Morrison*¹, Kent A. Gray², Miles T. See¹, and Mark T. Knauer¹, ¹*North Carolina State University, Raleigh, NC*, ²*Smithfield Premium Genetics, Rose Hill, NC*.
- 2:45 PM 763 **Estimates of genetic parameters for sow body weight loss during lactation.**
Cassandra L. Ferring*¹, Dale Hentges², Clint Schwab², and Mark T. Knauer¹, ¹*North Carolina State University, Raleigh, NC*, ²*The Maschhoffs, Carlyle, IL*.
- 3:00 PM 764 **Genetic selection for feed efficiency in crossbred animals.**
Rob Bergsma* and Egbert F. Knol, *Topigs Norsvin Research Centre B.V, Beuningen, the Netherlands*.

- 3:15 PM 765 **Genomic regions associated with response to PRRSV and PCV2b co-infection in nursery pigs.**
Jenelle R. Dunkelberger*¹, Nick V. L. Serão¹, Maureen A. Kerrigan², Joan K. Lunney³, Raymond R. R. Rowland², and Jack C. M. Dekkers¹, ¹Department of Animal Science, Iowa State University, Ames, IA, ²College of Veterinary Medicine, Kansas State University, Manhattan, KS, ³USDA, ARS, BARC, APDL, Beltsville, MD.
- 3:30 PM 766 **Genetic and economic effects of incorporating genomic predictions on health in swine breeding schemes.**
Chandraratne M. B. Dematawewa*¹, Anna Grosse Holthaus², Henner Simianer², and Jack C. M. Dekkers¹, ¹Iowa State University, Ames, IA, ²University of Göttingen, Göttingen, Germany.
- 3:45 PM 767 **Exploring causal networks underlying fat deposition and muscularity in pigs through the integration of phenotypic, genotypic and transcriptomic data.**
Francisco Peñagaricano*^{1,2}, Bruno D. Valente¹, Juan P. Steibel³, Ronald O. Bates³, Cathy W. Ernst³, Hasan Khatib¹, and Guilherme J. M. Rosa¹, ¹University of Wisconsin-Madison, Madison, WI, ²University of Florida, Gainesville, FL, ³Michigan State University, East Lansing, MI.
- 4:00 PM 768 **Genomic prediction accuracy of porcine respiratory and reproductive syndrome (PRRS) antibody response in commercial gilts and sows.**
Nick V. L. Serão*¹, Robert A. Kemp², Benny E. Mote³, John C. S. Harding⁴, Philip Willson⁴, Stephen C. Bishop⁵, Graham S. Plastow⁶, and Jack C. M. Dekkers¹, ¹Iowa State University, Ames, IA, ²Genesis, Oakville, ON, Canada, ³Fast Genetics, Saskatoon, SK, Canada, ⁴University of Saskatchewan, Saskatoon, SK, Canada, ⁵The Roslin Institute, Easter Bush, Midlothian, UK, ⁶University of Alberta, Edmonton, AB, Canada.
- 4:15 PM 769 **Genetic analysis and whole-genome wide association for feeding behavior traits in Duroc pigs.**
Shihui Jiao*¹, Christian Maltecca¹, Yijian Huang², and Kent A. Gray², ¹North Carolina State University, Raleigh, NC, ²Smithfield Premium Genetics, Rose Hill, NC.
- 4:30 PM 770 **Genomic mitigation of seasonality effect on carcass weight in commercial pigs.**
Breno D. Fragomeni*¹, Shogo Tsuruta¹, Daniela A.L. Lourenco¹, Kent Gray², Yijian Huang², and Ignacy Misztal¹, ¹Department of Animal and Dairy Science, University of Georgia, Athens, GA, ²Smithfield Premium Genetics, Rose Hill, NC.
- 4:45 PM 771 **Effect of divergent selection for residual feed intake in finishing pigs on juvenile IGF-I.**
Emily D. Mauch*¹, Nick V. L. Serão¹, Joel R. Steckelberg¹, Anna Wolc^{1,2}, and Jack C. M. Dekkers¹, ¹Department of Animal Science, Iowa State University, Ames, IA, ²Hy-Line International, Dallas Center, IA.

Companion Animal Symposium
Comparative nutrition—Protein and energy across species
 Chair: **Beth Kitts-Morgan, Berry College**
 Sponsor: **ASAS Foundation George C. Fahey Appreciation Club**
Suwannee 15

- 2:00 PM **Introduction.**
Beth Kitts-Morgan.
- 2:15 PM 772 **Thinking comparatively allows flexibility: The legacy of Duane Ullrey.**
Mark S. Edwards*, California Polytechnic State University, San Luis Obispo, CA.
- 2:45 PM 773 **Protein and energy metabolism in the development and management of obesity and chronic diseases in humans.**
David J. Baer*, USDA, ARS, Beltsville, MD.
- 3:15 PM **Break**
- 3:30 PM 774 **Brain and cognitive development: Assessing the impact of nutrition in a neonatal piglet model.**
Rodney W. Johnson*, University of Illinois, Urbana, IL.
- 4:00 PM 775 **Comparative gastrointestinal utilization of nitrogen, lysine, and glucose in equids and suids.**
Nathalie Trottier*, Michigan State University, East Lansing, MI.

- 4:30 PM 776 **Carnivores, omnivores, and herbivores—Concepts of ideal protein formulation for ornamental and commercial aquaculture feeds.**
Delbert M. Gatlin* and Sergio Castillo, *Texas A&M University System, College Station, TX.*

Dairy Foods Symposium
Processing and ingredient innovations to grow fluid milk sales
Chair: **David McCoy, Dairy Management Inc.**
Sponsor: **National Dairy Council**
Suwannee 13/14

- 2:00 PM 777 **Market implications and opportunities in the fluid milk and beverage sector.**
Alan Reed*¹, Madlyn Daley¹, Marla Buerk¹, and Chris Costagli², ¹*Dairy Management Inc., Rosemont, IL*, ²*Information Resources Inc., Chicago, IL.*
- 2:30 PM 778 **Implications of microbial quality of incoming milk and plant sanitation on shelf life and acceptance.**
Nicole H. Martin*, Rachel A. Miller, Stephanie N. Masiello, David J. Kent, Kathryn J. Boor, and Martin Wiedmann, *Cornell University, Ithaca, NY.*
- 3:00 PM 779 **Effect of milk composition and processing conditions on consumer liking.**
M. A. Drake*, *Southeast Dairy Foods Research Center, North Carolina State University, Raleigh, NC.*
- 3:30 PM **Break**
- 3:45 PM 780 **Shedding light on consumer acceptability of fluid milk: The partnership of retail dairy case lighting systems and packaging.**
Susan Duncan*, *Virginia Tech, Blacksburg, VA.*
- 4:15 PM 781 **Characterizing factors that influence milk flavor quality.**
Smaro Kokkinidou, David Potts, and Devin Peterson*, *University of Minnesota, St. Paul, MN.*

Milk Protein and Enzymes
Chair: **Milena Corredig, University of Guelph**
Suwannee 11/12

- 2:00 PM 782 **Dietary whey and casein produce differential effects on energy balance, gut hormones, glucose metabolism, and taste preference in diet-induced obese rats.**
Adel Pezeshki*, Andrew Fahim, and Prasanth Chelikani, *University of Calgary, Calgary, AB, Canada.*
- 2:15 PM 783 **Characterization of the bovine milk proteome produced by Holstein and Jersey breeds of dairy cows.**
Rink Tacoma*, Lam Ying Wai, Julia Ganister Fields, and Sabrina Greenwood, *University of Vermont, Burlington, VT.*
- 2:30 PM 784 **Lactoferrin and lactalbumin are more effective than whey protein in improving energy balance and glucose tolerance in diet-induced obese rats.**
Rizaldy Zapata*¹, Adel Pezeshki¹, Arashdeep Singh¹, Mary Chou², and Prasanth Chelikani¹, ¹*University of Calgary, Calgary, AB, Canada*, ²*Advanced Orthomolecular Research Inc., Calgary, AB, Canada.*
- 2:45 PM 785 **Partial hydrolysis of whey protein using immobilized enzymes and conjugation of these hydrolyzates with the aim of lowering whey protein allergenicity.**
Yuansheng Gong*¹, Lei Xu¹, and John A. Lucey^{1,2}, ¹*Department of Food Science, University of Wisconsin-Madison, Madison, WI*, ²*Center for Dairy Research, University of Wisconsin-Madison, Madison, WI.*

- 3:00 PM 786 **Effect of Maillard modification on reducing immunogenicity of whey protein isolate.**
Lei Xu*¹, Yuansheng Gong¹, and John A. Lucey^{1,2}, ¹University of Wisconsin-Madison, Department of Food Science, Madison, WI, ²Wisconsin Center for Dairy Research, Madison, WI.

Nonruminant Nutrition
Immune support
Chair: Ryan Dilger, University of Illinois
Sebastian I-4

- 2:00 PM 787 **Evaluating the efficacy of chemicals to mitigate *Salmonella* cross contamination in rendered protein meals.**
Roger A. Cochrane*, Anne R. Huss, and Cassandra K. Jones, *Kansas State University, Manhattan, KS.*
- 2:15 PM 788 **Supplemental effects of herbal additive on growth performance, health status, and carcass quality in finishing pigs as alternatives to the use of antibiotics.**
W. Parnsen*, S. H. Zhang, and S. W. Kim, *Department of Animal Science, North Carolina State University, Raleigh, NC.*
- 2:30 PM 789 **Effect of additives on survival of swine delta coronavirus (SDCoV) in complete feed.**
Katie M. Cottingham*¹, Harsha Verma², Fernando Sampedro², Pedro E. Urriola¹, Gerald C. Shurson¹, and Sagar M. Goyal², ¹Department of Animal Science, University of Minnesota, St. Paul, MN, ²Veterinary Population Medicine, University of Minnesota, St. Paul, MN.
- 2:45 PM 790 **Infection with porcine reproductive and respiratory syndrome virus (PRRSV) affects body protein deposition and alters amino acid metabolism in growing pigs.**
Whitney D. Stuart*¹, Thomas E. Burkey², Nicholas K. Gabler³, Kent Schwartz³, Thu Dinh⁴, Cornelius F. M. de Lange⁵, David Klein¹, John A. Dawson¹, and Anoosh Rakhshandeh¹, ¹Texas Tech University, Lubbock, TX, ²University of Nebraska-Lincoln, Lincoln, NE, ³Iowa State University, Ames, IA, ⁴Mississippi State University, Mississippi State, MS, ⁵University of Guelph, Guelph, ON, Canada.
- 3:00 PM 791 **Effect of selenium and vitamin E supplementation on muscular damage enzymes in horses under moderate exercise.**
Elias Velázquez-Cantón*, Aurora H. Ramírez-Pérez, Luis Alberto Zarco-Quintero, Delia Arlette Castillo-Mata, and Juan Carlos Ángeles-Hernández, *Facultad de Medicina Veterinaria y Zootecnia, Universidad Nacional Autónoma de México, Av. Universidad 3000 México, D.F., México.*
- 3:15 PM 792 **Effect of Sal CURB on digestibility of energy and nutrients by growing pigs.**
Yanhong Liu* and Hans H. Stein, *Department of Animal Sciences, University of Illinois, Urbana, IL.*
- 3:30 PM 793 **Effect of a 3-strain *Bacillus*-based direct-fed microbial on growth performance, volatile fatty acid production, carcass characteristics, and gastrointestinal tract weights in growing-finishing pigs fed low or high fiber diets.**
Neil W. Jaworski*¹, Augustine Owusu-Asiedu², Ajay Awati², Alastair Thomas², and Hans H. Stein¹, ¹University of Illinois at Urbana-Champaign, Urbana, IL, ²Danisco Animal Nutrition, DuPont Industrial Biosciences, Marlborough, UK.
- 3:45 PM 794 **Effect of a 3-strain *Bacillus*-based direct-fed microbial on growth performance and volatile fatty acid production in nursery pigs fed low or high fiber diets.**
Neil W. Jaworski*¹, Augustine Owusu-Asiedu², Ajay Awati², Alastair Thomas², and Hans H. Stein¹, ¹University of Illinois at Urbana-Champaign, Urbana, IL, ²Danisco Animal Nutrition, DuPont Industrial Biosciences, Marlborough, UK.
- 4:00 PM 795 **Effect of l-DOPA on performance and serum cholesterol of broiler.**
Babatunde R. Omidawura*, Adebisi F. Agboola, and Eustace A. Iyayi, *University of Ibadan, Ibadan, Oyo, Nigeria.*
- 4:15 PM 796 **Effect of high caloric diet enriched in medium-chain triglycerides and arginine supplementation on cholesterol and lipid metabolism in finishing pigs.**
Z. H. Zhou, D. W. Chen, P. Zheng, G. Tian, B. Yu*, and Y. Yao, *Animal Nutrition Institute, Sichuan Agricultural University, Chengdu, Sichuan, China.*
- 4:30 PM 797 **Effects of lactulose on growth, carcass characteristics, fecal microbiota, and blood constituents in broilers.**
M. Mohammadi*, S. Shanmugam, H. Y. Shin, S. Mohana Devi, and I. H. Kim, *Department of Animal Resource & Science, Dankook University, Cheonan, Chungnam, South Korea.*

- 4:45 PM 798 **Effect of supplying a nucleotide product (Ascogen) to sow diets on growth performance of the offspring in the nursery.**
I-Fen Hung*¹, Klaus Hoffmann², Peter Koeppl², and Merlin D. Lindemann¹, ¹University of Kentucky, Lexington, KY, ²Chemoforma Ltd, Augst, Switzerland.

Physiology and Endocrinology Symposium

Insulin revisited

Chair: Lance Baumgard, Iowa State University

Sponsor: Elanco Animal Health

Panzacola H-4

- 2:00 PM 799 **Insulin receptor signaling in normal and insulin-resistant states.**
Brian O'Neill*^{1,2}, ¹Joslin Diabetes Center, Boston, MA, ²Harvard Medical School, Boston, MA.
- 2:45 PM 800 **Roles for insulin-supported skeletal muscle growth.**
Robert P. Rhoads*¹ and Lance H. Baumgard², ¹Virginia Tech, Blacksburg, VA, ²Iowa State University, Ames, IA.
- 3:15 PM 801 **The biology of hyperinsulinemia induction of polycystic ovarian syndrome and its complications.**
Jean-Patrice Baillargeon*^{1,2}, ¹Université de Sherbrooke, Sherbrooke, QC, Canada, ²Research Center of Centre Hospitalier Universitaire de Sherbrooke, Sherbrooke, QC, Canada.
- 3:45 PM 802 **Insulin effects on mammary gland extraction and milk synthesis.**
Wendie S. Cohick*, Rutgers University, New Brunswick NJ.
- 4:15 PM 803 **Effects of insulin and heat stress on mTOR signaling cascade in bovine mammary epithelial cells.**
Kimberly R. Kassube*, Jeffrey D. Kaufman, and Agustin G. Rius, The University of Tennessee, Knoxville, TN.
- 4:30 PM 804 **Heat stress reduces the phosphorylation activity of mTOR signaling cascade in bovine mammary cells.**
Jeffrey D. Kaufman*¹, Kimberly R. Kassube¹, Celina Baravalle², and Agustin G. Rius¹, ¹The University of Tennessee, Knoxville, TN, ²Universidad Nacional del Litoral, Esperanza, Santa Fe, Argentina.
- 4:45 PM 805 **Proteome of adipose tissue in periparturient dairy cows related to insulin resistance.**
Maya Zachut*, Department of Ruminant Science, ARO, Volcani, Bet Dagan, Israel.

Production, Management, and the Environment V

Chair: Jimena Laporta, University of Florida

Panzacola F-2

- 2:00 PM 806 **Metabolizable energy intake effects on carcass quality of steers finished in southern Chile during summer time.**
Rodrigo A. Arias*¹, Christian Alvarado-Gilis¹, Tami Brown-Brandl², and Terry L. Mader³, ¹Instituto de Producción Animal, Universidad Austral de Chile, Valdivia Chile, ²MARC-ARS-USDA, Clay Center, NE, ³Mader Consulting LLC, Gretna, NE.
- 2:15 PM 807 **Metabolizable energy intake effects on tympanic temperature and ADG of steers finished in southern Chile during summer.**
Rodrigo A. Arias*¹, Christian Alvarado-Gilis¹, Tami Brown-Brandl², and Terry L. Mader³, ¹Instituto de Producción Animal, Universidad Austral de Chile, Valdivia, Chile, ²MARC-ARS-USDA, Clay Center, NE, ³Mader Consulting LLC, Gretna, NE.
- 2:30 PM 808 **Effect of maternal heat stress on calf growth performance and metabolism.**
J-D. Liu*¹, A. P. A. Monteiro¹, B. M. Ahmed², T. O. Asar², Z. Wu¹, M. J. Hayen², G. E. Dahl², J. K. Bernard¹, and S. Tao¹, ¹University of Georgia, Tifton, GA, ²University of Florida, Gainesville, FL.

- 2:45 PM 809 **Cows exposed to heat stress in utero exhibit improved thermal tolerance.**
Bahroz M. S. Ahmed*¹, Umair Younas¹, Turkey O. Asar¹, Serdal Dikmen², Peter J. Hansen¹, and Geoffrey E. Dahl¹, ¹University of Florida, Gainesville, FL, ²University of Uludag, Bursa, Turkey.
- 3:00 PM 810 **Feeding slow fermentable grains has the potential to ameliorate heat stress in sheep.**
Paula A. Gonzalez-Rivas*, Kristy DiGiacomo, Brian J. Leury, Jeremy J. Cottrell, and Frank R. Dunshea, Faculty of Veterinary and Agricultural Sciences, The University of Melbourne, Parkville, Victoria, Australia.
- 3:15 PM 811 **Heat stress at conception affects lifetime fertility, milk yield, and survival of Holstein cows.**
Pablo Pinedo*^{1,2} and Albert De Vries³, ¹Texas A&M AgriLife Research, Amarillo, TX, ²Department of Veterinary Pathobiology, College of Veterinary Medicine & Biomedical Sciences, Texas A&M University System, College Station, TX, ³Department of Animal Sciences, University of Florida, Gainesville, FL.
- 3:30 PM 812 **Effect of mild and moderate heat stress on milk yield and bovine milk composition in the tropical region.**
Vivian Fischer*¹, Alexandre Sausenbach Abreu³, Marcelo Tempel Stumpf⁴, André Thaler Neto², Daise Werncke¹, and Fernando André Schmidt², ¹Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil, ²Universidade Estadual de Santa Catarina, Lages, SC, Brazil, ³Universidade do Sul de Santa Catarina, Tubarão, SC, Brazil, ⁴Universidade de Rio Grande, São Lourenço, RS, Brazil.
- 3:45 PM 813 **A cow cooling investment decision support tool for dairy farms in low and high humidity regions.**
Bettie S. Kawonga* and Jeffrey M. Bewley, Department of Animal and Food Sciences, University of Kentucky, Lexington, KY.
- 4:00 PM 814 **Effect of feeding phytogenic compounds on preweaned dairy calves in a commercial setting.**
Bryan G. Miller*¹ and Nicolas D. Bettencourt², ¹Biomin USA, San Antonio, TX, ²A.L. Gilbert, Oakdale, CA.
- 4:15 PM 815 **Effect of condensed tannin extract supplementation on beef cattle performance and nitrogen balance: II. Finishing phase.**
Pake J. Ebert*¹, Adam L. Shreck², Jenny S. Jennings³, Noel A. Cole², and Eric A. Bailey¹, ¹West Texas A&M University, Canyon, TX, ²USDA-Agricultural Research Service, Bushland, TX, ³Texas A&M AgriLife Research, Amarillo, TX.
- 4:30 PM 816 **Evaluation of an extended release anthelmintic on performance and fecal parasite load of beef cattle grazing cool season pastures.**
J. D. Rivera*, M. L. Gipson, R. G. Gipson, and P. J. Slusher, Mississippi Agriculture and Forestry Exp. Station White Sand Branch Unit, Poplarville, MS.
- 4:45 PM 817 **Effect of yeast culture plus enzymatically hydrolyzed yeast supplementation during transition period on milk production and metabolic profile of dairy cows.**
Claudia Faccio Demarco¹, Vanessa Oliveira Freitas¹, Tatiele Mumbach¹, Eduardo Xavier², Raquel Fraga e Silva Raimondo³, Fernanda Medeiros Gonçalves¹, Francisco Augusto Del Pino¹, Viviane Rohrig Rabassa*¹, Sangita Jalukar⁴, Marcio Nunes Corrêa¹, and Cássio Cassal Brauner¹, ¹Universidade Federal de Pelotas, NUPEEC, Pelotas, RS, Brazil, ²Granjas 4 Irmãos S/A, Rio Grande, RS, Brazil, ³Universidade Federal do Rio Grande do Sul, Porto Alegre, RS, Brazil, ⁴Arm & Hammer Animal Nutrition, Princeton, NJ.

Production, Management, and the Environment Symposium
Environmental footprint of livestock production—Greenhouse gas emissions and climate change
Chair: Andy Cole, USDA-ARS, Bushland, Texas
Panzacola G-1

- 2:00 PM **Introduction.**
- 2:00 PM 818 **Environmental footprint of livestock production: A global perspective.**
Frank M. Mitloehner*, University of California, Davis, Davis, CA.
- 2:30 PM 819 **Environmental impact reduction strategies for pig farms.**
Richard Ulrich*¹, Greg Thoma¹, Jennie Popp¹, and Mark Hanigan², ¹University of Arkansas, Fayetteville, AR, ²Virginia Tech, Blacksburg, VA.

- 3:00 PM 820 **Quantifying greenhouse gas fluxes in animal production.**
Wendy Powers* and Matheus Capelari, *Michigan State University, East Lansing, MI.*
- 3:30 PM **Break**
- 3:45 PM 821 **Greenhouse gas emissions and nitrogen cycling from beef production systems: Effects of climate, season, production system, and diet.**
Galen E. Erickson*, Samodha C. Fernando, Terry J. Klopfenstein, Andrea K. Watson, James C. MacDonald, Anna C. Pesta, Allison L. Knoell, and Henry Paz, *University of Nebraska-Lincoln, Lincoln, NE.*
- 4:15 PM 822 **Forage utilization to mitigate greenhouse gas emissions by ruminants.**
Karen A. Beauchemin*, *Agriculture and Agri-Food Canada, Lethbridge Research Centre, Lethbridge, AB, Canada.*

Ruminant Nutrition
Modifying rumen microbial populations
Chair: **Nicholas DiLorenzo, University of Florida**
Panzacola H-2

- 2:00 PM 823 **Protozoa reduction in the rumen of grazing cattle fed mixtures of coconut and palm kernel oils.**
Oludotun O. Adelusi, Adebayo O. Oni*, Oluwaseun J. Idowu, Victoria O. Ojo, and Christopher F. Onwuka, *Federal University of Agriculture, Abeokuta, Ogun State, Nigeria.*
- 2:15 PM 824 **Total-tract fatty acid digestibility responses to increasing levels of palmitic acid supplementation of dairy cows receiving low- and high-fat diets.**
Jonas De Souza*, J. Eduardo Rico, Courtney L. Preseault, Michael S. Allen, and Adam L. Lock, *Michigan State University, East Lansing, MI.*
- 2:30 PM 825 **Daily patterns of hydrogen and volatile fatty acid concentrations in relation to thermodynamic control on fermentation in the bovine rumen.**
Hendrikus J. van Lingen*^{1,2}, Jueeli D. Vaidya^{1,3}, Sanne van Gastelen^{1,2}, Bartholomeus van den Bogert^{1,3}, André Bannink⁴, Caroline M. Plugge³, Hauke Smidt³, and Jan Dijkstra², ¹*Top Institute Food and Nutrition, Wageningen, Gelderland, the Netherlands*, ²*Animal Nutrition Group, Wageningen University, Wageningen, Gelderland, the Netherlands*, ³*Laboratory of Microbiology, Wageningen University, Wageningen, Gelderland, the Netherlands*, ⁴*Animal Nutrition, Wageningen UR Livestock Research, Wageningen, Gelderland, the Netherlands.*
- 2:45 PM 826 **Effects of chitosan on ruminal metabolism and in situ degradability of beef cattle.**
Darren D. Henry*, Francine M. Ciriaco, Vitor R. G. Mercadante, Tessa M. Schulmeister, Martin Ruiz-Moreno, G. Cliff Lamb, and Nicolas DiLorenzo, *North Florida Research and Education Center, University of Florida, Marianna, FL.*
- 3:00 PM 827 **Ellipsoid equation improves accuracy and efficiency of estimating protozoal volume.**
Benjamin A. Wenner*, Brooklyn K. Wagner, and Jeffrey L. Firkins, *Department of Animal Sciences, The Ohio State University, Columbus, OH.*
- 3:15 PM 828 **Effect of monensin inclusion on ruminal fermentation parameters in *Bos indicus* and *Bos taurus* steers consuming bermudagrass hay.**
Natasha L. Bell*^{1,2}, Robin C. Anderson³, Todd R. Callaway³, Marcia O. Franco⁴, and Tryon A. Wickersham¹, ¹*Texas A&M University, College Station, TX*, ²*Texas A&M University-Kingsville, Kingsville, TX*, ³*Southern Plains Agricultural Research Center, Agricultural Research Service, USDA, College Station, TX*, ⁴*Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.*
- 3:30 PM 829 **Effect of monensin withdrawal on ruminal fermentation parameters in *Bos indicus* and *Bos taurus* steers consuming bermudagrass hay.**
Natasha L. Bell*^{1,2}, Robin C. Anderson³, Todd R. Callaway³, Marcia O. Franco⁴, and Tryon A. Wickersham¹, ¹*Texas A&M University, College Station, TX*, ²*Texas A&M University-Kingsville, Kingsville, TX*, ³*Southern Plains Agricultural Research Center, Agricultural Research Service, USDA, College Station, TX*, ⁴*Universidade Federal de Viçosa, Viçosa, Minas Gerais, Brazil.*

- 3:45 PM 830 **Effects of solid feed level and roughage-to-concentrate ratio on ruminal drinking and passage kinetics of milk, concentrates, and roughage in veal calves.**
 Harma Berends*¹, Joost van den Borne¹, Norbert Stockhofe², Myrthe Gilbert¹, Tamme Zandstra¹, Wilbert Pellikaan¹, Kees van Reenen³, Eddie Bokkers⁴, and Walter Gerrits¹, ¹*Animal Nutrition Group, Wageningen University, Wageningen, Gelderland, the Netherlands*, ²*Central Veterinary Institute, Lelystad, Flevoland, the Netherlands*, ³*Livestock Research, Wageningen, Gelderland, the Netherlands*, ⁴*Animal Production Systems Group, Wageningen University, Wageningen, Gelderland, the Netherlands*.
- 4:00 PM 831 **Effect of dietary supplementation with resveratrol on nutrient digestibility, methanogenesis and ruminal microbial flora in sheep.**
 Tao Ma¹, Dan-dan Chen¹, Yan Tu¹, Nai-feng Zhang¹, Bing-wen Si¹, Kai-dong Deng², and Qi-yu Diao*¹, ¹*Feed Research Institute, Chinese Academy of Agricultural Sciences, Key Laboratory of Feed Biotechnology of the Ministry of Agriculture, Beijing, China*, ²*College of Animal Science, Jinling Institute of Technology, Nanjing, Jiangsu, China*.
- 4:15 PM 832 **Essential oils from goat weed (*Ageratum conyzoides*) and African basil (*Ocimum gratissimum*) can reduce in vitro enteric methane production.**
 Musibau A. Bamikole^{1,2}, Ibukun M. Ogunade*¹, Felipe Amaro¹, Yun Jiang¹, Thiago F. Bernardes¹, Vania R. Vasconcelos¹, Darren D. Henry³, F. O. Ugiagbe², U. J. Ikhatua², Nicolas DiLorenzo³, and Adegbola T. Adesogan¹, ¹*University of Florida, Gainesville, FL*, ²*University of Benin, Benin City, Nigeria*, ³*North Florida Research and Education Center, University of Florida, Marianna, FL*.
- 4:30 PM 833 **Effects of supplemental energy and protein source on performance of steers grazing irrigated corn residue.**
 Benjamin T. Tibbitts*¹, Cody A. Welchons¹, Robert G. Bondurant¹, Fred H. Hilscher¹, James C. MacDonald¹, and Rick N. Funston², ¹*University of Nebraska-Lincoln, Lincoln, NE*, ²*University of Nebraska West Central Research and Extension Center, North Platte, NE*.
- 4:45 PM 834 **Variability in predicted weaning weight of nursing calves using four models.**
 Phillip A. Lancaster*¹ and Luis O. Tedeschi², ¹*Range Cattle Research and Education Center, University of Florida, Ona, FL*, ²*Department of Animal Science, Texas A&M University, College Station, TX*.

OTHER EVENTS

Global Networking Reception
Butler
4:30 to 6:00 PM

The Global Networking Reception will feature a presentation by Kevin Folta, professor and chair of the Horticultural Sciences Department, University of Florida. All meeting attendees, family, and friends are invited.

Thursday, July 16

WORKSHOP

Mixed Models Workshop

Gatlin A-3

8:00 AM to 12:00 PM (continues from Wednesday)

The Mixed Models Workshop provides a comprehensive exposition of proper statistical data analysis and power determinations of commonly used experimental designs in the animal sciences; our approach is example-driven and primarily based on the various mixed model analysis procedures available in SAS software.

Instructors: **Nora Bello, Ken Koehler, and Kevin McCarter**

ORAL SESSIONS

Nonruminant Nutrition

Fiber

Chair: **Pedro Urriola, University of Minnesota**

Panzacola F-3

- 8:30 AM 835 **Effects of dietary mannan oligosaccharide supplementation on performance and immune response of sows and their offspring.**
X. D. Duan¹, D. W. Chen¹, P. Zheng¹, G. Tian¹, J. P. Wang¹, X. B. Mao¹, J. Yu¹, J. He¹, B. Li¹, Z. Q. Huang¹, Z. G. Ao², and B. Yu^{*1}, ¹*Institute of Animal Nutrition, Sichuan Agricultural University, Chengdu, Sichuan, China*, ²*Alltech Biological Product (China) Co. Ltd, Beijing, China*.
- 8:45 AM 836 **Dietary chitooligosaccharide supplementation alleviates immune challenge induced by lipopolysaccharide in weaned piglets.**
L. Zhang, G. Tian, D. W. Chen, B. Yu*, Y. Yao, J. Yu, P. Zheng, X. B. Mao, J. He, and Z. Q. Huang, *Animal Nutrition Institute, Sichuan Agricultural University, Chengdu, Sichuan, China*.
- 9:00 AM 837 **Effects of feeding fermented wheat with *Lactobacillus reuteri* on nutrient digestibility, growth performance, and intestinal fermentation in weaned pigs.**
M. H. A. Le^{*1}, Y. Yang¹, S. Galle¹, J. L. Landero¹, E. Beltranena^{1,2}, M. G. Gänzle¹, and R. T. Zijlstra¹, ¹*University of Alberta, Edmonton, AB, Canada*, ²*Alberta Agriculture and Rural Development, Edmonton, AB, Canada*.
- 9:15 AM 838 **Extracted rice bran improves performance and fecal parameters in weaning pigs via prebiotic action.**
M. Begum*, B. Balasubramanian, M. M. Hossain, S. D. Upadhaya, and I. H. Kim, *Department of Animal Resource & Science, Dankook University, Cheonan, Chungnam, South Korea*.

Production, Management, and the Environment VI

Chair: **Rafael Bisinotto, Cornell University**

Panzacola F-4

- 8:30 AM 839 **Associations between management practices and reproductive performance in Canadian dairy herds.**
José Denis-Robichaud^{*1}, Ronaldo L. A. Cerri², Andria Jones-Bitton¹, and Stephen J. LeBlanc¹, ¹*Department of Population Medicine, University of Guelph, Guelph, Ontario, Canada*, ²*Faculty of Land and Food Systems, University of British Columbia, Vancouver, British Columbia, Canada*.

- 8:45 AM 840 **Evaluation of Ovsynch and CIDR inserted concurrently with or two days after initiation of Ovsynch protocol to improve reproductive performance in lactating dairy cows with low estrus detection efficiency.**
Abid Hussain Shahzad*¹, Abdul Sattar¹, Nasim Ahmad¹, Ijaz Ahmad¹, Deniz Nak², and Yavuz Nak², ¹University of Veterinary and Animal Sciences, Lahore, Lahore, Punjab, Pakistan, ²Uludag University, Bursa, Bursa, Turkey.
- 9:00 AM 841 **Reproductive outcomes following presynchronization of dairy heifers with a 14-d CIDR and prostaglandin F_{2α}.**
Courtney K. Claypool*¹, Jennifer A. Spencer¹, Saulo Menegatti Zoca³, Bahman Shafii¹, William J. Price¹, Amin Ahmadzadeh¹, Neil R. Rimbey², and Joseph C. Dalton², ¹University of Idaho, Moscow, ID, ²University of Idaho, Caldwell, ID, ³UNESP, Botucatu, Sao Paulo, Brazil.
- 9:15 AM 842 **Effects of expression of estrus measured by activity monitors on ovarian dynamics and conception risk in Holstein cows.**
Augusto M. L. Madureira*^{1,2}, Bruna F. Silper², Tracy A. Burnett², Liam B. Polsky², Eraldo L. Drago Filho¹, Sergio Soriano³, Alex F. Sica³, José L. M. Vasconcelos¹, and Ronaldo L. A. Cerri², ¹Sao Paulo State University, Botucatu, SP, Brazil, ²University of British Columbia, Vancouver, BC, Canada, ³Colorado Dairies, Araras, SP, Brazil.
- 9:30 AM 843 **Vitality and morphology of Boer buck spermatozoa stored fresh for 72 hours.**
Olumide A. Ajao*, Daniel M. Barry, and Kow K. Benyi, University of Venda, Thohoyandou, Limpopo Province, South Africa.
- 9:45 AM **Break**
- 10:00 AM 845 **Environmental and economic consequences of subclinical ketosis and related diseases in dairy farming.**
P. F. Mostert*, E. A. M. Bokkers, C. E. Van Middelaar, and I. J. M. De Boer, Wageningen University, Animal Production Systems group, Wageningen, the Netherlands.
- 10:15 AM 846 **Characterizing the temporal pattern of leaky gut biomarkers in healthy and ketotic cows during the transition period.**
M. Abuajamieh*¹, S. K. Stoakes¹, M. V. Sanz Fernandez¹, J. S. Johnson¹, J. T. Seibert¹, E. A. Nolan¹, S. M. Lei¹, H. B. Green², K. M. Schoenberg², W. E. Trout², and L. H. Baumgard¹, ¹Iowa State University, Ames, IA, ²Elanco Animal Health, Indianapolis, IN.
- 10:30 AM 847 **A randomized clinical trial assessing the use of a single injection of dexamethasone combined with oral propylene glycol therapy for the treatment of hyperketonemia.**
Elise H. Tatone*¹, Michael B. Capel², Jessica L. Gordon¹, Stephen J. LeBlanc¹, and Todd F. Duffield¹, ¹Department of Population Medicine, University of Guelph, Guelph, ON, Canada, ²Perry Veterinary Clinic, Perry, NY.
- 10:45 AM 848 **Effects of prepartum digital dermatitis on first-lactation performance.**
Arturo Gomez*^{1,2}, Nigel Cook¹, Mike Socha², and Dörte Döpfer¹, ¹University of Wisconsin-Madison, Madison, WI, ²Zinpro Corporation, Eden Prairie, MN.
- 11:00 AM 849 **Identification of the most likely classical swine fever outbreak scenarios in the swine industry of Indiana.**
Shankar Yadav*¹, Nicole Olynk Widmar², and Hsin-Yi Weng¹, ¹Department of Comparative Pathobiology, Purdue University, West Lafayette, IN, ²Department of Agricultural Economics, Purdue University, West Lafayette, IN.

Ruminant Nutrition
Dairy rumen metabolism
 Chair: **Timothy Hackmann, University of Florida**
Panzacola F-2

- 8:30 AM 850 **A novel inhibitor persistently decreased enteric methane emission and increased weight gain of high-producing Holstein cows without negatively affecting milk production.**
 Alexander N. Hristov*¹, Joonpyo Oh¹, Fabio Giallongo¹, Michael T. Harper¹, Holley Weeks¹, Antonio F. Branco², Peter J. Moate³, Matthew H. Deighton³, S. Richard O. Williams³, Maik Kindermann⁴, and Stephane Duval⁵, ¹*Department of Animal Science, The Pennsylvania State University, University Park, PA*, ²*Departamento de Zootecnia, Universidade Estadual de Maringá, Maringá, Parana, Brazil*, ³*Agriculture Research Division, Department of Economic Development Jobs Transport and Resources, Ellinbank, Victoria, Australia*, ⁴*DSM Nutritional Products, Animal Nutrition and Health, Basel, Switzerland*, ⁵*DSM Nutritional Products France, Research Centre for Animal Nutrition and Health, Saint Louis Cedex, France*.
- 8:45 AM 851 **Effect of frequency of total mixed ration delivery on digestibility and milk production in lactating dairy cows: A meta-analysis and meta-regression.**
 Hamidreza Mirzaei-Alamouti*¹, Mehdi Kazemi-Joujili¹, Hamid Amanlou¹, and Mina Vazirigohar², ¹*Department of Animal Science, Faculty of Agriculture, University of Zanjan, Zanjan, Iran*, ²*Department of Animal Science, Campus of Agriculture and Natural Resources, University of Tehran, Karaj, Alborz, Iran*.
- 9:00 AM 852 **Relationship between rumen molar volatile fatty acid proportions and milk odd- and branched-chain fatty acid concentrations in cows fed diets containing sunflower oil.**
 Mina Vazirigohar*, Mehdi Dehghan-Banadaky, Kamran Rezayazdi, and Ardeshir Nejati-Javaremi, *Department of Animal Science, Campus of Agriculture and Natural Resources, University of Tehran, Karaj, Alborz, Iran*.
- 9:15 AM 853 **The effect of increasing level of by-product inclusion on milk production, milk composition, nutrient digestibility and nitrogen excretion in early lactation grazing dairy cows.**
 Billy Carey¹, Tommy M. Boland*¹, Stephen J. Whelan², Gaurav Rajauria¹, and Karina M. Pierce¹, ¹*School of Agriculture and Food Science, University College Dublin, Dublin, Ireland*, ²*DairyCo, Agriculture & Horticulture Development Board, Stoneleigh Park, Kenilworth, United Kingdom*.
- 9:30 AM 854 **Effects of feeding Fermenten or urea on milk production, rumen nitrogen metabolism, and microbial nitrogen content in lactating dairy cattle.**
 Samuel W. Fessenden*¹, Andreas Foskolos¹, Elliot Block², and Michael E. Van Amburgh¹, ¹*Department of Animal Science, Cornell University, Ithaca, NY*, ²*Arm & Hammer Animal Nutrition, Princeton, NJ*.
- 9:45 AM 855 **Effect of passage rate and pH on microbial diversity and total methanogens in continuous culture.**
 Benjamin A. Wenner*, Jill A. Stiverson, Zhongtang Yu, and Jeffrey L. Firkins, *Department of Animal Sciences, The Ohio State University, Columbus, OH*.
- 10:00 AM 856 **Lactational performance and ruminal morphometrics when mid-lactation dairy cows are fed *Saccharomyces cerevisiae* fermentation products.**
 Jon P. Pretz*¹, Subash Acharya¹, Ilky Yoon², Mark Scott², and David P. Casper¹, ¹*South Dakota State University, Brookings, SD*, ²*Diamond V Mills Inc., Cedar Rapids, IA*.
- 10:15 AM 857 **Effects of nitrate and docosaehaenoic acid on methane production in lactating dairy cows.**
 G. Klop*¹, B. Hatew¹, A. Bannink², and J. Dijkstra¹, ¹*Wageningen University, Animal Nutrition Group, Wageningen, the Netherlands*, ²*Wageningen UR Livestock Research, Wageningen, the Netherlands*.
- 10:30 AM 858 **Effects of clay (EcoMix) after a grain challenge on rumen health and metabolism of Holstein cows.**
 Saige A. Sulzberger*¹, Carlie C. Kalebich¹, Sergey Melnichenko², and Felipe C. Cardoso¹, ¹*University of Illinois, Urbana, IL*, ²*United Minerals Group, Kyiv, Ukraine*.
- 10:45 AM 859 **Magnitude of difference in chemical and nutrient profiles, ruminal degradation kinetics, and intestinal digestion of three different types of co-products from bio-oil processing for dairy cattle.**
 Xinxin Li*^{1,2}, Yonggen Zhang¹, and Peiqiang Yu^{1,2}, ¹*College of Animal Science and Technology, Northeast Agricultural University, Harbin, China*, ²*Department of Animal and Poultry Science, University of Saskatchewan, Saskatoon, Saskatchewan, Canada*.

- 11:00 AM 860 **Amino acid profiles of ruminal microbes, ruminal undegradable protein, and gastrointestinal contents in lactating dairy cows when corn stover or rice straw replaces alfalfa hay.**
Bing Wang*^{1,2} and J. X. Liu^{1,2}, ¹*Institute of Dairy Science, College of Animal Sciences, Hangzhou, P. R. China*, ²*MoE Key Laboratory of Molecular Animal Nutrition, Zhejiang University, Hangzhou, P.R. China*.
- 11:15 AM 861 **Effect of increasing concentration of dietary fiber in diets rich in plant oil on milk fat concentration, rumen parameters and feeding behavior of mid-lactating cows.**
H. R. Mirzaei Alamouti* and A. Aghaei, *Department of Animal Science, University of Zanjan, Zanjan, Iran*.

Ruminant Nutrition
Feedlot nutrition
Chair: Derek Brake, South Dakota State University
Panzacola F-1

- 8:30 AM 862 **Comparison of methods to calculate metabolizable protein requirements of growing beef cattle.**
Andrea K. Watson*¹, Terry J. Klopfenstein¹, Vic A. Wilkerson², Galen E. Erickson¹, and Jim C. MacDonald¹, ¹*University of Nebraska, Lincoln, NE*, ²*Purina Animal Nutrition, Forest Grove, OR*.
- 8:45 AM 863 **The effect of zilpaterol hydrochloride supplementation on gain efficiency, harvest yields and carcass grading of steers fed a maintenance intake.**
Lee-Anne J. Walter*¹, N. Andy Cole², Jenny S. Jennings³, John P. Hutcheson⁴, Beverly E. Meyer², Angela N. Schmitz¹, DeMetris D. Reed¹, and Ty E. Lawrence¹, ¹*West Texas A&M University, Canyon, TX*, ²*USDA ARS, Bushland, TX*, ³*Texas A&M AgriLife Research and Extension Center, Amarillo, TX*, ⁴*Merck Animal Health, Summit, NJ*.
- 9:00 AM 864 **The effect of zilpaterol hydrochloride supplementation on apparent nutrient digestibility and carbon-nitrogen retention of steers fed at maintenance intake.**
Lee-Anne J. Walter*¹, N. Andy Cole², Jenny S. Jennings³, John P. Hutcheson⁴, Beverly E. Meyer², Angela N. Schmitz¹, DeMetris D. Reed¹, and Ty E. Lawrence¹, ¹*West Texas A&M University, Canyon, TX*, ²*USDA ARS, Bushland, TX*, ³*Texas A&M AgriLife Research and Extension Center, Amarillo, TX*, ⁴*Merck Animal Health, Summit, NJ*.
- 9:15 AM 865 **The effect of zilpaterol hydrochloride supplementation on energy metabolism of steers at maintenance and fasting intake levels.**
Lee-Anne J. Walter*¹, N. Andy Cole², Jenny S. Jennings³, John P. Hutcheson⁴, Beverly E. Meyer², Angela N. Schmitz¹, DeMetris D. Reed¹, and Ty E. Lawrence¹, ¹*West Texas A&M University, Canyon, TX*, ²*USDA ARS, Bushland, TX*, ³*Texas A&M AgriLife Research and Extension Center, Amarillo, TX*, ⁴*Merck Animal Health, Summit, NJ*.
- 9:30 AM 866 **Effects of chromium propionate in combination with yeast on growth performance and carcass quality of finishing steers.**
Cadra L. Van Bibber-Krueger*, Justin E. Axman, John M. Gonzalez, and Jim S. Drouillard, *Kansas State University, Manhattan, KS*.
- 9:45 AM 867 **The influence of supplemental Zn-amino acid complex and Optaflexx feeding duration on growth performance and carcass characteristics of finishing beef cattle.**
Olivia N. Genther-Schroeder*¹, Mark E. Branine², and Stephanie L. Hansen¹, ¹*Iowa State University, Ames, IA*, ²*Zinpro Corporation, Eden Prairie, MN*.
- 10:00 AM 868 **Residual feed intake in ad libitum and limit-fed steers.**
Roberto D. Sainz*, *University of California, Davis, CA*.
- 10:15 AM 869 **Behavioral evaluation when using wet corn gluten feed or wet distillers grains plus solubles to adapt cattle to finishing diets.**
Lauren A. Ovinge*¹, Jhones O. Sarturi¹, Rick A. Stock², Galen E. Erickson³, and Terry J. Klopfenstein³, ¹*Texas Tech University, Lubbock, TX*, ²*Cargill Wet Milling, Blair, NE*, ³*University of Nebraska-Lincoln, Lincoln, NE*.
- 10:30 AM 870 **Effects of *Megasphaera elsdenii* on ruminal pH, VFA, and lactate during transition from 60 to 80% concentrate diet.**
Jake D. Thiesen*¹, Cadra L. Van Bibber-Krueger¹, Justin E. Axman¹, Celine C. Aperce², James S. Drouillard¹, and Kevin A. Miller², ¹*Kansas State University, Manhattan, KS*, ²*MS Biotec, Wamego, KS*.

- 10:45 AM 871 **Dry matter intake patterns of feedlot cattle.**
R. B. Hicks¹, R. P. Lake², and F. N. Owens*³, ¹*Oklahoma State University, Goodwell, OK*, ²*Hitch Consulting Services, Guymon, OK*, ³*DuPont Pioneer, Johnston, IA*.
- 11:00 AM 872 **Effect of backgrounding system on beef calf performance.**
Jordan L. Cox*¹, Kristin E. Hales², Kristen M. Ulmer¹, Rick J. Rasby¹, Steven D. Shackelford², Harvey C. Freetly², and Mary E. Drewnoski¹, ¹*University of Nebraska-Lincoln, Lincoln, NE*, ²*USDA-ARS, US Meat Animal Research Center, Clay Center, NE*.
- 11:15 AM 873 **Gene expression of the hypothalamus in steers fed high-concentrate diet upon entering feedlot phase.**
Jason E. Griffin*¹, Zhongde Wang², Jeffrey A. Clapper¹, Robbi H. Pritchard¹, Keith R. Underwood¹, and Michael G. Gonda¹, ¹*South Dakota State University, Brookings, SD*, ²*Utah State University, Logan, UT*.

Author Index

Numbers following names refer to abstract numbers; a number alone indicates an oral presentation, an M preceding the number indicates a Monday poster, a T indicates a Tuesday poster, and a W indicates a Wednesday poster. Monday, Tuesday, and Wednesday posters are listed first, followed by orals in numeric order.

The author index is created directly and automatically from the submitted abstracts. If an author's name is typed differently on multiple abstracts, the entries in this index will reflect those discrepancies. Efforts have been made to make this index consistent; however, error from author entry contributes to inaccuracies.

- A**
- Aamand, G. P., 753
Abbas, H. M., W138
Abbott, J. R., T235
Abdalla, A., W229
Abdalla, A. L., T514, 292
Abdalla, E. A. E., T97
Abdalla-Bozrayda, S., T97
Abdalla Filho, A. L., 292
Abdelaal, H. A., 254
Abdel-Rahman, G. A., T374
Abdullah, M., T442, 628
Abecia, J. A., M219
Abel, J. M., 131, 132, 408
Abell, C., M25
Abell, C. E., W16
Abioja, O. M., W238
Abiona, J. A., W238
Abojnah, Y., T144
Aboujaoude, C., M91, T84, T85, W66
Abra, M. B., M450
Abreu, A. R. C., W228
Abreu, A. S., 812
Abreu, D. C., 602
Abuajamieh, M., M40, W45, 246, 364, 490, 846
Acciaro, M., W491
Acedo, T. S., M331, M332, W294, 612
Acharya, I., T202, W196, 278
Acharya, S., M41, T171, T181, 172, 856
Achberger, E., W273
Achilonu, M. C., M492
Acker, D. G., 485
Acosta, D. A. V., M217, M404
Acuña, J., T402
Adams, A. E., M272, M273, M274, M275, M276, 136, 138, 139, 148
Adams, M. C., 656, 657
Adams, R., T62
Adams Progar, A., 696
Adams-Progar, A. L., M6
Adán, S., T507
Adderley, N. A., W10
Adebisi, A. E., T515, T517
Adebisi, O. A., W109
Adejumo, I. A., W109
Adeleke, M. A., M74
Adelusi, O. O., 271, 823
Adenaike, B. D., W238
Adeniji, O. A., W109
Adeola, L., M192
Adeola, O., M194, M516, 119
Aderinboye, R. Y., W209
Adesogan, A., 389
Adesogan, A. T., M383, T28, T470, T477, W166, W172, W190, W355, W367, 161, 216, 272, 832
Adewuyi, S. T., 271
Adjei-Fremah, S., M483
Adjou, K., M62
Afanador-Tellez, G., M197, T285
Agarussi, M. C. N., M325, W169, W170
Agarwal, S., 566
Agarwal, U., W255
Agboola, A. F., 795
Agenäs, S., 726
Agenbroad, A., W272
Aghaei, A., 861
Agrawal, A., 463, 464
Aguerre, M. J., W443, W462
Aguilar, P. R., M100
Aguilar, I., M67, T106, W80, 534, 535, 646
Aguilar-Aguilar, J. M., M437
Aguilar-Pérez, C. F., M442
Aguirre, R., W237
Agyekum, A. K., M491, W111
Ahmad, I., 840
Ahmad, M., 585
Ahmad, N., 134, 585, 628, 840
Ahmadpour, A., W469
Ahmadzadeh, A., M241, M303, 483, 841
Ahmed, B. M., W268, 808, 809
Ahola, J. K., M232, T342
Aiken, G. E., W36, 264
Ajanaku, A. O., 413
Ajao, O. A., 629, 843
Ajuwon, K., M194, W214
Ajuwon, K. M., M516
Akanwa, C. L., T330
Akbari, K., W342
Akers, K. A., 275
Akers, M. M., 452
Akers, R. M., T223, T229, T264, W218, 419
Akin, I., T54
Akins, M., T391
Akins, M. S., 281
Akinyemi, B. T., 273
Akison, L., 326
Akwetey, W. Y., 414
Al Abri, M., T236
Al Abri, M. A., T37
Al Naib, A., 452
Alabi, J., W244
Alam, M., T93, T94
Alamouti, H. R. M., M447, T494, W339, W342
Alarcon-Rojo, A. D., T107
Alarcón-Zúñiga, B., M403
Alas-Avelar, N. P., M437
Alas-García, E. A., M437
Alatengdalai, W466
Alavi, S., W99, W103, 393
Alayón-Gamboa, J. A., M442
Alazzeah, A. Y., M333
Albanell, E., T520, T521
Albarran-Portillo, B., T331
Albertini, T. Z., T433
Albino, L. F. T., M172, 306
Albrecht, E., M157, M164
Albuquerque, L. G., T83, W58, W59, W66, W72, W77, W78
Alcalde, C. R., M473,
Alcantara, A. A., M512, M513
Al-Doski, S., 112
Aldrich, C. G., W97, W99, W103, W105, 122, 393
Aldrich, G., W95
Aldrich, J. M., M365, T439
Alencar, M. M., W69
Alencar, S. M., 292
Alende, M., M420, 162
Alexander, B. M., 243
Alexander, L., W145
Alfred, C. R., M453, M454, M457
Alhadas, H. M., W436
al-Haddad, A., M262
Ali, A., T104
Ali, R., 209
Ali, R. A., 752

Alias, E., W190
 Allee, G., 310
 Allen, J. D., M262
 Allen, J. C., T261
 Allen, M. S., T397, T410, 171, 476, 824
 Allison, C., T117
 Allwardt, K., T67
 Almeida, A., W493
 Almeida, A. K., T497
 Almeida, F. N., 310
 Almeida, M. T. C., M463, T482, T519, T529, W507
 Almeida, N. M. d. C., M465
 Almeida, R., M290, M350, M355, T433
 Almeida, T. W., M182, M183
 Almeida, V. V., W230, W231, W400, W404
 Alpízar-Naranjo, A., T255
 Alqarni, S., T476
 Altman, A. W., W17, W36, 730
 Altman, J. A., T75
 Altman, M. B., T75
 Aluggingo, G. M., T455
 Alugongo, G. M., M451, T446
 Aluko, K. R., M510, M511
 Aluthge, N., W433
 Aluthge, N. D., T452, T453, W430
 Alvarado, M. S., W168
 Alvarado, R., T353
 Alvarado-Espino, A. S., T501, T505, W476, W478
 Alvarado-Espinosa, J. F., T526
 Alvarado-Gilis, C., 806, 807
 Alvarado-Gilis, C. A., W458, W461, 104, 105
 Alvarenga, P. V. A., W230, W231, W236
 Alvarez, G., W281
 Alvarez, J., 256
 Alvarez-Oxiley, A., W249
 Alvear, C., W4
 Alves, A. A., M24, M466
 Alves, B. G., M443
 Alves, B. R. C., 4
 Alves, D. D., W496, W497, W498
 Alves, L. C., T367, W164
 Alves, M. A. P., M338
 Alves, M. B. R., 635
 Alves, N. L., T502
 Alves, S. P., T258
 Alves, T. C., 876
 Alves de Azevedo, R., M381, M384, M387, W345, W346, 149
 Alves de Oliveira, H., T176, W165
 Alves Lino, F., W397, W403
 Alves Porto Meschiatti, M., W463
 Alward, K. J., 226
 Aly, S. S., W24, W35
 AlZahal, O., W328
 Amadori, M. S., T73
 Amamcharla, J., T112, 72
 Amamcharla, J. K., M7, W151, W152
 Amanlou, H., 851, M447, T205
 Amanullah, S. M., T461, T470, T480, W172, W194
 Amao, O. A., W241
 Amaral, H., M356, M359, M362
 Amaral, P. d. M., T366
 Amaral, P. M., W436
 Amaral-Phillips, D. M., M11, 215, 221
 Amaro, F., T477, W355, 161, 832
 Amaro, F. X., W166, W169, W190, 272
 Ambrose, D. J., M214, M215, M216, W258, W259, 284, 584
 Amen, T. S., 646
 Ames, N., W117
 Ametaj, B., T44, T45
 Ametaj, B. N., T5, T6, T7, T8, T9
 Amills, M., T507
 Amin, K. N., T196
 Ammah, A. A., T279
 Amorati, B., T361
 Amorim, R. N. L., W505
 Amorin, A. B., T299
 Amoroso, L., W46
 Amstalden, M., 4, 443
 Amundson, L. A., T290, T291
 Amundson, O. L., M229, T317, 133, 369
 Anand, S., T141, T197, W144, W145, 405
 Andersen, P. H., 248
 Anderson, C., T453, T493
 Anderson, C. L., T452
 Anderson, D. E., M423, 331
 Anderson, J. L., M340, T415, T416, T418, T426, T459, W329
 Anderson, L. H., M227
 Anderson, M., 725
 Anderson, M. J., M515, T241, T244, T536, W243
 Anderson, R., T173
 Anderson, R. C., M328, T351, W266, 828, 829
 Anderson, R. J., W24
 Anderson, R. V., 444
 Andrade, R. R., T183, W199
 Andrade, T. S., M224, M310, T500
 Andrae, J., M420
 Andrae, J. G., 218
 André, A., W102
 Andreini, E. A., T67
 Andres-Barranco, S., 237
 Andretta, I., M173, M505
 Andries, K. M., M476
 Andrieu, S., W350
 Anele, U. Y., T349, T373, T374, T375
 Anelich, C., W207
 Angel, C. R., T465
 Angel, O., W477
 Ángeles-Hernández, J. C., 791
 Angel-García, O., T526, W487, W488
 Angulo, A. E., T528
 Annibale Vendramini, T. H., W383
 Anthony, R. V., M51
 Antonio-Molina, G., T525
 Antunes de Lemos, M. V., T84, T85
 Antunes-Fernandes, E. C., 594
 Ao, C. J., M448, T456
 Ao, J., T295
 Ao, Z. G., 835
 Aparecida Izepi da Silva, M., M158
 Aparecido Ferro, J., M98
 Aperce, C. C., W311, 870
 Apgar, G. A., M508
 Apple, J. K., T527, 106
 Applegate, T. J., 591
 Appuhamy, J. A. D. R. N., M281, W281, W354, 596, 615, 625
 Aragona, K. M., M130, 622
 Araki, H., M356
 Aranda-Osorio, G., T158, T332
 Arango, J., M70
 Arantes Alvarenga, P. V., W235
 Araújo, C. E., W321, W322
 Araujo, C. M., W408
 Araújo, D. L. d. C., M465
 Araujo, G., W247
 Araújo, J. d. S., M465
 Araujo, J. M., T70
 Araújo, L. F., T294
 Araujo, M. J., M458, T504
 Araújo, R. C., T392
 Araújo, S. S., M472
 Araujo Batalha, C. D., W304
 Arcari, M. A., M443, 613
 Arcaro, J., T160
 Arce, J. A., T342
 Arceo, D. M., 178
 Arceo, M., 749
 Archibeque, S. L., T342, 346
 Arcuri, P. B., M370
 Ardalan, M., M440
 Arece-García, J., M56, T255
 Arechiga-Flores, C., W435
 Arelaro, L. F., T231
 Arellano, G., W477, W486
 Arellano-Rodriguez, G., W476, W480, W488, W487
 Arent, S., 113
 Arevalo Pinedo, L., W398
 Argüello, A., M471, M472, T248, T253, T254, T256, T257, T265
 Arias, F., 25
 Arias, R. A., 806, 807
 Arigbede, M. O., 273
 Aris, A., M267, T34, T267, 22, 723
 Arispe, S., 28
 Ariza-Nieto, C., M197, T266, T285
 Armendariz, C. K., M440
 Armentano, L. E., M279, T395, W11, W379, 488, 525

Armstrong, S. A., M44, M428, M464, M467
 Arnot, C., 34
 Aronovich, M., T483
 Arosh, J. A., 325
 Arrellano-Rodríguez, F., T505
 Arriaga-Jordan, C. M., T331
 Arrigoni, M. D. B., W296, W308, W310
 Arriola, K. G., M383, W166, W190, W355
 Arroquy, J. I., W402
 Arruda, I., 163
 Arthington, J. D., T337, T338, 710, 711
 Artioli, L. F., T355
 Artioli, L. F. A., T337, T338
 Aryana, K. J., T136, T137, T138, T143
 Arzapalo, P. I. D., 178
 Arzola, C., T173, W266
 Arzola-Alvarez, C., W181
 Asar, T. O., W268, 808, 809
 Asem-Hiablie, S., 697
 Asiama, E., M483
 Astesiano, A. L., W449
 Astessiano, A. L., T356, T362, W428, 743
 Astiz, S., M252
 Atarashi, F., T389
 Atayde dos Santos, L., W454
 Atkin, M. J., M13, T66
 Attaie, R., M101
 Atzori, A. S., T509
 Auclair, E., M62
 Augusto da Cruz, E., 499
 Austin, K. J., 243
 Auty, M. A. E., 563
 Avedoza, C. G., W424
 Avelar, E., M514
 Avendaño, S., 262
 Avila, A. R. A., M412
 Avila, S. C., M482
 Avilés, C., W75
 Avilés Nova, F., M124, W504
 Awati, A., M180, 793, 794
 Axe, D. E., 309
 Axman, J. E., W458, W461, 104, 105, 866, 870
 Ayala-Burgos, A. J., M442
 Ayangbile, G. A., W481, W482, W483
 Aylward, B. A., 293
 Azad, E., M41, M333, M374
 Azain, M. J., 119
 Azarpajouh, S., M25
 Azenha, M. V., T180, T184
 Azevedo, E. T., T340
 Azevêdo, J. A. G., M347, M354
 Azevedo, P., T19, 248
 Aziz Abadi, H. J., W192
 Azizi, M., M106, W135
 Azzone, J., 459

B

Baah, J., W191, W205
 Baars, J. J. P., 606
 Baba, T., W89
 Babinszky, L., 761
 Bach, A., M31, M267, M268, T34, T267, T370, T376, T407, W18, W247, W380, 22, 723
 Bacha, C. B., T484
 Backes, E., M46
 Backes, E. A., W62, 636
 Badaoui, B., M156
 Badhan, A., M436
 Baer, D. J., 773
 Baes, C. F., 384, 545
 Baez, G., 324
 Baez, G. M., M239, M277, M363, 129, 315, 678
 Baez, J. P., 360
 Baffa, D. F., M461, M462
 Bagnato, A., 384
 Baguma, Y., 555
 Bahram-Parvar, M., T128
 Bai, C., M448
 Bai, W., W239
 Baiao, N. C., W227, W228
 Baião, N. C., M258
 Baidoo, S. K., 119
 Baik, M., M88, T307, T377, W292, W293
 Bailey, E., M85
 Bailey, E. A., W270, W448, 339, 815
 Bailey, K. L., M27
 Baillargeon, J.-P., 801
 Bailleres, M., W333
 Bainbridge, M., M256, 598
 Bainbridge, M. L., T405, 166
 Baird, C., W126, W127
 Balachandar, V., M69
 Balasubramanian, B., M198, M204, 838
 Balcells, J., M438
 Baldassin, S., M344, M371
 Baldi, F., M91, M98, T83, T84, T85, W66, W72, W77, W78
 Baldi, F. S., M161, T81
 Baldin, M., M394, M415, W456, 286, 469
 Baldo, G. A. A., T73
 Baldone, V. N., M49
 Baldwin, T. J., 26
 Balieiro, J. C. C., M161, M179, M184
 Ball, L. L., M379
 Ballard, C. S., M32, W351, W386, 165, 621
 Ballou, M. A., M37, M309, T309, W26, W38, W330, W352, W409, 27, 153, 249, 494, 505, 518, 589, 590
 Balsalobre, M. A. A., M317
 Balseca-Paredes, M. A., W178, 265
 Balthazar, C. F., T123, T124, T125, T126

Bamikole, M. A., T477, W166, W190, W355, 161, 832
 Ban, J., M75
 Ban, Y., M139, M368, M449, T469, T478, W414, 332
 Banadacki, M. D., M447
 Bandyk, C. A., W163
 Bang, H., T316
 Bannink, A., T404, 169, 681, 825, 857
 Banta, J. P., W22, 67
 Banu, S. K., 325
 Banys, V. L., T398, W158
 Bao, H., W437
 Bapst, B., 384, 545
 Barajas, R., M45, M47, M323, M327, M518, W237, W271, W275, W470, W471
 Baravalle, C., 804
 Barazandeh, A., M82
 Barba, I., T251, T252, T253, T254, T256, T257
 Barba, L., T251, T252
 Barbano, D. M., M32, T192, 81, 471, 656, 657, 659
 Barbarick, K., 642
 Barba-Vidal, E., W47
 Barbe, F., 438
 Barbieri, R., T171
 Barbosa, D. C., T475
 Barbosa, E. F., T414, W360
 Barbosa, F. A., T341, W263
 Barbosa, J. L., W497, W498
 Barbosa, M. M., T359
 Barbosa, M. M. C., T169
 Barbosa, N. A. A., M172
 Barbosa, N. C. G., W302
 Barbosa, V. M., M257, M258
 Barbosa Carvalho, V., M321, M322
 Barbosa da Silva, M. V. G., W69
 Barbosa de Andrade, M. E., T518
 Barcellos, J. O., T340
 Barcellos, J. O. J., M100
 Barcelos, B., W442, 635, 184
 Bargo, F., T402
 Barkema, H., M251, M292, T52, 497
 Barker, C. M., T230
 Barletta, R. V., M277, 129, 678
 Barley, J., T32
 Barling, K. S., 610
 Barmore, J. A., M349
 Barnard, A., 293
 Barnett, R. L., W465
 Barnhart, K., T64
 Baron, V. S., 417
 Barragan, A. A., T4, T39, 362, 500, 733
 Barragan, H. B., T496
 Barrera-Almanza, S., W29
 Barreras, A., T523
 Barreto, R. d. S. N., 124, 125
 Barrett-Wilt, G. A., T240
 Barrile, L., W101, 394

Barrionuevo, M. C., W402
 Barros, C. C., M90, M95
 Barros, M., M356, M359
 Barros, T., W388
 Barry, D. M., 629, 843
 Barry, M. C., W324
 Bartels, W., 418
 Bartimus, H. L., T190, T510, W501
 Barton, B. A., M352
 Baruselli, P. S., T306, W262
 Bas, S., M242, T39, 362, 500, 733
 Basham, M. D., 636
 Basinger, K. L., T510, T527, W501
 Basiricò, L., T314
 Bass, C. S., T319
 Bassiony, S. M., T374
 Bastin, C., 10, 13
 Basto, D. d. C., W302
 Bastola, K. P., T129, W139
 Basu, U., 284
 Batalha, C. D. A., M331, W302
 Bateman, H. G., M365, T439, 155
 Bates, R. O., M76, 486, 532, 767
 Batista, A., T122
 Batista, E. D., M440, T358, 333, 335
 Batista, E. O. S., T306, W262
 Batistel, F., 706, 707
 Battacone, G., T110
 Baucells, J., M252, M266
 Bauman, D. E., T278
 Baumann, E., M378
 Baumberger, C., M264
 Bäumer, S., T467
 Baumgard, L. H., M40, W45, W110, 246, 364, 490, 800, 846
 Baumont, R., 179
 Bawa, D., T197, W144, 405
 Bax, A. L., T190, T189, T510, T527, W501
 Baxter, K., M415, 286
 Bayourthe, C., T481
 Bazemore, K. M., T117
 Bazemore, R., T117
 Bazinet, L., W148
 Beatty, N. F., M392, W369
 Beauchemin, K. A., T357, W280, W429, 595, 822
 Beaudry, K. L., M131
 Beaulieu, D., 572
 Beauregard, A., M391
 Beck, P., M46, T379, 742
 Becker Birgel, D., 184
 Beckers, J. F., W249
 Beckers, Y., 694
 Beckman, S., W144, W145, W146
 Bedere, N., 277
 Beever, J. E., 524
 Beguin, J. M., T422, T473
 Begum, M., M200, M204, M205, 838
 Behrens, J. H., W137
 Behrouzi, A., 584
 Beitz, D. C., 283, 591
 Bélanger, G., 417
 Bell, N. L., M328, T351, 828, 829
 Belliere, L. K., 655
 Bellingham, M., 9
 Bello, N., 525
 Bello, N. M., M76
 Beloshapka, A. N., 396
 Beltrame Benatti, J. M., W313
 Beltranena, E., W232, 574, 575, 837
 Belveal, J., W502
 Benatti, J. M. B., W312
 Benavides-Varela, D., T14, W23
 Benchaar, C., M408, M409, T279, T385, W278
 Benda, E. D., M392, W369
 Bender, R. W., M2, M349, M351, 699
 Benedeti, P. D. B., T361
 Benez, F. M., M33
 Benfield, D., M337
 Benheim, D. A., M396
 Benjamin, A., W37
 Benjamin, A. L., 29, 512, 518
 Bennett, R., M104, M105
 Benoit, S., 660
 Benson, A. K., 527, 530
 Benson, M. E., M446
 Bento, C. B. P., M370
 Benyi, K. K., 629, 843
 Benz, S. A., W44
 Bequette, B. J., M55, W255
 Beranger, J., T233
 Berchielli, T. T., M311, M317, M320, M434, M435, M445, M450, T378, T464, W291
 Berenchtein, B., W229
 Berends, H., 336, 830
 Berendss, H., M138
 Bergeron, R., 90, 154, 496, 501
 Berghorn, L. W., W386
 Bergsma, R., 764
 Berhow, M. A., T459
 Bermejo, L. A., T507
 Bernabucci, U., T314, W87
 Bernard, J. K., M284, W323, 217, 808
 Bernardes, P. A., W69, T169
 Bernardes, T. F., M383, T477, W190, 161, 832
 Bernardini, C., W212
 Berndt, A., 876
 Bernhard, B. C., 371
 Berry, D. P., M118, 260, 375, 679
 Berry, E. D., 530
 Berryhill, G. E., 95
 Berti, G. F., M338, W316, W454
 Bertics, S. J., M8, M352
 Berto, D. A., M26, T299
 Berto, P. N., T299
 Bertocco Ezequiel, J. M., M321, M322
 Bertoldi, G. P., W308, W309
 Bertoloni, A. V., T500
 Berton, M. P., M91, T81, T84, T85, W66, W72
 Bertoni, J. C., W318
 Bertram, M. G., 636
 Bertrand, J. K., W51, W54, 646
 Bernalhok Jacometo, C., 318, 319, 320
 Bessa, R. J. B., T258
 Beth de Ondarza, M., T448
 Bettencourt, E. M., 446
 Bettencourt, N. D., 814
 Bettero, V. P., M367, M377
 Bettis, S. E., T472
 Beverly, M., 725
 Beverly, M. M., M515, T241, T244, T536, W243
 Bewley, J. M., M9, M10, M11, M15, M132, M246, M291, M379, T200, T207, 80, 93, 196, 221, 229, 275, 353, 407, 813
 Bezerra, A., M52
 Bezerra, A. B., T68
 Bezerra, L. R., M458, M459
 Bhatt, H., M104, M105
 Bhatti, J. A., 628
 Bhukya, B., T168, 513
 Bi, P., 669
 Bi, Y., T228
 Biagioli, B., W283
 Bian, Y., M151
 Bianchi, L. M., T118
 Bicalho, F. L., T341, W263
 Bicalho, R., T26, W88, 23, 359, 509
 Bicalho, R. C., M211, M305, T101
 Bichard, M., T88
 Bickhart, D. M., W84, W86, 537
 Biehl, M. V., M224, M225, M230, M310, M444, T500, 613
 Bienzle, D., T204
 Biffani, S., W87
 Bigham, G. D., 507
 Bilal, G., 689
 Bilby, T. R., 55
 Binversie, E. S., W31
 Binyameen, M., 585
 Bionaz, M., M44, M376, T50, T51, T53, W502, 91, 298, 299
 Bird, S., W55
 Birgel, D. B., 635
 Birgel Junior, E. H., 184, 635
 Bishop, B. E., 131, 132, 408
 Bishop, S. C., 768
 Bisinotto, R. S., T322, 328, 704
 Bissonnette, N., T279, W94, W112
 Biswas, A. A., T211, W410
 Biswas, A. C., W131, W146
 Biswas, D., 145
 Biswas, S., M281
 Bitencourt, F., M255
 Bittar, C. M. M., M344, M369, M371

- Bittner, C. J., M48, M316, W433
 Black, R., 495
 Black, T. E., T148
 Blackburn, H., 634
 Blackburn, H. D., 531
 Blackmon, T. L., M426
 Blair, H. T., T345
 Blair, S. J., M380
 Blanc, C., T31, W32, W33
 Blanco-Ochoa, M., W459
 Blanton, J. R., 108
 Blas, V., T259
 Blässe, A.-K., T302, T445
 Blavi, L., M195, M196, M497, M499, T281, 191
 Blavy, P., 684
 Blenis, J., 386
 Block, E., T396, W60, W61, 603, 704, 854
 Bloedorn, D., M480
 Blom, E. J., M423, 331, 614
 Blount, A., W171
 Blount, A. R. S., W180
 Boada, K. M., T260
 Bobe, G., M44, T50, T51, T53
 Bobel, J. M., T235
 Bocer, T., T146
 Bochantin, K. A., M10
 Bocourt, R., M61
 Bocquier, F., W474
 Boczonadi, A., 698
 Bodine, T., M446
 Boe, R., W506
 Boeckmann, C. L., T189
 Boehmer, B. H., T347
 Boesche, K. E., M372, 285
 Bogaert, H., 421, 423
 Bohlen, J. F., M247, 226, 232
 Bohnert, D., M261, 28
 Boisclair, Y. R., W363, 472, 473
 Bok, J., M54, M88
 Bokelman, G. E., T74
 Bokkers, E., 830
 Bokkers, E. A. M., 845
 Boland, M. P., 287
 Boland, T. M., W492, 177, 179, 182, 183, 631, 633, 853
 Boligon, A., 651
 Bollwein, H., T277, T312, 680
 Bolsen, K. K., M128, T149
 Bolsen, R. E., T149
 Bombardelli, G. D., M265, T1, W8, W28
 Bomfim, G. F., T274, T275
 Bonagurio, L., M169
 Bonato, M. A., M512, M513
 Bond, G. B., 497
 Bondurant, R. G., W297, 341, 833
 Bonfante, E., 605, M259
 Bonfatti, V., 382
 Bonilha, S. F. M., W56
 Bonin, M. N., W314
 Bonnaillie, L. M., T116, W154
 Bono, J. L., 527, 530
 Bontempo, V., W112
 Booker, H., T478, W414
 Boor, K. J., 778
 Borchardt, M. A., 636
 Borchers, M. R., 353, M132
 Borda, E., T300, W384
 Borges, H. T., M146
 Borges, I. E., W400, W404
 Borges, L. A., T169
 Borges, L. L., W46
 Borghi, T. H., M468
 Bormann, J. M., 523
 Borowicz, P. P., 338
 Bórquez-Gastelum, J. L., T530
 Borquis, R., 651
 Boselli Bussioli, H., M321
 Bosworth, S. C., 263
 Bothe, H., T4, 733
 Bouland, J., T69
 Bouma, A., W125
 Boutinaud, M., T268, 98, 99
 Bova, T., T532
 Bova, T. L., T238, T246, T247, 673
 Bovenhuis, H., 12, 751
 Bowdridge, E. C., T311
 Bowdridge, S. A., T311
 Bowen, D. A., W337
 Bowen, L., M420, 162, 624
 Bowyer, A., 624
 Bradford, B. J., M149, M419, W370, 460, 492
 Bradford, H. L., 523
 Bradley, C. A., W357
 Bradley, C. M., W387
 Bradley, J. S., T224, T229, W218
 Braga, J. F. V., W228
 Braga, J. S., M33
 Bragagnolo, N., W136
 Braghini, R., T160
 Brainard, A. M., M375
 Brake, D. W., M423, T59, 331, 614
 Braman, W. L., W320
 Brameld, J., 109, 112
 Brameld, J. M., 50
 Branco, A. F., 597, 850
 Branco, G. C. L., T68
 Branco, R. H., W56
 Brand, T. S., M168, M488
 Brandão, M. I. B., W269
 Brandão, V. L. N., W187
 Brandi, R. A., W503
 Branham, K., T67
 Branham, K. A., 524
 Branine, M. E., T371, 867
 Brannick, E., 293
 Brassard, M. E., M484, M485
 Brauer, C. L., 506
 Brauner, C. C., T2, M218, 817
 Bravo, D. M., T431, 49
 Braz, W. D., T1
 Brem, G., T99
 Bremel, R. D., W34
 Brennan, K. M., M313, M326, W220, W350
 Breves, G., T420
 Brick, T. A., 362
 Bridges, G. A., M232, W55
 Bridges, P. J., M227, T310
 Brink, G. E., M121
 Brister, J. L., T246, T247
 Brito, A. F., M120, M386, M406, T393, T424, T444, 622, 732
 Brito, C. B. M., 394
 Brito, E., W229
 Brito, L. F., T180, T184
 Brito, L. F. C., 3
 Britten, M., W149, 79
 Broadbent, J., T134, T139, 561, 562
 Broadway, P. R., M37, M59, T25, T309, W26, W42, 27, 505, 589, 590
 Brochado, T., W503
 Broderick, G. A., M437, M441, T199, T212, T429, T435
 Broocks, A., T67
 Brooks, S., T236
 Brostaux, Y., 658
 Brouk, M., T41
 Brown, A. J., 231
 Brown, A. N., T381
 Brown, B. M., 452
 Brown, D., W341, 109, 112
 Brown, D. J., 716
 Brown, D. S., 408
 Brown, L., M314
 Brown, T. F., M3
 Brown-Brandl, T., 806, 807
 Bruckmaier, R. M., M87, M209, M212, T13, T276, T277, T312, W469, 101, 281, 432, 433, 680
 Bruneau, C., T363
 Bruno, K. A., W17, 730
 Bryan, K. A., W320
 Bryan, L. K., W42
 Bu, D. P., M152, M153, W411, W413, W415, W416, W417, W419, W420, W421, W422, W423, 435
 Buckley, F., M118
 Budiño, F. E. L., M182, M183
 Buel, G., 386
 Buenabad, L., W110
 Buerk, M., 777
 Buff, P. R., 390
 Buitenhuis, B., 751
 Buitrago, J. A. G., M210
 Bull, T., 258
 Burakowska, K., W464
 Burciaga-Robles, L. O., 516

Burdick Sanchez, N. C., M37, T309, W36,
W42, 27, 505, 589, 590
Burdikova, Z., 563
Burfeind, O., W15
Burg, P., 655
Burger, C. A., M155
Burgos, F. C., T528
Burhans, W. S., M366
Burken, D. B., M316
Burkey, T. E., W106, W107, W108, 790
Burnett, D. D., 104, 105
Burnett, T. A., M245, 842
Burnley, C., M288
Burns, G. W., W90
Burns, P., W242
Burriss, W. R., M227
Burrola-Barraza, M. E., T513
Busalacki, A. K., T190
Busato, K. C., M318, M324, W290
Bussoli, H. B., M322, W507
Butler, J., M375
Butler, S., 316, 317
Butler, S. T., 329, 679
Butler, W. R., M90, M95
Buzanskas, M. E., W69
Buzinaro, S. F. B., T482
Byck, P., 593
Byrd, E., M63, M64, 35, 36

C

Cabezas-Garcia, E. H., W450
Cabo, A., T258
Cabral, A. R., M158, M163
Cabral, A. R. R., T70
Cabral, G. F., W405, W406
Cabral da Silva, M., M429
Cabrera, R., 114
Cabrera, R. A., 118
Cabrera, V. E., M279, 350, 406
Cacite, F., W396, W439, W440
Cadesky, L., 70
Cady, R. A., W284, W285, W287, 211
Caetano, A., 634
Caetano, M., M350
Cai, D., 195
Caires, K. C., M80, T239
Caixeta, L., 755
Caixeta, L. S., W363, 472, 473
Caja, G., M156, T520, T521
Caldari, C., W96
Caldas, E. O. L., M258
Caldeira, M. O., M213
Calderón-Leyva, M. G., T505, T526, W487,
W488
Caldwell, J. D., T189, T190, T510, T527,
W501, 636
Calkins, C., 372
Callanan, J., M6

Callaway, T., W301
Callaway, T. R., M328, M334, T351, 828, 829
Calomeni, G. D., M367, M377, W318, W321,
W322
Calsamiglia, S., M252, M266, M278, T409,
T457, T468, W384
Calus, M., 380
Calus, M. P. L., 260
Calviello, R. F., M23, W2
Calvo-Lorenzo, M. S., M27, T67, 371
Camacho, A., M323, M327, W275
Camacho, C., M43
Camacho, L. M., T234
Camargo, G. M., 651
Camargo Junior, A. G., M321, M322
Camera, M., M145, M146, M147, M148
Camilo, F. R., W294, W452, W453, W455,
W457
Campanili, P. R. B., 607
Campbell, B. T., W210
Campbell, J., 461
Campbell, M. A., M32, 165
Campion, F. P., W492, 177, 182, 183, 631,
633
Campos, A., W166
Campos, A. F., T364, T365
Campos, C. C., M231
Campos, G. A., T294
Campos, M. M., M345, M347, M354, M370,
M384, M387, W378
Campos Carneiro, J., W381
Campos Martins, P., W345, W346, W381,
149
Campos-Granados, C. M., W23
Cañas-Álvarez, J. J., W75
Canellas, L. C., T340
Canesin, R. C., M445
Canestrari, G., 605, M259
Cannas, A., T502, T509, W491, W506
Cano, O., T34
Canovas, A., T409, T507
Cant, J. P., M364, 354, 430
Cantalapiedra-Hijar, G., 617
Cantarelli, V. d. S., M505
Canterberry, S. C., M60
Canterbury, L. G., W270
Canul-Solis, J. R., M442
Cao, S. Y., W412
Cao, Z., M19, M123, M125, M451, T228,
T450, T455, W326, 152
Cao, Z. J., T446, W327
Capel, M. B., 847
Capelari, M., 820
Capelesso, A. S., T466
Capote, J., M471, M472, T265, T507
Cappelozza, B., M261, 28
Cappelozza, B. I., M133
Caprio, A., 626
Capuco, A. V., T264, 419

Caputo, J., 707
Carabaño, M. J., W75
Caramalac, L. S., T337, 711
Carbonari, V., T508, 181
Carciofi, A. C., W100
Cardoso, B. O., 678
Cardoso, F., M217, T320
Cardoso, F. C., M358, M360, M404, T154,
T156, T217, T476, W7, W357, W362,
W364, W368, 456, 457, 702, 858
Cardoso, F. F., T414, T447, W182
Cardoso, G. J., M148
Cardoso, R. C., T176, W165, 4
Cardoso, V., T98
Cardoso Alves, L., W426
Cardoso da Conceição, E., W403
Cardoso dos Reis, A., W498
Cardoso Sanchês, S. S., W161
Carey, B., 853
Carlisle, A. E., 416
Carmago Verdurico, L., W383
Carmichael, D., 61
Carmo, A. S., M370, W79, W92
Carmona, L., W4
Carnahan, K. G., M241
Carneiro, B. C., 446
Carneiro, J. H., M350
Carneiro, J. C., M345
Carnier, P., 382
Carpenter, A. J., M149, M419, W370, 460
Carr, A., M104, M105
Carr, C., 197
Carrara, T. V. B., W310
Carrascal, E. L. T., M243
Carreño, L. O. D., T78, T79
Carrillo, E., W477, W478, W480
Carrillo-Castellanos, E., T501
Carriquiry, M., T356, T362, W52, W428,
W449, 502, 685, 743
Carro, M. D., M43, M61, T485, T486, T487,
W175, W431
Carroll, J. A., M37, M59, T25, T309, W26,
W36, W38, W42, W330, W352, W409, 27,
153, 505, 589, 590
Carson, D., T52
Carson, M., M364, 158, 430
Carstens, G. E., 610, 736
Carstens, P. D., M168
Carter, B., M446
Carter, S. D., M27, 119
Cartwright, S. L., 511
Carulla, J. E., M430
Carvalho, R., T83
Carvalho, A. L. E. G. F., M311, M450, W291
Carvalho, B. C., W221
Carvalho, B. H. R., T176, W165
Carvalho, E. B., T519, T529
Carvalho, F. F. R., T68, T504
Carvalho, G. B., M258

- Carvalho, G. G. P., W399, W401
 Carvalho, I. P. C., T464
 Carvalho, I. Q., M350
 Carvalho, J. R. R., M324, W290
 Carvalho, M. G., T170
 Carvalho, P., 351
 Carvalho, P. D., M236, M263, M277, T306,
 T324, W262, 329, 446, 675, 676
 Carvalho, V. B., T519, T529
 Carvalho Filho, I., 110
 Carvalho Marcolino, C., W317
 Casal, A., T362, W52, W449, 743
 Casares, L., W299, W333
 Casellas, J., M93, T507
 Casey, K. D., 339
 Casey, T., 295, 296
 Cash, K. A., W501
 Casper, D., T202, W196, W385, 278
 Casper, D. P., M286, M340, M361, T157,
 W332, W358, 89, 156, 160, 172, 600, 856
 Casperson, B. A., M373, T218
 Casperson, J. L., T418
 Cassidy, J. P., 648
 Cassani, Y., 110
 Cassell, H. S., 747
 Cassiano, E. C. O., T471
 Cassida, K. A., 61
 Castagna, A., T483
 Castagnino, D. S., T410
 Castagnino, P., M434, M435
 Castagnino, P. S., M445, T464
 Castañeda, J. S. M., T234
 Casteel, T., T344
 Castelán Ortega, O. A., M124, W504
 Castellini, F. R., W230, W231, W234
 Castilha, L. D., M169, M170
 Castilho, R. A., W225
 Castilhos, A. M., M36, W56
 Castillejos, L., M252, M278, M500, W6, W47,
 120
 Castillo, G., W110
 Castillo, M., M93
 Castillo, M. S., W178, 265
 Castillo, S., 776
 Castillo, Y., T173
 Castillo-Caballero, C., M400
 Castillo-Gallegos, E., W459
 Castillo-Lopez, E., T452
 Castillo-Mata, D. A., 791
 Castrejón, F. A., W188
 Castro, F. F., W107, W108, W236
 Castro, F. G. F., W306, W452, W455, W457
 Castro, G. D., W187
 Castro, J. J., 48
 Castro, L. M., W70
 Castro, M. M. D., W269
 Castro, N., M45, M47, M471, M472, T248,
 T253, T254, T256, T257, T265
 Castro, P., W110
 Castro Filho, E. S., T519, T529, W507
 Castro Salas, J. M., M124, W504
 Castro-Ramos, A. M., T304, T305
 Caton, J. S., 338
 Catterton, T. L., 289
 Cavadini, J., M122
 Cavadini, J. S., M121
 Cavalcanti, L. F. L., M381, M384, M387, T289
 Cavali, J., T378
 Cavani, L., T78, T79
 Cayetano, J., W418
 Cayford, E. L., 227
 Cecon, P. R., T462
 Celeghini, E. C. C., 635
 Celi, P., 321
 Cellesi, M., 650
 Center, K. A., 636
 Cerny, K. L., M227, T310
 Cerri, R. L. A., M133, M245, M248, M293,
 M300, T201, W27, 839, 842
 Cerrillo-Soto, M. A., T514, W168
 Cersosimo, L. M., M256, T405, 166, 598
 Cervantes, A. A. P., M383
 Cervantes, B. J., M45, M47, M323, M327,
 W271, W275
 Cervantes, M., M176, M514, W110
 Cesar, A. S. M., M91
 Chae, B. J., W114
 Chae, K., T303
 Chagas, J., M283
 Chagas, L. J., M331, W302, W304
 Chahine, M., T155, W272
 Chai, H.-H., W67
 Chai, J.-M., M470, M487, 111
 Chaix, G., W102
 Chamberlain, A. J., 679
 Chamberland, J., W150
 Chamberlin, D. P., M3
 Chamon de Castro Menezes, G., T366
 Chamorro, M. F., 141, 142
 Chandler, T. L., M8, M137, M352, 357
 Chang, J. S., M446
 Chang, L. Y., 544
 Chang, S. S., W222, W223
 Chapinal, N., 759
 Chaplin, R., M162
 Chapman, B. R., M13, T66
 Chapman, C. E., M130, T203
 Chapman, J. D., M428, T25, T394, W323
 Chapman, K. J., 231
 Chapoutot, P., 616
 Charaien, B., M425
 Charbonneau, E., M412, W15, W361
 Chardulo, L. A. L., T82, W50, W58, W59
 Charif, A., 278
 Chase, C. C., T317, W475
 Chase, L. E., W393, 81
 Chaucheyras-Durand, F., 489
 Chaves, A. V., M347, M354
 Chaves, R. F., M506
 Chay-Canul, A., T525
 Che, L., W40
 Chebel, R., 359, T20
 Chebel, R. C., M265, M305, M306, T1, T49,
 T101, W8, W28, W257, 252, 503
 Checura, C. M., T240
 Chelikani, P., 782, 784
 Chen, B., 74
 Chen, C., M174, 543
 Chen, C.-Y., M72
 Chen, D., 577
 Chen, D.-D., 831
 Chen, D. W., W113, W115, 796, 835, 836
 Chen, H., 115, 114, 117
 Chen, J., 127
 Chen, L., T155, T469, W215, 436
 Chen, L. Y., T239
 Chen, M., T163
 Chen, Y., W124, W429, 415, 459
 Cheng, J., T38
 Cheng, N., T191, W129
 Cheong, J. Y., M206
 Cheschin Ernandes, M., W282
 Chesnais, J. P., 19
 Chester-Jones, H., M268, M285, M398,
 M399, T449, T451, W395, 64, 693, 696
 Chestnut, A. B., M365
 Chevaux, E., T292, W191, W205, W298, 610,
 613
 Chi, F., M489, T389
 Chiaia, H. L. J., M91, T81, T85, W66, W72
 Chiarle, A., T408
 Chiavegato, M. B., 593
 Chilibroste, P., W52, W428
 Chilson, J. M., 69
 Ching, S., M489, T389
 Chiquini, J. P. M., W46
 Chirgwin, D. L., M386, T424
 Chitakasempornkul, K., T282
 Chizonda, S., T261
 Chizzotti, F. H. M., W187
 Chizzotti, M., 110
 Chizzotti, M. L., M318, M324, M381, W290
 Cho, C., M54
 Cho, C. I., T93, T94
 Cho, J. H., M198, M199, M207, 194
 Cho, J.-H., M494
 Cho, K. H., T93, T94
 Cho, S. J., 303
 Cho, Y.-M., W67
 Choi, B.-H., W76
 Choi, E. J., W41
 Choi, I. H., T480, W172
 Choi, J., T303
 Choi, J.-W., W67, W76
 Choi, T. J., T93, T94
 Choi, Y., M54, M88, T316
 Choi, Y. H., T94

Choi, Y. J., M504
 Choi, Y. K., W41
 Choi, Y. S., W467
 Choo, A., 386
 Chou, M., 784
 Choudhary, R. K., M142, 297
 Choudhary, S., M142, 297
 Chouinard, P. Y., M378, M391, M405, M407, M412, T393, T410, W361, 700
 Chouinard, Y., M411
 Choy, Y. H., T93
 Christensen, C., M449
 Christensen, D., M135
 Christensen, D. A., M139, M368, W176, 332
 Christian, S., 545
 Christine, F., 545
 Chud, T. C. S., W69, W79, W92
 Chung, H., M97, W68
 Chung, K. Y., W74, W222, W223
 Chung, R., T412, T413, T446, T455
 Chung, W.-H., W76
 Cifuentes-Lopez, O., W418
 Ciobanu, D. C., W106, 649
 Cipriano, R. S., M226
 Ciriaco, F. M., T148, W60, W61, 425, 604, 826
 Claeys, M. C., 228
 Clapper, J. A., M220, 873
 Claramunt, M., T356, T362, 685
 Clark, C. A., 453
 Clark, J. D., M15, M379, T200, 229
 Clark, J. K., T510, W501, 636
 Clark, M., 293
 Clark, S., 283
 Clarke, J., 527, 530
 Clatamunt, M., 743
 Clavero, T., W206
 Clay, J., 225
 Clay, J. S., 687
 Claypool, C., M241
 Claypool, C. K., M303, 841
 Clayton, H., 429
 Clemency, L. E. G., 225
 Cleveland, M. A., 18
 Clevenger, D., 637
 Clifford-Rathert, C. A., T190
 Climaco, W. L. S., W227
 Cline, G. F., M250, 447
 Clutts, P., 735
 Coblenz, W. K., M121, M122, T391, 636
 Cobos-Peralta, M. A., T530
 Cochrane, F., M239
 Cochrane, R. A., T172, 787
 Cockrum, R. R., T223
 Coelho, S. G., M345, M381, M384, M387, T273
 Coetzee, J. F., M27, M140, W13, 727
 Coffey, E. L., 375
 Coffey, K. P., 636
 Coffey, M., 14, 260, 522, 525
 Cohick, W. S., 802
 Cokeley, R. E., W366
 Coker, C., M104, M105
 Colazo, M. G., M214, M215, M216, W258, W259, 284, 584
 Cole, J., 749
 Cole, J. B., T102, W85, W86, 538, 647, 687
 Cole, K., T64
 Cole, N. A., W430, W448, 339, 815, 863, 864, 865
 Coleman, D. N., M5, T219
 Coleson, M. P. T., M221
 Colette, S., W373, 467
 Colinet, F., 10
 Collao-Saenz, E. A., T398, W158
 Collar, C., T306, W262
 Collazos Paucar, L. L., W398
 Collier, J. L., M155, T25
 Collier, R., M262, 130
 Collier, R. J., M155, T25
 Coloma, W., T300
 Colombarolli Bonfá, H., T462
 Colombini, S., M441
 Colpoys, J., M25
 Colpoys, J. D., W16, 185, 241
 Columbus, D. A., 302
 Combs, D., T262, W159, W184, W208
 Combs, D. K., M2, M349, M351, M417, W173, W177, 699
 Conceição, E. C., M424
 Conceição dos Santos, E., W496, W497, W498
 Condas, L. A. Z., T52
 Cone, J. W., 606
 Conley, M. M., 416
 Connor, E. E., T10, W349, 525
 Consentini, C. E. C., T489, W405, W406, W318
 Consolo, N. R. B., T372, W300
 Constant, É., W94
 Conte, S., 90
 Conte-Junior, C., T130
 Conti, T. L., 184
 Contreras, G. A., W253
 Contreras, V., W486
 Contreras-Govea, F. E., W198, W379
 Contu, M., 650
 Conway, A. C., M446
 Cook, D., M399, T451, W32, W33
 Cook, D. E., M349, M351, M417, W173, 699
 Cook, E. B., 186, 187
 Cook, N., 848
 Cooke, A. L., 416
 Cooke, J., 631
 Cooke, R., M261, T231, T355, 28
 Cooke, R. F., M133, T338
 Coon, C., 659
 Cooney, M., M389
 Cooper, T. A., T88, 537
 Copetti, L. C., M355
 Coradini, G. P., T467
 Corah, L., 56
 Corbett, B. P., 106
 Corea-Guillén, E. E., M437
 Corl, B., 436
 Corl, B. A., 94, 199, 700
 Corley, J., M59
 Cormican, P., 679
 Cornett, M. C., T226, W31, W39
 Corona, L., W188, W459
 Corona, M. B., M45, M47, W271
 Corral, A., T173, W266
 Corrales, J., T173
 Corral-Flores, G., W181
 Correa, L. B., W442
 Corrêa, A. M., W169, W170
 Corrêa, M., M217, T320
 Corrêa, M. N., M90, M95, M218, M404, T2
 Correa Castiblanco, D. M., W46
 Correddu, F., T110
 Corredig, M., T104, 752
 Corro, M. D., T259
 Cortinhas, C. S., M331, M332, W294, 612
 Corva, S., T408
 Costa, A. G. B. V. B., T489, W405, W406
 Costa, B., M21
 Costa, H. F., M226
 Costa, I. C., M345
 Costa, J. B., W399, W401
 Costa, J. H. C., W10
 Costa, J. M. S., M302, T327
 Costa, R. G., T502, T504, T509
 Costa, S., M441
 Costa Almeida, M. T., M321, M322
 Costa da Silva, L. R., W425
 Costa e Silva, L. F., W377, W378
 Costa Mota, V. A., W454
 Costagli, C., 777
 Cota, M., M514
 Cotanch, K. W., M32, W375, W386, 81, 165, 621
 Cotinot, C., 9
 Cottingim, K. M., 789
 Cottrell, J. J., 49, 321, 810
 Courty, P., T422
 Couse, A. M., M32
 Cousillas, G., T20, W37
 Coutinho, M. A. S., T313
 Couto, V. R. M., M424, W451, W452, W453, W455, W457
 Coverdale, J. A., 674
 Cox, J. L., 872
 Coy, B., W190
 Craft, M., 256
 Cramer, C. C., W31
 Cramer, M. C., 493
 Cravey, M., M46, W301, 742

Cravo Pereira, A. S., M163, M158, W282
 Cree, P., 471
 Creighton, P., 182, 183, 633
 Crenshaw, M. A., M167, M509, 108
 Crenshaw, T. D., M188, T290, T291, 119
 Crespo, F. J., 191
 Creus, E., 237
 Cristina, M., T121, W133, W134
 Croat, J. R., T418
 Crodian, J., 295, 296
 Crompton, L. A., 681
 Cromwell, G. L., 591
 Croney, C., M65, M295, 37
 Crookenden, M. A., 247
 Crooker, B., T49, W257
 Crooker, B. A., T20, T102, W37
 Crossland, W., W301
 Crossland, W. L., M334
 Crossley, R. E., M18
 Crow, K., 295
 Crowe, M., 316, 317
 Crowther, A. C., T424
 Crozara, A. S., T518
 Crozier, J. B., 232
 Crum, A. D., T243
 Crump, P., T435, T531
 Cruppe, L. H., M230, 445
 Cruywagen, C. W., W382
 Cruz, A., T120, T121, T122, T130, W133, W134
 Cruz, A. G., T125, T126
 Cruz, A. O., T474, T475
 Cruz, A. P. d. S., T270
 Cruz, G. D., W310
 Cruz, G. R. B., T509
 Cruz, T. M. P., T315
 Cruzen, S. M., 668
 Cruz-Hernandez, A., T525
 Csibi, A., 386
 Cuatucuamba, G., 448
 Cuheval, A., M104, M105
 Cuellar Orlandi Cassiano, E., W398
 Cuenca, J. K., W460
 Cui, S., W48
 Cui, X., T438
 Cui, Y., M151
 Culumber, M., T134, T139
 Cummings, B. P., 280
 Cummins, A., M65, M295, 37
 Cummins, C., 150
 Cunha, C. S., W221, W269
 Cunha, F., T21
 Cupp, A. S., T317
 Cupples, A. G., 610
 Curbelo-Rodríguez, J. E., M400, T304, T305
 Curi, R. A., W50, W58
 Curilla, W., 90
 Curler, M. D., 448
 Curran, F., 316, 317, 329

Curran, J. F., M232
 Curtiss, C. N., M3, M13, T66
 Cushman, R. A., M229, T317, 133, 369
 Cussen, R., T402
 Cutrim, A. A., M466
 Cyrillo, J. N. S. G., T82, T83, W77
 Cyrino, J. E. P., T315
 Cytryn, E., 415
 Czeglédi, L., 761

D

Da, Y., 540, M78, M84, T102
 da Costa, D. R., M325
 da Luz Silva, S., M158, M159, M163
 da Rosa, F., 651
 da Rosa, F. T., 91
 da Silva, F. M., W190
 da Silva, F. G., W408
 da Silva, L. D., M325
 da Silva, M. V. G. B., W79, W92
 da Silva, T. B. R., W75
 da Silva, T. C., M325, W169, W204
 da Silva Cabral, L., W396, W407, W438, W439, W440
 da Silva dos Santos, C., M260
 da Silva Guillen, Y. V., W234
 da Silva Junior, J. M., W426
 da Silva Martins, T., W426
 Dadalt, J. C., M179, M181, M182, M183, M184
 Daetz, R., T21, 23
 Dagorne, R. P., T422, T473
 Dahiya, H., M107, T197, 405, 654
 Dahl, G. E., M284, W268, 251, 808, 809
 Dahlen, C. R., M232
 Dai, W.-T., 465
 Dailey, R. A., T311
 Dal Jang, Y., T298
 Dalcq, A.-C., 694
 Daley, M., 777
 Dall'Acqua, P. C., T318, T325, T326
 Dallaire, M.-P., M391
 Dallantonia, E. E., M311, M434, M435, M317, M320, M450, W291
 Dal-Pai-Silva, M., W59
 Dalton, J., W90
 Dalton, J. C., M241, M303, 841
 Dan, N., T456
 Danashekar, D., W229
 Danes, M. A. C., T212, T429
 Dang, C. G., W74
 Dänicke, S., T55, T420, W254, 30, 477
 Daniel, E., W107, W234
 Daniel, J. A., T535
 Daniel, J.-B., 616
 Daniel, Z., 112
 Daniels, J., T62
 Daniels, K. M., M4, T206
 Dann, H. M., M32, W347, W386, 81, 165, 343, 471, 621
 Dannenberger, D., M164
 Danscher, A. M., 248
 Daramola, A., M58
 Darby, H. M., 263
 Darchuk, E., W157
 Dardenne, P., 10, 658
 Darien, B. J., T240, W34
 Das, G., W255
 Das Gupta, M., M53, 245
 Dash, S. K., M53, 245
 Daugherty, R. E., T189
 D'Aurea, A. P., M463
 D'Aurea, E. M. O., T529
 Davenport, K. M., M12
 Davidson, J. A., W387
 Davidson, S., 225
 Davies, P., T360
 Davila, F. S., T496
 Davila-Ramos, H., T516
 Davis, A. N., M385
 Davis, B. I., T129, W139
 Davis, D., M361
 Davis, G. H., M486
 Davis, J. H., T230
 Davis, R., M284
 Davis, S., 15
 Davis, T., 302
 Davis, T. Z., T179
 Davoodi, S., M133
 Dawson, J. A., 790
 Dawson, K. A., W160
 Dawson, L. J., T511, T512
 Day, M. L., M224, M225, M230, 205, 445
 Dayton, W. R., W224
 Daza, A., M498
 de Albuquerque, L. G., M91
 de Almeida, A. M., M471, M472, T258
 de Almeida Rufino, S. R., W345, W346
 de Andrade Ferreira, M., W425
 de Andrade Rocha Garcia, G. M., W46
 de Assis Lage, C. F., 149
 de Barros Melo, T. T., W425
 De Boer, I. J. M., 845
 de Brun, V., M219
 De Buck, J., T52
 de Campos Valadares Filho, S., W426
 de Carvalho, N. D., W158
 de Carvalho Basto, D., W304
 de Conti Fiorese, B., M158
 de Diego-Cabero, N., W119
 de Dios Garza Flores, J., T352
 de Freitas, J. E., W383
 De Garnica, M. G., T485
 de Godoy, M. R. C., 390, 396, 397
 de Haas, Y., 260
 de Haro-Marti, M. E., T155, W272

de Jesus-de Jesus, A., T304
 de Jong, G., 381, 529
 de la Fuente, G., M438
 De la Torre-López, G., M403
 de Lange, C. F. M., 790
 De Leon, C., M52, T170
 de Lima Júnior, V., W425
 de los Angeles de Santiago-Miramontes, M., T505
 de Matos, L. F., 167
 de Melo Amaral, P., T367, T369
 de Mercado, E., M502
 de Moraes Tosta, X., W161
 de Oca-Jiménez, R. M., 630
 de Oliveira Maia Parente, M., W161, W425
 de Passillé, A. M., 496, 501, 696
 de Paula, R. A., W204
 de Paula Freitas, A. V., T164
 De Prado Taranilla, A. I., T268
 de Resende, F. D., M312, W305
 de Resende, L. C., M114, W202
 de Resende Fernandes, J. J., W397, W403
 de Sales Silva, F. A., T367
 De Santiago, M. d. I. A., W486
 De Souza, J., W302, W304, W340, 466, 824
 de Souza, R., M473
 de Souza, V., T169
 de Souza Costa, F., M158, M163
 de Toledo Piza Roth, A. P., M312
 De Vries, A., M298, T24, T95, T105, 811
 De Vuyst, L., 661
 De Wolfe, T. J., T240, W34
 Dean, D., T449
 Deaver, S. E., 452
 Dechow, C. D., M141, 230, 349, 377
 Decker, J. E., 408, 524
 Deflandre, A., T267, T268
 DeFrain, J., W370
 Degano, L., 382
 Deglaire, A., 438
 Dehareng, F., 11, 10, 658
 Dehghan-Banadaky, M., M414, 470, 852
 Deibert, M. R., 572
 Deighton, M. H., 597, 850
 DeJarnette, J. M., 586
 DeJarnette, M., 445
 Dekkers, J., M25
 Dekkers, J. C. M., M70, 668, 765, 766, 768, 771
 Del Bianco Benedeti, P., T199, T369
 Del Collo, L. P., 145
 del Mar Serra, M., 191
 del P. Sanchez, M., T30
 Del Pino, F. A., 817
 Del Pino, F. A. B., M218
 Del Vale, T. A., M277
 Del Valle, T. A., T270, T489, W405, W406
 Delaby, L., W373, 277, 467, 684
 Delamagna, G. M., M317
 Delattre, L., 683
 Delevatti, L. M., M434
 Delfino Calomeni, G., W371, W383
 Delgado, E. F., T313
 Delgado, J. V., T507
 Delgado-Peraza, R. R., T206
 Deliephan, A., T172
 Dell, C. J., M120
 Dell Vale, T., M367, M377
 Dell'Agnolo, C., M479
 Dellamagna, G., W291
 Dellaqua, J. V. T., W308
 Dellevatti, L. M., M317
 DeLonge, M. S., 593
 Delouard, J.-M., 683
 Delveaux Batalha, C., W463
 Demarco, C. F., M218
 Dematawewa, C. M. B., 766
 Demeterco, D. D., W60, W61, 425
 den Hartog, L. A., 552
 Deng, K.-D., 111, 175, 831
 Deng, P., W98, W100
 Deng, Q., T5, T6, T9
 Denicol, A. C., W85
 Deniskova, T. E., T99
 Denis-Robichaud, J., T201, 21, 839
 Dennis, T. S., W30, 159, 170
 Deornellis, C. A., T189, T510
 Derakhshani, H., M333, M374, T17
 Deresz, F., T177, T187, W203
 Derksen, T., 578
 Derksen, T. J., 581
 Dersjant-Li, Y., M180
 Dervishi, E., T5, T6, T9
 Desantadina, R., T458, W333
 Deshpande, P. D., 378
 Detmann, E., T358, T359, T462, W426, 335, 454
 Detweiler, K. B., 396
 Devant, M., M31, T370, T376, T407, W18, 723
 Devi, S. M., M69, 797
 Devine, T. L., T350
 DeVries, T. J., M17, M18, M20, M251, M292, T390, W5, W307, 90, 154, 352, 355, 501, 510
 Dhillo, W. S., M220
 Diamantino dos Santos, F., W305, W316, W317, W454
 Diao, Q.-Y., M470, M487, T354, T438, W174, W195, 111, 175, 831
 Dias, E. A., T340
 Dias, J. D. L., T414
 Dias, M., W158
 Dias Barbosa da Silveira, I., 499
 Dias de Freitas Neto, M., M165
 Dias e Silva, N. C., T518
 Dias Junior, G. S., M114, T447, W182, W202
 Díaz, A., M43, M61, T485, T486, T487, W175, W431
 Díaz, C., W75
 Diaz, R. K., T213
 Diaz-Huepa, L. M., M169
 Diaz-Plascencia, D., W167
 Díaz-Royón, F., W359
 Dieho, K., T404
 Dietrich, A. M., M296, 86
 DiGiacomo, K., 810
 Dijkstra, J., T404, 169, 594, 681, 825, 857
 Dikmen, S., W81, 809
 Dikun, Y., M143
 Di-Lernia, M. R., T235
 Dilger, R. N., 51
 Dillon, J. A., 697
 DiLorenzo, N., M431, M432, T148, T360, T477, W60, W61, W171, W402, W460, 161, 368, 425, 604, 736, 826, 832
 Dimauro, C., T92
 Dineshkumar, D., 292
 Dinh, T., 790
 Diniz Valadares, R. F., W426
 Diniz-Magalhães, J., W400, W404
 Dipasquale, D., T314
 Dirandeh, E., M414
 Disenhaus, C., 277
 Diskin, M. G., M244
 do Amaral, B., 360
 do Amaral, L. A., T169
 Dobenecker, B., 547
 Doelman, J., M364, 430
 Doelman, J. H., 158
 Doepel, L., T399, T400, 497
 Doherty, E. L., T59
 Dohlman, T. M., 451, 453
 Dohme-Meier, F., M212
 Dolatkhahnejad, M., M106, W135
 Dolecheck, K. A., T207, 353
 Dolejsiova, A. H., M380
 Dolesji, A., T185
 Dolezal, M. A., 384
 Domingos, L. D., W136
 Domingues, L. P., 391
 Domingues Moreira, A., W313
 Dominguez, I. A., M176
 Dominguez, L., 256
 Dominguez, T. G., W168
 Domínguez-Vara, I. A., T530, W470, W471
 Domínguez-Viveros, J., T513
 Donaldson, J. R., M59, 644
 Dong, S., M123, M125
 Dong, S. Z., T446
 Donkin, S. S., M372, M373, T218, W256, 285
 Donnelly, D. M., M2, W173
 Donnelly, M. R., T23
 Donogh, J., T17
 Donovan, A., T24
 Doolan, P., M244

- Döpfer, D., T26, 848
Dórea, J. R. R., M331, M332, W294, 612
d'Orey Branco, R. A., T329
Dorian, G., 545
Dorin, C. L., W13
Dorsam, S. T., 338
Dorton, K., W29
Dorton, K. L., M375
dos Santos, A., 502
dos Santos Araújo, J., W161
dos Santos Costa, C., W161
Dos Santos Gonçalves Cyrillo, J. N., M34
dos Santos Ruiz, U., W234
Dou, Z., T168
Doumit, M. E., 483, M392
Doupbrate, D. I., M66
Dourado, S. B., M257
Dourte, D., 418
Downing, T. W., 62
Doyen, A., 660, W148, W149
Drackley, J. K., T3, T433, W325, W372, W437, 48, 455, 458, 706, 707
Drake, M. A., T191, T192, W129, 73, 779
Drane, T. N., T189, T510, W501
Drapala, K. P., 76
Drewnoski, M. E., W55, 157, 872
Driver, J., W71
Drouillard, J. S., M326, W311, W458, W461, 104, 105, 866, 870
Drum, J. N., M240
Du, H., 192, 242
Du, Y., M123, M125
Duan, X. D., 835
Duarte, C. R. A., W122
Duarte, D. A. S., M77
Duarte, M., 110
Duarte, M. S., W221, 454
Duarte de Souza, W., W164
Dubeux, J. C. B., M110, W171, W180
Dubrovsky, S. A., W24
Dubuc, J., 21
Duchens, M., 244
Duckett, S. K., 102, 103
Ducrocq, V., 277
Duersteler, M., T41, W368, 702
Duesterdieck-Zellmer, K. F., 428
Duferene, A., T143
Duff, G. C., 517
Duffield, T., 363
Duffield, T. F., M20, T204, 290, 355, 847
Duggin, J., W51, W54
Dukkipati, V. S. R., 247
Duncan, S., 780
Duncan, S. E., T118, T196
Dungan, R., M281, W354, 615, 625
Dunière, L., W191, W205
Dunkelberger, J. R., 765
Dunn, S. M., T5, T6, T7, T8, T9
Dunshea, F. R., 49, 321, 810
Duplessis, M., M269, M270
Dupont, D., 438
Duque, M., M154, 434
Duque-Madrid, P. C., T31
Duran-Melendez, L. A., W167
Durham, C., W125
Durocher, J., M270
Dusel, G., M171, T445, 304
Dutra, P. A., M215, M216, W258
Dutra de Resende, F., W312, W313, W316, W317, W454
Duval, B. D., W443
Duval, S., W429, 167, 597, 850
Duval, S. M., T357
Dyer, R., 293
- E**
- Eaglen, S. A. E., T88
Ealy, A. D., T223, T224, T229, W218, 311, 420, 450
Earleywine, T. J., M380, W387
Eastridge, M. L., M5, T219, 231
Eastwood, L., 572
Ebarb, S. M., 105
Ebel, K. K., T319
Eberhart, N. L., T152
Ebert, P. J., W448, 339, 815
Eberth, J. E., M85
Eborn, B. M., T151
Echeverri, J., M96, 383
Eckel, B., T302, T445
Eckel, E. F., T7, T8
Eckelkamp, E. A., 275
Eder, K., T445, W250
Eding, H., 381, 529
Edvan, R. L., M459
Edwards, D. B., W44
Edwards, E. M., 241
Edwards, M. S., 772
Edwards, S., T69
Egan, T., T156, T320
Egert, A. M., 264
Ekwemalour, K., M483
El Faro, L., T98, T150
Elghandour, M. M. Y., T234, 151, 611, 630
Elhanafy, M. M., T3, 707
El-Husseiny, O., M193
Elizondo-Salazar, J. A., T14, W23
El-Kadi, S. W., 667, 746, 747
Ellersieck, M. R., 131, 132
Elliott, N., 83
Ellis, E. R., 354
Ellis, J. L., 169, 681
Ellis, S., 206
Ellis, S. E., M131
Ellison, B., W434
Elsasser, T., 29
Elsasser, T. H., M55, T10, T20, T311, W20, W37, W349
Ely, L., 514, 627
Ely, L. O., M428, M464, M467, T394
Elzo, M. A., M68, M71, M73, M253, T86, T87, T91, T97, T105, T249, W71, W73, W91, W93, 541
Emanuele, S., M284
Emanuele, S. M., T448
Emerick, L. L., T341, W263
Emes, R., 109
Endo, H., T389
Endres, E. L., 281
Endres, M., M299, W392, W434, 252, 503, 693, 695, 696, 701
Engle, T. E., W377, W378
Enns, E. A., 256
Enríquez, I., W271
Enteshari, M., M106, W135
Erasmus, L., W446
Erasmus, L. J., T406, W207, 212
Erdman, R. A., T417, 289
Erickson, E., 295, 296
Erickson, G., T368, T493
Erickson, G. E., M48, M316, W433, W436, 821, 862, 869
Erickson, P. S., M130, M286, T203
Ernilov, A. N., W83
Ernandes, M. C., T471
Ernst, C. W., M76, 486, 532, 767
Ervin, D., W341
Escalera-Valente, F., T523
Escobar, E. N., T153
Escobar, J., 310
Escobar-Bahamondes, P., W280, 595
Escribano, A. J., T440
Espadamala, A., T43, T46, T47
Espasandin, A. C., T77, W449
Esperance, M., T255
Espigolan, R., M98, T83, T84, T85, W72, W77
Espino-Mercado, K., M400
Espinoza, D. A., T352
Espinoza, I., W186
Espinoza, J., T257
Espinoza, O. S., 705
Espinoza, S., M514, T454
Esser, N., T391
Esser, N. M., M121
Estell, R. E., W185
Estevam, D. D., W296, W309
Esteves, L. A. C., M169, M170
Estienne, M. J., M508, 5
Estill, C. T., 91
Estrada-Angulo, A., T514
Estrada-Flores, J. G., T331
Eubanks, B. M., T242
Eun, J.-S., T382, T383, T384, T388, W479, 87
Evans, A. C., M226
Evans, E., T352

Evans, J. R., T328
Evans, M. E., M476
Evans, N. P., 9
Evans, R. D., 375
Ezequiel, J. M. B., M463, T482, T519, T522,
T524, T529, W315, W507, W508
Ezzati, P., 248

F

Fabregas, F., M267, T34, 22, 723
Fabris, T. F., 287
Faccio Demarco, C., 817
Fachinello, M. R., M170
Faciola, A., T199, T212, T361, T366, T367,
T369
Facteau, M.-E., 513
Fadel, J. G., W358
Fadul-Pacheco, L., W361
Fahey, A. G., 183, 633
Fahey, A. W., W374
Fahey, G. C., 396
Fahim, A., 782
Fahrenholz, C. H., T282
Fair, T., 679
Fairbrother, J. M., T169
Fakolade, P. O., T250
Falana-Williams, M. B., W109
Falcão, Y. S., W314
Falconi, P. X., T260
Faleiros Castro, F., W235
Falk, J. M., 483
Famula, T. R., W53
Fan, Y., T450
Fang, L., M510
Fang, Z., W40
Farah, M. M., T79
Faria, B. K. A., M345
Faria, K., W187
Faria, P. B., M506
Farmer, C., 96
Farsuni, N. E., T205
Faugeron, J., W9
Faulkner, D. B., 524
Faulkner, M. J., 282
Faulkner, S. L., W219
Favaretto, J. A., M146, M147
Faverdin, P., 683
Faveri, J. C., M257
Fayer, R., 143
Fayyaz, M. H., 585
Fazzio, L., T458
Fecteau, M., 293
Fedorka-Cray, P. J., M271
Fehrmann-Cartes, K., 559
Feijó, G. L. D., W314
Feitosa, F. L. B., M91, T81, T84, T85, W66,
W72
Felicio, T., W133

Félix, A. P., W101, 391, 394
Felix, T. L., 738
Fellows, G. M., W357, W362
Feng, L., 227
Feng, X., 708, 709
Fensterseifer, S. R., 243
Fenu, A., W506
Ferguson, C. E., W63
Ferigato, R. S., T188
Fermin, L. M., T345
Fernandes, A. M., M429, M461, M462,
M429, T177, T187, W203
Fernandes, A. C. C., M133, W27
Fernandes, D. B., W306
Fernandes, H. J., W314, 711
Fernandes, J. J. R., M424, W294, W306,
W451, W452, W453, W455, W457
Fernandes, L. M. B., M257
Fernandes, M., M52, W493
Fernandes, M. H. M. R., M468, M469, W283
Fernandes, R. M., M312, M338, W312,
W316, W317
Fernandes, S. R., M474, M475, M479, M480,
M481, W500
Fernandes de Sousa, L., T518
Fernandes dos Santos, V. L., M466, W425
Fernández, A., W6
Fernandez, F., 256
Fernandez, K., W435
Fernando, R. L., M70, T80
Fernando, S., T493
Fernando, S. C., M348, M382, T452, T453,
W297, W430, W433, 821
Ferraretto, L., M306
Ferraretto, L. F., M112, M114, W202
Ferrari, V. B., T372, W336
Ferraz, J. B. S., W79
Ferraz, P., M288
Ferraz Branco, R. B., T164
Ferraz Junior, M. V. C., M224, M225, M230,
M310, M444
Ferré, A., M267
Ferreira, A. L., M347, M354
Ferreira, D. S., W315
Ferreira, E. M., T495
Ferreira, F., M298
Ferreira, G., T381, W211, 219, 227
Ferreira, J., 324
Ferreira, J. P., 129, 678
Ferreira, R., M148
Ferreira, R. A., M505
Ferreira, V. C., M81, 92
Ferreira Araujo, B. H., M322
Ferreira Baffa, D., W201
Ferreira Carvalho, R., M159
Ferreira de Almeida, G., T489
Ferreira de Jesus, E., M395, T489, W383
Ferreira Júnior, H. C., 306
Ferret, A., W14, W289

Ferring, C. L., 763
Ferrinho, A. M., M161, T81, T471, W66, W72,
W282
Ferris, C. P., T32, 618
Fessenden, S. W., M418, M422, 854
Fetrow, J., M305, T101, 359
Feugang, J. M., M509, 108
Fidler, A., 478
Fieguth, L., 30, T55
Field, M., M51
Fievez, V., T380
Figueiredo, A. M., T90
Figueiredo, D. M., T474, T475, W496, W497,
W498
Figueiredo, F. O. M., M469, T498
Figueiredo, G. d. P., 124
Figueroa, C. B., T183, W199
Figueroa, C. Y., T132
Filardi, R. S., W107, W108
Filgueiras, E., M283
Filho, A. A., W229
Filho, A. E. V., M280
Filho, A. V., T98
Filho, C. A. A. O., M347, M354
Filho, E. L. D., M248, M293, M300, 842
Filho, E. S. C., T482
Filho, I. C., M77
Filho, J. M. P., M243, T509
Filho, J. T. A., T502
Filho, M. A. M., M24, M465, M466
Filho, S. C. V., M319, T364, T365
Filho, W. I. S., W308, W309
Fiol, C., 502
Fiorentini, G., M445, T464
Firkins, J. L., M353, M410, T221, 827, 855
Fischer, A., 683
Fischer, M. C., M232
Fischer, V., M260, 499, 812
Fischer da Silva, A. V., 391
Fisher, T. M., M313
Fissolo, H., W402
Fleming, A., T104, 752, 759
Fletcher, R., T233
Fleury de Melo, A. H., W302, W304
Flores, L. R., W275
Flores-Mariñelarena, A., W181
Flores-Salas, J. M., T263, T501
Flores-Tensos, J. M., M437
Floury, J., 438
Flowers, W. L., 186, 187
Fluharty, F., 637, 690
Fluharty, F. L., T353
Flury, C., 384
Foegeding, E. A., T193, T194
Fokkink, W. B., M365
Fonseca, D. M., W165
Fonseca, L. F. S., M91
Fonseca, L. d. S., M505, M506
Fonseca, M. A., M334, T463

Fonseca, R., T78, T79
 Fonseca e Silva, F., M433
 Fonseca Paulino, M., W426
 Fontes, P. L. P., T148, W60, W61, 368, 425
 Foote, A. P., 46
 Forcada, F., M219
 Ford, S. P., 422, M223
 Forero, L. C., 691
 Forgiarini Vizzotto, E., 499
 Formiga, M. A., W408
 Formigoni, A., 605, M259
 Forni, M., W212
 Forotto, M. L., 302
 Forster, R., M41
 Foskolos, A., T398, W334, W338, 854
 Fossler, C. P., M271, M272, M273, M274, M275, 136, 138, 139, 145, 146, 147, 148
 Foster, J. L., 67
 Foth, A., M401, W389
 Foulquié, D., W474
 Fourdraine, R. H., 357
 Fowler, A. L., T243
 Fowler, P. A., 9
 Fowler, S. Q., M136, 508
 Foxworth, W. B., 632
 Fraga e Silva Raimondo, R., 817
 Fragomeni, B., 535
 Fragomeni, B. D., 534, 770
 Fragomeni, B. O., M67, T83, W77, 646
 Fraisse, C., 418
 Franca, T. N., M257
 França, I. G., M24
 França, V. R., T159
 France, J., 681
 Frances, O., M39
 Francisco, C. L., M36, W56
 Franco, M. O., M328, T351, T358, T359, 828, 829
 Franco-Gendron, N., 90
 François, D., W474
 Franks, M. K., 411
 Frasseto, M. O., W300
 Frederick, T., 597
 Fredin, S. M., W386, 621
 Fredrickson, E. L., W185
 Freetly, H. C., M229, 523, 524, 527, 872
 Freire, A. P. A., T495
 Freire, M. M., T498
 Freitas, B. V., T294
 Freitas, J. E., M367, M377, W318
 Freitas, M., T130
 Freitas, S., 23
 Freitas, V. O., M218
 Freitas Junior, J. E., W321, W322, W371
 Freking, B. A., M507
 Freua, M. C., W503
 Frey, J., 433
 Fricke, P. M., M236, M263, M277, T324, 329, 351, 446, 675, 676

Friend, T., 498
 Friggens, N. C., 684, 274, 616
 Frigoni, N. A. S. R., T318
 Frioni, N., T106
 Fritts, A., W242
 Froehlich, K., 701
 Froehlich, K. A., 160
 Fryxell, R. T., 495
 Fu, W., W239
 Fuenzalida, M. J., T324, 676
 Fugate, R. T., M137
 Fujieda, T., T386, T387
 Fukushima, R. S., T484, T492, 268
 Fulton, J., 37, M65, M295
 Fulton, J. E., M70
 Funston, R. N., W65, 2, 366, 367, 442, 444, 737, 833
 Furini, P. M., W345, W346
 Furlan, A. C., M170
 Furlan, J. J. M., M161, T85, W66, W72
 Furlan, J. M., T81
 Furness, J. B., 49
 Furuichi, T., M489
 Fustini, M., M259, 605
 Fuzeto, A. P., T484

G

Gabbi, A. M., M260
 Gabel, A. N., 230
 Gabler, N., M25
 Gabler, N. K., W16, 185, 668, 790
 Gabriel, A., T508, 181
 Gadberry, S., M46, 742
 Gaddis, K. L. P., 538
 Gaillard, C., T198, 274
 Galati, R. L., W315
 Galbraith, E., T41, W368, W392, 701, 702
 Galicia, L., W21
 Galina, C. S., T259
 Gallagher, G. R., T535
 Gallard, Y., W373, 467
 Gallardo, C., M179, M182, M183, M184
 Gallardo, D., T409
 Galle, S., 837
 Galli, J. R., 63
 Gallo, S. B., W503
 Galloway, D., 742
 Galoro, N., M169
 Galoro da Silva, L., T199, T361, T369
 Galton, D. M., T11
 Galvão, G., M183
 Galvao, K., 359
 Galvão, K. N., M288, M305, T21, T22, T28, T48, T101, 23, 358, 360
 Galvão, M. C., M318, M324, W290
 Galvao, V. C., T489, W321, W322, W405, W406
 Galvão Albuquerque, L., M98, T84, T85
 Galyean, M., 551, 591, 607
 Galyen, W., M46, 742
 Galyen, W. L., W62
 Gama, M. P. M., M280
 Gan, Z., 242
 Gander, A., W434
 Gandhi, A., 403, 556
 Gandra, J., M356, M359, M362, T508, 181
 Gandra, J. R., W318
 Gandy, J. C., T29
 Ganister Fields, J., 783
 Ganjkhanlou, M., M447
 Gänzle, M., 567
 Gänzle, M. G., 837
 Gao, H., M150, 753
 Gao, P., M448
 Gao, X., T214, T411, 85
 Gao, Y., T166
 Garad, P. S., 378
 Garbe, J. R., M84
 Garber, L. P., 136
 Garbossa, C. A. P., M505, M506
 Garcia, A. D., W359
 Garcia, D. A., T78
 Garcia, E. A., T73
 Garcia, J., T485, T487, W435
 Garcia, M., M55, M144, M94, T237, W73
 Garcia, R., M38, M57, M129, M490, T27, W19, W240
 Garcia, S., 197
 Garcia, W. C., 635
 Garcia Buitrago, J. A., M66
 García Martínez, A., W504
 Garcia-Fernandez, N., 78, T141
 Garcia-Flor, V. L., 151
 Garcia-Fruitos, E., T34
 Garcia-Guerra, A., M363, 315, 678
 Garcia-Martinez, J. E., W25
 Garcia-Sandoval, S., T516
 Gardenalli, R., T471, W282
 Gardina, R., W321
 Gardinal, R., M367, M377, W318, W322, W371, 389
 Garnsworthy, P. C., T432, 559
 Garossino, K., M337
 Garrett, E. F., T3, 707
 Garrett, J. E., M388, M390, T424
 Garrick, D., 384, 545
 Garrick, D. J., M70, T80, 524
 Garrido, P. B., M317
 Garrow, T. A., 457
 Garry, B., 179
 Gart, E. V., W42
 Garver, J. L., W340, 466
 Garza, B., 632
 Gasa, J., M195, M497, M499, 120
 Gaspa, G., T92, T110, T502
 Gately, R. E., 291

Gatlin, D. M., 776
 Gatrell, S., 579
 Gauvin, M.-P., 79
 Gaxiola, S. M., M45
 Gaytan, R. Z., T352
 Gaze, L., T130
 Gazi, I., 570
 Gebremedhin, K. G., W267
 Gehman, A. M., M353, M379
 Geiger, A. J., M131, T223, T229, T264, W218, 419
 Genest, S., 201
 Gengler, N., 10, 13, 658
 Genís, S., T34, 22
 Genther-Schroeder, O. N., 867
 Gentil, R. S., T495
 Gentry, W. W., 506
 Geppel, A., W179
 Geppert, T. C., M228, W303, 313, 314
 Geraldo, A. C. A. P. M., M86
 Gerard, P. D., W129
 Germano de Resende, R., T471, W282
 Gerrard, D. E., 667
 Gerrits, W., 830
 Gervais, R., M378, M391, M405, M407, M411, M412, T385, T410, 700
 Gessner, D. K., T445
 Gesteira Coelho, S., W345, W346, W381, 149
 Ghaderi-Zefrehei, M., M82
 Ghadimi, D., M309
 Ghaffarzadeh, M., M414
 Ghassemi Nejad, J., W468
 Ghedini, C. P., 602
 Ghilardi, B., W446
 Ghimire, S., M410
 Ghnenis, A. B., 422
 Ghorbani, G. R., T380
 Giallongo, F., W9, 167, 597, 620, 850
 Gibbons, W. R., T418
 Gibson, K. D., M141, 377
 Gibson, M. W., W105
 Gil, A., 256
 Gilbert, M., 830
 Gilbert, R., M305, T101, 359
 Giles, T., 109
 Gilfeather, C. L., M221, W260, 449
 Gilis, C. A., W311
 Gillen-Muñoz, J., W476
 Gillespie, J. M., T334
 Gilliam, J. N., M27
 Gillian-Daniel, D. L., 639
 Gimenez, D. F. J., M98
 Gimenez, D. F. R. J., M91
 Gimeno, D., M66, T77
 Gionbelli, M. P., W221, 454
 Gionbelli, T. R. S., W221, W377, W378, 454
 Giordano, J. O., M211, M249, T37, W277, 128, 279, 356, 448
 Giovanini, L., 63
 Gipson, M. L., 816
 Gipson, R. G., 816
 Gipson, T. A., M476, M477, M478, M485, T499, T511, T512
 Giraldo-Arana, D., M226
 Girard, C. L., T410
 Gittens, C., 293
 Giuliodori, M., T408
 Gladyr, E. A., T35, T99, W83
 Glória, L. S., M433
 Glosson, K. M., 48
 Gnan, S., T144
 Gobi, J. P., M173
 Gobikrushanth, M., M215, M216, W258, 23
 Godbee, R. G., T240
 Goddard, M. E., 522
 Godden, S., 696
 Godden, S. A., 86
 Goddik, L., W125, W126, W127, W128, W157
 Godfrey, R. W., 744, W49
 Godinez-Cruz, J., W418
 Godinho, E. C., W269
 Godkin, M. A., 290
 Goes, R., M356, M359, M362
 Goeser, J., M112, M416, M417, T491, W184
 Goetsch, A. L., M477, M478, M484, M485, T499, T511, T512
 Goff, B., 68
 Gohary, K., 363
 Gohel, M., 53
 Gokhale, S. B., M53
 Gold, R. M., W42
 Goldansaz, S. A., T5, T6, T9
 Goldhawk, C., 728
 Golombeski, G. L., W375
 Goltz, L., M474, M475, M479, M480, M481, W500
 Gomes, G. C., 360
 Gomes, L. M., M26, T299
 Gomes, L. C., M473
 Gomes, P. M., T70
 Gomes, R. A., M318, M324, W290
 Gomes, R. M. S., M24, M465, M466
 Gomes, V. C., T178
 Gomes da Silva, A., W65
 Gomes de Paiva, P., T489
 Gomes dos Santos, C., T474, T475, W496
 Gomes Moreira, K. K., W397, W403
 Gomez, A., 848
 Gomez, G. G., M401, W389
 Gomez, K., W502
 Gomez, N. A., 624, 626
 Gomez-Danes, A. A., T523
 Gómez-Fernández, J., M502
 Gómez-Izquierdo, E., M502
 Gomez-Vazquez, A., T525
 Gonçalves, F. M., M218, T2, 817
 Gonçalves, J. R. S., M224, M225, M230
 Gonçalves, J. S., T174, T175, T522, T524, W505
 Gonçalves, J. L., M443
 Gonçalves, P. H., M338, W305, W316, W317
 Gonçalves Barbosa, N. C., W304
 Gonçalves Cirqueira, P., M165
 Gonçalves Leite, R., M321, M322
 Gonda, M. G., 484, 873
 Gondim, C. W. R., W227
 Gondro, C., W74
 Gong, J., W112
 Gong, Y., T115, 785, 786
 Gonyou, H., M30
 Gonzalez, A., W178
 Gonzalez, J. M., T229, W458, 104, 105, 441, 866
 Gonzalez, L., W14
 Gonzalez, L. A., W289
 Gonzalez, M. A. L., T496
 Gonzalez-Alvarez, V., W476
 Gonzalez-Alvarez, V. H., T501, T505, W478
 Gonzalez-Duran, E. E., T137, T138
 González-García, E., T255, W197, W474
 González-Muñoz, S. S., T530, W162
 González-Peña, D., 738
 Gonzalez-Pena, D., M38, M57, M129, M490, T27, T101, W19, W240
 Gonzalez-Recio, O., 522
 Gonzalez-Rivas, P. A., 810
 González-Rodríguez, A., W75
 González-Ronquillo, M., W459
 Gonzalez-Tavizón, A., T505, T526
 Gonzalo, E., M188
 Goonewardene, L., W124
 Goossen, C. P., 263
 Gorden, P. J., 246, 364
 Gordiano, L. A., W408
 Gordienko, J. C., M136, 508
 Gordo, D. G. M., W72
 Gordon, J. L., 847
 Gordon, L. J., W307
 Gorgulu, M., W376
 Górka, P., W464
 Gorocica, M., W299, W333
 Gorocica-Buenfil, M. A., T353
 Görs, S., W255
 Gotoh, T., 588
 Gotoh, Y., W89
 Gott, P. N., T222
 Gouda, G. A., 173, 174
 Gourley, G., 118
 Gouvea, V. N., M224, M225, M230, M310, M444, T500
 Govindasamy-Lucey, S., 560
 Govoni, K. E., T61, T65, W216, W217, 291, 294
 Goyal, S. M., 789
 Gozho, G. N., M357

- Gracia, M. I., M493, M496
 Gracia de Garnica, M., T487
 Graff, H. B., W261
 Graham, J. K., M302, T327
 Graham, M. R., T311
 Grandin, T., 411, M35
 Granja-Salcedo, Y. T., M434, M435
 Grant, R. J., M32, W386, 81, 165, 343, 471, 621
 Gratton, G., M329
 Gratz, K. G., M3
 Graugnard, D. E., M313, M326, W220, W350, 464
 Graves, W. M., M247
 Gray, K., 770
 Gray, K. A., M501, 17, 762, 769
 Gray, M. N., W105
 Grazul-Bilska, A. T., T319
 Greco, L. F., T322, 328, 360, 704
 Gredler, B., 384
 Green, H. B., 211, 246, 846
 Green, J. A., T323
 Green, M. H., 468
 Greenleaf, E. N., T515, T517
 Greenwood, S., 783
 Greenwood, S. L., M341, M346
 Greiner, S. P., 746, 747
 Gressley, T., 293
 Grieger, D. M., M232
 Griffin, J. E., 873
 Grilli, E., W212
 Grimes, A., T67
 Grings, E. E., 2, 367, 614
 Grizotto, R. K., W453
 Grooms, D. L., M13, T66
 Gross, J. J., M87, M209, M212, 101, 680
 Grossbier, D., W146
 Groto, M. E., M163
 Grott, M. W., 159
 Grubbs, J. K., 668
 Gruen, D., 167
 Gruninger, R., M436
 Gruse, J., T227
 Grusenmeyer, D. J., 719
 Grutsch, A., T133
 Gu, M. J., W292
 Gu, X., 278
 Guan, D., M99
 Guan, L., W437, 489
 Guan, L. L., T357, T430, W124, W429, 322
 Guan, Y., T460
 Guard, C., T26, 509
 Guay, F., W112
 Güémez, H. R., M518, W237
 Guenther, J. N., M363, 129, 315, 678
 Guerrero-Cervantes, M., W168
 Guerra, A. F. Q. M., W122
 Guerra, J. E., W21
 Guerrero, M. d. J., W29
 Guerrero-Cervantes, M., T514
 Guevara, J. L., T173
 Guevara-Valdez, J. L., W167
 Guevera, J. M., M315, 712, 713
 Guillamón, E., M502
 Guillen, J., W392
 Guillen-Muñoz, J. M., T501, W478, W480
 Guillou, D., T292
 Guimarães, S. E. F., M77
 Guljukin, M. I., T35
 Gulley, J. W., W44
 Gunasegaram, S., T104, 752
 Günes, N., T503
 Gunn, P. J., M228, M229, W303, 313, 314, 451, 453
 Gunter, P. A., W447
 Guo, B., 240
 Guo, G., W327
 Guo, J. R., M152
 Guo, J. Y., 307, 309
 Guo, M., T111
 Gupta, B. P., W139
 Gurung, N., W479
 Gurung, N. K., 180
 Gusev, I. V., T35
 Gusmao de Quadros, D., 609
 Gutiérrez, G. F., T132
 Gutierrez, N. P., T30
 Gutierrez-Mendez, N., T107
 Guzmán, R. K., M329, M330, M421
- H**
- Ha, H.-K., W153
 Ha, J., M88
 Ha, N.-T., M87
 Haas, Y., 525
 Haberman, J., 498
 Habing, G. G., T219
 Hackbart, K., 351
 Hackmann, T., 342
 Hackmann, T. J., T213
 Hadley, M. A., T196
 Hadlich, F., 533
 Hadrich, J., 137
 Haerr, K. J., T154, T156, W357, W362
 Hafla, A. N., M120
 Haga, S., 588
 Hagevoort, G. R., M66
 Hahm, S.-W., M51
 Haile, A. B., M143
 Hailemariam, D. W., T5, T6, T7, T8, T9
 Haile-Mariam, M., 750
 Haines, D. M., 141, 142
 Hairgrove, T., 498
 Haisan, J., W429
 Hajilo, M., T494
 Hajjilou, M., M447
 Hales, K. E., 872
 Haley, D., 501
 Haley, D. B., 154, 290, 496
 Hall, C., 514
 Hall, J. O., T179
 Hall, L. W., M262
 Hall, M. B., W348, 168, 591
 Halpin, K., T449
 Hamlin, D. L., 340, 739
 Hammami, H., 10
 Hammock, I., W211
 Hammock, M., W211
 Hammock, N., W211
 Hammock, P., W211
 Hammon, H. M., T227, T403
 Hammond, A. J., M396
 Hamzaoui, S., M156
 Han, H., M51
 Han, O. K., W194
 Hanada, M., T40
 Hancock, D. W., W163
 Hancock, J. D., M203, 122
 Hanigan, M., T465, 681, 819
 Hanigan, M. D., M342, M410, W274, W276, W353, W356, 591, 708, 709, 746, 747
 Hannas, M. I., M172, 306
 Hänninen, L., 726
 Hansen, K., 477
 Hansen, L. B., T23, 373, 374, 376
 Hansen, P. J., T321, W81, W85, 220, 809
 Hansen, S. L., M427, 334, 347, 348, 524, 867
 Hansen, T. L., T242
 Haque, Z. Z., 557, 558
 Hardie, L. C., 526
 Hardin, D. K., 94
 Harding, J., W297
 Harding, J. C. S., 768
 Harding, J. L., M316
 Hardy, M. C., 229, 353
 Harland, R., M341, M346
 Harlow, B. E., T243
 Harmon, D. D., 746, 747
 Harmon, D. L., M482, 264, 270
 Harmon, R. J., 275
 Harper, M., 620
 Harper, M. T., W9, 167, 597, 850
 Harrington, J. A., W279
 Harris, D., 109, 112
 Harris, T. L., W330, W409, 153
 Harrison, J., T396, 459, 603
 Harrison, R., M341, M346
 Harry, H. R., M39, M49
 Harstine, B. R., 445
 Hart, C. G., W260
 Hart, S. P., T511, T512
 Harte, F. M., M103
 Härter, C. J., T497, T498, T506, W283
 Hartzell, M. C., M14
 Haruno, A., T386

Harvatine, K. J., M145, M148, M394, M415, T278, W456, 286, 345, 468, 469
 Hashmi, A. S., 628
 Haslag, W. M., T527
 Hassan, A., T141, T195, 78, 404
 Hassan, M., 134
 Hassanat, F., T385, W278
 Hassani, M. W., W376
 Hassen, A. T., W183
 Hastings, H. M., T441
 Hatamoto-Zervoudakis, L. K., W407, W438, W439, W440
 Hatanaka, H., 588
 Hatew, B., 857
 Hauschild, L., M173
 Hauser, M., T112, 72
 Haussler, K. K., T75
 Häussler, S., W251, W252, 670
 Havartine, K. J., M374
 Haviland, C. L., T67, 371
 Havill, K. M., 712
 Havlin, J. M., M388, M390
 Hawken, R. J., M67, 16, 760
 Hayen, J., W268
 Hayen, M. J., 808
 Hayes, B. J., 522, 679, 750
 Hayes, J., M478
 Hayes, S. H., T243
 Hazard, D., W474
 Hazel, A. R., T23, 373, 374, 376
 He, B., W123
 He, J., W113, W115, 577, 835, 836
 He, Y., W142
 He, Z., T374
 Heaton, M., W475
 Heersche, G., M246, 80
 Heguy, J., M127
 Heguy, J. M., M117
 Heibeck, S. M., T75
 Heidi, S.-H., 545
 Heinrichs, J., 330
 Heins, B. J., M119, M285, T23, 64, 373, 374, 376, 695
 Heiser, A., 247
 Heitman, A. J., 265
 Hemmer, J., T69
 Hemmings, K., 112
 Hemswoth, P. H., 32
 Henderson, A., 592
 Henderson, H. J., 652
 Henderson, S. L., M1
 Hendrick, S., 461
 Hendricks, J., T134
 Hendriks, W. H., 606
 Henning, P. H., 212
 Henrique, F. L., M23, W2
 Henrique da Silva, T., M395
 Henry, D. D., T148, T477, W60, W61, W460, 161, 368, 425, 604, 826, 832
 Henry, W., T296
 Hentges, D., 763
 Hentz, F., T466
 Herickhoff, L., W242
 Herlihy, M. M., 329
 Herling, V. R., T188, T484
 Hernández, C., T251, T252, T253, T254, T256, T257
 Hernández, H., T132
 Hernandez, J. A., 360
 Hernández, L., W110
 Hernandez, L. L., T209, T269, 97, 281, 704
 Hernandez, P., W473
 Hernandez, P. C., T183, W199
 Hernández-Bustamante, J. D., T526
 Hernández-Castellano, L. E., M471, M472, 432
 Hernández-García, A., 302
 Hernández-Mendo, O., W162
 Herrera, C. A. M., W488
 Herrero-Medrano, J., 261
 Herring, A. D., 42
 Herring, W. O., M72
 Hersom, M. J., M315, W55, 712, 713
 Hervé, L., 99
 Herzog, E., T445
 Hess, T., M46, T379, 742
 Hess, T. M., 311
 Hetta, M., T479, W394
 Hettinga, K. A., 594
 Heuwieser, W., W15, 20
 Hickey, C. D., 563
 Hicks, R. B., 871
 Hicks, V., 14
 Higgins, H., 509
 Higgs, R. J., T398, W393
 Hill, G. M., 119
 Hill, K. L., W64
 Hill, M., W250
 Hill, S. L., M232
 Hill, T. M., T203, T439, W343, 155
 Hilscher, F. H., W433, 833
 Hilsenbeck, H. L., W501
 Hindrichsen, I. K., W179, 169, 267
 Hinds, M., W183
 Hines, E. A., 241
 Hoar, B. R., W3
 Hodge, L. B., T238, T246, T247, 673
 Hodgman, C., 109, 112
 Hoene, L. H., M16
 Hoffman, L. C., M168, M488
 Hoffman, M. L., T65, W216, W217, 294
 Hoffman, P., T391
 Hoffman, P. C., M114, M121
 Hoffmann, K., 798
 Hofstetter, U., T245, T343, 239
 Hogan, J., 718
 Hogan, J. S., T222
 Hogan, S., 440
 Höjer, A., W394
 Holásková, I., M301, T311
 Holden, L. A., T533
 Hölker, M., W251, W252
 Holland, A. E., T394
 Holland, C. M., 66, 266
 Holland, J., 137
 Holloway, B., M361
 Holloway, C. T. L., T223
 Holscher, H. D., W100
 Holst, J. J., 48
 Holt, M. D., 162
 Holthaus, A. G., 766
 Holz, P., 431
 Homan, J., W34
 Homem Junior, A. C., M321, T519, T524, T529
 Honda, P. M., 287
 Hong, J.-Y., W153
 Hong, J.-K., M29
 Hong, S. H., W41, W43
 Hong, Y. H., M75
 Honrubia, P., M493, M496
 Hooper, H. B., M23, W2
 Horan, B., 375
 Horn, G. W., W447
 Horn, N. L., M516
 Hornick, J. L., W249
 Horst, J. A., M290, T90
 Horst, J. G., W482
 Horváth, M., 761
 Hoshide, A. K., 602
 Hosotani, G., T287
 Hossain, M. M., M200, 838
 Hosseindoust, A., M202
 Hosseini, A., W437
 Hostetler, D., M348, T452, T453
 Houin, B., M16
 Houssard, C., 660
 Hovey, R. C., 95
 Howard, J. T., 750
 Hristov, A. N., W9, W365, 167, 597, 620, 850
 Htoo, J. K., M171, M172, W121, 52, 304, 305
 Hu, F. L., 300
 Hu, H., M150
 Hu, L., W40, W215
 Hu, M., W466
 Hu, T., T171, T181
 Hu, W., M365
 Hu, X., M78, M84
 Hu, Y., 195
 Huang, L., W239, 653
 Huang, Q., T171, T181
 Huang, X., M449, W48
 Huang, X. B., T421
 Huang, Y., M501, 769, 770
 Huang, Z., M78, 188, 577
 Huang, Z. Q., W113, W115, 835, 836
 Hubbell, D., M46, T379, 742

Hubbell, D. S., T350, W62
 Huber, K., 30, 477
 Huenchullán, P. R., 722
 Huerta-Bravo, M., M403
 Huffman, T., W1
 Hughes, C. H. K., 420
 Hughes, H. D., M37, T309, 505, 507, 589, 590
 Hughes, J. M., W140, W141, 565
 Huhtanen, P., T479, W394, W450
 Hui, W., T401
 Huisma, C., M337
 Huisman, D., T441
 Hulbert, L. E., M136, W35, W38, 250, 494, 508
 Hullinger, G., 26
 Hulsegge, I., 380
 Hultquist, K. M., 89
 Hume, M., T173, W266
 Hung, I.-F., T297, 798
 Hunger, C., 190
 Hunter, A., 733
 Huntington, G. B., 346
 Huo, Y., W295
 Huppertz, T., M107, 440, 570, 654
 Hurley, D., 514
 Hurley, D. J., W323
 Hurt, E. E., 656, 657
 Hurtaud, C., W373, 467
 Husnain, A., 134
 Huson, H., W88
 Huson, H. J., T88, 755
 Huss, A. R., T172, W95, 787
 Huss-Danell, K., T479
 Hussein, A. H., 333, 335
 Hutchens, T., M476
 Hutcheson, J. P., 107, 521, 863, 864, 865
 Hutchison, J. L., W84, W86
 Huzzey, J. M., M21, M22, T36
 Hwang, H.-S., M29
 Hwang, J.-Y., W153
 Hygino, B., M473
 Hymes-Fecht, U. C., W198

I

Iandola, S. K., T117
 Ibáñez, R. A., 560
 Ibba, I., 650
 Ibeagha-Awemu, E. M., T279, W94
 Idowu, O. J., 823
 Idrobo, A. E., T260
 Ige, M., 273
 Iglesias, E., W269
 Ignacchiti, B. P., W187
 Ignacio, F.-F., 189
 Iiams, C., W183
 Iida, R., T57, W286
 Ikegami, E., T386, T387

Ikhatua, U. J., T477, 161, 832
 Imboden, M., W34
 Imumorin, I. G., M82, T80
 Indugu, N., T168, T488, 164, 513
 Infante, P., M86
 Ingale, S. L., W114
 Ingawa, K., 225
 Ingham, C., W502
 Ingham, E. R., T109
 Ingold, B. C., 243
 Íñiguez-González, G., T432, 559
 Ipek, A., T336
 Ipharraguerre, I., W119, W247
 Ipharraguerre, I. R., T402, 45, 48
 Iposu, S. O., 273
 Iqbal, S., 585
 Iqbal, Z. M., T442
 Ireland, F. A., 738
 Irsik, M., M315, 712, 713
 Isabela da Silva, C., M473
 Isaka, N., T267, T268
 Isaza, J. V., M96
 Isenberg, B. J., T444
 Ishaq, S. L., M460, W328
 Isiderio, K. C. P., M512
 Iske, C. J., 399
 Ismaiel, A. K., M50
 Ismail, H., M483
 Iukalo, A., M102
 Ivanov, L., W155
 Ivanova, L. A., T35
 Ivey, B. L., W63
 Ivey, S. L., T76
 Iwaasa, A., T181, W200
 Iwaniuk, M. E., W387
 Iyasere, O. S., T58
 Iyayi, E. A., 795

J

Jabbar, M. A., T442
 Jacobs, R. D., 311
 Jacometo, C. B., T2
 Jacques, K. A., M326, W458, 104, 105
 Jacquez, S., T140
 Jaeger, J. R., M232
 Jaeggi, J. J., 560
 Jaganathan, D., T61
 Jahnke, M. M., 451
 Jaichansukkit, T., M73
 Jalukar, S., 817, M218
 James, D. K., W185
 James, R., 709
 James, R. E., M296, T264, 57, 86, 224, 419
 Jamrozik, J., 754
 Jang, K., T293, T301
 Jang, Y., T293, T301
 Janini, A. P. R., W305
 Janni, K., 693

Janss, L. L., 41
 Jantz, J. A. B., M419, 460
 Janusckiewicz, E. R., T180, T184
 Janzen, E. D., M28, W13, 288
 Jao, M., M361
 Jarillo, J., W188
 Jarrett, J., 709
 Jatou, C., 757
 Jattawa, D., W91
 Javed, K., T442
 Jawor, P., T403
 Jaworski, N. W., 793, 794
 Jayaraman, B., 52
 Jayasinghe, N. K., M340
 Jeffrey, A. M., W95
 Jelinski, M. J., W13
 Jendza, J. A., M137
 Jenkins, C. J. R., M348, M382, T452, T453
 Jenkins, T., T396, 162
 Jenko, J., T88
 Jenks, M. L., 610
 Jennings, H. A., 485, 487
 Jennings, J. S., W430, W448, 339, 506, 815, 863, 864, 865
 Jenny, B. F., M380
 Jensen, J., 753
 Jeon, S. J., T22, 23
 Jeong, A., T131
 Jeong, C. D., W424
 Jeong, J. S., M200, M202
 Jeong, K. C., T21, T28, 23
 Jeong, W., T316
 Jesus, E. F., M367, M377, W405, W406
 Jewell, D., 550
 Jha, R., 571, 576
 Ji, D. H., W468
 Ji, J., 706
 Ji, S., M451
 Ji, Y., 424
 Jia, G. Q., 338
 Jia, Y., 270, 195
 Jiang, C. G., T354, 175
 Jiang, S. Z., T284
 Jiang, X.-R., W112
 Jiang, Y., M383, T477, W190, W355, W367, 161, 832
 Jiao, S., M501, 769
 Jiménez, L. M., T440
 Jimenez-Flores, R., T140, W156
 Jin, D., W411, W422
 Jin, L., T171, T181, W191, W200, W205
 Jin, S., W239, 653
 Jin, X. L., 300, 301
 Jirsaraei, B., W135
 Jo, C., T377, W293
 Jo, Y., T191
 Jodarski, G., 735
 Johansen, M., 623
 Johansson, B., 65

- Johnson, A., M25, M140, 600
 Johnson, A. K., W16, 185, 241
 Johnson, B., 607
 Johnson, D., W71
 Johnson, J. S., 238, 846
 Johnson, K. A., M446, 524
 Johnson, L. M., M255
 Johnson, M. E., 560
 Johnson, R. W., 774
 Johnson, S. E., T224, T229, W218, 420, 746, 747
 Johnson, T. M., 106
 Johnston, C., T390
 Johnston, L., M489, T389
 Johnstone, P. D., M486
 Jois, M., M393, M396
 Jokela, W., M122
 Jokela, W. E., 636
 Jolaosho, A. O., 271, 273
 Jolitz, E. S., M220
 Jolliet, O., 592
 Jolly-Breithaupt, M., W297
 Jones, A. K., W216, 291, 294
 Jones, A. L., W323
 Jones, C. K., T74, T172, T282, W95, W97, W103, W105, 123, 787
 Jones, J. J., 34
 Jones, J. O., T129, W139, W489
 Jones, K., T244
 Jones, S. A., W475
 Jones-Bitton, A., T201, 839
 Joo, Y., W178, 265
 Joo, Y. H., T461, T470, T480, W172, W194
 Jordan, E. R., M210
 Jordana, J., T507
 Jorge, A. M., M36, W56
 Jorgensen, M., 693, 696
 Jorquera, A. P., T528
 Jose, R. M., 189
 Joseph, R. T., M239
 Joshi, C., 53
 Joy, F., M329
 Juárez Sequeira, A. V., W402
 Juárez-Reyes, A. S., W168
 Judd, L. M., T490
 Judy, J. V., M382
 Juengel, J. L., M486
 Juengst, L., M55
 Julliard, V., 672
 Jun, L., M143, T401
 Jung, Y., 632
 Junior, A. C. H. T522, W315,
 Júnior, B. R. d. O., M381
 Júnior, C. A. S., T70
 Junior, C. G. S., T68
 Junior, G. A. O., W79, W92
 Junior, G. d. L. M., T518
 Junior, G. S. D., M112
 Júnior, V. L., M24
- Junqueira, O. M., W46
 Junqueira Rodrigues, D., W234, W235
 Juntwait, K. A., 622
- ## K
- Kabirizi, J. M., 555
 Kachman, S. D., 527, 530
 Kadam, H. D., M53, 245, 378
 Kafilzadeh, F., M309, M425, W192, W193
 Kahindi, R., M185, W121
 Kahl, S., T10, T20, W20, W37
 Kalaitzakis, E., T277, 680
 Kalantari, A. S., M279
 Kalebich, C. C., 858
 Kalivoda, J. R., 123
 Kallenbach, R. L., T492, 340
 Kalscheuer, R., 74
 Kalscheur, K. F., M340, W332, W359
 Kam, D. K., M335
 Kamal, M. M., 421, 423
 Kamanga-Sollo, E., W224
 Kamat, M. M., M14
 Kametani, M., M367, M377
 Kaminski, S. L., T319
 Kammes, K. L., T410
 Kamollirt, C., 312
 Kang, H., M29
 Kang, H. C., W74
 Kang, H. J., T307, W292
 Kang, H. S., W222, W223
 Kang, K. I., 303
 Kang, S., M54, M88
 Kaniyamattam, K., T95, T105
 Kannan, G., M452, M455, M456, M457, W489, W490
 Kappen, K., 399
 Karanja, J., M288
 Karcher, E. L., M3
 Kareem-Ibrahim, K., W238
 Kargar, S., T380, W379
 Karimi, A. H., W469
 Karle, B. M., W24
 Karns, J. S., 145, 147
 Karreman, H. J., T109
 Karren, B. J., T75
 Karwe, M. V., 70
 Kaske, M., 431
 Kassem, J. M., W138
 Kassube, K. R., 803, 804
 Kathannan, S., M198
 Kato, D., 588
 Katto, S., T159
 Kaufman, E. I., M20, 355
 Kaufman, J. D., 803, 804
 Kaur, H., M142, 297
 Kautz, F., 514, 627
 Kawahara, T., W89
 Kawas, J. R., T353
- Kawashima, C., M212, T40
 Kawonga, B. S., 813
 Kay, J. K., 247
 Kazemi-Joujili, M., 851
 Kazmer, G. W., T61
 Keating, A. F., W16
 Kebreab, E., M281, T465, W281, W354, W358, 596, 600, 615, 625
 Keefe, G. P., M292
 Keele, J., W475
 Keele, J. W., 504
 Kegley, B., 742
 Kegley, E., M46
 Kehler, C. E. J., 728
 Keim, J. P., W444
 Keisler, D. H., W261, W329
 Keith, E., T292
 Keller, A. K., 569
 Keller, L., T483
 Keller, M., W502
 Kelley, A. W., T388
 Kelley, S., 725
 Kelley, S. F., M515, T241, T244, T536, W243
 Kelly, D. J., 442
 Kelly, E. J., 26
 Kelly, F. W., 321
 Kelly, K. M., 221
 Kelton, D. F., M292, 82, 754, 759
 Kemp, B., 127, 276
 Kemp, R. A., 768
 Kemper, K. E., 679
 Kempker, A. J., T189, T190, T510
 Kenez, A., 30, T55
 Kennedy, E., M118, 150
 Kenny, A., M337
 Kenny, A. L., W264
 Kenny, D. A., M244
 Kent, D. J., 778
 Kent-Dennis, C., T225
 Kenyon, P., T345
 Kerby, J. L., 67, T186
 Kerley, M., T492
 Kerley, M. S., T287, W465, 334, 524
 Kerr, B., T465
 Kerr, D., T20, W37
 Kerr, D. E., 29, 100, 512, 518
 Kerr, K., 549
 Kerr, K. R., 389
 Kerrigan, M. A., 765
 Kersbergen, R. J., 602
 Kerth, C. R., T72
 Kesser, J., W250
 Kessler, E. C., 101
 Keuler, N. S., W34
 Khademi, T., T494
 Khadse, J. R., M53, 378
 Khafipour, E., M41, M333, M374, M408, M409, T17, T18, T19, W118, W120, 248
 Khalilvandi-Behroozyar, H., M414

- Khamisabadi, H., M425
 Khamooshi, S., W192
 Khan, M., 689
 Khan, M. A., M245, T36
 Khan, M. J., 464
 Khan, N. A., T478, W414
 Khan, O. A., W427
 Khanal, S., T115
 Khanal, S. N., M108
 Khanthusaeng, V., 312
 Khare, K., 541
 Kharitonov, S. N., W83
 Kharsinova, V. R., T99
 Khas-Erdene, M448, T456
 Khatabi, N., T144
 Khatib, H., 351, 767
 Khemsawat, J., T249
 Kholif, A. E., T234, 151, 173, 174, 611, 630
 Kholif, A. M., 173
 Kholif, S. M., 173, 174
 Kiarie, E., M491, W111, W117, W120, 113, 116, 573
 Kienitz, M.-A. J., M285
 Kienzle, E., 547
 Kil, D. Y., M189, M190, W226
 Kim, B., T293, T301
 Kim, B. G., M175, M186, M187, M191, W233, W424
 Kim, B. W., W468
 Kim, C. J., M460
 Kim, D., T28
 Kim, D. H., T461, T470, T480, W172, W194
 Kim, E. T., T461, T470
 Kim, G.-B., T131
 Kim, H. B., W41, W43
 Kim, H. C., W67, W74
 Kim, H. J., T307, T377, W222, W223, W292, W293, 106
 Kim, H. S., W222, W223
 Kim, I. H., M69, M198, M199, M200, M201, M202, M203, M204, M205, M206, M207, M208, 194, 303, 797, 838
 Kim, J., T293, T301, T303, T316, 580
 Kim, J. H., M189, M190
 Kim, J. J. M., 430
 Kim, J. K., M201, M207, W223
 Kim, K., T293, T301
 Kim, K. H., M494
 Kim, K.-S., M494, W226
 Kim, M. C., M189, M190
 Kim, M. S., 527, 530
 Kim, S., T293, T301, W74
 Kim, S. C., T461, T470, T480, W172, W194
 Kim, S. G., 386
 Kim, S. H., M504
 Kim, S. U., W467
 Kim, S. W., T286, 44, 114, 115, 117, 119, 307, 309, 788
 Kim, T. H., T480
 Kim, W., T293, T301
 Kim, W. K., 52
 Kim, Y., T293, T301
 Kim, Y. H., M494, T293, T301, W114
 Kimball, B. A., 416
 Kimball, S. R., 387
 Kindermann, M., T357, W429, 167, 597, 850
 Kindstedt, P. S., W140, W141, 565
 King, M. E., W64
 King, M. T. M., M18, W5, 510
 Kinley, R. D., 169
 Kinoshita, A., T55, 30, 477
 Kirch, B., M35
 Kirk, D., M339, W391
 Kirk, M., T202, 156
 Kirven, J., M101
 Kiser, J. N., M89, W90
 Kistemaker, G. J., 754
 Kizilkaya, K., M80, T80
 Klefot, J. M., 353
 Klein, D., 607, 790
 Kleinjan, J., T157
 Kleithermes, S. N., T527
 Kliemann, R. D., M474, M475, M479, M480, M481, W500
 Klop, G., 857
 Klopfenstein, T. J., 341, 821, 862, 869
 Klopp, R. N., 222
 Klotz, J. L., 68, 264, 270
 Knap, P. W., 262
 Knapp, J. R., T434, T443, W284, W285, W287, 202
 Knauer, M. T., 186, 187, 762, 763
 Knauer, W. A., 86
 Knights, M., T515, T517
 Knijn, H., 381
 Knoell, A. L., 821
 Knol, E. F., 261, 764
 Knorr, A., T280
 Knowles, D. P., M83
 Knowlton, K., T344
 Knowlton, K. F., M282, 708, 709
 Knox, P., 418
 Knox, R. V., M490, W240
 Knueven, C., W95
 Knupp, L. S., T502, T509, W491
 Knupp, S. N. R., W491
 Knutson, K., T33
 Koba, Y., W347
 Koch, B. M., W270, 102, 103
 Koch, C., T445, W250
 Kocic, H., T108
 Koeck, A., T104, 752, 754, 757, 759
 Koelling, B. E., T510
 Koenig, K., 482
 Koepfel, P., 798
 Koetz, C., M100
 Kohake, K. L., 122
 Köhler, J., M439
 Kohmann, M. M., M110
 Kohn, R. A., M410, T490
 Koketsu, Y., T57, W286, W288
 Kokkinidou, S., 781
 Kokkonen, T., M343
 Koknaroglu, H., W279
 Kolling, G. J., M260
 Kommineneni, A., T113, T114, W131, W146, 71
 Kondo, M., 588
 Konkrua, T., T86
 Kononoff, P. J., M348, M382, M401, T452, T453, W389
 Koolhaas, J. M., 235
 Koonawootrittriron, S., M68, M71, M73, M253, T86, T87, T91, T249, W91, W93
 Koprál, C. A., M271, M272, M273, M274, M275, 136, 138, 139, 148
 Korkmaz, F. T., 29, 512
 Kormondi, M., M495
 Koser, S. L., 285, M372, W256
 Kouakou, B., M452, M453, M454, M455, M456, M457, W489, W490, W499
 Koudele, K., W1
 Kovacs, A., 193
 Kovalsky, P., T245, T343
 Kozloski, G. V., M482, T466, T467
 Kradolfer, D., T312
 Kraft, J., M256, M341, M346, T405, 166, 263, 598
 Kraison, A., 312
 Kramarenko, A. S., T35
 Krause, A. R. T., T2
 Krauss, R., 25
 Kraut-Cohen, J., 415
 Krawczel, P., 495
 Krawczel, P. D., T152, 233
 Krehbiel, C. R., T67, 371
 Krempel, G. M., T274, T275
 Kristensen, R. C., M271, 145, 146, 147
 Krizan, S. J., W450
 Kromik, A., 533
 Kronberg, S. L., W445
 Ku, M. J., W467
 Kuang, S., 669
 Kuber, C., M128
 Kuber, R., M128
 Küçüksen, D. U., T503
 Kudupoje, M., W17, 730
 Kudupoje, M. B., W160
 Kuehn, C., M164
 Kuehn, L. A., 504, 523, 527, 530
 Kuester, O., W385
 Kühn, C., M157, 533
 Kuhn-Sherlock, B., 365
 Kulatilleke, I., M393
 Kulkarni, A. A., 245
 Kumar, S., T168, T488, T119, 164, 513

Kung, L., 603
Kungu, J., 555
Kunz, H.-J., 431
Kuo, L., T61
Kurman, C., 495
Kurtz, J. E., W320
Kutschenko, M., M506
Ku-Vera, J., T525
Ku-Vera, J. C., M442
Kuwahara, F. A., T178
Kwawukume, A. A., W118
Kweh, M., 83
Kweh, M. F., T220
Kwon, W. B., M186, M187, M191, W233
Kyle, C. R., W152
Kyuuno, W., T40

L

Labrie, S., W150
Lacasse, P., 98, T271
Lacava, A., 502
Lacerda, T., 634
Lacetera, N., W87
Lacroix, R., M269
Ladeira, M., 110
Ladeira, M. M., M318, M324, W290
Ladokun, A. O., W238
Lage, C. F. d. A., M384, M387
Lage, J. F., M317
Lager, K. J., M210
Lago, A., M289, M294, M304, M307, M308,
T31, T43, T46, T47, W32, W33
Lagreca, G. V., 103
Lahr, F. C., T274, T275
Lainé, A., 13
Lais Galati, R., W407, W438, W439
Lake, R. P., 871
Lam, T. H., T5, T6
Lamb, C., W71
Lamb, G. C., T148, W60, W61, 59, 327, 368,
425, 604, 736, 826
Lamberton, P., T268
Lampert, V. N., T340
Lamprecht, E. D., T241
Lana, Â. M. Q., T273
Lana, R. P., 602
Lancaster, P., T338
Lancaster, P. A., T178, W447, 736, 834
Landblom, D. G., 692
Landro, J. L., 837
Landi, V., T507
Lane, R. L., 583
Lanferdini, E., M505, M506
Lange, M., T142
Langer, C. N., W225
Lanna, D. P. D., M350, T433
Laodim, T., W93
Lapierre, H., T399, T400, T423, 619, 620
LaPierre, P. A., W325
Laporta, J., T269
Lara, L. J. C., M258, W227, W228
Lardner, H. A., M329
Lardy, G. P., 58
Larimore, E. L., T317, 586
Larios-Cueto, S., T332
Laroche, B., 438
Larrabee, K. E., T67
Larraín, R. E., 722
Larsen, L. B., 751
Larson, C. K., T371
Larson, H. E., M422
Larson, J. A., M232
Larson, J. E., M250, 447
Larson, J. M., 740, 741
Larson-Meyer, D. E., 243
Lascano, G., M420, 162, 624
Lascano, G. J., 198, 626
Latorre, M. A., M498, M502
Laubenthal, L., W251, W252
Laurentiz, A. C., W107
LaVigne, E. K., T63
Lawhon, S. D., W22, W42
Lawlor, T. J., 534, 535
Lawrence, A., M59
Lawrence, L. M., T243
Lawrence, R. D., T416, T426
Lawrence, T. E., 107, 521, 863, 864, 865
Lawton, A. B., M366
Lay, D. C., 238
Le, M. H. A., 837
Le Feunteun, S., 438
Le Gouar, Y., 438
Leal, I. C., T427
Leal, I. G., T428
Leal, L., M138, 158
Leal, M. L. R., T467
Leal Matarim, D., M158
Leal Perez, H., M321, M322
Leal Yepes, F. A., 280, 755
Lean, I. J., 704
Leane, S., 316, 317
Leão, A. E., W345, W346
Leão, A. G., W399, W401
Leão, B. C. S., T318, T325, T326
Leão, J. M., M345, T273, T341, W263
Leatherman, K. H., 224
Leatherwood, J., 725
Leatherwood, J. L., M515, T241, T244, T536,
W243
Lebeuf, Y., M378, M405, M407, M411
LeBlanc, B. D., W273
LeBlanc, S. J., M20, M134, T201, T204, W5,
82, 290, 355, 363, 510, 839, 847
Lechuga, R., T173
Leclerc, H., T352
Lecrubier, R., T473
Ledda, M., W491
Ledoux, D. R., T346, T348
Leduc, M., M405, M407
Lee, A., T192
Lee, B. B., M189, M190
Lee, B. H., W468
Lee, E. M., W222, W223
Lee, G., 386
Lee, G. I., W226
Lee, H. J., T377, T461, T470, T480, W172,
W194
Lee, I. K., W292
Lee, J., M64, M335, 325, 36
Lee, J. G., T94
Lee, J.-H., M335
Lee, J. H., M452, M453, M454, M455, M456,
M457, W489, W490, W499
Lee, J.-J., M335
Lee, K. Y., M201, M205
Lee, M., W424
Lee, M.-R., W153
Lee, S. H., W74, W114
Lee, S. K., W467
Lee, S. S., M504, T211, W410, W424, T470,
W194
Lee, S.-S., W76
Lee, W.-J., W153
Lee, Y., M54, M88
Lee-Rangel, H., W418
Lefebvre, D. M., 754, M269, M270
Lefevre, V., 655
Legarra, A., M67, 534, 535, 646
Lehenbauer, T. W., W24, W35
Lehloenya, K. C., W494
Lei, S. M., 846
Lei, X. G., 578, 579, 580, 581
Lei, Y., M208
Leistner, J. E., M15
Leitch, K. A., T118
Leite, R. F., M469, T519, T529, T498
Leite Barbosa, J., W496
Leite de Oliveira, F. C., T188
Leite Vieira, G., M321, M322
Lekatz, L. A., 338
LeMaster, C. T., M222
Lemcke, R. A., T239
Leme, P. R., M159, W400, W404, W503, 163
Leme, T. M. C., M86
Leme-dos Santos, T. M. C., M23, W2
Lemes, A. P., 876
Lemley, C. O., M221, M250, T238, W260,
447, 449
Lemma, B. B., M452, M453, M454, M455,
M456, M457, W490
Lemos, B. J. M., M424, W306, W451, 607
Lemos, M. V. A., W72, M91, T81, W66
Lemos, T., 181
Lemosquet, S., W373
Lemus, A. T., 220
Lengi, A., 436, 700

- Lengi, A. J., 94
Lents, C. A., M507
Leonardi, C., W32, W33
Leonardi, S., 688
Leon-Lucio, K., T158
Lérias, J. R., M472
Leriche, I., W102
LeRoy, C., M134
Leroy, F., 661
Lessard, M., W112
Lessard, M.-H., W150
Letourneau-Montminy, M.-P., M188
Leurent-Colette, S., 277
Leury, B. J., 321, 810
Levicnik, E., 182
Lewin, H. A., W84
Lewis, E., 179
Lewis, R. M., 269, 717
Lewis, S. K., 632
Leymaster, K., W475
Leymaster, K. A., 717
Leytem, A., M281, W354, 615, 625
Leyton, L., W190
Leyva-Medina, K. H., T516
Leyva-Orasma, C., W480
Leziér, D., M332
Li, A., M511
Li, B., 835
Li, C., W69, W239, W466, 427, 707
Li, F., T162, T165, T297
Li, H. L., M199, M202, M203, M208
Li, J., M166, 386
Li, J. N., W419
Li, L.-L., 337
Li, Q., M151
Li, R., T279, W120, W154
Li, S., M19, M123, M125, M162, M451, T18, T161, T163, T165, T166, T228, T455, W326, 662
Li, S. C., T19, 248
Li, S. L., T446
Li, T. S., M206
Li, X. M449, T210, W390, 859,
Li, X. Y., T284
Li, X. Z., W327
Li, Y., M30, W48, W200
Li, Z., W159, W177, W208
Li, Z. Y., T283
Lian, S., M152, 435
Liang, D., 406
Liang, G., W124
Liang, X., 337
Liang, X.-W., 337
Liang, Y., T472, W330, W352, W409, 153
Liang, Y. L., 27, W26
Liao, S. F., M167, 108
Liao, S. S., M509
Libardoni, R. N., T467
Liboreiro, D. N., M306, T1, W8
Lidauer, M., M343, 39
Liddane, M., M118
Lila, M. A., T193
Lim, D., W67, W76
Lim, J., W126, W127, W128
Lima, A. L., W508
Lima, A. R. C., M468, M469
Lima, C. G., T188
Lima, D. C., 394
Lima, F., T26, T320
Lima, F. S., M237, T322, 328
Lima, J. A. M., M345, M381, T273
Lima, J. M., M474
Lima, L. d. A., W158
Lima, M. M., W106, W107, W108, W236
Lima, P., W229
Lima, R. F., W182
Lima, S., T26, 23, 509
Lima Cavalcanti, L. F., 149
Lima Ferreira, A., W381
Lima Vellini, B., W313
Limesand, S., 130
Lin, B., 337
Lin, J., M375
Lin, R. S., M503
Lin, Y., W40
Linander, C. L., 292
Lindemann, M. D., T297, T298, 798
Linden, S., 515
Lindsey, A., W242
Linn, J., W395
Lino, F. A., W294, W451
Linscott, T., W128
Liou, S.-C., W154
Lira, R. J., T232
Lira de Sousa, J. T., T518
Lisembee, A. M., M379
Lissemore, K. D., 290
Litherland, N. B., W392, W434, 701
Littier, H., T344
Little, C. R., M516
Little, M. W., T32, 618
Littlejohn, B. P., W22
Littlejohn, M. D., 15
Liu, D., 242
Liu, E., W335
Liu, F., 321
Liu, G. E., W84
Liu, H., W132, W417
Liu, H. Y., 300, 301
Liu, J., M284, W132
Liu, J.-D., W268, 808
Liu, J. X., T412, T413, T421, T430, W123, 300, 301, 322, 860
Liu, L., W154
Liu, M., T421
Liu, R.-Y., 176, 682
Liu, W., W239, 653
Liu, X., W200
Liu, X. M., T283
Liu, Y., M157, W40, 792
Liu, Y. H., M201
Lizarraga, R., W299
Lluch-García, N., T304
Lo, L. L., M160, M503
Lobão da Silva, D. N., W392, W434, 701
Lobeck-Luchterhand, K. M., 503
Lobo, M. G., M359
Lobos, N., T435
Lobos, N. E., M363, T212, 315
Locatelli-Dittrich, R., M355
Locher, L., T55, 477
Lock, A. L., T397, W253, W331, W335, W340, 95, 171, 466, 824
Lockhart, J., T532
Loest, C. L., T76
Loether, T. M., 587
Loftus, A. S., T286
Lohakare, J., M376
Lollivier, V., T268, 98, 99
Lomb, J. C., M21, M22
Lombard, J., 137, 142
Lombard, J. E., M271, M272, M273, M274, M275, M276, 136, 138, 139, 140, 141, 143, 144, 145, 146, 147, 148
Lomeli, J. J., W275
Londoño, A. S., T63
Loneragan, E. H., 668
Loneragan, P., M244, 679
Loneragan, S. M., 668
Long, G., T295
Long, M. T., T235
Long, N. M., M222
Longo, A. L. S., M23, W2
Longuski, R., 476
Looper, M. L., T350
Loor, J. J., M52, M154, T3, T215, T432, T442, T476, T520, W57, W215, W220, W372, W437, 247, 318, 319, 320, 434, 455, 456, 457, 458, 463, 464, 706, 707
Lopes, A. R., T358
Lopes, A. C. O., W436
Lopes, F., M351, W184
Lopes, F. B., W70
Lopes, F. G., M100
Lopes, F. R., M238, T323
Lopes, J., 167, 620
Lopes, J. C., W9
Lopes, L. T., 306
Lopes, L. B., T341, W263
Lopes, N. M., M358, M360, W357, W362
Lopes, P. S., M77
Lopes de Oliveira, R., M165
López, A., W402, 383
Lopez, H., M255, 25
Lopez, M., 721
López, P., M502
Lopez, S., 611

López, Y., T255
Lopez de Toro, C., M252
Lopez-Bote, C. J., M498
López-Colom, P., M500
Lopez-Herrera, A., M96
López-Vergé, S., M195, M196, M499
Lorena, S., T120
Lorentsen, R., 113
Lott, S., 177
Loucks, W. I., M392
Lourenco, D. A. L., M67, T83, W77, W80, 534,
535, 539, 646, 760, 770
Lourenço, J. C. S., M474, M475, M479,
M480, M481, W500
Lourenço, J. M., W163
Louvandini, H., W229, 292
Lovatti, J. V. R., W221
Love, W. J., W24, W35
Lowe, G., 637
Loy, D. D., M427, 347, 348, 524
Loya-Olguin, J. L., T523
Lu, C., 109, 112
Lu, J., M509
Lu, Y., T114, T115, T229, W147, W218, 71,
525
Luan, S., T476, W368, 702
Lucas, R. C., T514
Lucena, L. R., 287
Lucey, J., W147
Lucey, J. A., M108, T115, 74, 560, 785, 786
Luchini, D., M217, M363, M404, T215, T435,
315, 318, 319, 320, 351, 455, 456, 457,
458
Luchini, N. D., W337
Luchterhand, K., 252
Luco, A., 25
Lucrecia, G.-V., 189
Lucy, M. C., M213, 316, 317, 329
Luff, W. G., T88
Luginbühl, T., 683
Lugo, A., 382
Luna-Orozco, J. R., W487, W488
Lundberg, A. L., M229
Lunesu, M. F., W491
Lunney, J. K., 765
Luo, J., T60, W484, W485, 577
Luo, W., 324
Lust, D. G., W270
Lüttgenau, J., T312
Luz, L. A., W164
Luz, P. H. C., T188
Luz, R.-C. M., 189
Luzbel de la Sota, R., T408
Lv, Z. W., W417
Lyle, P., M262
Lyles, J. L., M27, T67
Lynch, J. P., W191, W205

M

Ma, G., 603
Ma, J. Y., W327
Ma, L., M84, T102, W415, W419, W420,
W421
Ma, T., M470, M487, T438, W174, 175, 831
Ma, X., 653
Ma, Y. L., 310
Ma, Z., T28, 272
Ma, Z. X., W190
Maak, S., M157, M164
Mabelebele, M., W244
Mac Tilson, W., W210
MacAdam, J. W., 68
Macciotta, N. P. P., T92, W87, 650
MacDonald, J. C., M316, W297, 341, 821,
833, 862
Macedo de Almeida Martins, P. G., W496
MacGhee, M. E., T224, 420
Machado, A., M362
Machado, F. S., M345, M347, M354, M370,
M381, M384, M387, W377
Machado, T. J., 67
Machado, V., 509, T26
Machado-Neto, R., T315
Macías, D. S., T251, T252, T253, T254, T256,
T257
Maciel Fernandes, R., W313, W454
Macko, A., 130
Mackowiak, C., W171, W180
Macmillan, K., T454, 85
MacNeil, M. D., 523, 648
MacPherson, J. A. R., M138
Maddock, R. J., 692
Mader, T. L., W279, 806, 807
Madrid, S., 383
Madrona, G. S., T142
Madrugá, A., W14, W289
Madsen, P., 753
Madson, D. M., 453
Madureira, A. M. L., M248, M293, M300,
842
Madureira, E. R., M277
Madureira, M., M277
Maeda, Y., T21
Mafi, G. G., 371
Magalhães, A., W143
Magalhães, A. F. B., W72
Magalhães Campos, M., W345, W346,
W381, 149
Mage, C., M62
Magnabosco, C. U., W70
Magno Fernandes, A., W201
Magowan, E., T296
Mahanna, W. C., T437
Maia, C., 446
Maia, G. G., 287

Maier, C. S., T50, T51, T53
Mainar-Jaime, R. C., 237
Mainau, E., W6, W14, W289
Maioli, M. A., M226
Maiorano, A. M., W50
Maiorka, A., W101, 394
Majbeesh, S., 295, 296
Malaspina, M., 486
Malchiodi, F., T98, T104, 759
Maldague, X., W15
Malekjahani, F., T369
Malheiros, B. A., M183
Malheiros, J. M., W58, W59
Malkus, J., T223
Mallard, B., T104, 511, 752
Mallett, C., 207
Mallikarjunan, K., T196
Mallo, J., M500
Mallo, J. J., M493, M496, T440, 237
Mallory, E. B., 602
Malmuthuge, N., W124
Maltecca, C., M501, 687, 749, 750, 769
Maluta, R. P., T169
Mamedova, L. K., M149
Mammi, L. M. E., M259
Mamuad, L. L., M504, T211, W410, W424
Manbeck, A. E., W99, 393
Manca, C., W491
Manca, M. G., 650
Mançanares, A. C. F., 124
Mancillas-Flores, P. F., W181
Mangrum, K. S., M222
Manjarín, R., 302
Mann, S., M366, W245, 280, 755
Manor, M., 578, 579
Manor, M. L., 581
Manteca, X., W6, W14, W289
Manthey, A. K., T415, W329
Mantilla, L. R. R., M161
Mantovani, H. C., M370, W204
Mäntysaari, E. A., M343, 39
Mäntysaari, P., M343
Manuel, L., 189
Manuelian, C. L., T520, T521
Manunza, A., T507
Manzke, N. E., T286
Mao, H. L., T354
Mao, X., 577
Mao, X. B., W113, W115, 835, 836
Mao, Y., M92
Maquivar, M., T69, 480, 481, 482
Maquivar, M. G., T4, 733
Marchant, K. B., 66
Marcondes, M., T361
Marcondes, M. I., M283, M370, W187,
W221, W269, W377, W378
Marden, J. P., T481
Marden, J.-P., M62

- Marella, C., T113
 Margni, M., 660
 Mari, L. J., W298, 613
 Maria, A. P. J., W100
 Maria dos Santos, R., M231
 Marie-Magdeleine, C., M56
 Mariezcurrena-Berasain, M. A., W471
 Marin, E., W190
 Marin, M. P., 244, 462
 Mariniello Silva, T., M165
 Mariorano, A. M., T82
 Mariutti, L. R. B., W136
 Mariz, L., T366, T367, T369
 Mariz, L. D. S., W436
 Mark, T. B., 407
 Marostegan de Paula, E., T199, T361, T369
 Marostegan de Paula, R., W426
 Marques, C. A. T., M458, T504
 Marques, J. A., W298
 Marques, R., 28, M261, T231
 Marques, R. S., T355
 Marquez, J. J. C., M342, W353, W356
 Marquezini, G. H. L., T148
 Marquez-Melendez, R., W167
 Marsan, P. A., T92, W87
 Marti, S., M28, W13, 288, 728
 Martin, N. H., 778
 Martin, O., 684
 Martin, R. M., 61
 Martinez, C., W71
 Martinez, C. A., 541
 Martinez, J., W473
 Martinez, N., 83, 253, 328, 704
 Martinez, N. P., T322
 Martínez, A., T507
 Martínez, P. A., W188
 Martinez Baraldi Artoni, S., W46
 Martínez-Alfaro, J. C., T182
 Martínez-Camblor, P., W75
 Martini, A. P., 677
 Martín-Martín, G., W197
 Martín-Orúe, S., M500, W47
 Martins, A. S., T90
 Martins, C. L., W296
 Martins, C. M. d. M. R., M443
 Martins, D. d. S., 124
 Martins, E. C., W378
 Martins, J. P. N., 677
 Martins, L. K. S. A., M257
 Martins, M., W184
 Martins, M. F., 163
 Martins, P. C., M345, M384, M387
 Martins, P. G. M. d. A., W497, W498
 Martins, R. M., M325, W169, W355, W166, W190
 Martins, R. A. C., 445
 Martins, S. M. M. K., T294
 Martins, T., 110
 Martins, V. R., 677
 Martins da Silva, R. W. S., M260
 Martins de Souza, F., W397, W403
 Martins Lemos, B. J., W397, W403
 Martins Storillo, V., 184
 Martin-Tereso, J., M138, 336
 Marujo, M. V., W107, W108, W236
 Masching, S., 239
 Masello, M., M211, 128, 356
 Masiello, S. N., 778
 Masiero, M. M., W465
 Mason, B., M421
 Mason, F., T382
 Massarioli, A. P., 292
 Masser, D. T., 483
 Massie, C. M., M353
 Mastellar, S. L., 484
 Masuda, Y., 534, 535, 646
 Mateos, I., M43, T485, T486, T487, W175, W431
 Mathai, J. K., 305
 Mathews, A. T., M385, M413, 474, 475
 Mathur, P. K., 261
 Mathys, D., T62
 Matos dos Santos, R., T474, T475
 Matos Junior, J. B., W46
 Matte, J. J., W112
 Matthews, J. C., M227
 Mattiauda, D. A., W428
 Matzapetakis, M., M471
 Mauch, E. D., 771
 Maunsell, F., T24
 Mauricio, R. M., M347, M354
 Maus, D., W143
 Mavangira, V., T29
 Maverino, A., 502
 Maxime, D., 660
 Maxin, G., T423
 Maxwell, C. L., 371
 Maxwell, C. V., M508, 106
 May, K., 50
 May, N. D., M37, T309, 505, 506, 521, 589, 590
 May, S., 112
 Mayasari, N., 276
 Mayeres, P., 694
 Maynou, G., M267, M268
 Mayo, L. M., M246, M291, T200, 80, 353
 Mayorga, E. J., 364
 Mays, A. R., T246, T247, 409
 Mazalli, M. R., T81, W72
 Mazza, A., W506
 Mazza Rodrigues, P. H., W282, W398
 McAllister, T., M41, M436, T171, T181, T373, W200
 McAllister, T. A., M333, T349, T375, W176, W191, W205
 McArt, J. A. A., T42, T216, W245, 361, 755
 McAtee, J. D., 122
 McBirney, A. P., M1
 McBride, B. W., M20, W328, 355
 McBride, M. L., T25
 McCabe, M., 679
 McCain, A. R., W297
 McCammon, T., W272
 McCann, J. C., T476, W57
 McCann, M. A., 746, 747
 McCarron, A., 182
 McCarthy, M. M., W245, W246
 McCoard, S. A., T232
 McCormick, R. J., 422
 McCoski, S. R., T224, T229, W218, 420, 450
 McCourt, C. L., M352
 McCoy, D. R., 208, 564
 McCracken, J. A., 325
 McCracken, V. L., 452
 McCuistion, K. C., 67
 McCulley, R. L., 416
 McCutcheon, J., 637, 690
 McDanel, T. G., 504
 McDonalds, K., M30
 McElhenney, W. H., W479, 180
 McEvers, T. J., 521
 McFadden, J. W., M301, M385, M413, W363, W366, 472, 473, 474, 475
 McFadden, K. K., T65, W216, 291, 294
 McFadden, T., T225
 McFadden, T. B., W264
 McGeough, E., 703
 McGhee, C. E., T129
 McGlone, J. J., 392, 395, 398, 724
 McGovern, F. M., W492, 177, 182, 183, 631, 633
 McGreevey, N., T240
 McGuire, M. A., M392, W369
 McGuirk, S. M., W34
 McKillip, J. L., T133, T537
 McKinney, S. R., 468
 McKinnon, J. J., M139, M368, W176, 332
 McKnelly, A. T., W501
 McLean, D., T25
 McLean, D. J., M44, M428, M464, W323
 McLeod, K. R., W17, W36, W160, 730
 McMahan, D., T114, T134, T139, 71, 561, 562
 McMahan, D. J., W130, 663
 McManus, C., 634
 McMartin, L., T157
 McMillin, K. W., T334
 McMullen, P., T296
 McNamara, J. P., T441, T465, W369, 480, 481, 482
 McNeel, A. K., T317, 133
 McParland, S., 11, 14
 McSweeney, P. L. H., 560
 Meade, S. B., 196
 Meda-Alducin, P., M403
 Medeiros, A. N., T68, T502, T504, T509, W495

Medina, B., M495, W446
 Medina, J. V. C., 178
 Medina, L., T256
 Medrado, B. D., M257, M258
 Medrano, J. F., M93
 Medrano, M. M., T37, 356
 Meese, E. R., M4
 Mehta, D., T119, T195, 404
 Meier, S., 247, 365
 Meikle, A., M219, T345, W428
 Meirelles, F. V., 124, 125
 Meiring, P., W446
 Mele, M., T314
 Melendez, D., M28
 Meléndez, D. M., 288
 Melendez, P., 25, 462
 Melendez, P. G., 244
 Meletharayil, G. H., T113, T127, 75
 Melgar, F. R., T76
 Melilli, C., 81
 Mellado, M., T182, T263, T526, W486
 Mellado-Bosque, M. A., W25
 Mello Lima, J. A., W381
 Melnichenko, S., 858, W364
 Melo, A. C. C., M110
 Melo, C. M., M355
 Melo, G. F., W296
 Melo, G. M. P., T378
 Melo, L. F., M240
 Melo, L. E. H., W27
 Melo, M. I. V., M42, T427, T428
 Melo de Sousa, N., W249
 Menard, O., 438
 Mendes, A., M286
 Mendes, J. Z. B., W137
 Mendez, C. R. R., T528
 Mendonça, B. P. C., W306, W452, W455, W457
 Mendonça, F. B., T471, W282
 Mendonça, G. G., M280
 Mendonça, L. G. D., M136, M233, M234, M235, 508
 Mendonça Vieira, R. A., W201, W203
 Mendoza, C. C., M513
 Mendoza, G., W418, W473
 Menegassi, S. R. O., M100, T340
 Meneghel de Moraes, J., W302, W304
 Menegucci, P. F., M350
 Menezes, A. C. B., T367
 Menezes, B. B., W314
 Menezes, D. R., W408
 Meng, Q., W295
 Menghe, J., M396
 Menoyo, D., W119
 Mercadante, M. E. Z., T82, T83, W56, W77
 Mercadante, V. R. G., T148, W60, W61, 368, 425, 604, 826
 Mercado, F. T., W400, W404
 Mercer, S., T237
 Mereu, A., W119, W247
 Mergh Leão, J., W381
 Merino de Medeiros, M. I., T169
 Merrill, C., 603
 Merriman, K., 83
 Merriman, K. E., T220, 157
 Mertz, N. E., 739
 Meschiatti, M. A. P., M332, W302, 612
 Mesonero-Morales, A., T304, T305
 Mesquita, L. G., W300, W400, W404
 Messana, J. D., M311, M445, M450, T464, W291
 Metcalf, J. A., M364, 158, 430
 Metges, C. C., T12, W255
 Methot-Hains, S., W148
 Metzger, L., 71, T114, W145
 Metzger, L. E., T113, W131, W146
 Metzger, S. A., T209
 Meyer, A. M., M228, W303, 338, 740, 741
 Meyer, B. E., 863, 864, 865
 Meyer, D., M127, M254, M416, T208, W184, 601
 Meyer, L., T491, W184
 Meyer, L. R., T350, W62
 Meyer, T. L., 737
 Meyer, U., T55, T420, 30, 477
 Meyer, Z., W184
 Meyers, L., M46
 Meza, C., W477, W486
 Meza-Herrera, C. A., T501, T505, W476, W478, W480, W487
 Mezzomo, M. P., M482, T466
 Mi, F. Y., M448
 Miassi, G. d. M., M26, T299
 Miceli, N., M178
 Michael, M. A., M193
 Michael, N., W60, W61
 Michal, J. J., M446
 Middelbos, I. S., 396
 Mielenz, M., T12, T227
 Miesner, M., 335
 Miesner, M. D., 333
 Miglino, M. A., 125
 Miglior, F., T98, T104, W94, 19, 511, 752, 754, 757, 759
 Miguel, M. C. V., M226
 Mijic, P., T152
 Miles, J. L., T317
 Milián, G., M43, M61
 Millen, D. D., M266, M330, T457, W296, W308, W309, W310
 Miller, B., 698
 Miller, B. G., 814
 Miller, C., M254, T208, 601
 Miller, E. F., T76
 Miller, G., M516
 Miller, K. A., W311, 870
 Miller, L. M., T290
 Miller, M., W301
 Miller, P. S., T368, W106, 119, 591
 Miller, R., 748
 Miller, R. A., 778
 Miller, R. K., M426
 Miller, S., M94
 Miller-Cushon, E. K., M17
 Miller-Gaudette, C., 587
 Millman, S. T., M140, W13, W16, 727
 Milone, D., 63
 Milora, N., W179, 267
 Milora, N.-L., 169
 Miltenburg, C. L., T204
 Min, B., M58
 Min, B. J., M453, M454
 Min, B. R., M455, M456, M457, T384, W479, W489, 180
 Minami, N. S., T270
 Mingoti, G. Z., T318, T325, T326
 Mingoti, R., 23
 Mingoti, R. D., W383
 Miqueo, E., M344, M371
 Miramontes, M. d. S., T526
 Miranda, A. O., M39, M49
 Miranda, M., T160
 Miranda da Fonseca, D., T176, W164
 Mirando, M. A., 209
 Mirzaei Alamouti, H. R., W344, 851, 861
 Misztal, I., M67, M72, T83, W80, 534, 535, 536, 539, 646, 770
 Miszura, A. A., M230, M310, M444, W455
 Mitchell, M., 247, 365
 Mitloehner, F. M., 818
 Miura, M., M422, T386, T387, W351
 Miyada, V. S., T313
 Miyamoto, A., M212
 Miyazawa, Y., T386, T387
 Mjoun, K., W359, 87
 Moaen-ud-Din, M., 689
 Moallem, U., 126
 Moate, P. J., 597, 850
 Moats, J., M135
 Mobiglia, A. M., W294, W452, W453, W455, W457
 Mochal-King, C., 673
 Modesto, V. C., T378
 Moeller, S., 690
 Mohallem, R. d. F. F., M231
 Mohamed, A. G., W138
 Mohammadabadi, M., M82
 Mohammadi, M., M200, M204, M205, 797
 Mohammadi-Amiri, Z., 84
 Mohan, M. S., M103
 Mohtashami, B., W339
 Moisés, S. J., M136, W35, W220, 250, 508
 Mojapelo, M. M., W494
 Molina, B. S. d. L., M473
 Molina, M., T255
 Molino, A. B., T73
 Molitor, M., W147, 74

- Mollenkopf, D., T62
Molloy, B. P., W374
Moloney, J., M118
Momcilovic, D., W44
Moncada, M., T144
Monção, F., T508, 181
Monegue, H. J., T298
Monegue, J. S., T298
Monsignati, I., M321, M322, T482, W507
Monson, R. L., 587
Montagner, P., T2
Monteiro, A., 251
Monteiro, A. N. T. R., M169
Monteiro, A. P. A., M284, W268, 808
Monteiro, C. C. F., M369
Monteiro, H., T199, T361, T369
Monteiro, P. L., M240
Monteiro Lima, M., W235
Montenegro, L., W186
Montes de Oca, R., T234
Montesinos, V., M514
Montierth, L., T139
Montminy, M.-P. L., M173
Monzon-Armenta, J. M., T332
Moojen, F. G., M100, T340
Moon, R. D., 695
Mooney, A. K., W103
Moore, R. K., 754
Moore, S., 316, 317
Moore, S. G., 679
Moraes, E. A., M302, T327
Moraes, J., T125
Moraes, J. G. N., W90
Moraes, L. E., W358, 600
Moraes de Oliveira, I., W305, W312, W313, W316, W317
Mora-Gutierrez, A., M101
Morais, J. S., M459
Morais, J. P. G., T270
Morais, M. G., W314
Morais Júnior, N. N., W182
Morales, A., M514, W110
Morales, E., M176
Morales, M. S., W4
Morales de la Nuez, A., T253, T254, T256, T257
Morales Gomez, J. F., M159
Morales-Almaráz, E., W470
Morales-delaNuez, A., T248
Moraru, C. I., 70
Moreira, A. D., W305, W312
Moreira, C., 651
Moreira, E. d. A., M370
Moreira, E. M., M225, M444
Moreira, H., 651
Moreira, K. F., T474, T475
Moreira, R. H. R., M505, M506
Moreira, S. A. T., M370
Moreira, V. R., W273
Moreira da Silva, F. J., M86
Moreno, A., T266
Moreno, J., W47
Moreno, M. R., W171
Morera, P., T314
Moretti, D. B., T315
Moretti, M. H., M312, M338, W312, W313
Moretti, R. E., W425
Morgan, T. D., T76
Moriel, P., T231, T337, T338, T355
Moriyama, E., 527, 530
Morota, G., 649
Morrice, D. M., T88
Morris, C., 549
Morris, C. A., 33
Morris, C. L., 399, 485, 487
Morrison, M. D. A., 762
Morrison, S. Y., T154, T156, W325, 48
Morrow, A., M341, M346
Morrow, V., T69
Morsy, T. A., T234, 151, 173, 174, 611, 630
Mortati, M., 651
Morts, M. E., 122
Moser, D. W., 523, 646
Mosiman, A. M., W30, 170
Most, E., T445
Mostert, B. E., T100
Mostert, P. F., 845
Mote, B. E., 768
Motta de Souza, S., M370
Moura, A. S. A. M. T., T346, T348
Moura, L., 181, T508
Mourão, G. B., T433
Mouresan, E., W75
Mousel, M. R., M83
Moya, D., M28, W13, 288, 728
Moyes, K. M., M55, M144, T10, W349, 247, 515
Mu, N., 677
Muck, R. E., 636, W198
Mudadu, M. A., W69
Mudassir, M., 628
Mueller, L. F., M161, T81, W66, W72
Muhammad, S., W427
Muir, J. P., 645
Mukherjee, D., 558
Mulcahy, E. M., 77
Mulder, H. A., 261
Mullenix, M. K., 266
Müller, U., W250
Mulligan, F. J., W374
Mulvihill, D. M., 76, 77
Mumbach, T., M218, 817
Munari, D. P., W69, W75, W92
Munhoz, A. K., M238
Muniz, C. F., M170
Muñiz-Colón, G. C., T304, T305
Muñoz, J. M. G., T505
Muns, R., 120
Muntifering, R. B., 66, 266, 643
Murakami, A. E., W122
Murakami, F. Y., W101
Murata, L. S., T70
Murcia, C., T259
Murdoch, B. M., M12
Murdoch, G. M., W219
Murillo, E. X., M45, M47, W271
Murphy, M., 65
Murphy, M. R., M286, W357
Murray, A., 247
Mushtaque, M., M53
Musiy, L., T147
Mustafé de Almeida, C., W454
Muth-Spurlock, A. M., M250, 447
Mutsvangwa, T., M135, M421, M439
Mutvei, A., 386
Myers, K. C., 243
Myers, M. A., M9
N
Nadalin, A., W27
Nadeau, E., 65
Nagaraja, T. G., 520
Nagengast, L., M416, M417
Naile, T. L., 410
Nair, J., W176
Nair, M. N., M162
Najeeb, S., W432
Nak, D., 840
Nak, Y., 840
Nan, X. M., M152, W411, W416, W422, 435
Narciso, C. D., 287
Nardone, A., W87
Narvaez, N., M333
Nascimento, A. B., M230
Nascimento, E. M., M475, W500
Nascimento, V. A., W158
Nasr, E. A., 254
Natel, A. S., 292
Nathanielsz, P. W., M223
Naumann, H. D., T463, W501
Navajas Rennó, L., W426
Navanukraw, C., 312
Navarro, R. B., M350
Naveed, M. I., 134
Ndegwa, P., 459
Ndou, S. P., W117, 573
Neal, K., 87, T382, T383, T384, T388
Neave, H. W., M21, M22
Neeteson-Van Nieuwenhoven, A.-M., 262
Neff, P. J., 228
Negrao, J. A., T274, T275, T333
Negri, N., 605
Neibergs, H. L., M89, W90, 255, 524
Neibling, H. W., T155
Neil, X., T401
Nejati-Javaremi, A., 470, 852

Nelson, B., T195, 404
 Nelson, C., 83
 Nelson, C. D., T28, T220, 157, 704
 Nelson, D. C., 515
 Nelson, E. A., 614
 Nelson, J. A., 416
 Nelson da Costa, A., 23
 Nelthropp, H. C., W49, 744
 Nennich, T., M16
 Nennich, T. D., W30, 159, 170, 228
 Nepomuceno, D. D., M224, M225
 Neto, A. F. G., M474, M475, M479, M480, M481, W500
 Neto, A. J., M48, M311, M320, M450, W291, W407, W438, W439, W440
 Neto, A. T., 812
 Neto, H. R. L., T399, T400
 Neto, J. A. A., W312
 Neto, J. A. F., M225, M444
 Neto, J. M. S., M468, M469, T68
 Neto, J. T. N., W294
 Neto, M. A. T., M179, M183
 Neto, O. B., W506
 Neto, O. J. d. A. G., M24
 Neto, P. G. R., T89
 Neto, S. G., W495
 Neto Balieiro, G., T164
 Neto Leal, L., 336
 Netto, A. S., M277, W442, 163, 184
 Neuendorff, D., T329
 Neuffer, D., 665
 Neumann, M., T145
 Neupane, M., W90
 Neves, M. D., W457
 Neves, R. C., T216, 361
 Neves Ribas, M., 149
 Neville, E. W., W374
 Newbold, J. R., W349
 Newhouse, S. A., 281
 Newton, G. R., 632
 Nezamabadi-Pour, H., M82
 Ng'ambi, J., W244
 Nguyen, H. V., 302
 Nguyen, P., W102
 Nichols, K., 430
 Nichols, W. T., 107
 Nickerson, S., 514, 627
 Nicodemus, M., T233, T532, 673
 Nicolazzi, E. L., T92
 Niederecker, K. N., 740, 741
 Nielsen, K., T262
 Nielsen, P. P., 726
 Nielsen, U. S., 753
 Nielson, H. R., 442, 444, 737
 Nieuwhof, G., 522
 Nightingale, C. R., W409
 Nikaido, I., 649
 Nilsson, E., 726
 Ningrat, R. W. S., T384
 Nisa, M., W432
 Nisa, M. U., W427
 Niu, J. L., W419, W420, W421
 Niu, M., M281, W354, 615, 625
 Nobrega, D. B., T52
 Noce, A., T507
 Nofrarias, M., W384
 Nogueira, E. T., M506
 Nogueira, G. P., M226
 Nogueira, L., T121, T122, W133, W134
 Nogueira, R. G. S., T471
 Nogueira Filho, J. C. M., W400, W404
 Nolan, D. T., 93
 Nolan, E. A., M40, W45, 246, 364, 846
 Noppibool, U., M68
 Nordi, W. M., T315
 Norell, R. J., T151
 Norman, K. D., T186
 Norris, D., W244
 Northrop, E. J., 133
 Notter, D., 714
 Novais, M. A. S., W221
 Noziere, P., 617
 Nubiato, K., M159
 Nudda, A., T110
 Nuernberg, G., M164
 Null, D. J., W85, 647
 Nunes, A. S., W399, W401
 Nunes, R. V., W225
 Nunes Corrêa, M., 318, 319, 320, 817
 Nunes de Oliveira, H., W58, W59
 Nunes Parente, H., W161
 Nuñez, A. J. C., W230, W231, W400, W404
 Nuñez-Gonzalez, L. E., T523
 Nutcher, K., M128
 Nuti, L. C., 632
 Nuttelman, B. L., M48
 Nuzback, L., W183
 Nuzback, L. J., T437
 Nyachoti, C. M., M181, M206, M208, M491, M510, M511, W111, W117, 52, 573
 Nyachoti, M., M185, W120, W121
 Nyachoti, M. C., W118
 Nyaupane, N. P., T334
 Nydam, D. V., M366, W245, 280, 755
 Nyisalovits, A., 761
O
 Oba, M., M214, T214, T411, T454, W259, W280, W429, 85, 595, 705
 Oberg, C., T134, T139, 561, 562
 Oberg, T., T134
 Ochoa, J., 324
 Ochoa, P. A., W266
 O'Connell, A., T296
 O'Connell, N., T32, 618
 O'Connor, K. S., T444
 Odde, A., M262
 Odde, K. G., W64, 203, 640
 Odhiambo, J. F., M223, 422
 Odle, J., 591
 O'Doherty, J. V., W116
 O'Donovan, M., 179
 Oetzel, G. R., T42, 357
 Oguey, C., T363
 Ogunade, I. M., M383, T477, W190, W355, W367, 161, 832
 Oguntunde, M. M., W241
 Oh, D., M88
 Oh, J., W9, 620, 167, 597, 850
 Oh, S., T131
 Oh, S.-H., M517
 Oh, S.-Y., 194
 Ohtani, M., T40
 Oi, M., M489
 Ojo, R. O., M74
 Ojo, V. O., 271, 823
 Ojo, V. O. A., W209
 Okedi, L., 555
 Okere, C., 652
 Okine, E. K., T357
 Old, C. A., W53
 Oldenbroek, K., 380
 Olivares, A., M498
 Oliveira, A. A., T180, T184
 Oliveira, A. S., T419, 602
 Oliveira, C., M52, T170
 Oliveira, C. A., W298, W300
 Oliveira, C. A. L., M170
 Oliveira, C. T., M243
 Oliveira, D. E., M145, M146, M147, M148
 Oliveira, E., M356, M359, M362, T508
 Oliveira, E. A., T519, T529, 102
 Oliveira, E. R., 181
 Oliveira, F. A., M243
 Oliveira, G. B., T500
 Oliveira, G. C. B., W187
 Oliveira, G. S., M466
 Oliveira, H., 651
 Oliveira, J. P., M172
 Oliveira, L. J., 124, 125
 Oliveira, L. F. R., W308
 Oliveira, M., M231
 Oliveira, M. C., T169
 Oliveira, M. D. S., W336
 Oliveira, M. H., M318, M324, W290
 Oliveira, M. S. F., W107, W108, W236
 Oliveira, N. T. E., W225
 Oliveira, P. P. A., 876
 Oliveira, P. S. N., W315
 Oliveira, R. C., M8
 Oliveira, R. B. A., T126
 Oliveira, R. L., M458, M459, W399, W401, W495
 Oliveira, S. A., T274, T275
 Oliveira, S. G., W101, 394
 Oliveira, V. T., T341, W263

- Oliveira Freitas, V., 817
 Olivieri, B. F., M91, T84, T85
 Ollier, S., T271, 98
 Olmedo-Juárez, A., M56
 Olson, D., T143
 Olson, J., M399
 Olson, K. C., M232
 Oltjen, J. W., 691
 Olusola, O. O., 414, 413
 Oluwole, J. O., 414
 Oliveira Quadros, T. C., W46
 Olver, D. R., 200, 222
 Olynk Widmar, N., 849
 O'Mahony, J. A., 76, 77
 Omidiwura, B. R., 795
 Ominski, K., 703
 Ominski, K. H., 728
 Omojola, A. B., 412, 413, 414
 Omotoso, A. B., 412
 O'Neil, E., 579
 O'Neil, M. M., M315, 713
 O'Neill, B., 799
 O'Neill, H. V. M., 50
 Oni, A. O., 271, 823
 Ono, R. K., T78, T79
 Onwuka, C. F., 823
 Onwuka, C. F. I., W209
 Oporto, C. I. S., M468, M469
 Opsomer, G., 421, 423
 Ordoñez-Gomez, C. A., M197
 Orlandi, T., M482, T466
 Orlandi Cassiano, E. C., W282
 Orndorff, C. L., M385
 Orsel, K., 497, W13
 Orsi, A. M., M443
 Ortakci, F., T139, 561, 562
 Ortega, M. S., W85
 Ortiz, B. V., 418
 Ortiz, R. E., T285
 Ortiz, X. A., M262, T25
 Ortiz-Colón, G., M400
 Orunmuyi, M., T330
 Osborne, V. R., 354
 O'Shea, C. J., W116
 Oshibanjo, O. D., W109
 Oshiro, K., 400, 401, 402
 Osman, M., W432
 Osorio, I., T136
 Osorio, J., 91, M376, T215
 Osorio, J. S., T3, W372, 298, 299, 458, 463, 706, 707
 Ospina-Rojas, I. C., W122
 Oss, D. B., M370
 O'Sullivan, N. P., M70
 O'Sullivan, S. E., 50
 Osuna, M. A., M323
 Otani, L., 306
 Ott, T. L., M14
 Ou, Z., M76
 Ouellet, D. R., T423, 619
 Ouellet, V., W15
 Overton, T. R., M339, M366, W245, W246, W391, 280, 471, 755
 Overvest, M. A., 154
 Ovinge, L. A., 607, 869
 Owens, B., 632
 Owens, C. E., T436
 Owens, F., W183, W355, W367
 Owens, F. N., M314, T436, T437, 871
 Owens, M., M49
 Owusu-Asiedu, A., 793, 794
 Ozoje, M. O., M74, M80
- P**
- Pabón, M. L., M430
 Pacheco, E., 721
 Pacheco, J. A. S., T474, T475
 Pacheco, M. V. C., W377
 Pagán-Morales, M., T304, T305
 Page, T., M94
 Paibomesai, M., 511
 Pain, S., T345
 Paisley, S. I., 692
 Paiva, J. N., T70
 Paiva, P. G., M367, M377, W405, W406
 Paiva, S., 531, 634
 Paixão, M. L., W496, W497, W498
 Pajor, E., M28, M251, W13, 288
 Pajor, E. A., W5, 497, 510
 Pala, J., 563
 Palacín, I., M219
 Palacio, S., 501
 Palacios, C., W175
 Palin, M.-F., 96
 Paling, J., 61
 Pallares, P., T43, T46, T47
 Pallotto, M. R., 390
 Palma, M., M471, M472
 Palma Renno, F., W371, W383
 Palmay, J., T251, T252, T253, T254, T256, T257
 Palmonari, A., 605, M259
 Pan, L., W419, W420, W421
 Panahiha, P., W344
 Panazzolo, D. M., M260
 Pandalaneni, K., W151
 Pande, A. B., 378
 Pandey, P. K., M281
 Pandya, H., 53
 Panek, J., 563
 Pang, X., 424
 Panter, K. E., T179
 Pappan, K. L., 390
 Parada, R. D., 302
 Parales, J. E., M430, 700
 Parangaba, L., M362
 Paranhos da Costa, M. J. R., M33, W78, 729
 Paratte, R., 621
 Parente, H. N., M24, M465
 Parente, M. d. O. M., M24, M465, M466
 Parés, S., T34
 Parish, S., T69
 Pariz, C. M., W56
 Parize, A. C., 23, 358
 Park, B., M75
 Park, C. W., 73, 204
 Park, D., T143
 Park, D. H., W467
 Park, D.-J., T131
 Park, H.-S., M517
 Park, I., T286, T293, T301, 115, 117, 307
 Park, J., M335, W178, 265
 Park, J. C., T293, T301, W226
 Park, J. H., M198, M199
 Park, J. Y., T480
 Park, S., T293, T301
 Park, S. G., W467
 Park, S. J., T307
 Park, S. K., M186, M191
 Park, Y. W., T129, W139
 Parker Gaddis, K. L., 687
 Parmentier, H., 276
 Parnsen, W., 44, 788
 Parr, M., M244
 Parr, R. D., M60
 Parr, T., W325, 50, 109, 112
 Parreira, J., M472
 Parreira da Costa, L. K., T176, W165
 Parrish, J. J., 587
 Parrott, T., W392, 701
 Parsons, C., W98
 Parsons, C. L., M131, T264, 419
 Parsons, C. L. M., 452
 Parsons, C. M., 308
 Partridge, J., T167
 Parys, C., 620
 Paschoaloto, J. R., M321, M322, T482, T519, T529, W507
 Pasquetti, T. J., M169, 307
 Pastal, D., M474, M475, M479, M480, M481, W500
 Patel, H., M104, M105, T119, T195, T197, 53, 404, 405, 570
 Patel, H. A., M107, T127, 75, 654
 Patel, R., 53
 Paterson, J., M35
 Pathak, D., 297
 Patterson, D. J., 131, 132, 408
 Patton, R. A., 620
 Paucar, L. C., T471, W282
 Paudyal, S., T24, 25
 Paul, C. D., T515, T517
 Paula, E. M., T212
 Paula, M. R., M369, M371
 Paulsen, D., 495

Paulson, J. C., M119, 64
 Payandeh, S., W193
 Payne, C. E., M136, 508
 Paz, C. C. P., M280
 Paz, H., 821
 Paz, I. C. d. L. A., T73
 Peak, J. J., M12
 Peck, K. N., T65, W217
 Pederzolli, R.-L. A., W472, 461
 Pedro da Silva, S., T176, T518, W164, W165
 Pedrosa, V. B., T89, T90
 Pedroso, A. F., 876
 Peek, S. F., T240
 Peel, R. K., T342
 Pellarin, L. A., 612
 Pellechia, A. J. R., M33
 Pellerin, D., 501, W361
 Pellikaan, W., 830
 Pellikaan, W. F., 169
 Pempek, J. A., M5, T219
 Pena Carvalho de Carvalho, I., 336
 Penagaricano, F., T269, 351, 649, 767
 Peng, J., M174, T288, T295
 Peng, J. L., W468
 Peng, X., W40
 Penner, G., 723
 Penner, G. B., M329, M330, M421, W464, W472, 461, 489
 Pennington, P. M., 311
 Penrice, D. C., 638
 Penry, J. F., 688
 Perales, M., W477
 Perales-Garcia, M. V., W478
 Perali, C., T483
 Perano, K. M., W267
 Perdigão, A., W296
 Perecin, F., 125
 Pereira, A. B. D., M42, M130, T424, T425, T427, T428, T444, 622
 Pereira, A. M. F., M23, M86, W2
 Pereira, A. S., T447
 Pereira, A. S. C., M91, M161, T81, T85, T471, W66, W72
 Pereira, E. S., T68
 Pereira, F. T. V., 125
 Pereira, G. R., M100, T340
 Pereira, I. d. C., W296
 Pereira, J. C., M461, W201
 Pereira, K. S., M100
 Pereira, L. E. T., T188
 Pereira, L. F. P., W227, W228
 Pereira, L. G., T366
 Pereira, L. G. R., M347, M354, M370, M384, M387
 Pereira, M. C. S., W308, W309, W310
 Pereira, M. H., T323
 Pereira, M. H. C., M238
 Pereira, M. N., M358, M360, T392, T398, T414, T447, W182, W357, W360, W362
 Pereira, O. G., M319, M325, T364, T365, W169, W170, W204
 Pereira, P. H. S., 425
 Pereira, R. A., T2
 Pereira, R. A. N., T392, T414, T447, W182, W360
 Pereira, T., M283, T508
 Pereira Andrade, A., 609
 Pereira da Silva-Marques, R., W407, W438, W439, W440
 Pereira de Carvalho, M., 214
 Pereira de Figueiredo, M., 609
 Pereira dos Santos, R., T518
 Pereira Filho, J. M., T506
 Peres, R. F. G., W261
 Perestrelo, A. A., W314
 Pereyra, F., T77
 Perez, A., 256
 Pérez, A., W18
 Perez, B. I. C., T528
 Perez, G. C., T528
 Perez, H. L., M463, T519, T529, W507
 Pérez, J. F., M195, M196, T300, 191
 Pérez, M., W110
 Perez, V. G., T280
 Pérez-Camacho, C. P., T513
 Periasamy, A., 563
 Perini, J. E. G. N., T70
 Peripolli, V., M100
 Perkins, D., W479
 Perna, F., T471, W282, W398
 Pernell, C. W., T194
 Perondi, D., M173
 Perry, G. A., M228, M229, M232, T59, T317, T415, W329, 133, 313, 314, 369, 586, 614
 Perry, K. R., 486
 Perryman, K., W325
 Perryman, K. R., T434, T443
 Peruzzo, E., M431, M432
 Pessoa, D. D., T176, W165
 Pessoa, G. A., 677
 Pesta, A. C., 821
 Peters, L. D., 445
 Peters, S. O., M74, M80, M82, T80
 Petersen, J. L., 649
 Petersen, M. K., 2
 Peterson, D., 781
 Petersson-Wolfe, C. S., 86
 Pezeshki, A., 782, 784
 Pezzopane, J. R. M., 876
 Pfrimer, K., W319
 Phadke, N. L., M53, 245
 Phatak, A., 53
 Phatak, A. P., M53, 245
 Phelps, K. J., W458, 104, 105
 Phillip, D., 636
 Philipp, D., T350
 Phillips, P. E., 451, 453
 Phuong, H. N., 684
 Pi, Y., W415
 Piao, M., T377, W293
 Piao, M. Y., T307, W292
 Piao, X., M166
 Picasso, C., 256
 Picharillo, M. E., W463
 Picinin, G., 724
 Piechotta, M., W250, 30
 Pierce, K. M., 375, 853
 Pierre, L., T272
 Pillai, S. M., W216, 294
 Pillen, J. L., 507
 Pilo, P., 433
 Pinatti, E., T160
 Pinchak, W. E., 610
 Pineda, A., T217
 Pineda, M., T54
 Pinedo, P., T24, 25, 359, 462, 811
 Pinedo, P. J., M210, M305, T101, 244
 Piñeiro, J. M., T4, 362, 500, 733
 Piñeiro-Vázquez, A. T., M442
 Pinese, F., W400, W404
 Pinheiro, D. M., M226
 Pinheiro, M. G., 163
 Pinho, M., W184
 Pino, F., 330
 Pinto, A. C. J., M330, W308, W309
 Pinto, F. d. R., T169
 Pinto, L. F. B., T89
 Pires, A. V., M224, M225, M230, M310, M444, T474, T475, T500, W497, W498, 613
 Pirner, G. M., 395
 Pithua, P., 244, 462
 Pitta, D., T168, T488, 164, 513
 Piva, A., W212
 Place, S. E., T67, 371
 Plaizier, J., M357, T18, T19, 248, 703
 Plascencia, A., T523
 Plascencia-Jorquera, A., M323
 Plastow, G. S., 768
 Plata, F., W473
 Plaut, K., 295, 296
 Pliego, A. B., 630
 Plugge, C. M., 825
 Plumblee, J. R., M271
 Plummer, P. J., M140, 727
 Plummer, R. R., 392, 398
 Plumstead, P., M180
 Pohl, A., 20
 Pohler, K. G., T323, W261
 Polato, H. Z., T274, T275
 Polizel, D. M., M310, M444, T495, T500
 Polsky, L. B., M248, M293, M300, 842
 Polycarpo, G. V., M182, M183
 Pomar, C., M173, M188
 Pompeu, M. A., M258, T289, W227, W228
 Ponce, C. H., T260, W460

- Ponce de Leon, F. A., T102
Poncheki, J. K., M290
Pons, A., T507
Pontes, G., 351
Poock, S. E., M213, 131, 132, 408
Poore, M., T231
Pope, S., M110
Popp, J., 819
Poppy, G., T441
Pordesimo, L., T280
Pordomingo, A., 103
Pordomingo, A. J., M39
Porras, J. J. P., W119
Port, A. C. R., T484
Portela Santos, F. A., W463
Portela Santos, J. E., W371
Porter, J. H., T492
Portilla, Y., M43, M61
Porto Meschiatti, M. A., W304
Posada, I. J., T30
Posadas, G., M59
Possamai, A. P. S., M473
Posta, J., 761
Potocnik, K., 384
Potts, D., 781
Potts, H. L., T118
Potts, S. B., T417
Pouliot, Y., W148, W149, W150, 79, 660
Poulsen, N., 751
Pourakbari, A., T205
Povaluk, A. P., M145, M146, M147, M148
Powell, J., M46, 83
Powell, J. G., W62
Powell, J. L., W55, 157
Powell, K. J., T517
Powell, M., W443
Powel-Smith, B., T437
Power, M. L., M144
Powers, K. E., 410
Powers, W., 820
Powlowski, J., M436
Pozza, M., T145
Pozza, M. S. S., T142
Pozza, P., T145
Pozza, P. C., M169, M170, W225, 307
Pozzi, C., T160
Prado Alves, M. A., W305, W316, W317
Prados, L. F., W433, W436, T366, T367
Prajapati, J., 53
Prakapenka, D., M84
Pralle, R. S., 357, M8
Prata, M., T98
Pratt, S., M49
Pratt, S. L., M222
Preseault, C. L., W253, W335, W340, 824
Preston, N. G., W176
Pretz, J. P., M361, 172, 856
Price, C. A., 757
Price, D. M., M315, W55, 712, 713
Price, W. J., M303, 597, 841
Prichard, A. P., 281
Pringle, T. D., W51, W54, T535
Prinsloo, E., W207
Pritchard, R. H., 873
Progar, A. A., 693
Proudfoot, K. L., M5, T39, T219, 731
Pruden, A., T344
Pryce, J. E., 19, 522, 679, 750
Puchala, R., M477, M478, M484, M485, T499, T511, T512
Pukazhenthii, B., 311
Puledda, A., T92
Pulido, R., T402
Pulina, G., T110
Purdy, P. H., 531
Pursley, J. R., 677
Puspitasari, E., T135
Putarov, T. C., W100
Puyalto, M., M493, M496, M500, 237
Pyles, M. B., T243
- Q**
- Qi, M.-I., M470, 111
Qi, S., W355, W367
Qin, T., M153
Qiu, X., W239
Qu, X., T161, T162
Qu, Y., M55, T10, W349
Quaassdorff, M. A., M297
Queiroga, R. C. R. E., W495
Queiroga Ferreira, J., 609
Quenoizoré Soares, J., W407, W438, W439, W440
Quesnel, H., 99
Quigley, J. D., T439, W343, 155
Quintana, B., 723
Quintana, B. A., M113
Quintão Lana, Â. M., W345, W346
Quinteros, C. E., 356
Quntana, S., T458
- R**
- Rabassa, V. R., M218
Rabelo, A., M280
Rademaker, J., 381
Radke, T., T280
Rae, O., M315, W71, 712, 713
Raedts, P. J., M393
Raedts, P. J. M., M396
Raeth, M., T451
Raffrenato, E., M488, W207
Ragland, D., M192, M194
Rahmani, M., T17
Raices, R., T120, T121, T122, T130, W133, W134
Raices, R. S. L., T125
Raimondo, R. F. S., M218
Raja, J. S., W216, 294
Rajala-Schultz, P. J., T222, 362
Rajauria, G., 853
Rakhshandeh, A., M25, 790
Ralles, J., M126
Ramin, M., W394
Ramírez, M. A., W188
Ramirez, M. C., T496
Ramírez, R. G., W168
Ramírez-Godínez, J. A., W181
Ramírez-Pérez, A. H., 791
Ramirez-Valverde, R., T332
Ramos, M., T486
Ramos, M. H., T492, W184
Ramos, P. M., T313
Ramos, T., 391
Ramos dos Santos, F. C., T489
Ramsey, K. C., 69
Ranasinghe, P., M420
Ranasinghe, P. G., 626
Ranathunga, S. D., T531
Ranches, J., 710
Randel, L., 486
Randel, R. D., T329, W22, 135
Randi, F., M244
Raney, N. E., 532
Rangel-Santos, R., M403
Ranilla, M. J., M43, M61, T485, T486, T487, W431, W175
Raposo, E., T180, T184
Rasby, R. J., 366, 872
Raschka, C., 30
Rathi, G., M53
Rathi, P. C., W114
Raundrup, K., T258
Ray, D. L., T200, 229
Ray, P., T344
Ray, P. P., M282
Razavi, S., T128
Realino de Paula, J., W397
Rearte, R., T408
Recavarren, M., T458
Reddish, J. M., T64
Redhead, A. K., T515, T517
Redmer, D. A., T319
Reeb, P., 532
Reecy, J., 689
Reed, A., 777
Reed, D. D., 863, 864, 865
Reed, J., T67
Reed, J. A., 521
Reed, K. F., 600
Reed, S. A., T63, T65, W216, W217, 291, 294, 479
Reeg, A. M., T224
Refat, B., T373, T374
Regadas Filho, J. G. L., T462
Regassa, A., 52, W121

Regatieri, I. C., M85
 Regina da Silva, J., 391
 Regitano, L. C. A., W69
 Regmi, N., M167, 108
 Rehage, J., T55, W250, W254, 30, 477
 Reid, E. M., M109
 Reilingh, G. d. V., 276
 Reimann, F., 47
 Reinemann, D. J., 688
 Reis, R. A., M317, T180, T184, T378
 Reis, R. B., T273
 Reis, S. F., T393, 622
 Reisinger, N., 31, T245
 Rekaya, R., W51, W54, W82, 544
 Relling, A., M402, T408, T458, W299, W333
 Relling, A. E., M431, M432, T360
 Remache, R., T253
 R Emmelink, G., 276
 R Emmelink, G. J., 127
 Remmik, A., M287
 Remond, D., 438
 Remus, A., M173
 Remus, J. C., M180
 Ren, D., W132
 Ren, D. X., T354
 Ren, J., M78
 Ren, L., W239
 Ren, X. X., W327
 Renneberg, C., M147
 Renno, F. P., M367, M377, M395, T489,
 W318, W321, W322, W336, W405, W406
 Rentfrow, G., M162
 Resende, F. D., M338, W453
 Resende, K. T., T497, T498, T506, W283
 Resende, L. C., T414
 Reshalaitihan, M., T40
 Retallick, K. J., 523
 Rey, F. S. B., W79, W92
 Reynolds, C. K., 681
 Reynolds, L. P., 1, 338
 Rezamand, P., 69, 84
 Rezayazdi, K., M414, 470, 852
 Rezende Mazon, M., M159
 Rezende Moreira Couto, V., W397, W403
 Rezende Siqueira, G., W305, W313, W316,
 W317, W454
 Rhein, R. T., 636
 Rhim, S.-J., M29
 Rhind, S. M., 9
 Rhoads, M., M227
 Rhoads, M. L., 452
 Rhoads, R. P., 490, 800
 Rhoden, E. G., 180
 Riaz, U., 134
 Ribas, M. N., M381, M384, M387
 Ribeiro, A. B. C., T159
 Ribeiro, A. F., M311, M450, W291
 Ribeiro, E. S., T322, 253, 328, 704
 Ribeiro, F. R. B., 184, 632
 Ribeiro, K. G., M319, M325, T364, T365,
 W169, W170, W204
 Ribeiro, L. F., T169
 Ribeiro, L. P. S., T68
 Ribeiro, M. W., 70
 Ribeiro, P. A. P., M183
 Ribeiro, R. D. X., W399, W401, W495
 Ribeiro, S. M., W399, W401
 Ribeiro, S. V. G., M42
 Ribeiro Araújo, I. G., W161
 Ribeiro de Jesus, A. P., W161
 Ribeiro Junior, A. H., M318
 Ribeiro Pereira, L. G., W381, 149
 Ribeiro Soares, D., M34
 Ribeiro Tomich, T., W381, 149
 Ribó, J., T370
 Ricardo, V. P., M169
 Ricci, A., 676, 678
 Richard, B., T272
 Richard, M., 223
 Richards, C. J., T67, 371
 Richardson, B. N., T317, 133, 586
 Richardt, W., 65
 Richelieu, M., W179
 Richeson, J., T24
 Richeson, J. T., M37, T309, 505, 506, 507,
 589, 590
 Rico, D. E., M374, M411, M415, 286, 700
 Rico, J. E., M385, M413, W363, W366, 472,
 473, 474, 475, 824
 Ridha, I., T468
 Riewer, R., W434
 Righetto, P., W229
 Rigueiro, A. L. N., W308, W309
 Rijks, W., 276
 Riley, D., W73
 Rimbey, N. R., M303, 841
 Rincon, F. G. R., T528
 Riordan, A., W341
 Riordan, T., W341
 Ríos García, L. M., M124, W504
 Rios-Rincón, F. G., T514
 Rippeto, J. D., T510
 Risco, C., T24
 Risco, C. A., T21, 358, 360
 Ríspoli, V. F. P., 635
 Ríus, A. G., 803, 804
 Riva Donida, E., W438, W439, W440
 Rivas-Muñoz, R., W478, W487, W488
 Rivaz, R., W486
 Rivelli, I. M., M217
 Rivelli, M. I., M404, T154, T156
 Rivera, F. E., T394
 Rivera, F. Y., 91
 Rivera, H., W32, W33
 Rivera, J. D., 816
 Rivero, M., T248, W47
 Rivero, M. A., T265
 Rizzieri, R. A., W296
 Rizzo, E. K., T242
 Roberts, A. J., 2, 367
 Roberts, S. L., M37, T309, 505, 506, 507,
 589, 590
 Robinson, A. L., 241, 485, 487
 Robinson, C. L., 88
 Robinson, F. E., 638
 Robinson, G. D., 241
 Robinson, M., 135
 Robinson, P. H., M126, M127, T406
 Robitaille, G., W94
 Robker, R., 326
 Robles, I., M292
 Robles-Estrada, J. C., T516
 Robles-Trillo, P., W435, W476, W480
 Robsinson, P. H., M388, M390
 Rocha, C. O., T188
 Rocha, D. C., T474
 Rocha, G. C., T359
 Rocha, J. S. R., M258
 Rocha, L., M233, M234
 Rocha, L. D. S., M136, 508
 Rocha, L. S., M235
 Rocha, M. K., T340
 Rocha, N. B., M344, M369, M371
 Rocha-Frigoni, N. A. S., T325, T326
 Roche, J. R., T402, 247, 365, 599
 Rodenburg, T. B., 236
 Rodney, R., 83, 704
 Rodriguez-Zas, S., 359
 Rodrigues, R. J. B., M172
 Rodrigues, A. C., M318, M324, W290
 Rodrigues, A. D., T333
 Rodrigues, A. D. P., W261, 445
 Rodrigues, A. N., W170
 Rodrigues, D. J., W107, W108, W236
 Rodrigues, E., T483
 Rodrigues, J. F. H., T378
 Rodrigues, M., M261, 28
 Rodrigues, M. P., W436
 Rodrigues, M. T., M462
 Rodrigues, P. H. M., T471, W164
 Rodrigues, R. C., M465, W161
 Rodrigues, R. O., M213, W264
 Rodrigues Araújo, I., W161
 Rodrigues Gandra, J., W383
 Rodrigues Paranhos da Costa, M. J., M34
 Rodrigues Paulino, P. V., W407, W440
 Rodríguez, A. A., M111, M113, M116
 Rodríguez, F. D., T372
 Rodríguez, H., W168
 Rodríguez, J. J., T153
 Rodríguez, L. F. P., M23, W2
 Rodríguez, L. A., M1
 Rodríguez, M., M61, M278, W14, W289
 Rodríguez, M. A., W470, W471
 Rodríguez, N., T251, T252
 Rodríguez, P., M244
 Rodríguez, R., W486

- Rodriguez, S., M289, M294, M304
 Rodríguez-Almeida, F. A., T513
 Rodríguez-Figueroa, J. C., T107
 Rodríguez-Hernandez, K., T459
 Rodríguez-Martinez, R., T501, W435, W476, W477, W480, W487, W488
 Rodríguez-Muela, C., T173, W167, W181
 Rodríguez-Prado, M., W384
 Rodríguez-Zas, S. L., M38, M57, M129, M305, M490, T27, T101, W19, W240, 464, 738
 Roger, N., T440
 Rogers, G. M., W64
 Rogge, H. I., W21
 Rogge, I., M47, M323
 Roh, S., 588
 Rohrig Rabassa, V., 817
 Rojas, O. J., 121
 Rojo-Rubio, R., M56
 Rolf, M. M., T67, 524
 Roma, L. C., T150
 Roma Junior, L. C., W319
 Roman, L. A. R., T528
 Roman-Muniz, I. N., M273, M274, M276, 138, 139
 Romano, G. S., T89
 Romberg, F.-J., T445
 Romero, C., 244
 Romero, J. J., W178, 265, 272
 Romero, L. F., 113
 Romero, P., M497
 Romero-Perez, A., T357, W429
 Romero-Zúñiga, J. J., T15
 Romo, J. A., M45, M327, M518, W237, W271, W275
 Romo, J. M., M518, W237
 Roncato Duarte, K. M., T164
 Rondena Pesqueira Silva, L. C., W407, W438
 Rondina, D., W491
 Rondón, A. J., M61
 Roneker, C. A., 581
 Roque, A., W418
 Rorie, R. W., T350
 Rortvedt, J. A., W375
 Rosa, A., T160
 Rosa, C., T483
 Rosa, E. P., W314
 Rosa, G., M362, 359
 Rosa, G. J. M., M81, M305, T101, W70, 38, 92, 767
 Rosa, L. O., T364, T365
 Rosa, M., W187
 Rose, J. S., 564
 Rosenkrans, C. F., T350
 Roso, V. M., M100
 Ross, D., W334
 Ross, D. A., W338
 Ross, S., T393
 Rosser, C. L., M421
 Rossi, G. F., 677
 Rossi, L. G., M311, M450, W291, M320
 Rossiter-Burhans, C. A., M366
 Rossow, H., M397
 Rossow, H. A., T230, W53, W341
 Rostagno, H. S., M172, 306
 Roth, G., W456
 Roth, M. d. T. P., M312
 Rotta, P. P., W221, W377, W378
 Rottinghaus, G. E., T346, T348
 Rotz, C. A., 697
 Rouquette, F. M., T186, 67
 Rovai, M., T520, T521
 Rovere, G., T106
 Rowbotham, R. F., 686
 Rowe, J., T64
 Rowland, K., 626
 Rowland, R. R. R., 765
 Rowntree, J. E., 61, 593
 Rowson, A. D., M464, M467
 Roy, J.-P., M292
 Royer, A., W73
 Rozell, T. G., T308
 Ruas, J. R. M., T273
 Rubano, M. D., M120
 Rubattu, R., W506
 Rubio, I., T259
 Rubio, Y. B., 532
 Ruch, F., M516
 Ruda, L., 30
 Rude, B. J., M167, T238, T246, T247, 673
 Rueel, B., 190
 Ruegg, P. L., M264, T209, T262, T324, 686, 734
 Ruegger, R., 876
 Rufiner, H. L., 63
 Rufino, L. D. A., W169, W170
 Rufino, L. M. d. A., T358
 Ruggieri, A. C., T180, T184
 Ruh, K. E., M119
 Ruiz, M., T402
 Ruiz, O., T173, W266
 Ruiz de la Torre, J. L., W14, W289
 Ruiz-Flores, A., T158
 Ruiz-Holguin, N. E., W181
 Ruiz-Leon, M., T158
 Ruiz-Moreno, M., W180, 604, 826
 Ruiz-Sanchez, A., W258, 284, 584
 Rushen, J., 496, 501, 696
 Russ, I., 384
 Russell, D., 326
 Russell, J. R., 334
 Russell, R. A., 353
 Russi, J. P., M431, M432, T360, W299
 Rust, S. R., M13, T66
 Rutherford, T. F., 406
 Rutherford, W., W355, W367
 Rutz, F., 554
 Ryals, R., 593
 Ryan, C. M., M339, W391
 Ryan, K., 109
 Ryan, M. T., W492, 177
 Ryan, P. L., M509
 Rykov, R. V., T35
 Ryu, J. H., 303
- ## S
- Saathoff, K. G., M348
 Sabchuk, T. T., W101, 391, 394
 Sabikhi, L., T119
 Saborío-Montero, A., T15, T16
 Sadri, H., W250, W254
 Saensukjaroenphon, M., T282
 Sae-Tiao, T., M253
 Sahan, Ü., T336
 Sahar, M. W., W30
 Sahlü, T., M477, M478, M484, M485, T499, T511, T512
 Sainz, R. D., M283, W70, 868
 Sakamoto, L. S., 876
 Sala, R., T281
 Salak-Johnson, J., 721
 Salama, A. A. K., M154, M156, T520, T521, 434
 Salas-Reyes, I. G., T331
 Salazar, L. F. L., W269
 Salcedo, Y. G., M311
 Saleh, M. D., T299
 Salehi, F., T128
 Salehi, R., M214, W259, M215, M216, W258, 284
 Salem, A. Z. M., T234, W431, 151, 173, 174, 611, 630
 Sales, F. A., T232
 Salfer, I. J., M418, M422
 Salfer, J., 693
 Salfer, J. A., M299
 Salga Vegas, U., 160
 Salgado, R. L., T174, T175, T522, T524, W505
 Salles, F. A., T150, W319
 Salles, M. S. V., T150, W319
 Saltijeral Oaxaca, J. A., W21
 Salvador-Loreto, I., T331
 Salvati, G. G. S., M114
 Salvia, D., M356
 Samarini Machado, F., W345, W346, W381, 149
 Sambataro, M., M402
 Samii, S. S., M385, M413, 474
 Sampaio, C. B., T359
 Sampedro, F., 789
 San Vito, E., M317, M434, M435
 Sánchez, A., W186, T507
 Sanchez, C., W384

Sanchez, D., W186
 Sanchez, J. M. D., T178, T188
 Sánchez, J. M. I., T15, T16
 Sanchez, J. E., M176
 Sanchez, N., W473
 Sanchez, N. C. B., T25, W26
 Sanchez, W., W29
 Sanchez-Durte, J. I., W332
 Sánchez-Macías, D., T248
 Sánchez-Rodríguez, H. L., T304, T305
 Sánchez-Torres, J. E., W471
 Sanders, W. S., M509
 Sandoval Nogueira, R. G., W282, W398
 Sandri, E. C., M145, M147
 Sangali, C. P., M170, W225
 Sanglard, L., 110
 Santana, A. P., T70
 Santana, E. H. W., T159
 Santana, M. C. A., T378
 Santana, M. O., M311, M320, M450, W291
 Sant'Anna, A. C., 729, M33, W78
 Santellano-Estrada, E., W167
 Santi, P. F., W308
 Santin-Duran, M., 143
 Santos, A., M362
 Santos, A. A., W308, W309
 Santos, C. A., T81
 Santos, D. J. A., W69
 Santos, E. T., W46
 Santos, E. S., W399, W401
 Santos, E. R. S., M110, W171, W180
 Santos, F. C. R., W405, W406
 Santos, F. A. P., M331, M332, W302, W304,
 612
 Santos, I. C. B., M257
 Santos, J., 83, 351, 359
 Santos, J. E., T322
 Santos, J. E. P., M237, M288, M305, T21, T48,
 T101, T21, 253, 287, 328, 358, 360, 704
 Santos, J. F., M350
 Santos, L. S., M26, T299
 Santos, M., T508
 Santos, M. E. R., T176, W164, W165
 Santos, M. H., M224, M225, M230, M310,
 M444, T500
 Santos, P. A. C., M24
 Santos, P. C. d. S., W308
 Santos, P. P., 292
 Santos, R. M., 704
 Santos, R. O., M42
 Santos, S. A., T364, T365, T366, T367
 Santos, T. M., M474, M475, M479, M480,
 M481, W500
 Santos, V. C., W315
 Santos, V. G., 446, 676
 Santos, W. V. S., W452
 Santos Luz, Y., 609
 Santschi, D. E., M269, M270
 Sanz Fernandez, M. V., M40, W45, 246, 364,
 846,
 Sapkota, A., 238
 Sapp, R. L., 760
 Saraiva, A., M505, M506
 Saran Netto, A., W319
 Sargent, R., 142
 Sargolzaei, M., T104, 19, 752, 757, 759
 Saro, C., M43, T485, T486, T487, W175,
 W431
 Sarsour, A. H., W46
 Sartori, R., M240, 324, 351
 Sartorio, S. D., T270
 Sarturi, J. O., 607, 869
 Sarver, F., M85
 Sarwar, M., W432
 Sathler, D. F. T., W436
 Sato, F., M170
 Sato, H., T386
 Sato, T., T40, 400, 401, 402
 Sattar, A., 840
 Sattar, M. A., 134
 Saturnino, H. M., T273
 Sauerwein, H., W250, W251, W252, W254
 Sauvant, D., 616, 617
 Sawall, Z., W392, 701
 Sawyer, D., M416
 Sawyer, J. E., M426, 610
 Sayre, B. L., 715
 Sbardella, M., T313
 Scaglia, G., T185
 Scarpino-van Cleef, F. O., M463, W444
 Schacht, A., T55, 30
 Schaefer, D. A., W34
 Schäff, C. T., T403
 Schären, M., T420
 Schatz, T. J., 745
 Schatzmayr, G., 31
 Schauff, D. J., W481, W482, W483
 Schaumberger, S., T245, T343, 31, 239
 Schedle, K., 190
 Scheffler, T. L., 667
 Schell, T. H., M44
 Schell, T. J., M428
 Schellenberg, M., T181, W200
 Schenkel, F. S., T104, W69, 752, 754, 757,
 759
 Scheraiber, M., 391
 Schering, L., M157, M164
 Schieder, C., 190, 698
 Schimek, D., M398, T451
 Schingoethe, D. J., T380
 Schlather, M., M87
 Schlotterbeck, R. L., T439, W343, 155
 Schmidely, P., 684
 Schmidt, F. A., 812
 Schmidt, S. E., W253, W331
 Schmidt, T. B., W36
 Schmitz, A. N., 107, 863, 864, 865
 Schmitz, H. F. P., W30, 170
 Schnabel, R. D., 524
 Schneider, A., M90, M95, T320
 Schneider, J. E., 6
 Schneider, M., T193
 Schnell, B. P., M467
 Schoenberg, K. M., 246, 846
 Schoenfuss, T. C., M109, 568
 Scholljegerdes, E. J., W445
 Scholte, C. M., 84
 Scholtz, E., T204
 Schonewille, T. J., T404
 Schorer, M., T474, T475, W496, W497, W498
 Schramm, H. H., 94
 Schreiber, N. B., T328
 Schuenemann, G. M., M242, M305, T4, T39,
 T101, T222, 359, 362, 500, 733, 735
 Schuling, S., M398
 Schuling, S. E., W375
 Schulmeister, T. M., 604, 826
 Schultz, É. B., T518
 Schutz, L. F., 88
 Schütz, K., W12
 Schwab, C., T457, 763
 Schwab, C. G., M386, M406, T424, W393
 Schwartz, G. J., 388
 Schwartz, K., 790
 Schwartz, R. L., 581
 Schwartzkopf, K. S., 288
 Schwartzkopf-Genswein, K. S., M28, M34,
 W13, 728
 Schwarz, C., 190
 Schwebel, L., M411
 Schwegler, E., T2
 Scortegagna, F., M233, M234
 Scott, B. D., W277
 Scott, C., 486
 Scott, J. G., 180
 Scott, M., T18, T19, W29, 856
 Scott, M. F., W409, 172, 153
 Scott, T., M449
 Scott, T. A., M329
 Scuderi, R., 69
 Seabury, C., M305, 359
 Seabury, C. M., T101, 524
 Sechler, S. R., 66, 266
 Seck, M., T410
 Secundino, B., M356
 See, M. T., 762
 Seefried, F. R., 384, 545
 Segelke, D., 533
 Segers, J. R., W51, W54
 Sehested, J., T198, 274, 751
 Seibert, J., 246, 364
 Seibert, J. T., 846
 Seidel, G. E., T342
 Seidl, J. R., T246, T247
 Seifi, H. A., T36
 Seigler, L. A., T239

- Sela, S., 415
 Sellers, M. D., W409, 153
 Sell-Kubiak, E., 261
 Senan, S., 53
 Sentelle, J. M., 199
 Senturklu, S., 692
 Seo, J., M335, T293, T301
 Seo, S., M335, T293, T301
 Seok, S. A., W43
 Sepehri, S., T17
 Sequeira, M., T345
 Seradj, A. R., M438
 Serão, N., 110
 Serão, N. V. L., 765, 768, 771
 Seras-Franzoso, J., T34
 Serdino, J., 650
 Sermyagin, A. A., T99, W83
 Serra, A., T314
 Serra, O. R., W508
 Serrano, T., T120
 Sespere Oliveira, M., W234, W235
 Settari, P., M70
 Settles, M. L., W369
 Séverine, O., T272
 Severino, K., 462
 Sexten, W. J., 334, 340, 739
 Sgavioli, S., W46, W234
 Shackelford, S. D., 872
 Shafii, B., M241, M303, 84, 841
 Shah, N., 662
 Shah, N. P., 403, 556, 664
 Shahir, M. H., T494
 Shahzad, A. H., 840
 Shahzad, K., T215, W437, 434
 Shakhin, A. V., T99
 Shamay, A., 295, 296
 Shan, T., 669
 Shang, C., M282
 Shange, R., W479
 Shankar, U., 53
 Shanks, B. C., T189, T190, T510, T527, W501, 636
 Shanks, R. D., 748
 Shanmugam, S., 797, M207
 Shannon, M. C., 119, T287
 Shao, D., M19
 Share, E., T64
 Sharif, M., W427
 Sharma, P., 515
 Sharon, K. P., M37, T309, W26, W38, W409, 27, 494, 505, 518, 589, 590
 Sharpe, R., 9
 Shaughness, M., T417
 Shaver, R., M306, 351
 Shaver, R. D., M112, M114, M279, M363, W202, 315
 Shawl, C., 564
 Shearer, J., W13
 Sheehan, J. J., 563
 Shelton, B. W., 159
 Shende, V. H., M53
 Shenkoru, T., T199, T361, T369
 Shephard, T. A., 727
 Shepherd, T. A., M140
 Sherlock, R. G., 15
 Shetty, N., 381
 Shi, H., M451, W484
 Shi, H. T., W327
 Shi, W., 152
 Shigemori, S., 400, 401, 402
 Shike, D. W., W57, 524, 738
 Shim, M. K., W41, W43
 Shimosato, T., 400, 401, 402
 Shin, H. Y., M200, M206, 797
 Shingfield, K. J., W450
 Shinnars, K. J., 699
 Shinzato, I., M389, M422, T386, T387, W351, 620
 Shirazi-Beechey, S. P., 43
 Shivers, C., W73
 Shivley, C. B., M272, M275, 136, 140, 141, 143, 144, 148
 Shivley, C. S., M273
 Shoup, L. M., 738
 Showunmi, O. O., W209
 Shreck, A. L., W430, W448, 339, 815
 Shritz, V., W155
 Shuck, K. K., W475
 Shurson, G., 188
 Shurson, G. C., 789
 Si, B.-W., 831, T438, W174, W195, 831
 Sica, A. F., M293, M300, 842
 Siegford, J. M., W16
 Sifuentes dos Santos, J., T159
 Signer-Hasler, H., 384
 Silper, B. F., M248, M293, 842
 Silva, A., T121
 Silva, A. C. O., T123, T124
 Silva, A. F., W228
 Silva, A. M. A., M459
 Silva, B., W436
 Silva, B. C., W377
 Silva, C. F. P. G., M347, M354
 Silva, D. C. M., M36
 Silva, F. A. S., W378
 Silva, F. F., M77
 Silva, F. L., T70
 Silva, F. L. M., M344, M369
 Silva, F. M., M36
 Silva, G. B., T509
 Silva, G. G., W318
 Silva, H. L. A., T125
 Silva, H. M. S., M110, W171, W180
 Silva, J., W310
 Silva, J. A. I. V., W50
 Silva, J. A. V., T82, W58
 Silva, J. S., W442
 Silva, J. T., M344, M369, M371
 Silva, K. M., T70
 Silva, L., T508, 181
 Silva, L. D., M319, W452
 Silva, L. F. P., T372, W298, W300, W400, W404, 613
 Silva, L. H., T508
 Silva, L. H. P., 454
 Silva, L. H. R., W378
 Silva, M., T122
 Silva, M. B., M338, W56
 Silva, N., M359
 Silva, N. C. D., T497, T498, T499
 Silva, P. R. B., T1, T49, W8, W28, W257, 252, 503
 Silva, P. S., 635
 Silva, P. S. D., M345
 Silva, R., W134
 Silva, R. A., M350
 Silva, R. B., T392
 Silva, R. G., M224, M225, M310, M444, T500
 Silva, R. M. O., T79, T83, W77
 Silva, S. P., T497
 Silva, T. B. R., W69, W92
 Silva, T. C., M319, W170
 Silva, T. E., W269
 Silva, T. H., W318, W405, W406
 Silva, T. M., W399, W401, W495
 Silva, T. P. B., M257
 Silva, T. V., M237
 Silva, V. P., W169, W170
 Silva, W., 110
 Silva Antonelo, D., M159
 Silva de Oliveira, T., M429, M461, M462, T177, T187, W201, W203
 Silva del Rio, N., T205
 Silva Sobrinho, A. G., T506
 Silva-Del-Rio, N., M117, M289, M294, M304, M307, M308, T43, T46, T47, T54, T306, W262
 Silva-Guillen, Y. V., W230, W231
 Silveira, M. L., 711
 Silveira, P. A. S., M90, M95
 Silveira Pereira, J., W463
 Silvia, W. J., M246, 80
 Simianer, H., M87, 766
 Simielli Fonseca, L. F., M98
 Simões, G., T142, T145
 Simon, G. E., W3
 Simplício, M. G., T176, W165
 Sims, M., 742
 Sims, R. C., T383
 Sinedino, L. D. P., 287, 328
 Singh, A., 784
 Singh, H., 437
 Sinha, R., 527, 530
 Siqueira, G. R., M312, M338, W312, W453
 Siqueira, I., T170
 Siqueira, L. G. B., T321

Siqueira, O. H. G. B. D., W269
 Sires, R., T33
 Siurana, A., M278, T409
 Sjostrom, L. S., 695
 Skenandore, C., M217, T320
 Skenandore, C. S., M404, T154, T156, W7
 Skinner, M. K., 7
 Skinner, R. H., 417
 Sloan, B. K., M386, M406, W393
 Slusher, P. J., 816
 Slyvka, I., T146
 Smidt, H., 825
 Smiley, B., W355, W367
 Smillie, J., M329
 Smith, A. C., M313, M326, W220, W350
 Smith, B., W301
 Smith, D. S., M13, T66
 Smith, G., T167
 Smith, G. R., T186
 Smith, J. F., M262
 Smith, J. K., 746, 747
 Smith, J. M., 257
 Smith, K. E., 74
 Smith, M. F., 131, 132, 408, T323, W261
 Smith, S., 14
 Smith, S. B., M426
 Smith, T., 648
 Smith, W. B., 67
 Snell, A. M., W22
 Snelling, W. M., 523, 527, 530
 Snider, M. A., T71
 Sniffen, C. J., T448
 Soalheiro de Souza, R., M345, W381
 Soares, A. V., T467
 Soares, D. C., T497
 Soares, F. H., T70
 Soares, H. F., M265, T1, W8, W28
 Soares, I. A. d. C., M243
 Soares, K. R., W227, W228
 Soares, T. M., M42
 Sobelman, C. S., W96
 Soca, P., W449, 685, 743
 Soca, P. M., T356, T362
 Socha, M. T., T3, W32, W33, W372, 706, 707, 848
 Soder, K. J., M120, T393
 Soderholm, C., 160
 Soderlund, S., M314
 Sodipo, T. O., T58
 Sodr , W. J. d. S., M465, M466
 Soede, N. M., 127
 Sohi, R. S., M393
 Sol, C., 120, W6, W47
 Sol -Oriol, D., M195, M196, M497, M499, T281, T300, 191
 Sole, E. M., 198
 Sol , A., T370
 S lkner, J., 384
 Sollenberger, L. E., M110, W180
 Solorio-S nchez, F. J., M442
 Sol rzano, L. C., M111, M113, M116
 Sol rzano, L. L., M111, M113, M116
 Somers, R., 632
 Son, A. R., M175, W233
 Son, S.-H., M29
 Song, M., T293, T301
 Song, S., T131
 Song, X. H., W113, W115
 Sonnenberg, A. S. M., 606
 Sonstegard, T. S., T102, 537
 Sontag, S., T157
 Sontakke, S. H., M53
 Sood, P., 126
 Sopelsa, A., M260, 499
 Sordillo, L. M., T29, 491
 Sorge, U. S., 695
 Soriano, S., M293, M300, 842
 Sosa, C., M219
 Sotak-Peper, K. M., 308
 Soto, A. C., T528
 Soto, J., 190
 Soto, J. A., 193
 Soto, L. E., M47
 Soto-Urano,  . H., W162
 Souder, A., M375
 Sousa, B. M., T425
 Sousa, D. G., W294
 Sousa, D. O., M443, W298, W300, 613
 Sousa, R., T508
 Sousa, R. T., T372
 Southey, B. R., M129
 Souza, A., 351, W493
 Souza, A. H., M236, T306, W262
 Souza, A. P., T68
 Souza, F., 651
 Souza, F. M., M424, W451
 Souza, J. C. S. M., M182
 Souza, J. M., W298, W300
 Souza, J. R. S. T., W508
 Souza, J. S., M226, W27
 Souza, O. A., W309
 Souza, R., 181
 Souza, R. A., T495, W455
 Souza, R. C., M42, T425, T427, T428
 Souza, T. H. R., T414
 Souza, V. L., T433
 Souza, W. L., M302, T327
 Souza Junior, J. H. C. M., T427, T428
 Soyeur, H., 10, 658, 694
 S zc , A., T336
 Spackman, C., 68
 Spanghero, M., T382
 Spangler, D. A., W483
 Spangler, L. F., M313
 Spangler, M. L., 524
 Spanu, G., W491
 Sparks, C., 118
 Spelman, R. J., 15
 Spencer, J. A., M241, M303, 841
 Spencer, T. E., W90, 323
 Spicer, L. J., T328, 88
 Spiller, S., 531
 Spitsberg, V. L., W155
 Splan, R. K., 311
 Sprengle, N. T., 475
 Spricigo, D., T170
 Spurlock, D., 488, 525, 526
 Squizatti, M., W309
 Stackhouse, J. W., W24, 691
 Stackhouse-Lawson, K. R., 697
 Stahl, C. H., W212
 Stalder, K. J., 241, 485
 Stanford, K., T171, W200
 Stangaferro, M. L., M211, M249, T37, 128, 279, 356, 448
 Stanko, R. L., 443
 Stanley, J. A., 325
 Stanton, A. L., T226, W11, W31, W39, 234, 493
 Staples, C., W355, W367, 360, 389, 525
 Staples, C. R., M284, M383, 287
 Stark, C. R., T172, T282, 122, 123
 Starke, A., T12
 Starkl, V., T245
 Staudinger, E. J., W375
 Steckelberg, J. R., 771
 Steckler, T. L., M232
 Steele, M. A., M138, 158, 489
 Steelman, A. J., M57
 Stefanello, S., T466, T467
 Stefaniak, T., T403
 Stegelmeier, B. L., T179
 Steibel, J. P., M76, 532, 543, 767
 Stein, H. H., 119, 113, 121, 305, 308, 792, 793, 794
 Steinkamp, K. M., M392
 Step, D. L., 371, T67
 Stephan, R., 432
 Sterle, J. A., 485, 487
 Stern, M. D., M418, M422
 Stevens, J. S., T50, T51, T53
 Stevenson, J. S., M232, M233, M234, M235, 327
 Stewart, B., T379
 Stewart, C. R., W243
 Stewart, R. L., 59, W163
 Stinn, J., 727
 Stiverson, J. A., 855
 Stoakes, S. K., M40, W45, 246, 364, 490, 846
 Stock, R. A., 869
 Stockhofe, N., 830
 Stoffel, C. M., W379
 Stokes, R. S., M427, 347, 348
 Stokol, T., M339, T216, 361
 Stoldt, A.-K., T12
 Stone, A. E., M9, M10, M246, M291, T200, 80, 353, 407

- Stone, J. A., T56
 Stoop, W. M., 529
 Storer, W. A., W63
 Storillo, V. M., 635
 Stout, M. A., 73
 Stout, R. C., 697
 St-Pierre, B., W328
 St-Pierre, N., W283, W493
 Stradiotto, M. d. M., T333
 Strauss, M., W382
 Streacker, C. A., 582
 Strekozov, N. I., W83
 Stricker, C., 384
 Strider, D., M260
 Stuani, O. F., M355
 Stuart, W. D., 790
 Studstill, M. W., W163
 Stumpf, M. T., 499, 812
 Stutts, K., 725
 Stutts, K. J., M515, T241, T244, T536, W243
 Suagee, J. K., W96
 Suarez-Belloch, J., M498
 Suarez-Dominguez, H., T332
 Suarez-Mena, F. X., W343, 155
 Suarez-Trujillo, A., T265, 295
 Subulokun, A. V., T58
 Such, X., T520
 Suchodolski, J. S., 671
 Sucu, E., T503
 Sucupira, M. C. A., T495
 Südekum, K.-H., W251, W252
 Sulabo, R. C., 308
 Sulyok, M., T245, T343
 Sulzberger, S., T320
 Sulzberger, S. A., T154, T156, W364, 858
 Suman, S. P., M162
 Sun, C., 647
 Sun, F., W462
 Sun, H., T295
 Sun, H. Z., 322, T430
 Sun, P., W413, W417, W423
 Sun, Q.-Z., W195
 Sun, Y., 171, T397
 Sung, K. I., W468
 Sung, Y., T316
 Surita, L. M., W314
 Surjus, R. S., M240
 Suryawan, A., 302
 Susin, I., T495
 Sutton, W. A., W55
 Suwanasopee, T., M68, M71, M73, M253, T86, T87, T91, T249, W91, W93
 Suzuki, R., W347
 Suzuki, Y., 588
 Svindrych, Z., 563
 Swain, A. F., M315, 712, 713
 Swaminathan, M., 378
 Swanepoel, N., M126, M127, T406
 Swanson, K., W98, W100, W248, 390, 396, 397, 546
 Swanson, T. J., 338
 Swartz, J. E., 614
 Sweeney, B. M., M339, W391
 Sweeney, R., 513
 Sweeney, T., W116, W492, 177
 Swift, M., T349
 Swift, M. L., T373, T375, W232
 Sypherd, D. D., T317
 Szeto, H. H., 666
- T**
- Taasoli, G., M309, M425, W192, W193
 Tacoma, R., 783
 Tactacan, G. B., 194
 Tadeu dos Santos, G., W425
 Tadich, T., W4
 Takada, L., T83, W77
 Takiya, C., M359, M362
 Takiya, C. S., M367, M377, M395, W321, W322, W405, W406, W318, W371, W383
 Talaat, A. M., 254
 Talbot, G., W112
 Tamassia, L. F., M331, M332, 612
 Tamassia, L. F. M., W294
 Tamm, S. C., W219
 Tan, C., M78, M84, T295
 Tang, J. X., M7
 Tani, S., T57, W286, W288
 Tanida, M., T387
 Tanner, A. E., 269
 Tansman, G. F., W140, W141, 565
 Tao, J., T213
 Tao, L., W174
 Tao, S., M284, W268, 251, 360, 808
 Tao, X., 664
 Tapia-Robles, K. I., T501
 Taraba, J. L., 275
 Tarango-Hernandez, Y. S., T107
 Tatone, E. H., 847
 Taylor, H., T153
 Taylor, J. B., M83
 Taylor, J. F., 524
 Taylor, P. M., 385
 Taylor, R. K., M222
 Taylor, S. J., W374
 Teague, W. R., 593
 Tedeschi, L., W301
 Tedeschi, L. O., M334, T463, T465, 67, 645, 736, 834
 Tedó, G., T402
 Teets, C., T381
 Teixeira, I., W493
 Teixeira, I. A. M. A., M468, M469, T497, T498, T506, W283
 Teixeira, M. P. F., W227, W228
 Teixeira, P. D., M318, M324
 Teixeira, V. A., T427, T428
 Teixeira de Abreu, M. L., M505, M506
 Teixeira Passos, L., 499
 Tejada, L., W477
 Tejada, L. M., T182
 Tejido, M. L., W175
 Tekippe, J., 620
 Tempelman, R. J., M76, 525, 542, 543
 Temple, A. M., W481, W482, W483
 Temple, D., M497
 Teng, L., T28
 Tenley, S. C., T317
 Teramura, M., T40
 Ternman, E., 726
 Terré, M., 22, M267, M268, T407, W247, W380
 Terrill, T., W479
 Tessman, R. K., W30
 Testroet, E. D., 283
 Tetens, J., M87
 Tetreault, M., M366
 Teutsch, C. D., W210
 Tewoldebrhan, T., W354
 Thacker, P., M166, M185
 Thallman, R. M., 523
 Thandapilly, S. J., W117
 Thatcher, W. W., M237, M305, T101, T322, 287, 328, 359
 Thelen, K., W253
 Theodoridou, K., W441
 Théron, L., 13
 Therrien, D. A., M60
 Thierry, C., 655
 Thieszen, J. D., W458, W461, 104, 870
 Thoma, G., 819
 Thomas, A., 793, 794
 Thomas, B. N., M82
 Thomas, C. L., T527
 Thomas, D. L., M81, 92
 Thomas, J. M., 131, 132, 408
 Thomas, M., W71
 Thomas, M. J., M211, 128, 448
 Thomaz, M. C., W107, W108, W230, W231, W234, W235, W236
 Thomas, M. G., T80
 Thompsom, A., 607
 Thompson, A. C., M11
 Thompson, B. S., 146
 Thompson, I., T271, 360
 Thompson, M. J., T510
 Thompson, P. D., 688
 Thompson-Crispi, K., 511
 Thomsen, S. J., 232
 Thomson, D., W13, 370
 Thomson, J., 305
 Thornsberry, M., W395
 Thornton, K. J., W219, W224
 Tian, G., W113, W115, 796, 835, 836
 Tian, H., T38

- Tian, Q., 424
Tian, X.-Z., 176
Tibbitts, B. T., 367, 833
Ticiani, E., M145, M147, M148
Tiezzi, F., 749
Tilemahos Zervoudakis, J., W407, W438, W439, W440
Timms, L. L., T11, T33, T154, 241
Titgemeyer, E. C., M440, 333, 335
Titto, C. G., M23, M86, W2
Titto, E. A. L., M23, M86, W2
Tiwari, U. P., 571, 576
Toghiani, S., W82, 544
Toledo, M., 351
Toledo, M. Z., M363, 315, 678
Tomás, C., M502
Tomás de Resende, K., M468, M469
Tomasino, E., W126, W127, W128
Tomasula, P. M., T109, T116, W154
Tomaz, L. A., W309
Tomczak, D. J., 739
Tomich, T. R., M347, M354, M370, M384, M387
Tonhati, H., 651
Tonussi, R. L. T84, T85, W72,
Topliff, D. R., M210
Toral, F. L. B., T289
Toro-Mujica, P., 559
Torreão, J. N. C., M458, T504
Torrent, J., 163, M438
Torres, A. V. C., T502
Torres, C. A. A., M243
Torres, E., W186
Torres, R. A. L., T496
Torres-Rodriguez, E., W25
Torrezan, T. M., M344, M371
Totade, S. P., 378
Toth, J., T168
Tóth, T., M495
Totty, M. L., 88
Touati, K., W249
Touchette, K. J., 305
Touray, L., W499
Tower, J. E., W30, 170
Tran, H., T368, W106
Traspov, A. A., T99
Trayford, C. R., M239
Trcalek, C. R., M315, 712, 713
Trece, A. S., W269
Trejo, O. S. R., 178
Tremblay, G. F., M412
Tremblay-Marchand, D., W149
Tresoldi, G., W12
Trevisi, E., T3, W372, 91, 318, 320, 455, 456, 458, 706
Trevisol, E., M363, 129, 315, 324, 678
Trible, S. D., W97
Tricarico, J. M., W265
Trillo, Y., M289, M294, M304, M307, M308
Trindade Neto, M. A., M181, M182, M184
Trivedi, S., 53
Troeschler, A. H. A., M137
Trojan, S., 607
Trombetta, S. C., M136, 494, 508
Troscher, A., T314
Trott, J. F., 95
Trottier, N., T465, 775
Trout, W. E., 846, 246
Trujillo, A. I., W52, W449
Trujillo, A. S., 296
Trujillo-Gutiérrez, D., T530
Truong, A. D., M75
Tsai, C. C., M160, M503
Tsai, C.-Y., 69
Tsai, I. C., M132, M246, M291, 80, 353
Tsai, N. I., T200
Tsai, T.-C., 106, M508
Tsang, A., M436
Tse, C., M251
Tse, M. L. P., M26, T299
Tsisaryk, O., M102, T147, T146
Tsukahara, Y., M478, T499, T511, T512
Tsuruta, S., M67, M72, W80, 534, 535, 646, 760, 770
Tsuyuzaki, K., 649
Tu, Y., M470, M487, T354, T438, W174, 111, 175, 831
Tucker, C., W12
Tucker, C. B., W3
Tucker, H. A., T452, T453, T472, W347, W351, W386, 469
Tucker, H. L. M., M4, T206, 452
Tucker, J., 742, T379
Tucker, J. D., W62
Tugnoli, B., W212
Tun, H. M., M408, M409, T17, T18, T19, W118, W120
Tunick, M. H., T109, T117
Turbes, G., W126, W127, W128
Turiello, A., M402
Turiello, M. P., M402
Turzillo, A. M., 209
Tye, B. M., 87
Tyl, C. E., M109
Tyler, H. D., 241, 485, 487
Tyus, J., 115
- ## U
- Ugiagbe, F. O., T477, 161, 832
Ulbrich, S. E., T312
Ullah, N., 689
Ulloa, J. A. R., T294
Ulmer, K. M., 872
Ulrich, R., 819
Um, J. S., M189, M190
Umesiobi, D. O., M492
Underdahl, S. R., M232
Undersander, D., W159, W208
Undersander, D. J., W177
Underwood, K. R., 873
Ungerfeld, R., 502
Upadhaya, S. D., 303, 838
Upreti, P., W131
Upton, J., 688
Ureña, E., T254
Urge, M., M477
Urgeghe, P., 650
Uriarte, E., M128
Uriarte, J. M., M518
Urie, N. J., M272, M273, M275, 136, 140, 141, 143, 144, 148
Urio, M., M145, M146, M147, M148
Urioste, J., T77
Urioste, J. I., T106
Uriyapongson, S., 312
Urriola, P., 188
Urriola, P. E., 789
Urrutia, N. L., M394, M415, T278, 286, 468
Urso, P., 725
Ustunol, Z., T167
Usui, S., W288
Utembergue, B. L., M91
Utsumi, S. A., T444, 63
Utsunomiya, A. T. H., W79
Utt, M. D., 445, 586
Utterback, P., W98
Uwituze, S., W311
Uyeno, Y., W479
- ## V
- V, S., 53
Vadas, P., W443
Vaga, M., T479
Vaidya, J. D., 825
Vail, A. C., W63
Vailati Riboni, M., 455, 456, 457, 458
Valadares, R. F. D., T364, T365
Valadares Filho, S. C., M325, T366, T367, T462, W221, W377, W378, W436, 454
Valdes, E., 389
Valdés, K. Y., W431
Valdes-Garcia, Y. S., T523
Valdivia, A., M43
Valencia, A. P., 660
Valente, B. D., M81, 92, 767
Valente, T. S., W78, 729
Valentini, A., T92
Valenza, A., M244, 446
Valesco, G. M., M513
Valko, D. J., M40, 246, 364
Vallée, I., M62
Vallejo, D., M255
Valles de la Mora, B., T496
Vallet, J. L., T317
Valley, E. V., T61

- Valloto, A. A., M290, T90
Valoto, S. F., T89
Van Amburgh, M. E., T398, W334, W338, W393, 854
van Arendonk, J., 751
Van Bibber-Krueger, C. L., W311, W458, W461, 104, 866, 870
van Cleef, E. H. C. B., M463, T482, T522, T524, W311, W315, W505, W507, W508
van den Bogert, B., 825
van den Borne, J., 830
van der Merwe, D. A., M488
Van der Westhuizen, R. R., T100
Van Doormaal, B., T100
Van Doormaal, B. P., T88
Van Eenennaam, A., W24, W35, 60
Van Eetvelde, M., 421, 423
Van Emon, M. L., M427, 347
van Gastelen, S., 594, 825
Van Hekken, D. L., T109, T117
Van Kessel, J. A. S., 145, 147
van Knegsel, A., 276
Van Knegsel, A. T. M., 127
van Kuijk, S. J. A., 606
Van Laar, H., 616
van Lingen, H. J., 825
Van Marle-Köster, E., T100
Van Middelaar, C. E., 845
van Niekerk, W. A., W207
van Pelt, M. L., 756
van Reenen, K., 830
van Ryssen, J. B., W494
van Sambeek, D. M., W106, W108
Van Tassell, C. P., T102, 537
van Valenberg, H., 751
Vanacker, N., T272
Vanbergue, E., 467, W373
Van-Bibber Krueger, C. L., 105
VandeHaar, M. J., T465, W335, 466, 488, 525
Vander Ley, B. L., 741
Vandermyde, C. R., W481, W482
Vandermyde, D. R., W481, W482, W483
VanderWaal, K. L., 256
Vanelli, K., W101
Vann, G. G., M515
Vann, R. C., W22, 135
VanOverbeke, D. L., 371
VanRaden, P. M., T103, 40, 537, 647
Vantini Marujo, M., W235
VanWettere, A., 26
VanWieringen, L., 459
Vanzant, E. S., W17, W36, W160, 730
Vara, K., T520
Vardhanabhuti, B., W142, 439
Varela, A., M502
Varella dos Santos, P. F., M469
Vargas, J., W493
Vargas, J. A. C., M469
Vargas, L. M. M., T219
Vargas Jurado, N., 269, 717
Vargas-Bello-Pérez, E., T432, 559
Vargas-Leitón, B., T15
Vargas-Ramírez, A., T14, W23
Vargas-Rodríguez, C. F., M419, W370, 460
Varona, L., W75
Vasconcelos, A. C., T273
Vasconcelos, J. L. M., M133, M238, M248, M293, M300, T323, W261, 445, 842
Vasconcelos, V. R., W166, 161, 832
Vasconcelos de Oliveira Lima, A. G., M165
Vasconcelos Gracindo, T., W425
Vasquez, D. C. Z., T471
Vásquez, D. R., T285
Vasquez, M., W248
Vasseur, E., M251, W15, 90, 496, 501
Vasudevan, S., M14
Vaughn, M. A., 104, 105
Vaz, M., M356, M359
Vazirigohar, M., 470, 851, 852
Vazquez, A., W418
Vázquez, J. A., M327
Vázquez Chagoyán, J. C., T234
Vazquez-Anon, M., T472, 310, 469
Vázquez-Armijo, J., M56
Vázquez-Chagoyán, J. C., 630
Vazquez-Flores, S., W29
Vazquez-Mendoza, O. V., 151
Vecchiarelli, B., T168, T488, 164, 513
Vechetti-Junior, I. J., W59
Veerkamp, R., 525
Veerkamp, R. F., 260, 756
Vegara, C., 25
Veiga dos Santos, M., M443
Veira, D., W27
Vela, D. A., W460
Velasco Acosta, D. A., T156, T320
Velasquez, A. V., T484, W298, 268
Velayudhan, D. E., M181, M510, M511
Velázquez, E. A., W271
Velázquez-Cantón, E., 791
Velez, J. S., T4, 733, 735
Velez-Irizarry, D., 486, 532
Vélez-Monroy, L. I., T526
Veliz, F., W476, W477
Veliz, F. G., W478, W486, W480
Veliz-Deras, F. G., T501, T505, T526, W25, W435, W487, W488
Velooso, C. M., W221, W269
Veltmank, K., 592
Vencez González, S. A., M124
Vendramini, J. M., 710
Vendramini, J. M. B., T178
Vendramini, M., M356, M359, M362
Vendramini, T. H. A., M367, M377, M395, W321, W322, W371, W318
Venkitanarayanan, K., T61
Ventura, H. T., T78, T79
Ventura, R. V., W69
Venturini, G. C., T83, T84, T85, W77
Venugopal, M., 607
Verardo, L. L., M77
Verdú, M., M31, T376, W18
Verdugo, A. C., W50
Vergara, C. F., M255
Verma, H., 789
Verma, R., M142
Veronese, L. P., T270
Veroneze, R., M77
Veronezi, J. C., M23, W2
Verstegen, J. P., W262
Vestergaard, M., T198
Vezzoni Almeida, V., W234
Vianello, E., T302
Vianna, F. S., T123, T124
Vicario, D., 382
Vicente-Mainar, F., T331
Vidal, O., T507
Vieira, L. L. R., W294
Vieira, R. A. M., M429, M433, M461, M462, T177, T187
Vieira de Rezende, E., M231
Vieira Pires, A., W496
Vieira-Neto, A., M288, T22, T48, 23, 358
Vignola, M., 96
Vigors, S., W116
Vikser, M., 751
Vilas Boas, D. F., 876
Vilela, R. A., M86
Villadiego, F. A. C., T367, W378
Villalba, J. J., 68
Villar, F., M262
Villaverde, A., T34
Villega Barletta, R., W383
Villegas, K., 101
Vincent, D., T534
Vining, T. P., 736
Vinogradova, I. V., T35
Vinyeta, E., 121
Viotto, W. H., W136, W137, W143
Virkler, P. D., 146
Vissio, C., M402
Vitali, A., W87
Voelker Linton, J. A., T410
Voelz, B. E., M233, M234, 447
Volchinski, V., 415
Vollmer, A., T114, 71
Vollmer, A. H., W130
Volpi-Lagreca, G., M420
vom Saal, F., 8
von Borstel, K., T236
von Keyserlingk, M. A. G., M21, M22, M245, M292, T36, W10, 352, 497
Vonnahme, K. A., M221, W248, 338
Vsetecka, A. B., 484
Vuckovic, G., T152

W

- Wada, K., T389
Wadsworth, B. A., M132, M246, M291, T200, 80, 353
Wagner, A. L., 311
Wagner, B., 146
Wagner, B. K., T221, 827
Wagoner, T. B., T194
Wai, L. Y., 783
Waite-Cusic, J., W126, W127, W128, W157
Wakshlag, J. J., 280, 755
Walcheck, B., T20
Waldron, M. R., W264
Wales, B., 522
Walker, C., 365
Walker, C. G., 247
Walker, J. A., 586, 614, M229
Walker, J. D., T190, T189
Walker, N., T237 W434
Walker, R., M94
Wall, E., 14, 259
Wall, E. H., T431, 282
Wall, K. R., T72
Wall, S. K., 101, 432
Wallis, B. D., W447
Walpole, M. E., M421
Walsh, G. T., W156
Walsh, S. W., M226
Walter, K. W., T75, T76
Walter, L. J., 521
Walter, L.-A. J., W270, 107, 863, 864, 865
Walton, M. A., M223
Wan, C., 664
Wan, D., 337
Wanderer, M., M260, 499
Wang, B., M487, T421, 860
Wang, C., M84, M151, T111, T354
Wang, D., 677
Wang, F., M19, M152, M166, W295, 435
Wang, H., T111, T163, W215, 424
Wang, H.-C., M470, M487, 111
Wang, H. F., T354
Wang, H.-M., W195
Wang, H. Y., M153
Wang, J., 213
Wang, J. J., 115
Wang, J. K., T412, T413, T430, W123
Wang, J. P., 835
Wang, J. Q., W411, W413, W415, W416, W417, W422, W423, 435, 465
Wang, J., M150, T38, T161, T162, T163, T165, T166
Wang, K., 300
Wang, L., 646
Wang, L. F., 548
Wang, M., W215, 106, 424
Wang, P., 400, 401, 402
Wang, P. P., W411, W416, W422
Wang, Q., W112, 577
Wang, S.-S., W123
Wang, T., M166, M167, 108
Wang, X.-Z., W81
Wang, X., W48
Wang, Y., M19, M99, M123, M125, M333, M436, M451, T171, T181, T228, T283, W412, W191, W200, W205, 192, 240, 400, 401, 402, 592
Wang, Y. B., T61
Wang, Z., T511, T512, 525, 873
Wang, Z.-I., W195
Ward, L. S., T194
Ward, R. T., T434, T443
Warren, L. K., T235, T242, 311, 427
Wasdin, J., W71
Waseem, M., 689
Washburn, S., 225
Wasson, H. L., 200
Watanabe, D. H. M., W308, W309
Waters, K. M., T148
Watson, A. K., 341, 821, 862
Wattiaux, M. A., M297, T429, T435, T531, W361, W388, W443, W462, 641
Weaber, R. L., 523, 524
Weary, D. M., M21, M22, T36, W10, 352, 497
Weatherly, M. E., M379, 353
Weathers, J. D., T56, T71
Weaver, L. D., 231
Weaver, S. R., 97, 281
Webb, S., T69
Weber, E., 118
Weber, W., T49, W257
Weber, W. J., T20, W37
Webster, T. K. M., M365
Weed, B. C., 673
Weeks, H., 597, 850
Weeks, H. L., W365
Weeks, S., 624
Weems, J. D., W357
Wegrzyn, J. L., W217
Wehmeyer, M., T472
Wei, H., M174, T288, 664
Wei, S.-J., 337
Wei, W., M143
Wei, Z., M143
Wei, Z. H., T413, T430
Weich, W., T157
Weigel, K., 525
Weikard, R., 533
Weimer, P. J., W198, W396
Weinberg, Z., 415
Weis, A. J., 744
Weisbjerg, M. R., 274, 623
Weiss, C. P., W458, 104, 105, 506
Weiss, W. P., T368, T434, T443, 282, 591
Weissend, C. J., 66, 266
Welch, S., W462
Welchons, C. A., 341, 833
Weld, K. A., T395, W11
Weldon, B., 295
Wellnitz, O., T13, T276, T277, T312, 433, 680
Wells, D. F., 527, 530
Wells, J. B., W51, W54
Wells, J. E., 527, 530
Wells, K. D., T346, T348
Wells, S. J., 256
Welsh, M. D., T32
Welsh, T. H., T329, W22, 135
Welter, K. C., 163
Wen, F., T163
Wen, J., M448
Weng, H.-Y., 849
Weng, Z.-Q., M70
Wenner, B. A., M353, M410, T221, 827, 855
Werncke, D., 499, 812
Werner, T., M375
Wert-Lutz, A. E., M373, T218
Weschenfelder, M. M., T2
West, J. K., 451
Westphalen, M. F., M310, M444, T500
Wettemann, R. P., T347
Whang, K.-Y., T303
Wheeler, R., M486
Whelan, S. J., 853
Whitaker, B. D., 582, 583
White, B., M52
White, H. M., M8, M137, M352, W337, 357
White, L. M., T76
White, M. E., W224
White, R. R., T465, W274, W276, W353, W356, 591
White, S. H., 427
White, S. N., M83
Whitehouse, N., T435
Whitehouse, N. L., M386, M406, T424
Whitley, N., M517
Whittier, J. C., T342
Whittier, W. D., M232
Wiat, S., T268
Wickersham, T. A., M328, M426, T351, 828, 829
Widener, C. L., M247
Widmann, P., 533
Widmar, N., M63, M64, M65, M295, 35, 36, 37
Wiebusch, A. T., 711
Wiedemann, S., 431
Wiedmann, M., 778
Wiggans, G. R., T88, T102, 537
Wightman, D. L., 572
Wijesiriwardana, D., 321
Wijma, R., M211, M249, T37, 128, 279, 356, 448
Wilbers, L. S., T190, T527, W501
Wilcox, M., M63
Wilde, R. E., W13
Wildeus, S. A., M452, W490

Wilkerson, V. A., 862
 Wilkins, J. A., 248
 Wilkinson, M. G., 563
 Wilks, D., 459
 Willard, S. T., M509, 135
 Williams, C., T185
 Williams, C. A., 426
 Williams, C. C., M380, 201, 223
 Williams, D. R., W24
 Williams, G. L., 4, 443
 Williams, H., 109
 Williams, J. E., M392, W369
 Williams, S. E., W347
 Williams, S. R. O., 597, 850
 Willson, P., 768
 Wilson, B. K., 371
 Wilson, C. S., 531
 Wilson, D. J., 26
 Wilson, J., 293, 725
 Wilson, M., M508
 Wilson, R. M., W260
 Wilson, T. B., W57, 738
 Wiltbank, M. C., M236, M239, M240, M277,
 M363, T324, W262, 129, 315, 324, 351,
 675, 676, 678
 Wimmers, K., M157
 Winder, C. B., 290
 Windig, J., 380
 Windle, M., M115
 Windschitl, P. M., W375
 Winkler, A., T445
 Winkler, J., T308
 Winston, D. R., 199, 224
 Wiseman, J., 50
 Witherspoon, T., M456, M457
 Withrock, I. C., M140, 727
 Wittum, T., T62
 Woerner, D. R., T342
 Wohlgemuth, S. E., 427
 Woiwode, R. H., M35
 Wojtowicz, A., W90
 Wolc, A., M70, 771
 Woldesenbet, S., M101
 Wolf, C., 137
 Wolffram, S., T12, T227
 Wongpom, B., T87
 Wood, A. Y., 452
 Wood, J. D., 54
 Wood, J. R., T317
 Wood, K. M., M329, M330, M421, 461
 Woolliams, J. A., T88
 Woolpert, M. E., 81, 343
 Workman, J. D., T39, 500
 Worku, M., M483
 Wormsbecher, L. M., 496
 Woyengo, T. A., M177, M178, 116
 Wregor, R., T296
 Wright, A.-D. G., M256, M460, T405, W328,
 166, 598

Wright, C., W479
 Wright, C. L., 484, 614
 Wright, J. R., T103
 Wright, T. C., 354
 Wright-Johnson, E. C., T317
 Wrighton, K. C., M353
 Wu, D., W40
 Wu, F., W40
 Wu, G., M166
 Wu, J., M361
 Wu, J. S., T421
 Wu, Q., 664
 Wu, W.-X., 176, 682
 Wu, Y., T228
 Wu, Z., W323, W326, 808
 Wynands, E. M., 82
 Wynn, S., T40
 Wyzen, B., 694

X

Xavier, E., 817
 Xavier, E. G., M218
 Xia, H., M166
 Xia, K., M282
 Xia, Y. F., T354
 Xia, Z.-S., 337
 Xiang, Q., M174
 Xiao, J., T455
 Xiao, J. X., T446
 Xie, X., T430
 Xin, H., 727, M140
 Xin, H.-l., 682
 Xin, S., M92
 Xiong, H., 240
 Xochitemol-Hernández, A., W459
 Xu, F., 664
 Xu, H., W485, 664
 Xu, J. C., W415, W419, W420, W421
 Xu, L., W84, 785, 786
 Xu, N. N., T413
 Xu, Q., W40
 Xu, S., W40
 Xu, Y., W48
 Xu, Z., T171, W200
 Xue, P., M194
 Xue, S., W466

Y

Yacoubi, N., T481
 Yadav, S., 849
 Yajing, B., W441
 Yamagishi, M., 634
 Yamaguchi, S., W89
 Yamamoto, S. M., W408
 Yamamoto, Y., 400, 401, 402
 Yan, C., W40
 Yan, H., W214

Yan, S., T375
 Yancey, J. W., 720
 Yanchukov, I. N., W83
 Yañez, J., M177
 Yañez, J. L., M176
 Yang, B., W123
 Yang, B.-Z., 337
 Yang, C., W42
 Yang, C. W., T283, T284, W412
 Yang, F., T413
 Yang, S., 227
 Yang, S. Y., 87, T382, T383, T384
 Yang, W., T349, T373, T374, T375
 Yang, Y., W254, 837, 682
 Yang, Z., M92
 Yang, Z. B., T283, T284, W412
 Yao, K. Y., T412
 Yao, W., M166
 Yao, Y., W113, W115, 796, 836
 Yaqoob, M., 689
 Yarborough, J. K., T178
 Yasui, T., W246
 Yazman, J., 210
 Ye, J. A., T412, T413
 Yeah, Y., T361
 Yeh, Y., T199
 Yelich, J. V., M315, W55, 712, 713
 Yeoman, C. J., 517
 Yeung, C. K., T135
 Yeung, M., T135
 Yi, G., 553
 Yi, H., 192
 Yiannikouris, A., W160
 Yilmaz Dikmen, B., T336
 Yin, Y., M511
 Ying, J. Y., M394, 468
 Ying, Y., M415, W456, 286, 469
 Ylioja, C. M., M149
 Yoder, A. D., T74
 Yodklaew, P., T91
 Yohe, T. T., M4, T206
 Yongqing, Y., M143
 Yoon, H., T470, W172
 Yoon, I., M375, T18, T19, T412, T413, T446,
 T455, W409, 153, 172, 856
 Yoshitoshi, F. N., W100
 Younas, U., W268, 628, 809
 Young, A. J., T383, T388, 87
 Young, A. N., 636
 Young, K., T396, 162
 Young, M. G., W232
 Younker, S., W395
 Youssef, N. N., W130
 Yu, B., W113, W115, 577, 796, 835, 836
 Yu, C., 192
 Yu, J., W113, W115, 577, 835, 836
 Yu, K., W484
 Yu, L., 424, W215

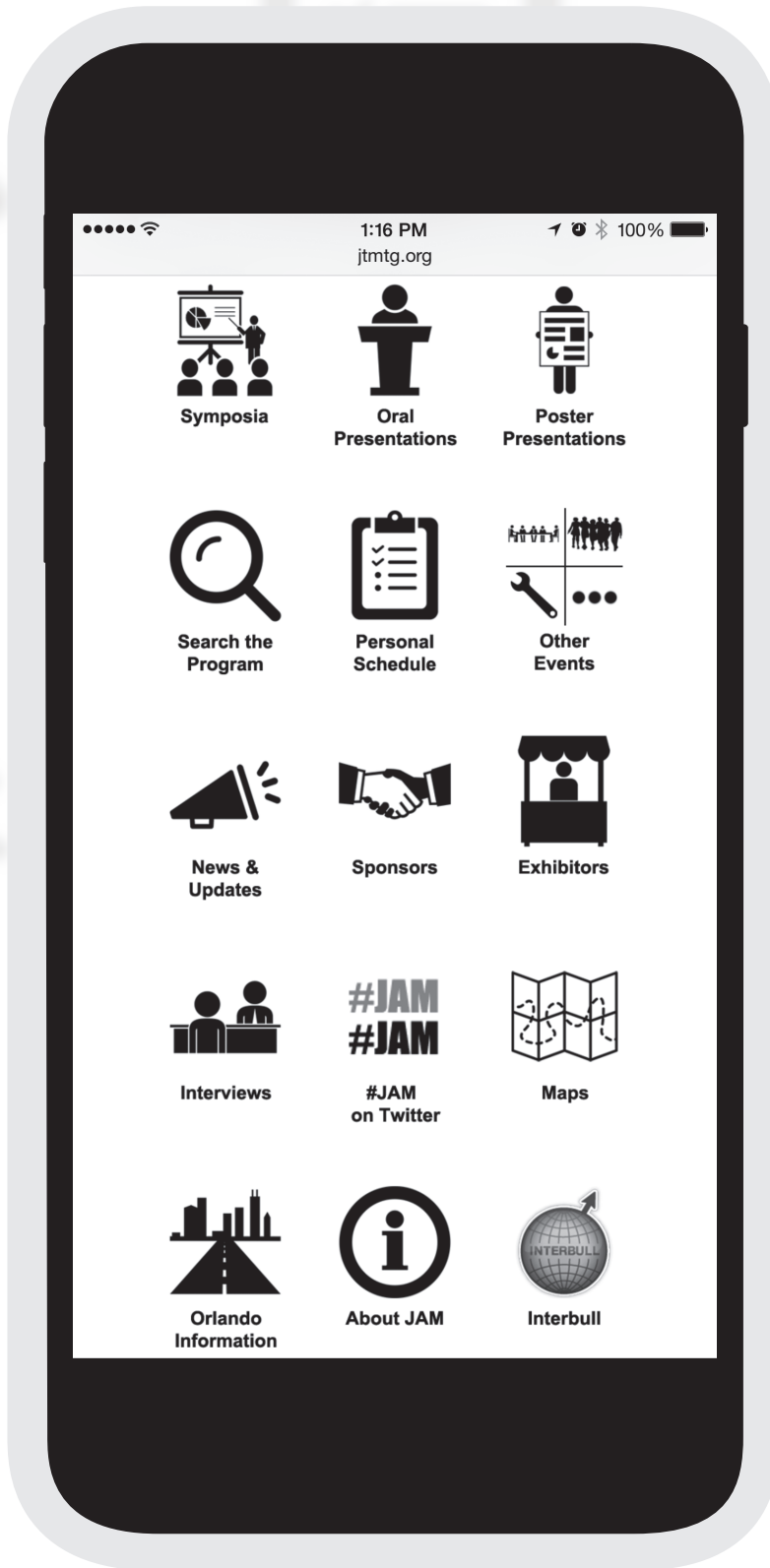
Yu, P., M139, M368, M449, T210, T469, T478, W176, W390, W414, W441, 332, 859
 Yu, Q., M99
 Yu, Z., M353, 855
 Yuan, K., 621
 Yuan, M., 195
 Yukalo, V., M102
 Yun, C. H., W292
 Yun, H. M., M203, M207
 Yunta, C., W247, W380

Z

Zacaroni, O. F., T414, W182
 Zachut, M., 126, 805
 Zadnkarimi, F., T51
 Zadra, L. E. F., M280
 Zaldumbide, G. A., W39
 Zaleski, H. M., 571
 Zambom, M., T145
 Zambom, M. A., T142
 Zandkarimi, F., T50, T53
 Zandstra, T., 830
 Zarella, A. J., M23, W2
 Zanetti, D., T366, W269, 454
 Zanetti, M. A., W319, W442
 Zanferari, F., M367, M377, M395, W321, W322, W371
 Zang, Y., M301
 Zanton, G. I., T212, T452, T453, T472, 344, 469
 Zanzalari, K., M339, W391
 Zanzalari, K. P., M428, W323
 Zapata, R., 784
 Zapata Vasquez, D. C., W282, W398
 Zarco-Quintero, L. A., 791
 Zarrin, M., T13, W469
 Zavaleta-Mancera, H. A., W162
 Zbinden, C., T276, T312, 433
 Zeferino, C. P., T346, T348
 Zeng, Q., 653
 Zeni, D., T466
 Zenobi, M., 389
 Zerby, H., 690

Zeringue, L., W273
 Zezeski, A. L., 452
 Zhang, B. X., T412
 Zhang, F., M192
 Zhang, G., T5, T6, T7, T8, T9
 Zhang, H., M92, T456, 192
 Zhang, J., T165, W411, W416
 Zhang, L., 836
 Zhang, N., M151
 Zhang, N.-F., M470, M487, T438, W174, 111, 175, 831
 Zhang, Q., W256
 Zhang, S., T115, 117
 Zhang, S. H., 788
 Zhang, S. J., 44
 Zhang, T., W413
 Zhang, T. L., M448
 Zhang, X., T450, T469, 539, 557, 760
 Zhang, Y., M448, T38, T166, T210, W390, 859
 Zhang, Y. D., W413
 Zhang, Z., 664
 Zhao, D., T455
 Zhao, E., M99
 Zhao, F. Q., 300
 Zhao, J., 310
 Zhao, M., W413, W423
 Zhao, P. Y., M199, M201, M202, M203, M204, M205, M208
 Zhao, R., 195
 Zhao, S. G., W416, W422
 Zhao, X., T271, T279
 Zhao, Y., M78, M99, T373, T375, W178, 265
 Zheng, L., M174
 Zheng, N., M150, T38, T161, T162, T163, T165, T166, 465
 Zheng, P., W113, W115, 577, 796, 835, 836
 Zheng, Y., W239, 653
 Zheng, Y. K., M448
 Zhong, J., 653
 Zhong, Q., T460
 Zhou, H., W174
 Zhou, L., 542
 Zhou, M., W429

Zhou, X., T161, T162, W232, 574, 575
 Zhou, X. Q., W413, W423
 Zhou, Y., T288
 Zhou, Z., M404, 318, 319, 320, 455, 456, 457
 Zhou, Z. H., 796
 Zhu, D., W423
 Zhu, H. B., M153
 Zhu, J., T60
 Zhu, L., 577
 Zhu, L.-Q., 176
 Zhu, W., T412, T413, T430, W132
 Zhu, X., M92
 Zhu, Y. X., W415
 Ziegler, B., M398, T451
 Ziegler, D., M268, M398, M399, T449, T451, W395
 Zierden, D., 418
 Zijlstra, R. T., M177, M178, W232, 116, 548, 574, 575, 837
 Zimmerman, P., 599
 Zimmerman, S., 599
 Zinicola, M., T26, 509
 Zinn, R., 519
 Zinn, R. A., T436
 Zinn, S. A., T65, W216, W217, 291, 294
 Zinovieva, N. A., T35, T99, W83
 Zobel, G., 148
 Zoca, S. M., 841, M303
 Zolini, A. M., M243
 Zontini, A. M., W334, W338
 Zou, C.-X., 337
 Zou, S., T297
 Zou, Y., M123, M125, T288
 Zuffo, B. N., M481
 Zuidhof, M. J., 638
 Zuidhof, S., 507
 Zumbach, B., M67
 Zúñiga, A., T182
 Zuniga, J., 389
 Zuniga, J. E., M383
 Zuñiga-Villegas, J. B., T516
 Zwierzchowski, G., T7, T8, T44, T45



Symposia



Oral Presentations



Poster Presentations



Search the Program



Personal Schedule



Other Events



News & Updates



Sponsors



Exhibitors



Interviews

#JAM
#JAM

#JAM
on Twitter



Maps



Orlando
Information



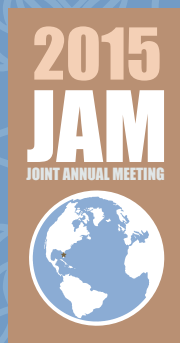
About JAM



Interbull

Future Meeting Date

**Salt Lake City, Utah
July 19–23, 2016**



www.jtmtg.org/2015