

## ABSTRACTS

### American Dairy Science Association® American Society of Animal Science

Sunday, July 12, 2015

#### SYMPOSIA AND ORAL SESSIONS

Late-Breaking Original Research Session .....	LB1–LB8 .....	i
Triennial Reproduction Symposium: Developmental programming of fertility.....	1–9 .....	1
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 .....	4
Breeding and Genetics Symposium: Joint Interbull/JAM Session: Use of genomics to improve limited and novel phenotypes in animal breeding.....	15–19 .....	6

Monday, July 13, 2015

#### POSTER PRESENTATIONS

ADSA-SAD (Student Affiliate Division) Undergraduate Student Poster Competition.....	M1–M16 .....	8
Animal Behavior and Well-Being I.....	M17–M36 .....	13
Animal Health: Beef cattle.....	M37–M48 .....	20
Animal Health: Immunology .....	M49–M62 .....	25
Bioethics .....	M63–M66 .....	30
Breeding and Genetics: Application and methods in animal breeding—Swine, poultry, and other species.....	M67–M85 .....	32
Breeding and Genetics: Molecular genetics .....	M86–M100 .....	38
Dairy Foods: Chemistry.....	M101–M109 .....	43
Forages and Pastures: Silages and forages in dairy production systems .....	M110–M128 .....	46
Graduate Student Competition: ADSA Production Division Graduate Student Poster Competition, MS.....	M129–M141 .....	53
Lactation Biology I.....	M142–M156 .....	58
Meat Science and Muscle Biology .....	M157–M165 .....	63
Nonruminant Nutrition: Amino acids .....	M166–M177 .....	66
Nonruminant Nutrition: Enzymes and minerals .....	M178–M197 .....	71
Nonruminant Nutrition: General I .....	M198–M208 .....	78
Physiology and Endocrinology: Effects of nutrition and metabolism on ruminant reproduction .....	M209–M229 .....	82
Physiology and Endocrinology: Estrous synchronization and detection of estrus in cattle .....	M230–M250 .....	90
Production, Management and the Environment I .....	M251–M309 .....	98
Ruminant Nutrition: Beef I.....	M310–M338 .....	118
Ruminant Nutrition: Dairy I.....	M339–M415 .....	128
Ruminant Nutrition: General I.....	M416–M451 .....	155
Small Ruminant I.....	M452–M488 .....	168
Swine Species .....	M489–M518 .....	181

#### SYMPOSIA AND ORAL SESSIONS

Animal Health: Reproductive health and acute immune responses.....	20–31 .....	191
Bioethics Symposium: Effects of science, government, and the public in directing the future of animal agriculture.....	32–37 .....	195
Breeding and Genetics Symposium: Relevance of modeling in the genomics era.....	38–42 .....	197
Comparative Gut Physiology and Nonruminant Nutrition Symposium: The gut–brain axis—Sensing and signaling.....	43–54 .....	199

Extension Education Symposium: Extension and industry outreach for tomorrow's producers.....	55–60	203
Forages and Pastures: Forages for livestock systems.....	61–69	205
Graduate Student Competition: ADSA Dairy Foods Graduate Student Oral Competition.....	70–79	208
Graduate Student Competition: ADSA Production Division Graduate Student Oral Competition, MS.....	80–92	212
Graduate Student Competition: ADSA Southern Section Graduate Student Oral Competition.....	93–94	217
Lactation Biology Symposium: Mammary gland biology revisited.....	95–101	218
Meat Science and Muscle Biology.....	102–112	221
Nonruminant Nutrition: Enzymes and processing.....	113–123	225
Physiology and Endocrinology: Reproduction and estrous synchronization.....	124–135	229
Production, Management, and the Environment I.....	136–148	234
Ruminant Nutrition: Dairy calves.....	149–160	239
Ruminant Nutrition: Dairy rumen fermentation.....	161–172	244
Small Ruminant: Nutrition.....	173–184	248
Swine Species.....	185–195	252
ADSA-SAD (Student Affiliate Division) Undergraduate Competition: Dairy Foods.....	196–201	256
ADSA Foundation PhD Symposium: Meeting the present and future demand for employees with a PhD.....	202–209	258
ADSA Multidisciplinary and International Leadership Keynote (MILK) Symposium:		
Global dairy perspective—Production, processing, people, politics, and priorities.....	210–214	261
ADSA Southern Section Symposium: Maximizing forage quality in the Southeast.....	215–219	263
ADSA-SAD (Student Affiliate Division) Undergraduate Competition: Dairy Production.....	220–226	265
ADSA-SAD (Student Affiliate Division) Undergraduate Competition: Original Research.....	227–232	267
Animal Behavior and Well-Being Symposium:		
Novel and multidisciplinary approaches to animal welfare.....	233–236	269
Animal Health: Swine health and transition cows.....	237–248	271
Animal Health Symposium: Understanding and reducing the impact of various stressors on immune responses and health of cattle.....	249–253	276
Bovine tuberculosis (TB) and paratuberculosis (Johne's disease) Symposium:		
What we know and what we need to know.....	254–258	278
Breeding and Genetics: EAAP Genetics Symposium: Breeding for environmental sustainability.....	259–262	280
Forages and Pastures: Grasses and silages.....	263–273	282
Graduate Student Competition: ADSA Production Division Graduate Student Oral Competition, PhD.....	274–287	286
Graduate Student Competition: ADSA-ASAS Northeast Section Graduate Student Oral Competition.....	288–294	291
Lactation Biology I.....	295–301	294
Nonruminant Nutrition: Amino acids and minerals.....	302–310	297
Physiology and Endocrinology: Nutrition, reproduction and metabolism.....	311–322	300
Physiology and Endocrinology Symposium: Progesterone as an endocrine regulator of fertility in cattle.....	323–329	305
Ruminant Nutrition: General.....	330–341	308
Ruminant Nutrition Symposium: Time required for diet adaptation and minimization of carry-over effect in ruminants: Evidence-based decisions.....	342–348	312

## Tuesday, July 14, 2015

### POSTER PRESENTATIONS

Animal Health: Lactating cows.....	T1–T55	315
ASAS Undergraduate Student Poster Competition.....	T56–T76	334
Breeding and Genetics: Application and methodology in animal breeding—Beef.....	T77–T85	341
Breeding and Genetics: Applications and methodology in animal breeding—Dairy.....	T86–T106	345
Dairy Foods: Dairy products.....	T107–T130	352
Dairy Foods: Microbiology.....	T131–T147	360
Extension Education.....	T148–T157	365
Food Safety.....	T158–T175	369
Forages and Pastures: Silages and forages in beef and sheep production systems.....	T176–T190	375
Graduate Student Competition: ADSA Dairy Foods Graduate Student Poster Competition.....	T191–T197	380
Graduate Student Competition: ADSA Production Division Graduate Student Poster Competition, PhD.....	T198–T222	383
Growth and Development I.....	T223–T232	391
Horse Species.....	T233–T247	395

International Animal Agriculture .....	T248–T262 .....	400
Lactation Biology II.....	T263–T279 .....	405
Nonruminant Nutrition: General II .....	T280–T291 .....	411
Nonruminant Nutrition: Sows and piglets .....	T292–T303 .....	415
Physiology and Endocrinology: Environment, metabolism and physiological processes.....	T304–T315 .....	419
Physiology and Endocrinology: Reproductive tissues, gametes, and embryo development .....	T316–T329 .....	424
Production, Management and the Environment II .....	T330–T350 .....	429
Ruminant Nutrition: Beef II.....	T351–T379 .....	436
Ruminant Nutrition: Dairy II .....	T380–T457 .....	447
Ruminant Nutrition: General II.....	T205, T458–T493 .....	475
Small Ruminant II.....	T494–T530 .....	488
Teaching/Undergraduate and Graduate Education .....	T531–T537 .....	501

## SYMPOSIA AND ORAL SESSIONS

ADSA Production Division Symposium: Production efficiency of the dairy cow .....	349–353 .....	504
Animal Health: Transition cow health .....	354–365 .....	506
ARPAS Symposium: Reproductive efficiency of beef cows—Current status and new technologies .....	366–369 .....	511
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 .....	513
Breeding and Genetics: Application and methods—Dairy I.....	373–384 .....	514
Cell Biology Symposium: Regulation of growth through amino acid sensing.....	385–388 .....	518
Companion Animals: Nutrition and behavior .....	389–399 .....	520
Dairy Foods: Microbiology.....	400–405 .....	524
Extension Education .....	406–411 .....	526
Food Safety .....	412–415 .....	528
Forages and Pastures Symposium: Implications of climate change on the resiliency of forage and pasture production systems .....	416–418, 876 .....	530
Growth and Development I.....	419–425 .....	532
Horse Species Symposium: Exercise physiology of the horse .....	426–429 .....	535
Lactation Biology II.....	430–436 .....	537
Milk Protein and Enzymes Symposium: High milk protein foods—Challenges and opportunities in structures and digestion.....	437–441 .....	540
Physiology and Endocrinology: Reproduction in cattle .....	442–453 .....	542
Ruminant Nutrition: Amino acids and metabolism .....	454–465 .....	547
Ruminant Nutrition: Dairy .....	466–477 .....	552
Teaching/Undergraduate and Graduate Education .....	478–487 .....	556
ADSA Production Division Symposium: The rumen and beyond—Nutritional physiology of the modern dairy cow .....	488–492 .....	560
Animal Behavior and Well-Being I.....	493–503 .....	562
Animal Health: Beef cattle health, lameness and mastitis.....	504–515 .....	566
Beef Cattle Nutrition Symposium: Feeding Holstein steers .....	516–521 .....	570
Breeding and Genetics: Feed efficiency and methods .....	522–533 .....	572
Breeding and Genetics: Genomic methods.....	534–545 .....	577
Companion Animal Symposium: Bioenergetics of pet food .....	546–550 .....	581
Contemporary and Emerging Issues and International Animal Agriculture Symposium: Ahead to 2050—Global livestock production challenges: Current status, future needs, production obstacles.....	551–555 .....	583
Dairy Foods: Cheese and chemistry .....	556–565 .....	585
Dairy Foods Symposium: Recent developments in manufacturing and applications of lactose and lactose derivatives.....	566–570 .....	589
Nonruminant Nutrition: Feed ingredients.....	571–581 .....	591
Physiology and Endocrinology: Gametes and stress .....	582–590 .....	595
Production, Management, and the Environment II .....	591–602 .....	599
Ruminant Nutrition: Manipulating rumen function.....	603–614 .....	604
Ruminant Nutrition: Protein metabolism.....	615–626 .....	608
Small Ruminant: General.....	627–637 .....	613
Teaching/Undergraduate and Graduate Education Symposium: Teaching graduate students to teach and be successful at teaching .....	638–642 .....	617

Wednesday, July 15, 2015

POSTER PRESENTATIONS

Animal Behavior and Well-Being II .....	W1–W18 .....	619
Animal Health: Dairy calves and heifers .....	W19–W39 .....	625
Animal Health: Monogastric health .....	W40–W48 .....	633
Beef Species .....	W49–W65 .....	636
Breeding and Genetics: Genomic methods and application—Beef .....	W66–W78 .....	642
Breeding and Genetics: Genomic methods and application—Dairy .....	W79–W94 .....	647
Companion Animals: Nutrition .....	W95–W105 .....	653
Comparative Gut Physiology .....	W106–W124 .....	657
Dairy Foods: Cheese .....	W125–W141 .....	664
Dairy Foods: Processing .....	W142–W157 .....	670
Forages and Pastures: General forages and forage systems .....	W158–W211 .....	675
Growth and Development II .....	W212–W224 .....	693
Nonruminant Nutrition: Energy and fiber .....	W225–W237 .....	697
Physiology and Endocrinology: Male reproduction, deers, and poultry .....	W238–W244 .....	702
Physiology and Endocrinology: Metabolism, health, and physiological processes .....	W245–W262 .....	705
Production, Management and the Environment III .....	W263–W288 .....	712
Ruminant Nutrition: Beef III .....	W289–W317 .....	721
Ruminant Nutrition: Dairy III .....	W318–W393 .....	732
Ruminant Nutrition: General III .....	W394–W465 .....	758
Ruminant Nutrition: Other ruminants .....	W466–W472 .....	783
Small Ruminant III .....	W473–W508 .....	786

SYMPOSIA AND ORAL SESSIONS

ASAS Early Career Awards .....	874–875 .....	798
ASAS Graduate Student Symposium: Networking to achieve interdisciplinary research .....	643–645 .....	799
Breeding and Genetics: Beef and meat species .....	646–653 .....	800
Dairy Foods: Processing and chemistry .....	654–660 .....	803
Dairy Foods Symposium: Advances in bacterial exopolysaccharides—From production to applications in dairy foods and health .....	661–664 .....	806
Growth and Development Symposium: The mitochondrion—A powerhouse for the cell or a key to animal productivity? .....	665–670 .....	807
Horse Species Symposium: Recent advances in the microbiome and physiology of the hindgut of the horse and dog .....	671–674 .....	809
Physiology and Endocrinology: Estrous synchronization and metabolism .....	675–682 .....	811
Production, Management, and the Environment III .....	683–689 .....	814
Production, Management, and the Environment IV .....	690–697 .....	817
Ruminant Nutrition: Lactation responses .....	698–705 .....	820
Ruminant Nutrition: Mineral nutrition .....	706–713 .....	823
Small Ruminant Symposium: Genetic improvement in small ruminants for the future .....	714–717 .....	826
ADSA-ASAS Northeast Section Symposium: Bridging the gap between animal protein production and consumers, current and future .....	718–720 .....	828
Animal Behavior and Well-Being II .....	721–730 .....	829
Animal Health Symposium: Maintaining animal health in organic dairy herds .....	731–735 .....	833
Beef Species I .....	736–747 .....	835
Breeding and Genetics: Application and methods—Dairy II .....	748–759 .....	840
Breeding and Genetics: Poultry and swine .....	760–771 .....	844
Companion Animal Symposium: Comparative nutrition—Protein and energy across species .....	772–776 .....	848
Dairy Foods Symposium: Processing and ingredient innovations to grow fluid milk sales .....	777–781 .....	850
Milk Protein and Enzymes .....	782–786 .....	852
Nonruminant Nutrition: Immune support .....	787–798 .....	854
Physiology and Endocrinology Symposium: Insulin revisited .....	799–805 .....	859
Production, Management, and the Environment V .....	806–817 .....	861
Production, Management and the Environment Symposium: Environmental footprint of livestock production—Greenhouse gas emissions and climate change .....	818–822 .....	865
Ruminant Nutrition: Modifying rumen microbial populations .....	823–834 .....	867

**Thursday, July 16, 2015**

**SYMPOSIA AND ORAL SESSIONS**

Nonruminant Nutrition: Fiber .....	835–838 .....	872
Production, Management, and the Environment VI.....	839–849 .....	874
Ruminant Nutrition: Dairy rumen metabolism .....	850–861 .....	878
Ruminant Nutrition: Feedlot nutrition .....	862–873 .....	882
Author index .....		887
Keyword index .....		927