THIRTY-SECOND MEETING

Midwestern Sectional Scientific Sessions and Business Meetings

March 15–17, 1999

AMERICAN SOCIETY OF ANIMAL SCIENCE

and the

AMERICAN DAIRY SCIENCE ASSOCIATION

Polk County Convention Center

Formerly Des Moines Convention Center

501 Grand Avenue, Des Moines, Iowa 50309
AMERICAN SOCIETY OF ANIMAL SCIENCE

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Cornell University

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Savoy, IL

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Purdue University, West Lafayette, IN

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Kansas State University, Manhattan

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Virginia Tech, Blacksburg

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ASAS MIDWESTERN SECTION

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Thirty-Second Meeting
Midwestern Sectional Scientific Sessions
and
Business Meetings

AMERICAN SOCIETY OF ANIMAL SCIENCE
AND
AMERICAN DAIRY SCIENCE ASSOCIATION

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1998–1999 Committees ................................................................. Page 48
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IMPORTANT PHONE NUMBERS

Meeting Registration Desk: 515/242-2528
Press Room: 515/242-2517
Savery Hotel: 515/244-2151
Kirkwood Hotel: 515/244-9191
Hotel Fort Des Moines: 515/243-1161
Embassy Suites: 515/244-1700
Marriott: 515/245-5500

REGISTRATION

Convention Center, Lobby
Monday, March 15, 10:00 a.m. - 9:00 p.m.
Tuesday, March 16, 7:00 a.m. - 4:00 p.m.
Wednesday, March 17, 9:00 a.m. - 12:00 p.m.

<table>
<thead>
<tr>
<th>Category</th>
<th>Before March 1</th>
<th>After March 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>ADSA/ASAS Members</td>
<td>$50</td>
<td>$70</td>
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<tr>
<td>Undergraduate</td>
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<td>Students</td>
<td>$10</td>
<td>$10</td>
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<tr>
<td>Graduate Students</td>
<td>$10</td>
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<tr>
<td>Post Doctoral Fellow</td>
<td>$10</td>
<td>$10</td>
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<tr>
<td>ASAS Fellows</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Nonmember</td>
<td>$75</td>
<td>$100</td>
</tr>
</tbody>
</table>
BOARD OF DIRECTORS MEETING
Monday, March 15, 8:00 a.m. - 12:00 noon
ASAS and ADSA, Savery Hotel, Room 210

RECEPTION
Monday, March 15, 6:00 p.m. - 8:00 p.m.
Convention Center, Room 134
Courtesy of Hoffmann-LaRoche, Inc.

CONTEMPORARY ISSUES COMPETITION
Monday, March 15, 3:00 p.m. - 5:00 p.m.
Convention Center, Room 144

ACADEMIC QUADRATHLON
Quiz Bowl Competition
Monday, March 15, 8:00 p.m.
Convention Center, Room 144

Results of the Academic Quadrathlon will be announced following the Quiz Bowl Competition

REFRESHMENTS
Tuesday, March 16, 9:30 a.m. - 4:00 p.m.
Exhibit Hall, Room 206
Courtesy of Optimum Quality Grains, LLC

Wednesday, March 17, 9:30 a.m. - 12:00 noon
Exhibit Hall, Room 206
Courtesy of Optimum Quality Grains, LLC

POSTER SESSIONS
Tuesday, March 16, 8:00 a.m. - 5:00 p.m.
Exhibit Hall, Room 206

Wednesday, March 17, 9:00 a.m. - 12:00 noon
Exhibit Hall, Room 206

RECEPTION
Tuesday, March 16, 5:00 p.m. - 7:00 p.m.
Exhibit Hall, Room 206
Courtesy of IMC-AGRICO, Feed Ingredient Division
SYMPOSIUM
MONDAY, MARCH 15
NONRUMINANT NUTRITION
Nutraceuticals: Nutrition or Nirvana?
1:00 p.m. - 3:00 p.m.
Room 204FG

TUESDAY, MARCH 16
PHYSIOLOGY
Prolactin and Related Hormones
8:00 a.m. - 12:00 noon
Room 136

BREEDING AND GENETICS
Incorporation of Biotechnology into Animal Genetics Teaching
1:00 p.m. - 3:30 p.m.
Room 205E

RUMINANT NUTRITION AND FORAGES
Designing and Evaluating Grazing Systems
1:00 p.m. - 5:00 p.m.
Room 134

WEDNESDAY, MARCH 17
EXTENSION
Predicting Energy Content in Feeds
9:00 a.m. - 12:00 noon
Room 138

BREAKFASTS
Tuesday, March 16, 6:45 a.m.
Extension - Savery Hotel, Terrace Room
Program Chairs - Savery Hotel, Iowa Room

Wednesday, March 17, 7:00 a.m.
Convention Center, Room 134
ASAS/ADSA Awards Program

LUNCH
Tuesday, March 16, 11:30 a.m. - 1:30 p.m.
Exhibit Hall, Room 206
Major Contributor Fort Dodge Animal Health

A box lunch will be served in the Exhibit Hall for those individuals who ordered and paid for it on the registration form (You’ll have a ticket in your registration packet). There will be a limited number of box lunches available for purchase in the Exhibit Hall for those individuals who did not order it in advance. The box lunches available for sale will be on first-come basis.
MIDWESTERN SECTION
ASAS BUSINESS MEETING

Wednesday, March 17, 8:30 a.m.
Room 134
S. P. Ford, Presiding

MIDWEST BRANCH
ADSA BUSINESS MEETING

Wednesday, March 17, 8:30 a.m.
Room 204AB
R. D. Shaver, Presiding

A SPECIAL THANK YOU
from the Midwestern Section of the
American Society of Animal Science
and
the Midwest Branch of the
American Dairy Science Association
for support of the 1999 meetings
to the following companies:

Outstanding Young
Scientist Awards

Extension - Land O’Lakes
Research - Roche Vitamins Inc., Animal
Nutrition & Health
Teaching - Moorman Manufacturing Co.

NPPC Swine Innovation
(Abstract) Awards

Basic Research - National Pork Producers Council
Applied Research - National Pork Producers Council
Education - National Pork Producers Council

Innovation in Dairy
Research Award

Land O’Lakes Feed

Agribusiness Award

ADM, Animal Health and Nutrition

Student Competition
Paper Awards

Graduate - DeKalb Feeds, Inc.
Undergraduate - Farmland Industries, Inc.
Contemporary Issues
Competition
Optimum Quality Grains, LLC

Academic Quadrathlon
American Protein Corporation
Hoechst Roussel Vet Co.

Receptions
Monday - Hoffmann-LaRoche, Inc.
Tuesday - IMC-AGRICO,
Feed Ingredient Division

Lunch (Tuesday)
Fort Dodge Animal Health

Breakfast (Wednesday)
Diamond V. Mills, Inc.
Cargill Animal Health, Ivy Laboratories,
Vetlife, Inc.

Cyber Cafe
Cargill Animal Health

Symposia
EXTENSION
Cargill Corn Milling
Farmland Industries
Moorman Manufacturing Co.

RUMINANT NUTRITION
Leopold Center for Sustainable Agriculture
SPONSORS

PLATINUM LEVEL
($5,000.00 and above)

Hoffman-LaRoche, Inc.
IMC-Agrico Feed Ingredient Division

GOLD LEVEL
($2,000.00–4,999.00)

Cargill Animal Health
Fort Dodge Animal Health
Optimum Quality Grains, LLC
Roche Vitamins Inc., Animal Nutrition & Health

SILVER LEVEL
($1,000–1,999.00)

American Protein Corporation
BASF Corporation Animal Nutrition
Diamond V. Mills, Inc.
Hoechst Roussel Vet
National Pork Producers Council

BRONZE LEVEL
($500.00–999.00)

ADM, Animal Health and Nutrition
Akey, Inc.
DeKalb Feeds, Inc.
Farmland Industries, Inc.
Hubbard Feeds Inc.
Ivy Laboratories
Land O’Lakes
Land O’Lakes Feed
Leopold Center for Sustainable Agriculture
Moorman Manufacturing Co.
Pfizer Animal Health
Pig Improvement Company
Prince Agri-Products, Inc.
Purina Mills, Inc.
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OTHER
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Agri-Nutrition Services, Inc.
Cargill Corn Milling
DeKalb Swine Breeders Inc.
ExSeed Genetics
Golden Sun Feeds, Inc.
Hormel Foods Corporation
International Ingredient Corp.
Kent Feeds, Inc.
United Feeds, Inc.
Vigortone Ag Products, Inc.

FOOD & WATER SAFETY SYMPOSIUM

Sponsored by American Association of Bovine Practitioners

Monday, March 15th
7:30 a.m. - 3:00 p.m.
Room 138

Registration available on site

Time
7:30  Registration in convention center
8:30  Doug Powell - Risk Assessment
9:15  Dale Hancock - E. coli O157:H7
10:00 BREAK
10:30 John Gay - Salmonella, including DT 104
11:15 Rob Atwill - Cryptosporidia
12:00 LUNCH
1:30  David White - Antibiotic Resistance in Bacteria Isolated from Cattle
2:30  Panel Discussion
NONRUMINANT NUTRITION SYMPOSIUM

Nutraceuticals: Nutrition or Nirvana?

Monday p.m., March 15
Room 204FG
Chairperson: Gary L. Cromwell
University of Kentucky, Lexington

Time  
1:00 Nutraceuticals: Definition and perceptions  
L. M. Lawrence, University of Kentucky, Lexington
1:25 Vitamins and minerals as nutrient/nutraceuticals  
D. H. Baker, University of Illinois, Urbana
1:50 Soy phytoestrogens in swine production  
T. A. Winters, Southern Illinois University, Carbondale
2:15 Soybean isoflavones: Effects on growth and immunity in mammalian systems  
D. R. Cook, Akey, Inc., Lewisburg, OH
2:40 Potential of straight-chain fructooligo-saccharides to improve swine performance  
M. S. Kerley, University Missouri, Columbia

CONTEMPORARY ISSUES IN ANIMAL AGRICULTURE

Undergraduate Competition Paper Session

Monday p.m., March 15
3:00 p.m. – 5:00 p.m.
Room 144
Jerry Shurson, Chair
University of Minnesota, St. Paul

Time  
Paper
3:00 Opening Remarks: Jerry Shurson, University of Minnesota, St. Paul
3:05 Quantification and Nutrient Concentration of Manure Produced by Intensive Grazing Dairy Cows.  
Jennifer Rediske, Luther College, Decorah, IA.  
Faculty sponsor/advisor: Dr. Wendy Powers, Iowa State University, Ames
3:20 Comparative Strategies in Nutrient Management,  
Brandon Hill, Michigan State University, East Lansing.  
Faculty sponsor/advisor: Dr. David Hawkins, Michigan State University, East Lansing.
Leah Becker, University of Minnesota, St. Paul.  
Faculty sponsor/advisor: Dr. Jerry Shurson, University of Minnesota, St. Paul.
Johnna Seaman, Michigan State University, East Lansing.  
Faculty sponsors/advisors: Dr. Nathalie Trottier and Dr. Adroaldo Zanella, Michigan State University, East Lansing.
4:05 Why Should Scientists Be Involved in Animal Agriculture Issues of Public Concern?  
Dr. Ellen Bergfeld, Former FASS Congressional Fellow.
4:35 Questions/Discussions

The winners will be announced immediately following the Academic Quadrathlon Competition.
OPTIMUM RESEARCH FORUM ON VALUE ADDED GRAINS

Monday, p.m., March 15
4:30 p.m. - 6:00 p.m.
Room 204FG

Find out about genetically altered grains - What traits can be altered? What are the genetics and agronomics behind trait-altered grains? Why is identity preservation important? What is the feeding value of high oil grain for swine? for cattle? What computerized calculation aids are available to evaluate high oil grain and silage for producers? What rapid assay procedures can verify grain quality? What impact will trait-altered grains have on grain and livestock production systems and the public? Attend this pre-conference forum and get answers to your questions about value-added-grains from specialists with Optimum Quality Grains L.L.C., a DuPont-Pioneer joint venture.

BREEDING AND GENETICS I

Molecular Genetics

Tuesday a.m., March 16
Room: 205E
Chairperson: Daniel Pomp, University of Nebraska, Lincoln

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>9:00</td>
<td>QTL mapping with multiple markers in outbred populations. B. R. Southey, R. L. Fernando, L. Totir, C. Stricker, and T. Wang, 1Iowa State University, Ames, IA, 2ETH, Zurich, Switzerland, 3University of Illinois, Urbana, IL.</td>
</tr>
<tr>
<td>7</td>
<td>9:30</td>
<td>Localization of a juvenile recessive cataract mutation to proximal chromosome 7 in mice. E. J. Cargill, D. Pomp, and M. K. Nielsen, University of Nebraska, Lincoln.</td>
</tr>
<tr>
<td>8</td>
<td>9:45</td>
<td>Genetic parameters of fatty acid composition of porcine longissimus dorsi muscle. R. N. Goodwin, T. J. Knight, D. C. Beitz, and P. J. Berger, 1National Pork Producers Council, Des Moines, IA, 2Iowa State University, Ames, IA.</td>
</tr>
<tr>
<td>9</td>
<td>10:00</td>
<td>Genetic variation of fatty acid desaturation in pigs. T. J. Knight, R. N. Goodwin, and D. C. Beitz, 1Iowa State University, Ames, IA, 2National Pork Producers Council, Des Moines, IA.</td>
</tr>
</tbody>
</table>

ENVIRONMENT AND LIVESTOCK PRODUCTION I

Tuesday a.m., March 16
Room: 205J
Chairperson: Donald. C. Lay, Iowa State University, Ames

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Paper</th>
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<tbody>
<tr>
<td>29</td>
<td>8:00</td>
<td>The behavioral and physiological responses of pigs to segregated early weaning. Y. Yuan, M. Tauchi, and A. J. Zanella, Department of Animal Science, Michigan State University, East Lansing, MI.</td>
</tr>
</tbody>
</table>
31 8:30 Interaction of nursery and grow-finish space allocation on performance from weaning to slaughter. M. C. Brumm*, M. Ellis*, L. J. Johnston*, D. W. Rozeboom*, D. R. Zimmerman*, and NCR-89 Committee, 1University of Nebraska, Concord, NE USA, 2University of Illinois, Urbana, IL USA, 3University of Minnesota, Morris, MN USA, 4Michigan State University, Lansing, MI USA, 5Iowa State University, Ames, IA USA.


33 9:00 A comparison of peri- and post-parturient behavior in Yorkshire (Y) and Meishan (M) gilts. M. F. Haussmann* and D. C. Lay, Jr., Iowa State University, Ames IA.

34 9:15 Tail-docking alters behavior but not acute phase proteins of young dairy calves. S.D. Eicher* and J.L. Morrow-Tesch, USDA-ARS, West Lafayette, IN.

ENVIRONMENT AND LIVESTOCK PRODUCTION II

Tuesday a.m., March 16
Room: 205J
Chairperson: Gary D. Weesner, Purdue University, West Lafayette, IN

No. Time Paper

36 10:00 Effects of pre-shipping vs arrival medication with tilmicosin phosphate and feeding chlortetracycline on health and performance of newly received beef cattle. G. C. Duff*, D. A. Walker, K. J. Malcolm-Callis, M. W. Wiseman, and D. M. Halford, Clayton Livestock Research Center, New Mexico State University, Clayton, NM USA.

37 10:15 **Undergraduate Competitive Paper** - Detection of *Mycoplasma bovis* in bulk milk samples submitted for somatic cell counting by nested polymerase chain reaction. C. C. Pinnow1, J. A. Butler*, K. P. Sachse2, H. H. Hotzel1, L. L. Timms1, and R. F. Rosenbusch1, 1Iowa State University, Ames, Iowa, 2Institute for Veterinary Medicine, Jena, Germany.

38 10:30 **Undergraduate Competitive Paper** - Use of estradiol to stimulate postnatal viability in piglets less than 1.5 kg at birth. B. A. DeMontigny*, R. M. Weigi, and J. E. Tilton, North Dakota State University, Fargo, ND.

39 10:45 Effect of 21-day weaning weight, nursery feeding and management program and sex on pig performance to 56 days of age. B. F. Wolter*, R. M. Sierens, and M. Ellis, University of Illinois, IL/US.

40 11:00 Evaluation of genotype, therapeutic antibiotic and health management effects on swine lean growth rate. D. C. Kendall*, B. T. Richert, J. W. Frank, B. A. Belstra, S. A. DeCamp, and A. P. Schinckel, Purdue University, West Lafayette, IN.

41 11:15 Development of a swine forum by the swine production class and its efficacy in affecting opinions. R. C. Thaler* and D. M. Marshall, South Dakota State University, Brookings, SD USA.

42 11:30 Laboratory methods in animal reproduction. L. L. Anderson*, Iowa State University, Ames.

EXTENSION I

Dairy Calves and Heifers

Tuesday a.m., March 16
Room: 138
Chairperson: David B. Fischer, University of Illinois, Edwardsville

No. Time Paper
56 8:00 Effect of milk replacer fat level (20% vs. 15%) on calf starter intake and calf performance during hot weather. D. R. Catherman*, Strauss Feeds, LLC, Watertown, WI.

57 8:15 Effects of protein content in milk replacers on growth, nutrient utilization, and body composition of Holstein calves. R. M. Blome*, J. K. Drackley1, G. C. McCoy1, and C. L. Davis1, University of Illinois, Urbana, IL.

8:30 **INVITED Research Discussion**: Calf from birth to weaning. J. D. Quigley, III, American Protein Corporation, Ames, Iowa.

9:10 **INVITED Research Discussion**: Calf from weaning to four months of age. J. L. Morrill, Kansas State University, Manhattan, Kansas.

9:50 Roundtable discussion
10:15 Adjourn
<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Paper</th>
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<tbody>
<tr>
<td>70</td>
<td>8:00</td>
<td>INVITED Antimicrobial-induced growth: a possible mechanism. M. R. Hathaway*, University of MN.</td>
</tr>
<tr>
<td>74</td>
<td>9:15</td>
<td>Effect of triiodothyronine (T3) on heat production of MH and ML mice. M. G. Knobbe, M. K. Nielsen, and J. L. Miner, University of Nebraska.</td>
</tr>
<tr>
<td>75</td>
<td>9:30</td>
<td>Acylation stimulating protein and fatty acid esterification in the pig. C. L. Ramsel*, S. K. Jacobi, K. Cianflone, and J. L. Miner, University of Nebraska, McGill University.</td>
</tr>
<tr>
<td>76</td>
<td>9:45</td>
<td>Feeding status and the reponsiveness of bovine adipose tissue to human acylation stimulating protein (hASP). S. K. Jacobi, K. Cianflone, and J. L. Miner, University of Nebraska, McGill University.</td>
</tr>
<tr>
<td>77</td>
<td>10:00</td>
<td>Adipose and skeletal muscle expression of genes related to lipid metabolism in finishing pigs deprived of feed. S. Q. Ji, R. L. Godat, G. M. Willis, G. R. Frank, S. G. Cornelius, and M. E. Spurlock, Purina Mills, Inc., St. Louis, MO.</td>
</tr>
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<td></td>
<td>10:15</td>
<td>BREAK</td>
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**GROWTH, DEVELOPMENT, MUSCLE BIOLOGY AND MEAT SCIENCE II**

Tuesday a.m., March 16
Room: 204C
Chairperson: Michael E. Spurlock, Purina Mills, Inc. St. Louis, MO

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>79</td>
<td>10:45</td>
<td>Carcass and live value of cull beef cows. J. K. Apple*, University of Arkansas, Fayetteville.</td>
</tr>
<tr>
<td>83</td>
<td>11:45</td>
<td>Graduate Competitive Paper - Growth and health of Holstein calves fed milk replacers supplemented with antibiotics or Enteroguard*. D. C. Donovan*, S. T. Franklin, A. R. Hippen, and H. Prezler, South Dakota State University, University of Kentucky.</td>
</tr>
</tbody>
</table>
NONRUMINANT NUTRITION I

Sow Nutrition

Tuesday a.m., March 16
Room: 204AB
Chairperson: James E. Pettigrew,
Pettigrew Consulting International, Louisiana, MO

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Paper</th>
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</thead>
<tbody>
<tr>
<td>106</td>
<td>8:00</td>
<td>Graduate Competitive Paper - Effect of amino acid intake during gestation on sow body weight changes and litter size. D.R. Ball*, J.F. Patience, and R.T. Zijlstra, Prairie Swine Centre Inc., Saskatoon, Canada.</td>
</tr>
<tr>
<td>109</td>
<td>8:45</td>
<td>Quantitation of body endogenous amino acid contribution in the lactating sow. X. F. Guan*, P. K. Ku, and N. L. Trottier, Michigan State University, East Lansing, MI.</td>
</tr>
<tr>
<td>110</td>
<td>9:00</td>
<td>Effects of litter size on nutrient mobilization in lactating sows. S. W. Kim*, W. L. Hurley, and R. A. Easter, University of Illinois, Urbana IL.</td>
</tr>
</tbody>
</table>

NONRUMINANT NUTRITION II

Growing-Finishing Pig Nutrition

Tuesday a.m., March 16
Room: 204FG
Chairperson: John F. Less, Archer Daniels Midland Co., Decatur, IL

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Paper</th>
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</thead>
<tbody>
<tr>
<td>112</td>
<td>8:00</td>
<td>Added dietary fat improved growth performance and feed efficiency in grow-finish pigs under commercial conditions. S.S. Dritz*, M.D. Tokach, R.D. Goodband, and J.L. Nelssen, Kansas State University, Manhattan.</td>
</tr>
<tr>
<td>113</td>
<td>8:15</td>
<td>Nutritional modification of late finishing swine diets in a controlled heat stress environment. J. D. Spencer*, G. L. Allee*, J. Usry*, and R. D. Boyd*, 1University of Missouri-Columbia, 2Heartland Lysine, Chicago, IL, 3PIC-USA, Franklin, KY.</td>
</tr>
<tr>
<td>114</td>
<td>8:30</td>
<td>Effects of genotype and dietary fat on pork quality and carcass composition. J.M. Eggert*, S.E. Mills, A.P. Schinckel, J.C. Forrest, A.L. Grant, B.A. Watkins, and E.J. Farrand, Purdue University, West Lafayette, IN/USA.</td>
</tr>
<tr>
<td>115</td>
<td>8:45</td>
<td>Graduate Competitive Paper - Hydrogenated dietary fat improves pork quality of pigs from two lean genotypes. L. A. Averette*, M.T. See, and J. Odle, North Carolina State University, Raleigh, NC 27695.</td>
</tr>
<tr>
<td>117</td>
<td>9:15</td>
<td>Effects of conjugated linoleic acid (CLA) on growth and composition of lean gilts. J. M. Eggert*, M. A. Belury, A. Kempa-Steczko, and A. P. Schinckel, Purdue University, W. Lafayette, IN/USA.</td>
</tr>
<tr>
<td>118</td>
<td>9:30</td>
<td>Effects of diet manipulation on growth performance, carcass characteristics, and meat quality of intact male pigs. C. A. Maloney*, R. H. Hines, J. D. Hancock, H. Cao, and J. S. Park, Kansas State University, Manhattan.</td>
</tr>
<tr>
<td>119</td>
<td>9:45</td>
<td>Effects of betaine and space allocation on growth performance, plasma urea concentration, and carcass characteristics of growing and finishing barrows. S. J. Kitt*, P. S. Miller, A. J. Lewis, and H.-Y. Chen, University of Nebraska, Lincoln.</td>
</tr>
<tr>
<td>120</td>
<td>10:00</td>
<td>BREAK</td>
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</table>

Chairperson: Scott D. Carter,
Oklahoma State University, Stillwater

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>121</td>
<td>10:15</td>
<td>Effect of dietary energy source and free choice feeding on performance of high lean pigs. J. E. Sabin* and T. S. Stahly, Iowa State University, Ames.</td>
</tr>
<tr>
<td>122</td>
<td>10:30</td>
<td>Corn energy values for growing pigs. I. B. Kim*, G. L. Allee*, T. S. Sauber*, and R. F. Sanders*, 1University of Missouri-Columbia, MO, 2Optimum Quality Grains, LLC, Des Moines, IA.</td>
</tr>
</tbody>
</table>
127 9:30 The effect of feeding a liquid milk replacer to small pigs after weaning. G. L. Allee, K. J. Touchette, and J. J. Berkemeyer*, University of Missouri-Columbia.


132 10:45 Evaluation of a coproduct from pork slaughter plants as a protein source for starter pigs. D.J. Lee*, B.R. Dunsford, J.D. Hancock, K.L. Herkelman, M.D. Tokach, and J.D. Hahn - Kansas State University, Manhattan, Farmland Industries, Inc., Kansas City, MO.

133 11:00 Effects of commercially available soybean cultivars and extrusion temperature on growth performance and nutrient digestibility in nursery pigs. H. Cao*, J. D. Hancock, T. L. Gugle, W. T. Schapaugh, J. M. Jiang, J. S. Park, and J. M. DeRouchey, Kansas State University, Manhattan.


PHYSIOLOGY I

Symposium: Prolactin and Related Hormones
Sponsor: Midwest sections of ASAS and ADSA
Tuesday a.m., March 16
Room: 136
Chairperson: Lewis Sheffield,
University of Wisconsin, WI

Time
8:00  Bovine prolactin-related hormones.
   Linda Schuler, University of Wisconsin
9:00  Protein motifs that regulate the activity of lactogenic hormones.
   Charles Brooks, The Ohio State University
10:00 Interactions of prolactin and growth factor signaling pathways.
     Lewis Sheffield, University of Wisconsin
11:00 Bovine placental lactogen or chorionic somatomammotropin?
     John Byatt, Monsanto Co., St. Louis

RUMINANT NUTRITION AND FORAGES I

Poster Session (8:00 a.m. - 12:00 noon)
Tuesday a.m., March 16
Exhibit Hall, Room 206
(10:00 a.m. - 12:00 noon Authors Available)
Chairperson: Allen H. Trenkle,
Iowa State University, Ames

No. Paper
217 Performance and carcass characteristics of steers on programmed gain finishing systems. T. L. Scott*, C. T. Milton, T. L. Mader, and T. J. Klopfenstein, 1University of Nebraska, Lincoln, 2University of Nebraska Northeast Research and Extension Center, Concord.
219 Comparison of methods for calculating energy values from feed analyses. F. N. Owens*, M. A. Hinds, and S. D. Soderfund, Optimum Quality Grains, LLC., Des Moines, IA.
220 Effects of virginiamycin or monensin and tylosin on ruminal fermentation characteristics in steers fed diets based on dry-rolled corn with or without wet corn gluten feed. S. E. Ives*, E. C. Tietgmeyer, T. G. Nagaraja, A. del Barrio*, and D. J. Bindel, 1Kansas State University, Manhattan, 2University of the Philippines Los Banos.
221 Influences of delaying initial implant or re-implant date on production characteristics and carcass traits of steers fed high grain content diets. S. J. Bierman*, R. H. Pritchard, and R. T. Brandt, Jr., 1South Dakota State University, Brookings, SD USA, 2Hoescht Roussel Vet, Overtland Park, KS USA.
222 Effects of inoculation with either Propionibacterium strain P-63 alone or combined with Lactobacillus acidophilus strain LA53545 on performance of feedlot cattle. D. Swinney-Floyd, B. A. Gardner*, F. N. Owens, T. Rehberger, and T. Parrott, 1Oklahoma State University, Stillwater, 2Agtech, Inc., Waukesha, WI.
223 Effect of Interseeding Legumes into Endophyte-Infected Tall Fescue Pastures on Forage Production and Steer Performance. L. W. Lomas*, J. L. Moyer, and G. L. Kilgore, Kansas State University, Parsons.
224 Feeding raw soybeans in finishing cattle diets. T. T. Marston*, K. K. Kreikemeier, and J. F. Gleighorn, Kansas State University, Manhattan.

16

Effects of supplementing limit-fed, wheat middling-based diets with either soybean meal or non-enzymatically browned soybean meal on growing steer performance. C. M. Coetzer*, J. S. Drouillard, E. Coetzer, and R. H. Wessels, Kansas State University, Manhattan.

Impact of feedlot tenure on live weight gain, carcass measures, and economic value of steers. J.T. Wagner*, D.R. Gill, and F.N. Owens, Oklahoma State University.

Evaluation of corn steep liquor as a replacement for corn and supplement in a cattle finishing diet. A. Trenkle*, Iowa State University, Ames, Iowa U.S.


Effect of different Ca:P ratios in lamb diets on absorption and retention of phosphorus. I. Mejia-Haro*, D. R. Brink1, and J. Mejia2, 1University of Nebraska, Lincoln, NE, 2University of Guanajuato, Mexico.

Effects of the inclusion of different levels of iron in lamb diets on absorption and retention of phosphorus. I. Mejia-Haro*, D. R. Brink, J. Mejia, and J. M. Sanchez, 1University of Nebraska, 2University of Guanajuato, Mexico.

Effect of cooked molasses blocks containing different protein levels on performance of heifers fed prairie hay with or without supplemental alfalfa. E. C. Titzemeyer, J. S. Drouillard, D. J. Bindel, R. D. Hunter, and T. Nutsch, Kansas State University, Manhattan.

Feeding value of field pea forage and grain for growing beef heifers. W.W. Poland*, P. M. Carr, and L. J. Tisor, 1North Dakota State University, Dickinson.

Using Arsoy as a protein supplement in growing cattle diets. T.T. Marston, L. E. Wankel*, and K. K. Kreckemeyer, Kansas State University, Manhattan.


Effect of hybrid on quality of grain sorghum stubble components. J. E. Turner*, K. P. Coffey, W. K. Coblentz, K. W. Kelley, D. A. Scarbrough, and K. E. Lesmeister, 1University of Arkansas, Fayetteville, AR/USA, 2Kansas State University, Parsons, KS/USA.


Frequency of protein supplementation on net portal and hepatic flux of nitrogenous compounds in mature ewes consuming bromegrass hay. C. L. Ferrell* and H. C. Freely, USDA-ARS, U.S. Meat Animal Research Center, Clay Center, NE.

Extra-supplementation of Ca and P to lactating beef cows wintered on fescue stubble hay. L. F. Caswell*, Coronet Industries, Inc., Plant City, FL.

Corn versus sorghum distillers grains for lactating dairy cows. S. Al-Suwaiegh* and R. Grant, University of Nebraska-Lincoln.

Effect of brown-midrib corn silage on lactation performance by dairy cows. M. A. Bal, J. G. Coors*, and R. D. Shaver, University of Wisconsin, Madison, WI.

Effect of brown midrib sorghum on lactational performance of dairy cows. G. Aydin, R. J. Grant, and K. Boddugarit*, University of Nebraska, Lincoln, NE.

Evaluation of corn distillers grains versus a blend of protein supplements with or without ruminally protected amino acids for lactating cows. C. Liu*, D. J. Schingaethe, and G. A. Stegeman, South Dakota State University, Brookings, SD, U.S.A.

Dry matter intake and milk production by lactating cows fed hydrolyzed poultry feathermeal and bloodmeal. T. R. Johnson*, G. M. Anthony-Clapper, J. W. Lemkuher, and P. A. Ludden, 1Purdue University, West Lafayette, IN.


Performance of calves fed texturized calf starter or modified-soy milk replacer that has been extruded into dry, micro pellet form. T. E. Johnson*, H. B. Perry, B. L. Miller, and M. A. Fowler, Land O’ Lakes, Webster City, Iowa.
Ruminant Nutrition and Forages II
Feedlot and Stocker Nutrition
Tuesday a.m., March 16
Room: 134
Chairperson: Lyle W. Lomas,
Kansas State University, Parsons

No. Time Paper

249 8:00 Effects of feeding regimen and days fed on performance and carcass characteristics of feedlot steers. J.E. Rossi*, S.C. Loerch, S.J. Moeller, and J.P. Schoonmaker, The Ohio State University, Wooster, OH.

250 8:15 Effects of Rumensin Level and Bunk Management Strategy on Finishing Steers. K.C Fanning*, C.T. Milton1, T.J. Klopfenstein1, D.J. Jordan1, R.J. Cooper1, and J.C. Parrott1, 1University of Nebraska, Lincoln, NE 68583, 2Elanco Animal Health, Indianapolis, IN 46285.

251 8:30 Influence of feeding brown midrib corn silage during the growth phase on performance of feedlot steers. K. E. Tjardes*, D. D. Buskirk1, M. S. Allen1, L. D. Bourquin1, H. D. Ritchie1, and S. R. Rust1, 1Michigan State University, East Lansing, MI.

252 8:45 Undergraduate Competitive Paper - Effect of supplementation with cooked molasses blocks on intake and digestion by steers fed forages of differing qualities. J. W. Ringler*, E. C. Titgemeyer, J. S. Drouillard, and R. H. Greenwood, Kansas State University, Manhattan.

253 9:00 Effect of cattle type and stocking rate on weight gain of steers grazing old world bluestem pastures. C. J. Ackerman*, H. T. Purvis II, G. W. Horn, R. R. Reuter, and J. N. Carter, Oklahoma State University, Stillwater, OK.

254 9:15 Influence of the novel urease inhibitor N-(n-butyl) thiophosphoric triamide (NBPT) on ruminal nitrogen metabolism, diet digestibility, and nitrogen balance in lambs. P. A. Ludden*, D. L. Harmon1, M. S. Plunkett1, G. B. Huntington2, B. T. Larson1, and D. E. Axe1, 1Dept. of Animal Sciences, University of Kentucky, 2Dept. of Animal Sciences, North Carolina State University, 3IMC-Agrico Inc., Bannockburn, IL.

255 9:30 Influence of the novel urease inhibitor N-(n-butyl) thiophosphoric triamide (NBPT) and dietary urea concentration on ruminal nitrogen metabolism, diet digestibility, and nitrogen balance in lambs. P. A. Ludden*, D. L. Harmon1, M. S. Plunkett1, G. B. Huntington2, B. T. Larson1, and D. E. Axe1, 1Dept. of Animal Sciences, University of Kentucky, 2Dept. of Animal Sciences, North Carolina State University, 3IMC-Agrico, Inc., Bannockburn, IL.


10:00 BREAK


258 10:30 The role of methionine as a methyl group donor in cattle. C. A. Loest*, E. C. Titgemeyer, R. H. Greenwood, and G. St-Jean, Kansas State University, Manhattan.


260 11:00 Corn bran, solvent-extracted germ meal, and steep liquor/distillers solubles blends for finishing yearlings. D.W. Hemold*, R.J. Cooper, T.J. Klopfenstein, C.T. Milton, and R.A. Stock2, 1University of Nebraska, Lincoln, NE, 2Cargill Corn Milling, Blair, NE

261 11:15 Effects of supplemental protein on intake and apparent digestibility of stockpiled bermudagrass hay in beef steers. J.S. Wheeler, D.L. Lalman, and C.A. Lents, Oklahoma State University, Stillwater, OK/USA.

262 11:30 Effects of supplemental copper on cellular and humoral immune responses and performance of newly weaned calves. M.S. Davis*, G.E. Carstens*, J.C. Bramum1, R.E. Mock2, and A.B. Johnson3, 1Texas A & M University, College Station, TX, 2Texas Veterinary Medical Diagnostic Laboratory, Amarillo, TX, 3Zinpro Corporation, Eden Prairie, MN.

BREEDING AND GENETICS II
Poster Session (1:00 p.m. - 5:00 p.m.)
Tuesday p.m., March 16
Exhibit Hall, Room 206
(3:00 p.m. - 5:00 p.m. Authors Present)

No. Paper

10 Correlated response in placental efficiency in swine selected for an index of components of litter size. H Mesa*, LT Banner1, CJ Bracken1, TJ Sfafranski1, RK Johnson2, and WR Lamberson1, 1University of Missouri-Columbia. Columbia, MO, 2University of Nebraska-Lincoln. Lincoln, NE.
13 Divergent Selection on the Basis of Blood Serum Insulin-like Growth Factor I Concentration in Angus Cattle: Response in Female Reproductive Traits. A. Yilmaz*, M. E. Davis1, and R. C. M. Simmen2, 1Department of Animal Sciences, The Ohio State University, 2Department of Animal Science, University of Florida.
17 Multiple trait analysis of resistance to gastrointestinal nematode parasites in pure and crossbred Red Maasai and Dorpersheep. S.L. Rodriguez-Zas*, B. R. Southey2, R. L. Baker3, and D. Gianola1, 1University of Wisconsin, Madison, WI, 2Iowa State University, Ames, IA, 3International Livestock Research Institute, Nairobi, Kenya.

**BREEDING AND GENETICS III**

**Symposium: Incorporation of Biotechnology into Animal Genetics Teaching**

**Tuesday p.m., March 16**
**Room: 205E**

Chairperson: Daniel Pomp, University of Nebraska, Lincoln

<table>
<thead>
<tr>
<th>Time</th>
<th>Paper</th>
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</thead>
<tbody>
<tr>
<td>1:00</td>
<td>Introductory Comments</td>
</tr>
<tr>
<td></td>
<td>D. Pomp, University of Nebraska, Lincoln, NE</td>
</tr>
<tr>
<td>1:10</td>
<td>Undergraduate Teaching</td>
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<tr>
<td></td>
<td>R. D. Geisert, Oklahoma State University, Stillwater, OK</td>
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<td>M. F. Rothchild, Iowa State University, Ames, IA</td>
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<tr>
<td>1:35</td>
<td>Graduate Teaching</td>
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<td></td>
<td>C. A. Bidwell, Purdue University, West Lafayette, IN,</td>
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<td></td>
<td>D. Pomp, University of Nebraska, Lincoln, NE</td>
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<tr>
<td>2:10</td>
<td>Corporation</td>
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<td></td>
<td>D. A. Funk, ABS Global, Inc. DeForest, WI</td>
</tr>
<tr>
<td>2:45</td>
<td>Roundtable discussion</td>
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</table>

**GROWTH, DEVELOPMENT, MUSCLE BIOLOGY AND MEAT SCIENCE III**

**Tuesday p.m., March 16**
**Room: 204C**

Chairperson: Wesley N. Osburn, Michigan State University, East Lansing

<table>
<thead>
<tr>
<th>No. Time</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>84 1:00</td>
<td>Influence of amino acid content of grower and finisher diets on quality characteristics of pork from Duroc pigs selected for lean growth efficiency. S.M. Lonergan*, E. Huff-Lonergan2, L.I. Chiba1, L.T. Frobish1, S.B. Jungst1, and D.L. Kuhlens1, 1Auburn University, 2Iowa State University.</td>
</tr>
<tr>
<td>86 1:30</td>
<td>Relationship of muscle fiber orientation during Hydrodyne treatment to tenderness, aging, and proteolysis of beef. B.M. M. O'Rourke*, C.R. Calkins*, R.T. Rosano*, J.S. Easteridge2, M.B. Solomon2, and J.B. Long3, 1University of Nebraska, Lincoln, NE, 2USDA, ARS, BARC, MSRL, Beltsville, MD, 3Hydrodyne, Inc., San Juan, PR.</td>
</tr>
<tr>
<td>87 1:45</td>
<td>Dietary supplementation of creatine monohydrate in swine finishing diets improves fresh pork quality. E.P. Berg*, J.D. Spencer, and G.L. Allee, University of Missouri-Columbia.</td>
</tr>
</tbody>
</table>
2:00 Color Stability and Tenderness Properties of Beef from Vitamin E Fed Cattle. S.E. Harris\textsuperscript{1}, E. Huff-Lonergan\textsuperscript{2}, and S.M. Lonergan\textsuperscript{1}, \textsuperscript{1}Auburn University, \textsuperscript{2}Iowa State University.

2:15 Comparison of the meat quality traits of the porcine longissimus dorsi and gluteus medius muscles. L.A. Kinman\textsuperscript{1}, P.K. Camfield\textsuperscript{1}, C.P. Allison\textsuperscript{2}, and J.E. Cannon\textsuperscript{2}, \textsuperscript{1}Oklahoma Panhandle State University, Goodwell, OK, \textsuperscript{2}DEKALB Swine Breeders, Inc., DeKalb, IL.

**GROWTH, DEVELOPMENT, MUSCLE BIOLOGY AND MEAT SCIENCE IV**

Tuesday p.m., March 16
Room: 204C
Chairperson: Bradley J. Johnson, South Dakota State University, Brookings

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Paper</th>
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<tbody>
<tr>
<td>91</td>
<td>3:00</td>
<td>Effects of CLA supplementation on pork quality characteristics in crossbred growing-finishing barrows. B.R. Wiegand\textsuperscript{*}, F.C. Parrish, Jr., and J.C. Sparks, Iowa State University Ames, IA.</td>
</tr>
<tr>
<td>92</td>
<td>3:15</td>
<td>Effects of CLA supplementation on ham quality characteristics of crossbred growing-finishing barrows. S.T. Larsen\textsuperscript{*}, B.R. Wiegand, F.C. Parrish, Jr., and J.C. Sparks, Iowa State University, Ames, IA.</td>
</tr>
<tr>
<td>93</td>
<td>3:30</td>
<td>Effects of CLA supplementation on quality and sensory characteristics of pork. R.L. Thiel-Cooper\textsuperscript{*}, B.R. Wiegand, F.C. Parrish, Jr., and J.A. Love, Iowa State University, Ames, IA.</td>
</tr>
<tr>
<td>94</td>
<td>3:45</td>
<td>Effects of vascular infusion of cattle after exsanguination with a solution of saccharides, sodium chloride, and phosphates, with or without vitamin C, on carcass and meat palatability traits. E.J. Yancey\textsuperscript{*}, T.E. Dobbels\textsuperscript{1}, M.E. Dikeman\textsuperscript{1}, and E. Katsamanis\textsuperscript{2}, \textsuperscript{1}Kansas State University, Manhattan, \textsuperscript{2}University of Minnesota, St. Paul.</td>
</tr>
<tr>
<td>95</td>
<td>4:00</td>
<td>Effects of vascular infusion of cattle after exsanguination with a solution of saccharides, sodium chloride, and phosphates, or with calcium chloride on carcass traits and meat palatability. M.E. Dikeman\textsuperscript{*}, T.E. Dobbels, J.J. Schoenbeck, and M.C. Hunt, Kansas State University, Manhattan, Kansas.</td>
</tr>
<tr>
<td>96</td>
<td>4:15</td>
<td>Ultrasound assessment of marbling score in steers and bulls. R. Rekaya\textsuperscript{*}, J.R. Brethour\textsuperscript{2}, S.C. Arp\textsuperscript{1}, and D.M. Schaefer\textsuperscript{1}, \textsuperscript{1}University of Wisconsin, Madison, WI, \textsuperscript{2}Kansas State University, Hays, KS.</td>
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**NONRUMINANT NUTRITION IV**

**Vitamins and Minerals**

Tuesday p.m., March 16
Room: 204AB
Chairperson: Gary L. Cromwell, University of Kentucky, Lexington

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Paper</th>
</tr>
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<tbody>
<tr>
<td>137</td>
<td>1:00</td>
<td>Ascorbic acid synthesis in the fetal, nursing, and weaned pig. S. Ching\textsuperscript{*} and D.C. Mahan, The Ohio State University, Columbus.</td>
</tr>
<tr>
<td>138</td>
<td>1:15</td>
<td>Efficacy of vitamin E in the diets or drinking water of 2-week old weaned pigs. I. Moreira, D.C. Mahan, S. Ching, and T.G. Wiseman\textsuperscript{*}, The Ohio State University, Columbus.</td>
</tr>
<tr>
<td>139</td>
<td>1:30</td>
<td>Higher levels of selected B-vitamins improve performance and lean deposition in growing/finishing swine. M.D. Lindemann\textsuperscript{1}, G.L. Cromwell, J.L.G. van de Ligt, and H.J. Monnague, University of Kentucky, Lexington.</td>
</tr>
<tr>
<td>140</td>
<td>1:45</td>
<td>Assessment of chrome tripolinate addition and dietary protein levels on performance and carcass composition of growing pigs. C.P.A. van de Ligt\textsuperscript{*}, M.D. Lindemann, and G.L. Cromwell, University of Kentucky, Lexington.</td>
</tr>
<tr>
<td>141</td>
<td>2:00</td>
<td><strong>Graduate Competitive Paper</strong> - Effect of L-carnitine and/or chromium nicotinate on glucose tolerance and insulin sensitivity in growing pigs. S.L. Johnston\textsuperscript{*}, I.M.J. Mevissen\textsuperscript{1}, L.L. Southern\textsuperscript{1}, J.O. Matthews\textsuperscript{1}, J.M. Fernandez\textsuperscript{1}, and K.O. Owen\textsuperscript{1}, \textsuperscript{1}LSU Agricultural Center, Baton Rouge, LA, \textsuperscript{2}Lonza, Inc., Fair Lawn, NJ.</td>
</tr>
<tr>
<td>142</td>
<td>2:15</td>
<td>Effect of chromium tripolinate supplementation on total immunoglobulin concentration in sows and their offspring. J.L.G. van de Ligt\textsuperscript{*}, M.D. Lindemann, R.J. Harmon, H.J. Monnague, and G.L. Cromwell, University of Kentucky, Lexington.</td>
</tr>
<tr>
<td>143</td>
<td>2:30</td>
<td>Effect of maternal chromium tripolinate supplementation on growth performance and immune status of weaning pigs. J.L.G. van de Ligt\textsuperscript{*}, M.D. Lindemann, R.J. Harmon, H.J. Monnague, and G.L. Cromwell, University of Kentucky, Lexington. 2:45 BREAK Chairperson: Phillip S. Miller, University of Nebraska, Lincoln</td>
</tr>
<tr>
<td>144</td>
<td>3:00</td>
<td>Dietary Available Phosphorus Needs of High Lean Pigs. B.R. Frederick\textsuperscript{*} and T.S. Stahly, Iowa State University, Ames.</td>
</tr>
<tr>
<td>145</td>
<td>3:15</td>
<td>Performance and phosphorus excretion of growing-finishing pigs fed low- phytic acid corn. J.L. Pierce\textsuperscript{*} and G.L. Cromwell, University of Kentucky, Lexington.</td>
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<tr>
<td>No.</td>
<td>Paper</td>
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<tr>
<td>146</td>
<td>Effects of phytase on bioavailability of phosphorus in normal and low-phytic acid corn. J. L. Pierce* and G. L. Cromwell, University of Kentucky, Lexington.</td>
<td></td>
</tr>
<tr>
<td>147</td>
<td>Bioavailability of phosphorus in low- and high-ash meat and bone meal of pork and beef origin for pigs. S. L. Traylor*, G. L. Cromwell, and M. D. Lindemann, University of Kentucky, Lexington.</td>
<td></td>
</tr>
<tr>
<td>148</td>
<td>Prolonged feeding of high levels of organic and inorganic selenium to primiparous sows. Y. Y. Kim* and D. C. Mahan, The Ohio State University.</td>
<td></td>
</tr>
<tr>
<td>149</td>
<td>Bioavailability of iron in iron proteinate for weanling pigs. A. J. Lewis*, H. Y. Chen, and P. S. Miller, University of Nebraska, Lincoln.</td>
<td></td>
</tr>
<tr>
<td>150</td>
<td>The effects of added zinc from zinc sulfate or zinc sulfate/zinc oxide combinations on weanling pig growth performance. J. C. Woodworth*, M. D. Tokach, J. L. Nelssen, R. D. Goodband, P. R. O'Quinn, and T. M. Fakler, Kansas State University, Manhatten, Zinpro Corp., Eden Prairie, MN.</td>
<td></td>
</tr>
<tr>
<td>151</td>
<td>The effects of added zinc from an organic zinc complex or inorganic zinc sources on weanling pig growth performance. J. C. Woodworth*, M. D. Tokach, J. L. Nelssen, R. D. Goodband, P. R. O'Quinn, and T. M. Fakler, Kansas State University, Manhatten, Zinpro Corp., Eden Prairie, MN.</td>
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**NONRUMINANT NUTRITION V**

**Poster Session (1:00 p.m. - 5:00 p.m.)**

**Tuesday p.m., March 16**

**Exhibit Hall, Room 206**

(1:00 p.m. - 3:00 p.m. Authors Available)

<table>
<thead>
<tr>
<th>No.</th>
<th>Paper</th>
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<tbody>
<tr>
<td>153</td>
<td>Spray-dried animal blood cells in diets for weanling pigs. Q. Zhang*, T. Veum, and D. Bollinger, University of Missouri, Columbia, MO USA.</td>
</tr>
<tr>
<td>154</td>
<td>Menhaden fish meal and spray dried animal plasma in weanling pig diets. T. L. Veum*, D. W. Bollinger, and C. Mitchell, University of Missouri, Columbia, MO USA.</td>
</tr>
<tr>
<td>159</td>
<td>Incorporation of short-chain fructooligosaccharides and Tylan into diets of early weaned pigs. M. D. Howard*, H. Liu, J. D. Spencer, M. S. Kerley, and G. L. Allee, University of Missouri, Columbia, MO.</td>
</tr>
<tr>
<td>165</td>
<td>Determination of apparent ileal digestibility and digestible and metabolizable energy values for conventional or dry extruded-expelled soybean meal for swine diets. J. C. Woodworth*, M. D. Tokach, J. L. Nelssen, R. D. Goodband, P. R. O'Quinn, D. A. Knabe, and N. W. Said, Kansas State University, Manhattan, Texas A&amp;M University, College Station, Insta-Pro International, Des Moines, IA.</td>
</tr>
<tr>
<td>167</td>
<td>Supplementing grain energy sources with field peas and full-fat canola seed in swine growing-finishing diets. D. G. Landblom and W. W. Poland, North Dakota State University, Dickinson Research Extension Center, Dickinson, ND.</td>
</tr>
</tbody>
</table>
Tuesday p.m., March 16

Room: 136

Chairperson: Jeffrey Stevenson, Kansas State University, Manhattan

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Paper</th>
</tr>
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<tbody>
<tr>
<td>193</td>
<td>1:00</td>
<td>Graduate Competitive Paper - The effect of exogenous estradiol-17β (E2β) during elongation on placental size at d112 of gestation in the Meishan (M) pig. M. E. Wilson* and S. P. Ford, Iowa State University, Ames IA.</td>
</tr>
<tr>
<td>194</td>
<td>1:15</td>
<td>Estrogen receptor genotype is not associated with placental size in the pig. K. A. Vonnahme*, M. E. Wilson, and S. P. Ford, Iowa State University, Ames, IA.</td>
</tr>
<tr>
<td>195</td>
<td>1:30</td>
<td>Inability of Progesterone to Delay Return to Estrus in 14 d Weaned Sows. D. F. Hentges*, T. J. Safranski1, and W. E. Ford, Iowa State University, Ames, IA.</td>
</tr>
<tr>
<td>196</td>
<td>1:45</td>
<td>Follicular development and atresia during the luteal phase of the estrous cycle in gilts selected for high ovulation rate and controls. H.W. Yen*, K. Anumuganathan, and Dwayne R. Zimmerman, University of Nebraska, Lincoln.</td>
</tr>
<tr>
<td>197</td>
<td>2:00</td>
<td>Expression of basic fibroblast growth factor in placental tissues of early pregnant ewes. K.R. Maddock*, D.A. Redmer, and K. W. Purser1, 1University of Arkansas, Fayetteville, 2Zinpro Corp., Eden Prairie, MN.</td>
</tr>
<tr>
<td>198</td>
<td>2:15</td>
<td>Effect of dietary chromium-L-methionine on glucose metabolism of growing pigs. E. B. Kegley*, T. M. Fakler, and C. V. Maxwell1, 1University of Arkansas, Fayetteville, 2Znipro Corp., Eden Prairie, MN.</td>
</tr>
<tr>
<td>200</td>
<td>2:45</td>
<td>Evaluation of high-oil corn feeding strategies for grow-finish pigs. D. C. Kendall, K. A. Bowers*, B. T. Richert, and T. R. Cline, Purdue University, West Lafayette, IN.</td>
</tr>
<tr>
<td>201</td>
<td>3:00</td>
<td>Nutritional value of genetically improved high-lysine, high-oil corn for young pigs. P. R. O’Quinn*, J. L. Nelssen1, R. D. Goodband1, D. A. Knabe2, J. C. Woodworth1, M. D. Tokach1, and T. T. Lohrmann3, 1Kansas State University, Manhattan, 2Texas A&amp;M University, College Station, 3Optimum Quality Grains, L. L. C., Des Moines, IA.</td>
</tr>
<tr>
<td>202</td>
<td>3:15</td>
<td>Evaluation of modified tall oil, chromium nicotinate, and L-carnitine on growth and carcass traits of finishing pigs. P. R. O’Quinn*1, J. L. Nelssen1, R. D. Goodband1, D. A. Knabe2, J. C. Woodworth1, M. D. Tokach1, and T. T. Lohrmann3, 1Kansas State University, Manhattan, 2Texas A&amp;M University, College Station, 3Optimum Quality Grains, L. L. C., Des Moines, IA.</td>
</tr>
</tbody>
</table>

**PHYSIOLOGY II**


Ruminant Nutrition and Forages III
Symposium: Designing and Evaluating Grazing Systems

Sponsors: Leopold Center for Sustainable Agriculture
Midwest Sections of ASAS and ADSA

Tuesday p.m., March 16
Room: 134
Chairperson: James R. Russell, Iowa State University, Ames

<table>
<thead>
<tr>
<th>Time</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:00</td>
<td>Introduction to symposium</td>
</tr>
<tr>
<td>1:10</td>
<td>Beef stocker grazing</td>
</tr>
<tr>
<td>1:50</td>
<td>Beef cow-calf grazing</td>
</tr>
<tr>
<td>2:30</td>
<td>BREAK</td>
</tr>
<tr>
<td>3:00</td>
<td>Dairy cow grazing</td>
</tr>
<tr>
<td>3:40</td>
<td>Mixed animal species grazing</td>
</tr>
<tr>
<td>4:20</td>
<td>Panel discussion</td>
</tr>
</tbody>
</table>

Breeding and Genetics IV
Quantitative Genetics

Wednesday a.m., March 17
Room: 205E
Chairperson: Michael M. Schutz, Purdue University, West Lafayette, IN

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>18</td>
<td>9:00</td>
<td>Heritability of peak race performance in Quarter Horses. L. M. Kalooostian, T. S. Stewart, M. A. Russell, and M. M. Schutz, Purdue University, West Lafayette, IN.</td>
</tr>
<tr>
<td>19</td>
<td>9:15</td>
<td>Pair-wise correlations of dystocia scores among different parities of Holstein cows. C. M. B. Dematawewa and P. J. Berger, Iowa State University, Ames, IA.</td>
</tr>
<tr>
<td>20</td>
<td>9:30</td>
<td>Potential for international type evaluation of Jersey sires in the United States, Denmark and New Zealand. K. A. Weigel, University of Wisconsin, Madison.</td>
</tr>
<tr>
<td>21</td>
<td>9:45</td>
<td>Genetic correlation between milk yield in five regions of USA. R. Rekaya, K. A. Weigel, and D. Gianola, University of Wisconsin, Madison.</td>
</tr>
<tr>
<td>22</td>
<td>10:00</td>
<td>Comparison between traditional and fuzzy logic definitions of Herd-Year-Season groups in Holsteins. R. Rekaya, K. A. Weigel, and D. Gianola, University of Wisconsin, Madison.</td>
</tr>
</tbody>
</table>
ENVIRONMENT AND LIVESTOCK PRODUCTION III
Poster Session (9:00 a.m. - 12:00 noon)
Wednesday a.m., March 17
Exhibit Hall, Room 206
(9:00 a.m. - 11:00 a.m. Authors Available)

No. Paper
43 The effect of steers grazing 1/2 vs 3/4 season native grass pastures. F.K. Brazle, G.L. Kilgore, and M.R. Fausett, Kansas State University, Manhattan, Kansas.
44 The effect of starting weight, body condition, and age on gain of cattle grazing native grass. F. K. Brazle* and J. Higgins, Kansas State University, Manhattan, Kansas.
45 Practical lessons in feeding bison bulls for meat. V. L. Anderson* and B. Miller, 1Carrington Research Extension Center, North Dakota State University, 2Double MM Bison Ranch, Carrington, ND.
46 Effect of pre-weaning and/or pre-vaccination on weight change during the weaning process. K. P. Coffey*, D. H. Hellwig, C. F. Rosenkrans, Jr., W. K. Cobblentz, L. B. Daniels, T. H. Holt, D. S. Hubbell, III, and H. B. Watson, University of Arkansas, Fayetteville, AR / USA.
47 Effects of gestation housing on reproductive performance of primiparous sows. D. Kent* and M. S. Honeyman, Iowa State University, Ames.
48 Weight gain of steers grazing cool-season perennial grasses in Oklahoma. R. R. Reuter*, G. W. Hom, C. J. Ackerman, J. N. Carter, and L. A. Redmon, Oklahoma State University; Stillwater, OK.
50 Comparison of selected fractionate analyses of two types of University food service waste streams regarding their use as a livestock feedstuff. P. M. Walker, L. K. Karr*, and N. A. Pyatt, Illinois State University, Normal, IL/USA.
52 Early weaned pig performance in hoop structures during early summer. M. E. Larson* and M. S. Honeyman, Iowa State University, Ames.
53 Effects of late summer protein or mineral supplementation on rate of gain for steers grazed on tall or midgrass prairie sites. T. N. Bodine, H. T. Purvis II, M. T. Van Koevering, and E. E. Thomas, Oklahoma Agricultural Experiment Station, Farmland Industries, Elanco.
54 Performance of lactating dairy cows in three different cooling systems. M.J. Meyer*, J.F. Smith, J.P. Hamer III, J.E. Shirley, and E.C. Tligtgemeier, Kansas State University, Manhattan, KS.

EXTENSION II
Poster Session (9:00 a.m. - 12:00 noon)
Wednesday a.m., March 17
Exhibit Hall, Room 206
(10:00 a.m. - 12:00 noon Authors Available)

No. Paper
58 Effect of mechanical processing of alfalfa silage on lactation performance by dairy cows. A. G. Jirovec*, E. L. Miller, K. J. Shinners, and R. D. Shaver, University of Wisconsin, Madison, WI.
Survey of feeding and management practices on six high producing Wisconsin dairy herds. J. L. Keuning*, S. L. Gunderson1, and R. D. Shaver2. 1University of Wisconsin-Extension, Madison, WI, 2University of Wisconsin-Madison, Madison, WI.

Survey of mean particle length of processed corn silages on commercial Wisconsin dairies. R. L. Novak*, K. J. Shinners, and R. D. Shaver, University of Wisconsin, Madison, WI.

The dairy technician certification program. J. F. Keown* and R. J. Grant, University of Nebraska-Lincoln, Lincoln, NE.

Results of youth skill-a-thon competitions in Ohio. S. J. Moeller*, J. P. Black, D. M. Wulf, and S. L. Boyles, The Ohio State University, Columbus, OH.

NPPC Innovation Award Winner - Education Pork Central - a New Information Center for Nebraska Producers. D. E. Reese*, L. L. Bitney, and A. Prosch, University of Nebraska, Lincoln, NE USA.


Wean-to-finish swine production results in leaner pigs at market. S. S. Dritz*1, R. A. Vinson2, J. F. Connor3, M. D. Tokach1, R. D. Goodband1, and J. L. Nelssen1. 1Kansas State University, Manhattan, 2Oneida IL, 3Carthage Vet Ltd, Carthage IL.


**EXTENSION III**

**Symposium: Predicting Energy Content in Feeds**

Sponsors: Cargill Corn Milling, Farmland Industries, Moorman Manufacturing Co.

Wednesday a.m., March 17

Room: 138

Chairperson: Richard J. Grant, University of Nebraska, Lincoln

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>67</td>
<td>9:00</td>
<td>New methods for estimating the energy value of corn silage. W. P. Weiss*, Ohio State University, Wooster.</td>
</tr>
<tr>
<td>68</td>
<td>9:40</td>
<td>Practical use of energy values in ration formulation. S. M. Abrams*, Nutrition Professionals, Inc.</td>
</tr>
<tr>
<td>69</td>
<td>10:20</td>
<td>Energy prediction from a feed testing lab perspective. P. K. Sirois*, DHI Forage Lab, Ithaca, NY/USA.</td>
</tr>
<tr>
<td></td>
<td>11:00</td>
<td>Roundtable Discussion</td>
</tr>
</tbody>
</table>

**GROWTH, DEVELOPMENT, MUSCLE BIOLOGY AND MEAT SCIENCE V**

**Poster Session (9:00 a.m. - 12:00 noon)**

Wednesday a.m., March 17

Exhibit Hall, Room 206

(9:00 a.m. - 11:00 a.m. Authors Available)

<table>
<thead>
<tr>
<th>No.</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>97</td>
<td>Serum concentrations of IGF-I and relative amounts of IGF binding proteins (IGFBPs) in growing boars, barrows and gilts. J. A. Clapper* and T. M. Clark, South Dakota State University.</td>
</tr>
<tr>
<td>99</td>
<td>Interactions of Specific Domains of Muscle Talin with Actin Filaments. H. S. Lee*, J. S. Schmidt, and R. M. Robertson, Iowa State University, Ames.</td>
</tr>
<tr>
<td>100</td>
<td>Effect of the RN gene, feed withdrawal and lysine deficient diet on fresh longissimus quality. B. S. Bidner*, M. Ellis, D. P. Witte, M. England, D. Campion, and F. K. McKeith, University of Illinois, Urbana.</td>
</tr>
<tr>
<td>101</td>
<td>Effect of the RN gene and feed withdrawal prior to slaughter on fresh longissimus quality and sensory characteristics. B. S. Bidner*, M. Ellis, K. D. Miller, M. Hemann, D. Campion, and F. K. McKeith, University of Illinois, Urbana.</td>
</tr>
<tr>
<td>102</td>
<td>Yield and value of beef by-products from cull beef cows is affected by body condition scores. J. K. Apple*, J. C. Davis, J. D. Stephenson, and C. B. Boeger, University of Arkansas, Fayetteville.</td>
</tr>
<tr>
<td>104</td>
<td>The effects of swine dietary supplementation of modified tall oil, chromium nicotinate, and L-carnitine on longissimus muscle quality characteristics and display color stability. A. T. Waylan*, P. R. O’Quinn, J. A. Unruh1, R. D. Goodband1, J. L. Nelssen1, J. C. Woodworth1, M. D. Tokach1, and K. Q. Owen2. 1Kansas State University, Manhattan, 2Lonza Inc., Fair Lawn, NJ.</td>
</tr>
</tbody>
</table>

### NONRUMINANT NUTRITION VI

#### Protein and Amino Acids

**Wednesday a.m., March 17**

**Room: 204FG**

**Chairperson: Charles V. Maxwell**, University of Arkansas, Fayetteville

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>181</td>
<td>9:00</td>
<td>Valine is a Limiting Amino Acid in Low-Protein Nursery Diets. I. Mavromichalis*, D. M. Webel¹, J. L. Emmert¹, R. L. Moser², and D. H. Baker¹, ¹University of Illinois, Urbana, IL, ²United Feeds, Inc., Sheridan, IN.</td>
</tr>
<tr>
<td>185</td>
<td>10:00</td>
<td>Crystalline lysine, threonine and methionine supplementation of grain sorghum-based, low protein diets for growing and finishing swine. R. O. Myer* and D. W. Gorbet, University of Florida, Gainesville.</td>
</tr>
<tr>
<td>186</td>
<td>10:15</td>
<td>Effect of feeding low protein diets on performance of growing pigs. M.E. Johnston*, J.L. Usry², and R.D. Boyd¹, ¹PIC USA, Franklin, KY, ²Heartland Lysine, Chicago, IL.</td>
</tr>
<tr>
<td>189</td>
<td>11:00</td>
<td>Calculated body-N loss or infused alanine-N is not recovered from starved newborn pigs. N.J. Benevenga*, T.W. Rasch, L.G. Haas, B.D. Mickelson, and J.A. Davis, University of Wisconsin-Madison, Madison, WI.</td>
</tr>
<tr>
<td>190</td>
<td>11:15</td>
<td>Effects of corn hybrids fed to growing pigs on nitrogen metabolism. J. L. Snow*, L L. Andersen², D. Rozeboom², M. Allen², and N. L. Trotter², ¹University of Illinois; Urbana, IL, ²Michigan State University; East Lansing, MI.</td>
</tr>
<tr>
<td>191</td>
<td>11:30</td>
<td>Effect of dietary soy genistein on growth and immune response in pigs during a viral challenge. LL. Greiner*, T.S. Stahl¹, and T.J. Stabel¹, ¹Iowa State University, Ames, IA, ²USDA/ARS/National Animal Disease Center, Ames, IA.</td>
</tr>
</tbody>
</table>

### PHYSIOLOGY III

#### Poster Session (9:00 a.m. - 12:00 noon)

**Wednesday a.m., March 17**

**Exhibit Hall, Room 206**

(10:00 a.m. - 12:00 noon Authors Available)

<table>
<thead>
<tr>
<th>No.</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>205</td>
<td>Differences in testicular function and structure associated with high or low plasma concentrations of FSH during development in littermate boars. D. D. Lunstra*, T. H. Wise, and J. J. Ford, USDA, ARS, RLH U.S. Meat Animal Research Center, Clay Center, NE.</td>
</tr>
<tr>
<td>206</td>
<td>The impact of pregnancy on small intestinal and hepatic tissue growth and energy use in beef heifers.. A. N. Scheaffer*¹, J. S. Caton¹, M. L. Bauer¹, D. A. Redmer¹, and L. P. Reynolds¹, ¹North Dakota State University.</td>
</tr>
</tbody>
</table>
Concentrations of milk components change dynamically throughout the early secretory period in Jersey cows. G. Bobe* and G. L. Lindberg, Iowa State University, Ames, IA/USA.

Effects of oral administration of concentrated equine serum to newborn foals on immunoglobulin G levels. C.J. Hammer*, H.D. Tyler, and P.A. Miller, Iowa State University, Ames, IA 50011.

Calving season, length of gestation, parity, and milk yield affect the composition of colostrum in lactating Jersey cows. G. Bobe* and G. L. Lindberg, Iowa State University, Ames, IA/USA.


Correlation of processing temperature to feeder calf performance and health. T.R. Falkner, J.S. Drouillard, G.L. Stokka, A.S. Flake, D.A. Blasi, and G.L. Kuhl, Kansas State University, Manhattan, KS.

**RUMINANT NUTRITION AND FORAGES IV**

**Cow and Heifer Nutrition**

Wednesday a.m., March 17

Room: 134

**Chairperson:** Patrick C. Hoffman, University of Wisconsin

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Paper</th>
</tr>
</thead>
<tbody>
<tr>
<td>263</td>
<td>9:00</td>
<td>Weight gain and heat production in light weight mature cows following an increase in feed intake. H. C. Freety*, J. A. Nienaber, and S. E. Echterkamp, USDA, ARS, U.S. Meat Animal Research Center.</td>
</tr>
<tr>
<td>264</td>
<td>9:15</td>
<td>Impact of divergent wheat milling byproducts in supplements on the forage use and performance of beef cattle consuming low-quality, tall-grass prairie forage. C. G. Farmer*, R. C. Cochran1, D. D. Simms2, J. S. Held1, and C. P. Mathis1, 1Kansas State University, Manhattan, 2Consolidated Nutrition, Omaha, NE.</td>
</tr>
<tr>
<td>266</td>
<td>9:45</td>
<td>Effects of supplemental undegradable intake protein (UIP) on the performance of lactating beef cows grazing Oklahoma winter tallgrass prairie. C.A. Lents*, D.L. Lalman, J.S. Wheeler, and R.P. Wettemann, Oklahoma Agricultural Experiment Station, Stillwater.</td>
</tr>
<tr>
<td>267</td>
<td>10:00</td>
<td>Conjugated linoleic acid content of milk fat is increased by feeding an animal fat low in linoleic acid. A. D. Beaulieu and J. K. Drackley, University of Illinois, Urbana, USA.</td>
</tr>
<tr>
<td>270</td>
<td>10:45</td>
<td>Effect of dietary thiamin supplementation on lactation performance by dairy cows. R. D. Shaver*, University of Wisconsin, Madison, WI.</td>
</tr>
<tr>
<td>271</td>
<td>11:00</td>
<td>Use of high oil and high lysine corn in dairy-calf starter diets. H. Chester-Jones*, J. G. Linn1, D. G. Johnson3, R. W. Briggs1, D. M. Ziegler1, and D. Jergensen3, 1University of Minnesota, Waseca, MN, 2University of Minnesota, St. Paul, MN, 3University of Minnesota, Morris, MN, 4Crows Corn Hybrids, Milford, IL, 5SoyPlus, Ralston, IA.</td>
</tr>
</tbody>
</table>
PROGRAM COMMITTEES
1998-1999

BREEDING AND GENETICS
D. Pomp, Chair
M. Schutz
K. Weigl

ENVIRONMENT AND LIVESTOCK PRODUCTION
D. Lay, Chair
G. Weesner
J. Spain

EXTENSION
D. Fischer, Chair
S. Boyles
L. Johnston

GROWTH, DEVELOPMENT, MUSCLE BIOLOGY, AND MEAT SCIENCE
M. White, Chair
W. Osbum
M. Spurlock

NONRUMINANT NUTRITION
G. Cromwell, Chair
D. Holzgraefe
S. Carter

PHYSIOLOGY
L. Sheffield, Chair
J. Wheaton
J. Stevenson

RUMINANT NUTRITION/FORAGES
J. Russell, Chair
P. Hoffman
L. Lomas
TEACHING
B. Skaar, Chair
T. Jilek
R. Dado

YOUNG ANIMAL SCIENCE LEADERS
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1998-1999

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R. Shayer
J. Smith
M. Seimens
R. Goodband

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R. C. Cochran
B. Newton
R. Prather
J. Firkins
D. Pomp

TEACHING AWARD
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D. Banks
H. Tyler
P. Clark
C. Youngs
D. Parrett

AGRICULTURAL BUSINESS AWARD
D. Williams, Chair
J. Barmore
D. McLaren
P. Windschitl
D. Dill
C. Luhman

NPPC INNOVATION AWARD
R. Lemenager, Chair
D. Meeker
G. Libal
R. Coffey
T. Ward
T. Stahly
INNOVATION IN DAIRY RESEARCH AWARD

J. Drackley, Chair
J. Barmore
M. Faust
J. Firkins
A. Kertz
J. Stevenson

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T. Stahly
D. Meeker

ADSA NOMINATIONS

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M. Faust
M. F. Hutjens

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1998-1999

J. Galvin, Chair
B. Richert
W. Powers
M. Bauer
M. Carlson
J. Sterle

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D. Williams, Chair
J. Shurson

STUDENT CONTEMPORARY ISSUES

J. Shurson, Chair
R. Erickson
J. A. Sterle
A. L. Prill Adams
B. Skaar
INVITATIONAL COMPETITIVE RESEARCH PAPER EVALUATION COMMITTEES
1998-1999

GRADUATE STUDENTS

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J. Caton
J. Odle
R. Nold
M. Wiltbank
A. DiConstanso

UNDERGRADUATE STUDENTS

G. Hill, Chair
S. Franklin
H. Tyler
D. Moser
J. Miner

PAST RECIPIENTS OF AWARDS FOR YOUNG ANIMAL SCIENCE LEADERS

OUTSTANDING EXTENSION SPECIALIST AWARD

1971 G. E. Ricketts, University of Illinois
1972 V. B. Mayrose, Purdue University
1974 M. R. Geasler, Iowa State University
1976 R. J. Vatthauer, University of Wisconsin
1977 R. J. Epley, University of Minnesota
1978 W. L. Singleton, Purdue University
1979 D. E. Schafer, Kansas State University
1980 L. R. Corah, Kansas State University
1981 M. G. Hogberg, Michigan State University
1982 C. W. Spaeth, Kansas State University
1983 L. H. Thompson, University of Illinois
1984 M. F. Hutjens, University of Illinois
1985 G. L. Kuhl, Kansas State University
1986 D. D. Simms, Kansas State University
1987 F. K. Brazle, Kansas State University
1988 S. B. Laudert, Kansas State University
1989 M. A. Russell, Purdue University
1990 D. F. Parrett, University of Illinois
1991 D. B. Faulkner, University of Illinois
1992 J. L. Nelissen, Kansas State University
1993 A. P. Schinckel, Purdue University
1994 D. A. Funk, University of Wisconsin, Madison
1995 G. C. Shurson, University of Minnesota
1996 R. D. Shafer, University of Wisconsin, Madison
1997 R. D. Goodband, Kansas State University
1998 Not given

OUTSTANDING RESEARCHER AWARD

1971 D. H. Baker, University of Illinois
1972 C. E. Allen, University of Minnesota
1974 F. N. Owens, University of Illinois
1976 W. G. Bergen, Michigan State University
1977 D. E. Bauman, University of Illinois
1978 G. L. Allee, Kansas State University
1979 S. E. Curtis, University of Illinois
1980 T. L. Veum, University of Missouri
1982  B. D. Schanbacher, Roman L. Hruska U.S. Meat Animal Research Center
1983  H. A. Garverick, University of Missouri
1984  G. C. Fahey, Jr., University of Illinois
1985  J. J. Ford, Roman L. Hruska U.S. Meat Animal Research Center
1986  C. L. Ferrell, Roman L. Hruska U.S. Meat Animal Research Center
1987  D. Gianola, University of Illinois
1988  S. P. Ford, Iowa State University
1989  L. L. Berger, University of Illinois
1990  M. F. Rothschild, Iowa State University
1991  M. F. Smith, University of Missouri
1992  D. L. Harmon, Kansas State University
1993  M. Koohmaraie, Roman L. Hruska, U.S. Meat Animal Research Center
1994  L. G. Sheffield, University of Wisconsin, Madison
1995  J. Odle, University of Illinois
1996  J. L. Nelssen, Kansas State University
1997  R. S. Prather, University of Missouri
1998  D. Pomp, University of Nebraska

OUTSTANDING TEACHER AWARD

1971  B. G. Harmon, University of Illinois
1972  R. E. Hunsley, Purdue University
1974  D. H. Gee, South Dakota State University
1976  T. R. Cline, Purdue University
1977  P. J. Cunningham, University of Nebraska
1978  B. D. Moser, University of Nebraska
1979  C. L. Hausler, Southern Illinois University
1980  T. R. Carr, University of Illinois
1981  M. E. Dikeman, Kansas State University
1982  R. E. Morrow, University of Missouri
1983  D. J. Kesler, University of Illinois
1984  R. A. Easter, University of Illinois
1985  D. F. Parrett, University of Illinois
1986  J. G. Sebranek, Iowa State University
1987  D. R. Brink, University of Nebraska
1988  K. M. Irvin, The Ohio State University
1989  R. P. Lemenager, Purdue University
1990  B. R. Skaar, Iowa State University
1991  D. A. Nichols, Kansas State University
1992  M. A. Russell, Purdue University
1993  D. K. Combs, University of Wisconsin, Madison
1994  L. C. Martin, Kansas State University
1995  M. E. Benson, Michigan State University
1996  B. D. Banks, Michigan State University
1997  H. D. Tyler, Iowa State University
1998  C. R. Youngs, Iowa State University

AGRIBUSINESS AWARD

1995  P. L. Houghton, Heartland Cattle Co., McCook, Nebraska
1996  J. A. Barmore, Vita Plus Corp., Madison, Wisconsin
1997  D. E. Dill, Dairy Strategies, Mendota Heights, MN
1998  C. M. Luhman, Land O’Lakes Research Farm, Webster City, IA
PAST WINNERS OF INVITATIONAL COMPETITIVE RESEARCH PAPER AWARDS

UNDERGRADUATE STUDENTS

1987  R. E. Raw, University of Missouri
1988  J. A. Ragains, University of Missouri
1989  G. L. Ambrose, South Dakota State University
1990  C. N. Kemper, University of Missouri
1991  T. R. Eberle, North Dakota State University
1992  B. J. MacDonald, North Dakota State University
1993  B. L. Dunn, Kansas State University
1994  S. M. Nelson, University of Nebraska
1995  L. J. Trinity, Iowa State University
1996  M. E. Cunningham, Oklahoma State University
1997  C. E. Sorenson, South Dakota State University
1998  S. L. Strickland, University of Nebraska

GRADUATE STUDENTS

1976  D. G. Haught, Iowa State University
1977  L. L. Berger, University of Nebraska
1978  G. F. Collings, Michigan State University
1979  R. D. Boyd, University of Nebraska
1980  D. G. Cieslak, University of Wisconsin
1981  W. F. Pope, University of Nebraska
1982  P. F. Saenger, Purdue University
1983  D. A. Redmer, University of Missouri
1984  W. F. Brown, University of Nebraska
1985  J. H. Brendemuhl, University of Nebraska
1986  P. L. Houghton, Purdue University
1987  M. H. Wilde, The Ohio State University
1988  T. R. Radke, University of Nebraska
1989  K. K. Kreikemeier, Kansas State University
1990  R. A. Nold, Kansas State University
1991  M. D. Tokach, University of Minnesota
1992  G. F. Louis, University of Nebraska
1993  B. T. Larson, University of Missouri
1994  L. H. Anderson, The Ohio State University
1995  M. L. Augenstein, University of Minnesota
1996  D. D. Koehler, University of Minnesota
1997  R. A. Nold, South Dakota State University
1998  K. J. Rozeboom, University of Minnesota

PAST WINNERS OF UNDERGRADUATE CONTEMPORARY ISSUES COMPETITION

1998  M Bode, University of Missouri
      D. Hasekamp, University of Missouri
      J. Rumph, Michigan State University
      M Schoenfield, University of Minnesota

ASAS MIDWESTERN SECTION PRESIDENTS

1963  O. G. Bentley, Illinois
1964-65 R. H. Grummer, Wisconsin
1966-67 G. R. Johnson, Ohio State
1968  R. J. Meade, Minnesota
1969  J. A. Hoefer, Michigan State
1970-71 W. E. Dinusson, North Dakota State
1972  J. F. Lasley, Missouri
1974-75 V. C. Speer, Iowa State
1976  H. S. Teague, Ohio State
1977  R. M. Luther, South Dakota State
1978  B. N. Day, Missouri
1979-80 D. R. Zimmerman, Nebraska
1981  A. L. Pope, Wisconsin
1982  R. D. Goodrich, Minnesota
1983  E. R. Miller, Michigan State
1984  W. R. Woods, Purdue
1985  L. R. Corah, Kansas State
1986  B. D. Moser, Missouri
1987  S. E. Curtis, Illinois
1988  R. G. Zimbelman, Upjohn; D. J. Meisinger, Indiana
1989  T. J. Klopfenstein, Nebraska
1990  J. R. Romans, South Dakota State
1991  J. E. Pettigrew, Minnesota
1992  C. E. Sasse, Cenex/Land O’Lakes
1993  M. G. Hogberg, Michigan State
1994  G. L. Allee, Missouri
1995  S. K. Webel, Purina Mills, Bloomington, IL
1996  D. L. Meeker, National Pork Producers Council, Des Moines, IA
1997  T. S. Stahly, Iowa State
1998  R. P. Lemenager, Purdue

ADSA MIDWEST BRANCH
PRESIDENTS

1992  J. F. Keown, Nebraska
1993  J. G. Linn, Minnesota
1994  D. J. Schingoethe, South Dakota
1995  J. L. Morrill, Kansas
1996  M. F. Hutjens, Illinois
1997  M. A. Faust, Iowa State

FUTURE MEETINGS

2000  March 13-15
2001  March 19-21
2002  March 18-20
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<tr>
<td>Nonruminant Symposium</td>
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<td>Optimum Grains Research Forum</td>
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