Dr. Michael L. Looper, President
University of Arkansas, Fayetteville, AR

Dr. Debora L. Hamernik, President-Elect
University of Nebraska - Lincoln, Lincoln, NE

Dr. Debra K. Aaron, Past President
University of Kentucky, Lexington, KY

Dr. Todd A. Armstrong, Foundation Trustee Chair
Elanco Animal Health, Greenfield, IN

Dr. James L. Sartin, JAS Editor-in-Chief
American Society of Animal Science, Champaign, IL

Dr. Phillip S. Miller, Recording Secretary/Midwest Section Director
University of Nebraska - Lincoln, Lincoln, NE

Dr. Shawn L. Archibeque, Program Director/Director-at-Large
Colorado State University, Fort Collins, CO

Dr. Thomas A. Hoagland, Director-at-Large/Northeastern Section Director
University of Connecticut, Storrs, CT

Dr. Russ B. Muntifering, Southern Section Director
Auburn University, Auburn, AL

Dr. Jack C. Whittier, Western Section Director
University of Nebraska - Lincoln, Scottsbluff, NE

Dr. Mike D. Tokach, Director-at-Large
Kansas State University, Manhattan, KS

Dr. Joseph P. Cassady, Director-at-Large
South Dakota State University, Brookings, SD

Dr. Sally E. Johnson, Director-at-Large
Virginia Tech, Blacksburg, VA

Dr. Connie K. Larson, Director-at-Large
Zinpro Corporation, Eden Prairie, MN

Dr. Elisabeth J. Lonergan, Director-at-Large
Iowa State University, Ames, IA

Dr. Chantal Farmer, Director-at-Large
AAFC, Sherbrooke, QC, Canada

Dr. Mark K. Petersen, Director-at-Large
USDA-ARS, Miles City, MT
Dr. Teresa A. Davis, Director-at-Large
Baylor College of Medicine, Houston, TX

Kyle J. McLean, Graduate Director
North Dakota State University, Fargo, ND

Amanda K. Jones, Graduate Director
University of Connecticut, Storrs, CT

Dr. Meghan C. Wulster-Radcliffe, Chief Executive Officer
American Society of Animal Science, Champaign, IL

Ms. Jacelyn M. Hemmelgarn, Chief Operations Officer
American Society of Animal Science, Champaign, IL

ASAS MIDWESTERN SECTION

OFFICERS 2015-2016

Dr. Jason K. Apple, President
University of Arkansas, Fayetteville, AR

Dr. Aimee E. Wertz-Lutz, President-Elect
ADM Animal Nutrition, Inc., Quincy, IL

Dr. Jon P. Schoonmaker, Secretary
Purdue University, West Lafayette, IN

Dr. Alan G. Mathew, Past President
Purdue University, West Lafayette, IN

Dr. Phillip S. Miller, Director
University of Nebraska - Lincoln, Lincoln, NE

Dr. Daryl H. Kleinschmit, ASAS/ADSA Director-at-Large
Zinpro Corporation, Yankton, SD

Tasia M. Taxis, Graduate Student Director
University of Missouri, Columbia, MO

Trey Kellner, Graduate Student Director
Iowa State University, Ames, IA
AMERICAN DAIRY SCIENCE ASSOCIATION®

OFFICERS 2015-2016

Dr. Susan Duncan, President
Virginia Tech, Blacksburg, VA

Dr. Lou Armentano, Vice President
University of Wisconsin, Madison, WI

Dr. Al Kertz, Past President
ANDHIL LLC., St. Louis, MO

Dr. Scott Rankin, Past, Past President
University of Wisconsin, Madison, WI

Dr. Marjorie Faust, Treasurer
ABS Global, De Forest, WI

Dr. Matt Lucy, JDS Editor-in-Chief
University of Missouri, Columbia, MO

Dr. Leo Timms, Director
Iowa State University, Ames, IA

Dr. Normand St-Pierre, Director
The Ohio State University, Columbus, OH

Dr. Kenneth Griswold, Director
Kemin Industries, Des Moines, IA

Dr. Karen Schmidt, Director
Kansas State University, Manhattan, KS

Dr. Paul Kindstedt, Director
University of Vermont, Burlington, VT

Dr. Stephanie Clark, Director
Iowa State University, Ames, IA

Dr. Mike Socha, Foundation Chair
Zinpro Corporation, Eden Prairie, MN

Dr. Elizabeth Davis, SAD President
Virginia Tech, Blacksburg, VA

Dr. Adam Geiger, GSD President
Virginia Tech, Blacksburg, VA

Mr. Peter Studney, Executive Director
American Dairy Science Association, Champaign, IL
ADSA® MIDWEST BRANCH

OFFICERS 2015-2016

Dr. Tamilee Nennich, President
Nutrition Dairy Specialist, Freeport, MN

Dr. Diane M. Spurlock, Vice President
Iowa State University, Ames, IA

Dr. Phil Cardoso, Secretary
University of Illinois, Urbana, IL

Dr. David B. Carlson, Past President
Elanco, Columbia, MO

Dr. Jeffrey M. DeFrain, Director
Zinpro Research and Nutritional Services, Pretty Prairie, KS

Dr. Daryl Kleinschmit, ASAS/ADSA Director-at-Large
Zinpro Corporation, Yankton, SD
# TABLE OF CONTENTS

2015-2016 Officers of ASAS and ASAS Midwestern Section ........................................1
2015-2016 Officers of ADSA and ADSA Midwest Branch ........................................3
Registration Information ..........................................................................................6
Complimentary Shuttle Information .......................................................................6
Important Phone Numbers ...................................................................................6
Job Resource Center ............................................................................................7
ARPAS CEUs ........................................................................................................7
Schedule of Events ...............................................................................................8
2016 Award Sponsors ............................................................................................10
2016 Midwest Meeting Sponsors ........................................................................11
Poster Schedule ................................................................................................12
Special Events .....................................................................................................13
Scientific Session Program
  Symposia and Oral Sessions .............................................................................15
  Poster Sessions ................................................................................................57
2015-2016 Committees .......................................................................................82
Past Award Winners ..........................................................................................85
Past Midwestern Section Presidents ................................................................95
Floor Plans .........................................................................................................97
REGISTRATION
Iowa Events Center, Lobby
Sunday, March 13, 3:00 pm – 5:00 pm
Monday, March 14, 7:00 am – 6:00 pm
Tuesday, March 15, 7:00 am – 4:00 pm
Wednesday, March 16, 7:00 am – 11:00 am

COMPLIMENTARY SHUTTLE SCHEDULE
Continuous shuttle service between the noted hotels (per route) and the Convention Center during these time periods:

SHUTTLE 1
Des Moines Marriott – Renaissance Savery – Iowa Events Center

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 am to 8:30 am</td>
<td>7:00 am to 9:00 am</td>
<td>7:00 am to 9:00 am</td>
</tr>
<tr>
<td>4:00 pm to 7:30 pm</td>
<td>6:00 pm to 8:00 pm</td>
<td>11:00 am to 1:00 pm</td>
</tr>
</tbody>
</table>

SHUTTLE 2
Embassy Suites – Holiday Inn Downtown – Iowa Events Center

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:30 am to 8:30 am</td>
<td>7:00 am to 9:00 am</td>
<td>7:00 am to 9:00 am</td>
</tr>
<tr>
<td>12:00 pm to 2:00 pm</td>
<td>12:00 pm to 2:00 pm</td>
<td>11:00 am to 1:00 pm</td>
</tr>
<tr>
<td>4:00 pm to 7:30 pm</td>
<td>6:00 pm to 8:00 pm</td>
<td></td>
</tr>
</tbody>
</table>

IMPORTANT PHONE NUMBERS
Des Moines Marriott (Downtown): 515.245.5500
Renaissance Savery: 515.244.2151
Embassy Suites: 515.244.1700
Holiday Inn Downtown: 515.283.0151
Holiday Inn Express and Suites Des Moines (Downtown): 515.657.8181
Hyatt Place Des Moines (Downtown): 515.282.5595
**JOB RESOURCE CENTER**

The traditional Job Resource Center and the Cyber Café will be located in the Foyer on Level Three in the Community Choice Credit Union Convention Center. Sign-up sheets for making “connections” and instructions for use of the Placement Center will be posted.

Students, graduates and experienced professionals are encouraged to post résumés at the Job Resource Center. Professionals from hundreds of companies, universities and governmental agencies are represented each year at the Midwest Meeting. Prospective employees are requested to bring 25 to 50 copies of their (two-page) résumés.

Employers from industry, academia and government are encouraged to post position announcements. Employers are asked to bring 25 to 50 copies of all position announcements.

Job descriptions and résumés can be posted at the Job Resource Center beginning at noon on Monday, March 14, 2016.

---

**ARPAS CONTINUING EDUCATION UNITS**

The 2016 Midwest Meeting has been approved for up to 16 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.

---

**ASAS CAREER CENTER**

ASAS Career Center is the premier electronic recruitment resource for the animal science industry. This site is a great tool that offers benefits to both employers and job seekers alike.

<table>
<thead>
<tr>
<th>EMPLOYERS</th>
<th>JOB SEEKERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Here, employers and recruiters can access the most qualified talent pool with relevant work experience to fulfill staffing needs.</td>
<td>This site offers job seekers the opportunity to send information out to potential employers and search job postings.</td>
</tr>
</tbody>
</table>

http://careers.asas.org/
SCHEDULE OF EVENTS

All rooms are at the Community Choice Credit Union Convention Center (CCCUC) unless otherwise noted.

Schedule note

Continued in 2016: All posters will be presented as ePosters. This format offers some new and exciting options for poster presenters and attendees. Most notably, all posters will be on display for the duration of the meeting and available to all attendees to view at their leisure. The posters have been divided into six mini poster sessions to allow greater access to the presenters. Please see page 12 for a full description of the ePosters and a list of the poster sessions.

MONDAY, MARCH 14, 2016

7:30 AM Gary Allee Breakfast, Grand Ballroom A
7:30 AM Graduate Student Breakfast and Learn, 101/102
8:00 AM AQ Written Exams, CCCUC (See AQ organizer for room assignments)
8:00 AM Gary Allee Symposium: Changing Consumer/Customer Demands, Opportunities for Nutritionists, Grand Ballroom A
8:30 AM ADSA/ASAS Midwest Board of Directors, Boardroom 2
10:00 AM AQ Quiz Bowl Preliminary Rounds, 103, 104 and 105
12:00 PM Bentley Symposium and Lunch, Grand Ballroom B
12:45 PM Poster Session I, Grand Ballroom Foyer
1:00 PM David H. Baker Amino Acid Symposium, 318/319/320
1:30 PM Graduate Student Oral Competition – MS, 302/303
1:30 PM Graduate Student Oral Competition – PhD, 306/307
1:30 PM Undergraduate Student Oral Competition I, 312/313
1:30 PM Undergraduate Student Oral Competition II, 304/305
5:00 PM Poster Session II, Grand Ballroom Foyer
6:00 PM Reception and Recognition of Young Scholar Winners, Grand Ballroom A
7:00 PM AQ Quiz Bowl Finals and Awards Presentation, Grand Ballroom A
8:00 PM Graduate Student Mixer, Johnny’s Hall of Fame (off-site)

TUESDAY, MARCH 15, 2016

MORNING

7:30 AM Poster Session III, Grand Ballroom Foyer
8:30 AM Animal Behavior, Housing and Well-Being Symposium: Part I, 302/303
8:30 AM Breeding and Genetics Symposium, 304/305
8:30 AM David Schingoethe Symposium, 306/307
8:30 AM Growth, Development, Muscle Biology and Meat Science Symposium, 318/319
8:30 AM Harlan Ritchie Symposium, 312/313
8:30 AM Nonruminant Nutrition: Grow/Finish I, 314/315
8:30 AM  Nonruminant Nutrition Symposium, 316/317
8:30 AM  Physiology, 401
8:30 AM  Ruminant Nutrition: By-Products 308/309

AFTERNOON

12:00 PM  Digestive Physiology of Pigs Lecture and Lunch, Grand Ballroom A
12:30 PM  AQ Lunch, 101/102
12:45 PM  Poster Session IV, Grand Ballroom Foyer
1:30 PM  Animal Behavior, Housing and Well-Being Symposium: Part II, 302/303
1:30 PM  Breeding and Genetics, 304/305
1:30 PM  Extension – Dairy Symposium, 306/307
1:30 PM  Growth, Development, Muscle Biology and Meat Science, 318/319
1:30 PM  Nonruminant Nutrition: Feed Additives, 314/315
1:30 PM  Nonruminant Nutrition: Feed Manufacturing, 316/317
1:30 PM  Reproductive Physiology, 401
1:30 PM  Ruminant Nutrition, 308/309
1:30 PM  Ruminant Nutrition Symposium, 312/313
3:15 PM  Nonruminant Nutrition: Sow/Boar
5:00 PM  Poster Session V, Grand Ballroom Foyer
6:00 PM  Business Meeting and Awards Program, Grand Ballroom A
7:00 PM  Reception, Grand Ballroom A

WEDNESDAY, MARCH 16, 2016

7:30 AM  Poster Session VI, Grand Ballroom Foyer
8:30 AM  Animal Behavior, Housing and Well-Being, 312/313
8:30 AM  Equine Welfare Symposium, 304/305
8:30 AM  Extension – Swine, 314/315
8:30 AM  Extension – Beef/Small Ruminant, 318/319
8:30 AM  Nonruminant Nutrition: Grow/Finish II, 306/307
8:30 AM  Nonruminant Nutrition: Nursery Pigs, 308/309
8:30 AM  Physiology Symposium, 316/317
8:30 AM  Ruminant Nutrition: Feed Additives, 302/303
8:30 AM  Teaching Symposium: Evolving the Science Curriculum, 401

CAMERA, VIDEO CAMERA, AND CELL PHONE POLICY
Use of cameras, video cameras, and cell phones (for calls or as cameras) is prohibited during oral and poster presentations to minimize disruption and unauthorized dissemination of data. Violators may be asked to leave the session/conference. Exceptions to this policy must be approved in advance by Midwest ASAS Program Secretary.
**POSTER SCHEDULE**

**Returning in 2016 – ePosters**

All posters will be presented as ePosters. This format offers exciting options for poster presenters and attendees. Most notably, all posters will be on display for the duration of the meeting and available to all attendees to view at their leisure. This new technology is less expensive than printed posters and is easily transportable. Some features of the ePosters include:

- Posters are no longer constrained to a single page; ePosters offer the option to have multiple pages per poster.
- Videos, animations, graphs and images can be embedded into the poster.
- Graphs and images can be expanded to full screen view with a single click, allowing for a more detailed presentation.
- The ePosters will be available after the meeting to attendees to view via the meeting website.

The posters have been divided into six mini poster sessions to allow greater access to presenters. The list of poster sessions, with presentation times, appears below.

**MONDAY, MARCH 14, 2016**

*Poster Session I – Authors present 12:45 pm – 1:30 pm*
  Graduate Student Poster Competition-M.S
  Growth, Development, Muscle Biology, and Meat Science Physiology
  Undergraduate Student Poster Competition I

*Poster Session II – Authors present 5:00 pm – 5:45 pm*
  Graduate Student Poster Competition-Ph.D
  Nonruminant Nutrition I
  Undergraduate Student Poster Competition II

**TUESDAY, MARCH 15, 2016**

*Poster Session III – Authors present 7:30 am – 8:15 am*
  Nonruminant Nutrition II
  Ruminant Nutrition I

*Poster Session IV – Authors present 12:45 pm – 1:30 pm*
  Animal Behavior, Housing and Well-Being
  Extension - Swine
  Nonruminant Nutrition III

*Poster Session V – Authors present 5:00 pm – 5:45 pm*
  Extension - Dairy
  Extension – Beef/Small Ruminant
  Nonruminant Nutrition IV
  Ruminant Nutrition II

**WEDNESDAY, MARCH 16, 2016**

*Poster Session VI – Authors present 7:30 am – 8:15 am*
  Nonruminant Nutrition V
  Odor and Nutrient Management
SPECIAL EVENTS

Bentley Lecture
Monday, March 14 • 12:00 pm • Grand Ballroom
Dietary strategies to ameliorate the physiological effects of heat stress in livestock
Dr. Frank Dunshea, The University of Melbourne
To view information about Dr. Dunshea and his research, please visit his website: http://www.findanexpert.unimelb.edu.au/display/person28608#tab-affiliation
Sponsored by: Bentley Appreciation Club
Registration is required; attendance is limited to the first 400 registrants. Registration fee is $10.00.

Reception & Recognition of Young Scholar Winners
Monday, March 14 • 6:00 pm • Grand Ballroom A
Join us for the opening reception of the 2016 Midwest Meeting. This is a great time to catch up with your colleagues. We will also take the time to recognize the 2016 Young Scholar Winners. Young Scholars must be in attendance to receive their award.

ASAS Undergraduate Midwestern Academic Quadrathlon Quiz Bowl Finals & Award Presentation
Monday, March 14 • 7:00 pm • Grand Ballroom
ASAS is excited to offer our undergraduates the chance to compete in the Midwestern Section Academic Quadrathlon (AQ). The AQ competition will conclude with the Quiz Bowl final Monday night as the final two teams compete for the honor of representing the Midwestern Section at the national AQ in Salt Lake City. Following the Quiz Bowl final the AQ Awards will be presented. Please come out and support our undergraduates.

Graduate Student Breakfast and Learn
Monday, March 14 • 7:30 AM-8:30 AM • Room 101/102
This Breakfast and Learn event will provide a valuable experience for individuals interested in both academic or industry positions! Dr. Mike (Mose) Moseley represents a potential employer and will conduct an interactive “interview workshop” discussing the interviewing process, how to prepare yourself before the interview, and conduct mock interviews, providing examples from experiences with potential job candidates. Mose’s 35 year tenure has run through Upjohn, Pharmacia, Pfizer, and Zoetis serving in both Discovery and Development. He ultimately landed a job as Director in Global Development & Operations and Global Project Team Leader for Zoetis as well as being a Dale Carnegie Instructor for the last 25 years.
Preregistration is required. Registration fee is $10.00.
Graduate Student Mixer  
**Monday, March 14 • 8:00 pm • Johnny's Hall of Fame**  
Join your fellow graduate students at a mixer for all to enjoy. This event will provide an opportunity to catch up with old friends and make new ones so don’t miss it. **Preregistration is highly recommended; all students are welcome. Registration fee is $10.00.**

Digestive Physiology of Pigs Lecture and Lunch (sponsored by DPP-NA)  
**Tuesday, March 15 • 12:00 pm • Grand Ballroom**  
**Microbial colonisation, metabolism and immunity in the young piglet**  
*Mick Bailey, University of Bristol, School of Clinical Veterinary Science, Langford House, Langford, Bristol, UK*  
Optimal function of the intestinal microbiota is a critical component to enteric health: maintaining intestinal barrier function; immune responses to pathogens; and maintaining optimal metabolism. This presentation will address the development and function of the intestinal microbiota as well as pre-, pro- and syn-biotics. What is the science telling us, and how do we make progress in this area, against a backdrop of increasing pressure on antibiotics?  
*Sponsored by: ASAS Midwestern Section/ADSA Midwestern Branch Joint Board  
Registration is required; attendance is limited to first 400 registrants. Registration is $10.00.*

Business Meeting and Awards Program  
**Tuesday, March 15 • 6:00 pm • Grand Ballroom A**  
Please join the ASAS Midwestern Section / ADSA Midwestern Branch Joint Board this evening for the annual Business Meeting and 2016 Awards Program. Immediately following the Awards Program, everyone is invited to come to the final reception of the 2016 meeting.

Reception  
**Tuesday, March 15 • 7:00 pm • Grand Ballroom A**  
Come and join us after the Business Meeting and Awards Program to celebrate and congratulate all of the 2016 Midwest award winners.
SYMPOSIA AND ORAL SESSIONS  
Monday, March 14, 2016

GARY ALLEE SYMPOSIUM  
Chair: Dustin Kendall, Prestage Farms, Inc  
Sponsor: Grand Ballroom

8:00 AM Welcome - Changing Consumer/Customer Demands, Opportunities for Nutritionists.

8:05 AM 89 Challenges of shifting consumer demand in the pork processing industry.  
C. Kaster*, Smithfield Foods, Kansas City, MO

8:50 AM 90 Electronic Sow Feeding (ESF): The Lemonade of Pen Gestation.  
T. D. Parsons*, Department of Clinical Studies, School of Veterinary Medicine, University of Pennsylvania, Kenneth Square

9:30 AM 91 Crate-free sow housing and electronic feeding systems – a value proposition for improved sow nutrition.  
O. F. Mendoza* and A. M. Gaines, The Maschhoffs, LLC, Carlyle, IL

10:05 AM Break.

10:15 AM 92 Exploring connections between metabolic profiles, stress responses and immune function.  
J. A. Carroll*, N. C. Burdick Sanchez, and P. R. Broadway, USDA-ARS, Livestock Issues Research Unit, Lubbock, TX

11:00 AM 93 Production Specific Marketing Programs: What Do They Mean for Nutritionists and How Do We Adapt?.  
M. J. Bertram*, First Choice Livestock, Urbandale, IA

11:45 AM Panel Discussion.

11:55 AM Concluding Remarks.

DAVID H. BAKER AMINO ACID SYMPOSIUM  
Chair: Nathalie L. Trottier, Michigan State University  
Sponsor: 320

1:00 PM Welcoming Remarks.

1:05 PM 38 David H. Baker: A Study in Academic Scholarship.  
R. A. Easter*, University of Illinois at Urbana-Champaign
1:45 PM 39  
**Comparison of the effects of reduced CP, amino acid supplemented diets on growth performance in swine.**  
C. E. Vonderohe¹, K. M. Mills¹, M. D. Asmus¹, E. R. Otto-Tice¹, C. V. Maxwell¹, B. T. Richert¹, and J. S. Radcliffe¹, ¹Purdue University, West Lafayette, IN, ²Department of Animal Science, Division of Agriculture, University of Arkansas, Fayetteville

2:00 PM 40  
**Quantifying variable amino acid efficiencies in lactating sows.**  
R. R. White*¹, S. Zhang², N. Regmi², and N. L. Trottier², ¹Virginia Tech, Blacksburg, ²Michigan State University, East Lansing

2:15 PM 41  
**Citrulline and de novo arginine synthesis in perinatal and young pigs.**  
J. C. Marini*¹², U. Agarwal¹, I. C. Didelija¹, B. Stoll¹, and D. G. Burrin¹, ¹USDA-ARS Children’s Nutrition Research Center, Baylor College of Medicine, Houston, TX, ²Section of Critical Care Medicine, Baylor College of Medicine, Houston, TX

2:55 PM  
**Break.**

3:10 PM 42  
**An update on modeling dose response relationships: accounting for correlated data structures and heterogeneous variance in linear and non-linear mixed models.**  
M. A. D. Goncalves, N. M. Bello*, S. S. Dritz, M. D. Tokach, J. M. DeRouchey, J. C. Woodworth, and R. D. Goodband, Kansas State University, Manhattan

3:50 PM 43  
**Effects of standardized ileal digestible valine:lysine ratio on growth performance of 25- to 45-kg pigs under commercial conditions.**  
M. A. D. Goncalves*, M. D. Tokach¹, S. S. Dritz¹, N. M. Bello¹, K. J. Touchette², R. D. Goodband¹, J. M. DeRouchey¹, and J. C. Woodworth¹, ¹Kansas State University, Manhattan, ²Ajinomoto Heartland, Inc., Chicago, IL

4:05 PM 44  
**Determination of lysine adequacy on a population basis for growing pigs.**  
C. E. Zier-Rush¹, C. Neill³, S. B. Jungst², N. Matthews³, D. S. Rosero*¹, and R. D. Boyd¹, ¹The Hanor Company, Inc., Franklin, KY, ³PIC, Hendersonville, TN

4:20 PM 45  
**Evaluating protein quality of human foods using the pig as a model.**  
H. Stein*, J. Mattai, University of Illinois at Urbana-Champaign
GRADUATE STUDENT ORAL COMPETITION-M.S

Chair: ,
Sponsor: 302-303

1:30 PM 94  Effect of harvest method on corn residue quality and RUP supplementation on residue quality and performance of growing calves.
T. M. King*, R. G. Bondurant, J. L. Harding, J. C. MacDonald, and T. J. Klopfenstein, University of Nebraska-Lincoln

1:45 PM 95  Evaluation of a xylanase and an emulsifier in broilers fed different levels of dried yeast.
N. J. Rodriguez*1, J. Less2, T. R. Radke2, A. Hesse3, and V. G. Perez4, 1UNAM, Mexico City, Mexico, 2ADM Animal Nutrition, Decatur, IL

2:00 PM 96  Effect of Sorting Boar Spermatozoa by Sex Chromosomes on Oviduct Cell Binding.
R. A. Winters*1, L. M. Nettenstrom2, D. G. Lopez2, K. L. Willen- burg2, R. Vishwanath2, and D. J. Miller1, 1University of Illinois at Urbana-Champaign, 2Sexing Technologies Inc., DeForest, WI

2:15 PM 97  Effects of standardized ileal digestible valine:lysine ratio on nursery pig performance.
A. B. Clark*1, M. D. Tokach1, S. S. Dritz1, K. J. Touchette2, M. A. D. Gonçalves1, J. M. DeRouchey1, R. D. Goodband1, and J. C. Woodworth1, 1Kansas State University, Manhattan, 2Ajinomoto Heartland, Inc., Chicago, IL

2:30 PM 98  Impact of elevated preovulatory estradiol during a fixed-time AI protocol on uterine environment and embryonic survival to day 16.
E. J. Northrop*1, J. J. Rich1, R. A. Cushman2, and G. A. Perry3, 1Department of Animal Science, South Dakota State University, Brookings, 2USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE, 3Department of Animal Science, South Dakota State University, Brookings

L. A. Bachmeier*1, S. J. Moeller2, C. Carr3, J. M. Young4, X. Sun1, J. H. Liu1, S. B. Schauunaman1, and D. J. Newman1, 1North Dakota State University, Fargo, 2The Ohio State University, Columbus, 3University of Florida, Gainesville

3:00 PM 100  Post-mortem proteolysis and meat tenderness in crossbred steers identified as lowly or highly feed efficient.
In vitro investigations on the use of non-nutritive sorbent additives to sequester boar taint compounds.
P. Park*, I. B. Mandell1, C. F. M. de Lange2, and J. Squires1,
1Department of Animal and Poultry Science, University of Guelph, ON, Canada,
2University of Guelph, ON, Canada

Changes in Late Gestation Beef Cow Circulating Metabolite and Metabolic Hormone Concentrations Due to Feeding Stockpiled Tall Fescue Versus Tall Fescue Hay.
J. M. Larson*, K. N. Niederecker1, and A. M. Meyer2, 1Division of Animal Sciences, University of Missouri, Columbia,
2University of Missouri, Columbia

Effects of treating sorghum wet distillers grains plus solubles with calcium hydroxide in steam-flaked corn-based finishing diets on dry matter intake and ruminal fermentation characteristics.
W. W. Gentry*, C. P. Weiss1, C. M. Meredith1, C. L. Brauer1,
F. T. McCollum1, N. A. Cole2, and J. S. Jennings1, 1Texas A & M AgriLife Research and Extension Center, Amarillo,
2USDA-ARS, Bushland, TX

Gross return to corn acres through cattle feeding as influenced by choice of harvest endpoint.
T. A. Johnson*, A. Hohertz1, and A. DiCostanzo1, 1University of Minnesota, St. Paul

Effect of Feeding a Corn Hybrid Containing Alpha Amylase on Finishing Cattle Performance and Carcass Characteristics.
M. L. Jolly-Breithaupt*, M. E. Harris1, B. L. Nuttelman1, D. B. Burken1, G. E. Erickson1, J. C. MacDonald1, and M. K. Luebbe2,
1University of Nebraska-Lincoln, 2University of Nebraska, Scottsbluff

Effects of supplemental soy peptide on growth performance and gut health of nursery pigs.
L. Zheng*, I. Park, and S. W. Kim, North Carolina State University, Raleigh
Evaluating the inclusion level of medium chain fatty acids to reduce the risk of PEDV in feed and spray-dried animal plasma.

R. A. Cochrane\textsuperscript{*1}, M. Saensukjaroenphon\textsuperscript{1}, S. S. Dritz\textsuperscript{1}, J. C. Woodworth\textsuperscript{1}, A. R. Huss\textsuperscript{1}, C. R. Stark\textsuperscript{1}, J. M. DeRouchey\textsuperscript{1}, M. D. Tokach\textsuperscript{1}, R. D. Goodband\textsuperscript{1}, J. F. Bai\textsuperscript{1}, Q. Chen\textsuperscript{2}, J. Zhang\textsuperscript{2}, P. C. Gauger\textsuperscript{2}, R. Main\textsuperscript{2}, and C. K. Jones\textsuperscript{1}, \textsuperscript{1}Kansas State University, Manhattan, \textsuperscript{2}Iowa State University, Ames

Liquid Feeding Fermented DDGS to Weanling Pigs: Improvement of Growth Performance with Added Enzymes and Microbial Inoculants.

M. Wiseman\textsuperscript{*1}, D. Wey\textsuperscript{1}, and C. F. M. de Lange\textsuperscript{2}, \textsuperscript{1}Department of Animal Biosciences, University of Guelph, ON, Canada, \textsuperscript{2}University of Guelph, ON, Canada

Impact of sex on composition and quality of fresh loins, bellies, and fresh and processed hams.

E. K. Arkfeld\textsuperscript{*1}, D. A. Mohrhauser\textsuperscript{2}, D. A. King\textsuperscript{3}, T. L. Wheeler\textsuperscript{1}, A. C. Dilger\textsuperscript{1}, S. D. Shackelford\textsuperscript{1}, and D. D. Boler\textsuperscript{1}, \textsuperscript{1}University of Illinois at Urbana-Champaign, \textsuperscript{2}Smithfield Foods, Denison, IA, \textsuperscript{3}USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE

Immune system stimulation (ISS) induced by \textit{E. coli} lipopolysaccharide (LPS) alters amino acid metabolism in growing pigs.

W. D. Stuart\textsuperscript{*1}, T. E. Burkey\textsuperscript{2}, N. K. Gabler\textsuperscript{3}, K. J. Schwartz\textsuperscript{3}, D. Klein\textsuperscript{1}, J. A. Dawson\textsuperscript{1}, A. R. Pendleton\textsuperscript{4}, C. F. M. de Lange\textsuperscript{5}, and A. Rakhshandeh\textsuperscript{1}, \textsuperscript{1}Texas Tech University, Lubbock, TX, \textsuperscript{2}University of Nebraska-Lincoln, \textsuperscript{3}Iowa State University, Ames, \textsuperscript{4}Amarillo College, Amarillo, \textsuperscript{5}University of Guelph, ON, Canada

Effects of Heat Stress and Zinc Supplementation on the Lipidome of Growing Pigs.

L. Wang\textsuperscript{*1}, P. E. Urriola\textsuperscript{2}, Z. Luo\textsuperscript{2}, Z. J. Rambo\textsuperscript{3}, M. E. Wilson\textsuperscript{3}, J. L. Torrison\textsuperscript{3}, G. C. Shurson\textsuperscript{2}, and C. Chen\textsuperscript{1}, \textsuperscript{1}Department of Food Science and Nutrition, University of Minnesota, St. Paul, \textsuperscript{2}Department of Animal Science, University of Minnesota, St. Paul, \textsuperscript{3}Zinpro Corporation, Eden Prairie, MN

Genetic Parameters and Genomic Regions Associated with Piglet Response to Vaccination for Porcine Reproductive and Respiratory Syndrome (PRRS) Virus and Co-Infection with PRRS Virus and Porcine Circovirus Type 2b (PCV2b).

J. R. Dunkelberger\textsuperscript{*1}, N. V. L. Serão\textsuperscript{1,2}, M. A. Kerrigan\textsuperscript{1}, J. K. Lunney\textsuperscript{4}, R. R. R. Rowland\textsuperscript{1}, and J. C. M. Dekkers\textsuperscript{1}, \textsuperscript{1}Iowa State University, Ames, \textsuperscript{2}North Carolina State University, Raleigh, \textsuperscript{3}Kansas State University, Manhattan, \textsuperscript{4}USDA, ARS, BARC, APDL, Beltsville, MD
3:30 PM  113  Optimizing Cost and Environmental Impact of Pig Diets.
J. Burek*, G. Thoma, C. V. Maxwell, J. Popp, and R. Ulrich,
1University of Arkansas, Fayetteville, AR, 2Department of
Animal Science, Division of Agriculture, University of Arkansas,
Fayetteville, 3University of Arkansas, Fayetteville

UNDERGRADUATE STUDENT ORAL COMPETITION I
Chair: Paul M. Walker, Illinois State University
Sponsor: 312-313

1:30 PM  400  Spinning Straw into Milk: Can a 95% Byproduct Diet
Support Milk Production?.
M. Hulett*, C. M. Ylioja†, T. A. Wickersham, and B. J.
Bradford, 1Department of Animal Sciences and Industry;
Kansas State University, Manhattan, 2Texas A&M University,
College Station

1:45 PM  401  Impact of initiating a fixed-time AI program on herd calving
date and weaning weight.
L. K. Quail*, R. A. Cushman, and G. A. Perry,
1South Dakota State University, Brookings, SD, 2USDA, ARS, U.S. Meat Animal
Research Center, Clay Center, NE, 3Department of Animal
Science, South Dakota State University, Brookings

2:00 PM  402  Circulating Blood Urea Nitrogen and Glucose Concentrations
of Neonatal Beef Calves during the First 72 Hours.
K. A. Pearl*, J. M. Larson, and A. M. Meyer,
1Division of Animal Sciences, University of Missouri, Columbia, 2University
of Missouri, Columbia

2:15 PM  403  Effects of Neonatal Litter Size and Age on Ovarian Gene
Expression and Follicular Development in Gilts.
M. W. McClure*, R. A. Cushman, D. J. Nonneman, and C. A.
Lents, 1University of Tennessee-Martin, 2USDA, ARS, U.S. Meat Animal
Research Center, Clay Center, NE

2:30 PM  404  Effects of Copper Oxide Bolus Supplementation on
Performance of Stocker Calves Grazing Endophyte Infected
Tall Fescue.
G. R. Pettig*, B. C. Shanks, J. D. Caldwell, A. L. Bax, H. L.
Bartimus, C. A. DeOrnellis, C. L. Boeckmann, J. J. Markway, and M. J. Kramer,
1Lincoln University, Jefferson City, MO, 2Purina Animal Nutrition Center LLC, Gray Summit, MO,
3Department of Agriculture and Environmental Science, Lincoln
University, Jefferson City, MO
2:45 PM  405  Evaluation of Parasite Resistance to Commonly Used Commercial Anthelmintics in Meat Goats.
M. K. Goolsby*, M. L. Leite-Browning, and R. Browning, Jr.
Tennessee State University, Nashville, Alabama A&M University, Huntsville

3:00 PM  406  Differential expression of genes in the liver associated with gain and intake in beef steers.
C. M. Zarek*, A. K. Lindholm-Perry, and H. C. Freely
U.S. Meat Animal Research Center, Clay Center, NE, USDA, ARS, US MARC, Clay Center, NE, USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE

UNDERGRADUATE STUDENT ORAL COMPETITION II

Chair: 
Sponsor: 
304-305

1:30 PM  407  The Effect of Diet on Serum Antibody Response to Vaccine in Horses.
O. A. Kendall*, A. Young, E. D. Lamprecht, J. L. Leatherwood, and R. C. Bott
South Dakota State University, Brookings, Cargill, Elk River, MN, Sam Houston State University, Huntsville, TX

1:45 PM  408  Determining the standardized ileal digestible lysine requirement of 6.8 to 15.9 kg pigs.
Kansas State University, Manhattan

2:00 PM  409  Comparison of delayed weaning on lamb growth and parasitism while grazing red clover.
K. Nickles, J. S. McCutcheon, D. Clevenger, G. Lowe, M. Sword, and F. L. Fluharty
The Ohio State University, Columbus, The Ohio State University, Mount Gilead, The Ohio State University, Wooster

2:15 PM  410  Effects of commercial formaldehyde inclusion and lysine level on nursery pig performance.
Kansas State University, Manhattan
2:30 PM  411  Increased dietary soybean meal does not affect performance during a PRRSV-Mycoplasma hyopneumoniae challenge. A. L. O’Connell¹, W. P. Schweer¹, K. Schwartz¹, G. Gourley², M. A. FitzSimmons³, and N. K. Gabler¹, ¹Iowa State University, Ames, ²Gourley Research Group LLC, Webster City, IA, ³Swine Graphics Enterprises, Webster City, IA

2:45 PM  412  Concentrations of progesterone, estrogen, and insulin in serum during early pregnancy in crossbred Angus beef heifers. Concentrations of progesterone, estrogen, and insulin in serum during early pregnancy in crossbred Angus beef heifers. T. L. Ellig¹, K. J. McLean¹, C. R. Dahlen¹,², P. P. Borowicz¹,², L. P. Reynolds¹,², and J. S. Caton¹,², ¹North Dakota State University, Fargo, ²Center for Nutrition and Pregnancy, Fargo, ND

3:00 PM  413  Calcium and magnesium absorption and retention by growing goats offered diets with different calcium sources. J. E. Long¹, K. P. Coffey², J. D. Caldwell³, D. Philipp², R. T. Rhein¹, and A. N. Young³, ¹Department of Animal Science, University of Arkansas Division of Agriculture, Fayetteville, ²University of Arkansas, Division of Agriculture, Fayetteville, ³Purina Animal Nutrition Center LLC, Gray Summit, MO

3:15 PM  414  Influence of semen handling on post-thaw sperm motility. C. L. Mogck and G. A. Perry, Department of Animal Science, South Dakota State University, Brookings
SYMPOSIA AND ORAL SESSIONS
TUESDAY, MARCH 15, 2016

ANIMAL BEHAVIOR, HOUSING AND WELL-BEING
SYMPOSIUM: PART I
Chair: Jennifer A. Brown, Prairie Swine Centre
Sponsor: 302-303

8:30 AM  Welcoming Remarks.

8:40 AM  10  The Role of Breeding in Positive Welfare Change.

9:25 AM  11  Implementing animal well-being technologies, U.S. producer perspective.
            A. E. DeDecker*, Smithfield Hog Production Division, Rose Hill, NC

10:10 AM  Break.

10:25 AM  12  Engineering solutions to address challenges to animal well-being.
            A. R. Green*, University of Illinois at Urbana-Champaign

11:10 AM  13  Six questions for veterinarians.
            J. Deen*, Dept. of Veterinary Population Medicine, University of Minnesota, St. Paul

BREEDING AND GENETICS SYMPOSIUM
Chair: Juan P. Steibel, Department of Animal Science, Michigan State University
Sponsor: 304-305

8:30 AM  Welcoming Remarks.

8:35 AM  34  Genomic prediction using a model based on haplotype clusters.
            S. D. Kachman*, University of Nebraska-Lincoln

9:10 AM  Break.

9:20 AM  35  Advances in Genomic Selection and GWA.
            I. Misztal*, University of Georgia, Athens
9:55 AM 36 Discovery of QTL using a QTL-Effects Model in a Multi-Generational Pedigree.
R. L. Fernando¹, J. Zeng¹, H. Cheng¹, D. Habier¹, A. Wolc³, D. J. Garrick², and J. C. M. Dekkers¹, Iowa State University, Ames, ²Iowa State University, Ames, ³Hy-Line International, Dallas Center, IA, ⁴Massey University, Palmerston North, New Zealand

10:30 AM 37 Modeling Networks for Prediction and Causal Inference in Quantitative Genetics and Genomics.
G. J. M. Rosa*, University of Wisconsin-Madison

DAVID SCHINGOETHE SYMPOSIUM

Chair: Daryl H Kleinschmit, Zinpro Corporation
Sponsor: 306-307

8:30 AM 46 Modifying the composition of milk to increase marketability.
D. J. Schingoethe*, South Dakota State University, Brookings

9:10 AM 47 The History, Mechanism, and Modification of Milk Fat Synthesis in Ruminants.
K. J. Harvatine*, Penn State University, State College

9:50 AM 48 Milk composition and synthesis in dairy goats and sheep.
M. Rovai¹ and G. Caja², ¹South Dakota State University, Brookings, SD, ²Group of Ruminant Research (G2R), Universitat Autonoma de Barcelona, Bellaterra, Barcelona, Spain

10:30 AM 49 (Young Scholar) Physiological and molecular mechanisms associated with performance, immunometabolic status, and liver function in transition dairy cows fed rumen protected methionine or choline.
Z. Zhou¹, M. Vailati Riboni¹, O. Bulgari¹, E. Trevisi², T. A. Garrow¹, J. K. Drackley¹, P. Cardoso¹, D. N. Luchini³, and J. J. Loor¹, ¹University of Illinois at Urbana-Champaign, ²Università Cattolica del Sacro Cuore, Piacenza, Italy, ³Adisseo S.A.S., Alpharetta, GA

11:00 AM 50 (Young Scholar) Control of bovine pyruvate carboxylase expression by saturated and unsaturated fatty acids and impact on fatty acid metabolism.
K. E. Boesche*, S. L. Koser, and S. S. Donkin, Purdue University, West Lafayette, IN
11:30 AM  51  (Young Scholar) Postpartum protein nutrition for dairy cows.
W. D. Weich\textsuperscript{1}, K. F. Kalscheur\textsuperscript{2}, and D. P. Casper\textsuperscript{1}, \textsuperscript{1}South Dakota State University, Brookings, \textsuperscript{2}USDA-ARS Dairy Forage Research Center, Madison, WI

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

Chair: Chad A. Stahl, F.A.C.T.S.
Sponsor: 318-319

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 AM</td>
<td>137 Use of Visible and Near Infrared Spectroscopy to Predict Beef and Pork Quality. S. D. Shackelford\textsuperscript{1}, D. A. King, and T. L. Wheeler, USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE</td>
</tr>
<tr>
<td>9:15 AM</td>
<td>138 The quandaries of measuring meat quality. J. K. Apple\textsuperscript{1} and J. W. S. Yancey\textsuperscript{2}, \textsuperscript{1}Department of Animal Science, University of Arkansas Division of Agriculture, Fayetteville, \textsuperscript{2}Department of Animal Science, University of Arkansas, Fayetteville</td>
</tr>
<tr>
<td>10:00 AM</td>
<td>139 Differentiating Lamb Flavor. D. R. Woerner\textsuperscript{1}, T. W. Hoffman, J. D. Tatum, and K. E. Belk, Colorado State University, Fort Collins</td>
</tr>
</tbody>
</table>

**HARLAN RITCHIE SYMPOSIUM**

Chair: W. J. Sexten, Certified Angus Beef LLC
Sponsor: 312-313

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 AM</td>
<td>Welcoming Remarks.</td>
</tr>
<tr>
<td>8:35 AM</td>
<td>150 Alternative cow-calf production systems: Opportunities and challenges. R. J. Rasby\textsuperscript{1}, J. M. Warner\textsuperscript{2}, K. H. Jenkins\textsuperscript{1}, and T. J. Klopfenstein\textsuperscript{2}, \textsuperscript{1}Department of Animal Science, University of Nebraska-Lincoln, \textsuperscript{2}University of Nebraska-Lincoln, \textsuperscript{3}University of Nebraska, Scottsbluff</td>
</tr>
<tr>
<td>9:20 AM</td>
<td>Implementing the 2015 Beef NRC Changes in Cow Herd Nutrition. Ron Lemenager, Purdue University, West Lafayette, IN</td>
</tr>
<tr>
<td>10:05 AM</td>
<td>Break.</td>
</tr>
<tr>
<td>Time</td>
<td>Event</td>
</tr>
<tr>
<td>--------</td>
<td>----------------------------------------------------------------------</td>
</tr>
</tbody>
</table>
| 10:20 AM | Implementing the 2015 Beef NRC Changes in Growing and Finishing Cattle.  
  Galen Erickson, University of Nebraska-Lincoln |
| 11:05 AM | Transparency in the Food System: Communicating Science to the Consumer.  
  J. Jones, The Center for Food Integrity |

**NONRUMINANT NUTRITION: GROW/FINISH I**

Chair: Victor G. Perez; Roman Moreno,  
ADM Animal Nutrition; Seaboard Foods  
Sponsor: 314-315

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
</table>
| 8:30 AM | (Young Scholar) Characterization of variability in the U.S. pork supply.  
  E. K. Arkfeld1, S. D. Shackelford2, A. C. Dilger1, and D. D. Boler1,  
  1University of Illinois at Urbana-Champaign, 2USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE |
| 9:00 AM | (Young Scholar) Requirements for digestible Ca by growing pigs.  
  J. C. González-Vega1, C. L. Walk2, and H. H. Stein1,  
  1University of Illinois at Urbana-Champaign, 2AB Vista, Marlborough, United Kingdom |
| 9:30 AM | Digestible calcium requirements for 25 to 50 kg pigs.  
  J. C. González-Vega1, C. L. Walk2, and H. H. Stein1,  
  1University of Illinois at Urbana-Champaign, 2AB Vista, Marlborough, United Kingdom |
| 9:45 AM | Impact of increasing dietary energy concentration through graded levels of corn oil or choice white grease on carcass characteristics in pigs.  
  T. Kellner1, S. Wisdom2, G. Gourley3, and J. F. Patience1,  
  1Iowa State University, Ames, 2Swine Graphics Enterprises, Webster City, IA, 3Gourley Research Group, Webster City, IA |
| 10:00 AM | Impact of the source and level of dietary fat on growth performance as well as apparent and true total tract digestibility of acid hydrolyzed ether extract in growing and finishing pig diets.  
  T. Kellner1, G. Gourley2, S. Wisdom3, and J. F. Patience1,  
  1Iowa State University, Ames, 2Gourley Research Group, Webster City, IA, 3Swine Graphics Enterprises, Webster City, IA |
10:15 AM  223  Efficacy of supplemental liquid L-lysine for pigs in comparison to crystalline L-lysine HCl.
W. Parnsen\textsuperscript{1*}, J. Wang\textsuperscript{1}, K. J. Touchette\textsuperscript{2}, Z. Jiang\textsuperscript{2}, and S. W. Kim\textsuperscript{1}, \textsuperscript{1}North Carolina State University, Raleigh, \textsuperscript{2}Ajinomoto Heartland, Inc., Chicago, IL

10:30 AM  224  Diet nutrient digestibility and growth performance of weaned pigs fed canola meal samples varying in nutritive quality.
L. F. Wang\textsuperscript{1*}, E. Beltranena\textsuperscript{1,2}, and R. T. Zijlstra\textsuperscript{1}, \textsuperscript{1}Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada, \textsuperscript{2}Alberta Agriculture and Forestry, Edmonton, AB, Canada

10:45 AM  225  Prediction of the concentration of standardized ileal digestible (SID) amino acids among sources of distillers dried grains with solubles (DDGS) for growing pigs: A meta-analysis.
Z. Zeng\textsuperscript{1*}, G. C. Shurson, and P. E. Urriola, Department of Animal Science, University of Minnesota, St. Paul

11:00 AM  226  Amino acid digestibility of five samples of canola meal fed to ileal-cannulated grower pigs.
B. V. Le Thanh\textsuperscript{1*}, X. Zhou\textsuperscript{1}, E. Beltranena\textsuperscript{2}, and R. T. Zijlstra\textsuperscript{1}, \textsuperscript{1}University of Alberta, Edmonton, AB, Canada, \textsuperscript{2}Alberta Agriculture and Forestry, Edmonton, AB, Canada

J. K. Mathai\textsuperscript{1*}, Y. Liu, and H. H. Stein, University of Illinois at Urbana-Champaign

11:30 AM  228  Effect of fat sources on ATTD of minerals.
L. A. Merriman\textsuperscript{1*}, C. L. Walk\textsuperscript{2}, and H. H. Stein\textsuperscript{1}, \textsuperscript{1}University of Illinois at Urbana-Champaign, \textsuperscript{2}AB Vista, Marlborough, United Kingdom

11:45 AM  233  Evaluating the effects of sodium sesquicarbonate in the grow-finish phase fed during summer months.
L. Greiner\textsuperscript{1*}, A. Graham\textsuperscript{1}, B. Knopf\textsuperscript{1}, and W. Plocher\textsuperscript{2}, \textsuperscript{1}Carthage Innovative Swine Solutions, LLC, Carthage, IL, \textsuperscript{2}Tronox Specialty Alkali Corporation, Green River, WY

12:00 PM  230  Effect of divergent selection for Residual Feed Intake on whole body protein turnover in growing gilts fed either adequate or lysine deficient diets.
D. J. Hewitt\textsuperscript{1*}, C. F. M. de Lange\textsuperscript{2}, T. Antonick\textsuperscript{1}, J. C. M. Dekkers\textsuperscript{3}, A. R. Pendleton\textsuperscript{4}, and A. Rakhshandeh\textsuperscript{1}, \textsuperscript{1}Texas Tech University, Lubbock, \textsuperscript{2}University of Guelph, ON, Canada, \textsuperscript{3}Iowa State University, Ames, \textsuperscript{4}Amarillo College, Amarillo, TX
NONRUMINANT NUTRITION SYMPOSIUM

Chair: Thomas E. Burkey, University of Nebraska
Sponsor: 316-317

8:30 AM  Welcoming Remarks.

8:50 AM  267  What is ‘gut health’ and how do you quantify/measure it?
A. J. Moeser*, North Carolina State University, Raleigh

9:20 AM  268  New probiotic Bacillus strain improving gut health in piglets.
B. Lantz*, B. K. Nielsen† and R. Cernat‡, Chr. Hansen A/S, Clumber, Ohio, Chr. Hansen A/S, Hoersholm, Denmark

9:35 AM  269  Use of dietary carbohydrates as prebiotic in swine diets.
R. T. Zijlstra*, J. M. Fouhse, E. Beltranena, A. M. H. Le, and M. G. Gaenzle, Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada

10:05 AM  270  Impact of different high fiber diets on intestinal cell proliferation and differentiation in finishing pigs.
Z. Huang*, P. E. Urriola, G. C. Shurson, and M. Saqui-Salces, Department of Animal Science, University of Minnesota, St. Paul

10:20 AM  Break.

10:35 AM  271  Effects of dietary supplementation of phytobiotics on growth performance and health status of growing-finishing pigs.
I. Park*, W. Parnsen, and S. W. Kim, North Carolina State University, Raleigh

10:50 AM  428  Lysozymes as an alternative to antibiotics in swine feed.
W. T. Oliver and J. E. Wells, USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE

11:20 AM  272  Alternatives to antibiotics: biotechnological approach to deliver recombinant bioactive proteins.
E. Huynh, C. F. M. de Lange, and J. Li*, University of Guelph, ON, Canada
PHYSIOLOGY
Chair: Patrick J. Gunn, Department of Animal Science, Iowa State University
Sponsor: 401

8:30 AM 336 Heat stress affects the serum concentrations of free amino acids in growing pigs.
A. Morales¹, M. Cota¹, N. Ibarra¹, N. Arce¹, J. K. Htoo², and M. Cervantes³, ¹ICA - Universidad Autónoma de Baja California, Mexicali, Mexico, ²Evonik Nutrition & Care GmbH, Hanau-Wolfgang, Germany

8:45 AM 305 Does heat stress alter the pig’s response to dietary fat source, as it relates to apparent or true total tract digestibility of dietary lipids?.
T. Kellner*, L. H. Baumgard, and J. F. Patience, Iowa State University, Ames

9:00 AM 306 Effects of dietary chromium propionate during heat stress on finishing pigs.
E. J. Mayorga¹, S. K. Stoakes¹, J. T. Seibert¹, E. A. Horst¹, M. Abuajamieh¹, S. Lei¹, L. Ochoa², B. Kremer², and L. H. Baumgard², ¹Iowa State University, Ames, ²Kemin Industries, Inc., Des Moines, IA

9:15 AM 307 Supplementation of a Lactobacillus acidophilus fermentation product can attenuate the acute phase response following a lipopolysaccharide challenge in pigs.
P. R. Broadway¹, J. A. Carroll¹, N. C. Burdick Sanchez¹, B. E. Bass², and J. W. Frank², ¹USDA-ARS, Livestock Issues Research Unit, Lubbock, TX, ²Diamond V, Cedar Rapids, IA

9:30 AM 308 Intestinal microbiota and expression of genes involved in immunity are modulated in nursing piglets by growth performance in the first week of life.
M. Lessard¹, K. Deschéne², B. Morissette²-³, M. Blais², F. Beaudoin², K. Lauzon², and G. Talbot², ¹Agriculture and Agri-Food Canada, Sherbrooke, QC, Canada, ²Agriculture and Agri-Food Canada, Dairy and Swine Research and Development Centre, Sherbrooke, QC, Canada, ³Université de Sherbrooke, Sherbrooke, QC, Canada

9:45 AM 309 Evaluation of a QTL for porcine circovirus type 2b (PCV2) viral load on growth performance in inoculated and vaccinated pigs for PCV2.
D. M. van Sambeek², E. R. Tosky, P. S. Miller, D. C. Ciobanu, and T. E. Burkey, University of Nebraska-Lincoln
10:00 AM  310  Piglet Growth Before Weaning has Long-Term Effects on Intestinal Barrier Function.  
A. Mereu¹, J. J. Pastor¹, D. Chin², G. Rimbach², and I. R. Ipharraguerre¹,²  
¹Lucta S.A., Barcelona, Spain, ²Institute of Human Nutrition and Food Science, University of Kiel, Kiel, Germany

10:30 AM  311  Dietary D-xylose effects on growth performance and portal-drained viscera nutrient fluxes, insulin production, and oxygen consumption in growing pigs.  
A. K. Agyekum¹, M. C. Walsh², E. Kiarie¹,³,⁴, J. S. Sands¹,⁵, and C. M. Nyachoti¹  
¹University of Manitoba, Winnipeg, MB, Canada, ²Danisco Animal Nutrition, DuPont Industrial Biosciences, Marlborough, UK, United Kingdom, ³DuPont Industrial Biosciences - Danisco Animal Nutrition, Marlborough, United Kingdom, ⁴University of Guelph, ON, Canada, ⁵BioQuest UK Ltd, Marlborough, United Kingdom

10:45 AM  312  Use of AliveCor Heart Monitor for Heart Rate and Rhythm Evaluation in Domestic Water Buffalo Calves.  
J. Smith¹, J. Ward¹, T. Urbano², and M. Mueller³  
¹Iowa State University College of Veterinary Medicine, Ames, ²School of Veterinary Medicine, University of California, Davis, ³Blue Pearl Veterinary Partners, Seattle, WA

11:00 AM  313  Plasma analytes concentrations of beef heifers diverging in frame size and known feed efficiency group.  
A. B. P. Fontoura¹, F. E. Doscher, C. R. Dahlen, K. Ringwall,  
K. A. Vonnahme, L. L. L. H. Hanna, and K. C. Swanson, North Dakota State University, Fargo

RUMINANT NUTRITION: BY-PRODUCTS

Chair: Mary Drewnoski, University of Nebraska-Lincoln  
Sponsor: 308-309

8:30 AM  366  Accurate Amounts and Nutritive Values of Corn Residue.  
S. E. Gardine¹, A. K. Watson², J. L. Harding¹, and T. J. Klopfenstein¹  
¹University of Nebraska-Lincoln, ²Department of Animal Science, University of Nebraska-Lincoln

8:45 AM  367  Evaluation of different byproduct combinations along with treated corn stover on growing steer performance.  
K. M. Ulmer², C. J. Bittner, F. H. Hilscher, G. E. Erickson, and J. C. MacDonald, University of Nebraska-Lincoln
<table>
<thead>
<tr>
<th>Time</th>
<th>Session No.</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>9:00 AM</td>
<td>368</td>
<td>Effects of co-ensiling high moisture corn stover with co-products on spoilage, aerobic stability, nutrient composition, and in situ digestibility.</td>
<td>M. H. Sena*, T. L. Felix, W. T. Meteer, and D. W. Shike, University of Illinois at Urbana-Champaign</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>370</td>
<td>The effect of corn silage harvest DM and rumen undegradable protein supplementation in silage growing diets growing beef cattle.</td>
<td>F. H. Hilscher*, J. L. Harding, R. G. Bondurant, T. J. Klopfenstein, and G. E. Erickson, University of Nebraska-Lincoln</td>
</tr>
<tr>
<td>9:45 AM</td>
<td>371</td>
<td>Influence of two fat levels of dry distillers grains in diets with corn or barley on growing and finishing feedlot and carcass performance of steers.</td>
<td>C. L. Engel¹, V. L. Anderson², and K. C. Swanson³, ¹North Dakota State University, Carrington Research Extension Center, Carrington, ND, ²Carrington Research Extension Center, North Dakota State University, Carrington, ³North Dakota State University, Fargo</td>
</tr>
<tr>
<td>10:00 AM</td>
<td>372</td>
<td>Evaluation of the Value of Fiber in Distillers Grains Plus Solubles on Performance of Finishing Cattle.</td>
<td>J. E. Burhoop*, L. J. Schneider, C. J. Bittner, F. H. Hilscher, J. C. MacDonald, R. A. Moxley, D. R. Smith, and G. E. Erickson, ¹University of Nebraska-Lincoln, ²Mississippi State University, Mississippi State, ³School of Veterinary Medicine and Biomedical Sciences, University of Nebraska-Lincoln</td>
</tr>
<tr>
<td>10:15 AM</td>
<td>373</td>
<td>Effects of Feeding Isolated Nutritional Components in Distillers Grains on Growing Cattle Performance.</td>
<td>B. B. Conroy*, C. J. Bittner, J. C. MacDonald, M. K. Luebbe, and G. E. Erickson, ¹University of Nebraska, Scottsbluff, ²University of Nebraska-Lincoln</td>
</tr>
<tr>
<td>10:30 AM</td>
<td>374</td>
<td>Effects of feeding corn condensed distillers solubles and crude glycerin alone or in combination on growth performance and carcass characteristics of finishing steers.</td>
<td>C. P. Weiss*, W. W. Gentry, C. L. Brauer, F. T. McCollum, N. A. Cole, and J. S. Jennings, ¹Texas A &amp; M AgriLife Research and Extension Center, Amarillo, ²USDA-ARS, Bushland, TX</td>
</tr>
<tr>
<td>10:45 AM</td>
<td>375</td>
<td>Effect of crude glycerin concentration on growing steer performance in forage diets.</td>
<td>R. G. Bondurant*, J. C. MacDonald, G. E. Erickson, and T. J. Klopfenstein, University of Nebraska-Lincoln</td>
</tr>
<tr>
<td>Time</td>
<td>Session</td>
<td>Title</td>
<td>Authors</td>
</tr>
<tr>
<td>--------</td>
<td>---------</td>
<td>----------------------------------------------------------------------</td>
<td>------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>11:00 AM</td>
<td>376</td>
<td>Effects of ruminal alkalinizing and/or buffering agents fed to feedlot steers on performance and carcass characteristics.</td>
<td>N. A. Lancaster* and J. P. Schoonmaker, Purdue University, West Lafayette, IN</td>
</tr>
<tr>
<td>11:15 AM</td>
<td>377</td>
<td>Effects of Different Inoculum Used for in vitro and in situ Digestion Procedures Performed on Corn Residue Samples.</td>
<td>H. C. Hamilton*¹, J. L. Harding², J. C. MacDonald¹, and T. J. Klopfenstein², ¹Department of Animal Science, University of Nebraska-Lincoln, ²University of Nebraska-Lincoln</td>
</tr>
<tr>
<td>11:30 AM</td>
<td>378</td>
<td>Relationship Between TDN and OM Digested in Beef Cattle Finishing Diets.</td>
<td>H. C. Hamilton*¹, J. L. Harding², J. C. MacDonald¹, T. J. Klopfenstein², and A. K. Watson¹, ¹Department of Animal Science, University of Nebraska-Lincoln, ²University of Nebraska-Lincoln</td>
</tr>
<tr>
<td>11:45 AM</td>
<td>379</td>
<td>Effects of diet type and feeding phase on intake and feed efficiency of beef cattle.</td>
<td>C. Cassady*, T. L. Felix, and D. W. Shike, University of Illinois at Urbana-Champaign</td>
</tr>
</tbody>
</table>

**ANIMAL BEHAVIOR, HOUSING AND WELL-BEING SYMPOSIUM: PART II**

Chair: Jennifer A. Brown, Prairie Swine Centre

Sponsor: 302-303

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:30 PM</td>
<td>23</td>
<td>Opportunities for monitoring and improving animal welfare using precision dairy monitoring technologies.</td>
<td>J. M. Bewley*, University of Kentucky, Lexington</td>
</tr>
<tr>
<td>2:15 PM</td>
<td>24</td>
<td>Improving Welfare, Health and Productivity in Pigs by Optimizing Adaptation.</td>
<td>J. E. Bolhuis* and B. Kemp, Adaptation Physiology Group, Wageningen University, Wageningen, Netherlands</td>
</tr>
</tbody>
</table>
BREEDING AND GENETICS
Chair: Juan P. Steibel, Department of Animal Science, Michigan State University
Sponsor:
304-305

1:30 PM  25  Number born alive accuracy changes by including crossbred records when estimating Large White and Landrace breeding values from a large seedstock supplier.
D. L. Beam¹, J. W. Mabry², and K. J. Stalder¹, ¹Department of Animal Science, Iowa State University, Ames, ²Iowa State University, Ames

1:45 PM  26  Genome-wide association study (GWAS) for residual feed intake (RFI) and component traits of feed efficiency in pigs divergently selected for RFI.
N. V. Serão*¹,², E. D. Mauch³, S. K. Onteru¹, M. F. Rothschild², and J. C. M. Dekkers², ¹North Carolina State University, Raleigh, NC, ²Iowa State University, Ames, ³National Dairy Research Institute, Karnal, India

2:00 PM  27  Performance of Genomic Prediction using Haplotypes in New Zealand Dairy Cattle.
M. K. Hayr*¹, T. Druet², and D. J. Garrick¹, ¹Iowa State University, Ames, ²University of Liège, Liège, Belgium, ³Massey University, Palmerston North, New Zealand

2:15 PM  28  The use of alternative genomic metrics in swine nucleus herds to manage the diversity of purebred and crossbred animals.
J. T. Howard¹, F. Tiezzi¹, Y. Huang², K. A. Gray², and C. Maltecca¹, ¹North Carolina State University, Raleigh, ²Smithfield Premium Genetics, Rose Hill, NC

2:30 PM  29  Mitigating the effect of seasonality on sow reproductive performance using genetic selection.
M. R. Bryan*¹, C. Maltecca¹, K. A. Gray², Y. Huang², and F. Tiezzi¹, ¹North Carolina State University, Raleigh, ²Smithfield Premium Genetics, Rose Hill, NC

2:45 PM  30  Genome-wide association study for meat quality traits in an F2 Duroc x Pietrain population.
S. Casiro*¹, D. Velez-Irizarry¹, R. O. Bates¹, C. W. Ernst², and J. P. Steibel¹, ¹Department of Animal Science, Michigan State University, East Lansing, ²Genetics Program, Michigan State University, East Lansing
3:00 PM  31  Characterization of objective feet and leg joint measurements between selection and second gestation and between separate gestation ages in swine.
J. D. Stock*1, J. A. Calderón Díaz2, B. E. Mote3,4, and K. J. Stalder4, 1Department of Animal Science, Iowa State University, Ames, 2Iowa State University, Ames, 3University of Nebraska-Lincoln, 4Fast Genetics Inc., Saskatoon, SK, Canada

3:15 PM  32  QTL and candidate genes associated with heifer pregnancy rate and stayability in beef cattle.
M. Saatchi*1,2 and D. J. Garrick1,3, 1Iowa State University, Ames, 2American Simmental Association, Bozeman, MT, 3Massey University, Palmerston North, New Zealand

EXTENSION - DAIRY SYMPOSIUM
Chair: Jill L. Anderson, South Dakota State University
Sponsor: 306-307

1:30 PM  66  Midwest Dairy Processing Needs, Trends, and changes.
V. V. Mistry*, South Dakota State University, Brookings

2:00 PM  67  Organic pasture versus conventional dairying – is there a difference in sustainability.
B. J. Heins*, University of Minnesota West Central Research and Outreach Center, Morris, MN

2:30 PM  68  Field observations of automated dairy calf feeding systems in the upper Midwest.
N. B. Litherland* and A. M. Hoskins, Vita Plus Corporation, Madison, WI

3:00 PM  69  Key Factors Affecting Automated Milking System Performance.
J. A. Salfer*1 and M. I. Endres2, 1University of Minnesota, St. Cloud, 2University of Minnesota, Saint Paul

3:30 PM  70  (Young Scholar) Effects of milk replacer feeding regimen to the pre-ruminant calf on crude protein utilization, digestibility, and growth.
C. E. Chapman*, University of New Hampshire, Durham

4:00 PM  71  (Young Scholar) Potential Body Site Reservoirs for Coagulase Negative Staphylococcal Intramammary Infection in Heifers.
P. R. F. Adkins* and J. R. Middleton, University of Missouri, Columbia

4:30 PM  72  (Young Scholar) Strategies for Programming the Lactation.
A. J. Carpenter*, Department of Animal Sciences and Industry, Kansas State University, Manhattan
GROWTH, DEVELOPMENT, MUSCLE BIOLOGY AND MEAT SCIENCE

Chair: Chad A. Stahl, F.A.C.T.S.
Sponsor:
318-319


1:45 PM 128 Moringa oleifera as an alternative protein source to soybean meal in pig production. A. Ruckli and G. Bee, Institute for Livestock Sciences, Posieux, Switzerland, Agroscope Institute for Livestock Sciences, Posieux, Switzerland


2:15 PM 130 Carcass length is a poor predictor of the number of boneless chops from a pork loin. K. B. Wilson, M. F. Overholt, E. K. Hogan, C. M. Shull, A. C. Dilger, and D. D. Boler, University of Illinois at Urbana-Champaign, The Maschhoffs, LLC, Carlyle, IL


3:00 PM 133 Low fat ground beef patties have increased oxidation compared with high fat ground beef patties. 
D. R. Reynolds¹, J. V. Cooper¹, B. R. Wiegand¹, Z. D. Callahan², A. B. Koc³, L. Schumacher¹, L. Fernando¹, and C. L. Lorenzen¹, ¹University of Missouri, Columbia, ²Division of Animal Sciences, University of Missouri, Columbia, ³Clemson University, Clemson

3:15 PM 134 Comparison of new and modern lighting technologies on ground beef color. 
J. V. Cooper¹, D. R. Reynolds¹, B. R. Wiegand¹, Z. D. Callahan², A. B. Koc³, L. Schumacher¹, and C. L. Lorenzen¹, ¹University of Missouri, Columbia, ²Division of Animal Sciences, University of Missouri, Columbia, ³Clemson University, Clemson

3:30 PM 135 Grass fed or DFD?.
A. Apaoblaza¹, S. K. Matarneh², E. M. England², T. L. Scheffler³, S. K. Duckett¹, and D. E. Gerrard¹, ¹Virginia Polytechnic Institute and State University, Blacksburg, ²The Ohio State University, Columbus, ³University of Florida, Gainesville, ⁴Clemson University, Clemson

3:45 PM 136 Autophagy Induction in the Pig Follicular Stage Ovary during Heat Stress.

NONRUMINANT NUTRITION: FEED ADDITIVES

Chair: Huyen Tran; Tofuko Awori Woyengo, University of Nebraska; University of Alberta
Sponsor: 314-315

1:30 PM 151 Evaluation of copper source addition in the grow-finish phase. 
L. Greiner¹, A. Graham², B. Knopf², R. J. Harrell², and J. Connor³, ¹Carthage Innovative Swine Solutions, LLC, Carthage, IL, ²Professional Swine Management, Carthage, IL, ³Carthage Veterinary Service, Ltd, Carthage, IL

1:45 PM 152 Effects of Lactobacillus acidophilus fermentation product supplementation in different nutrient density diets on growth performance, nutrient digestibility, fecal microbiota and fecal noxious gas emissions in weanling pigs. 
R. X. Lan¹, J. M. Koo², S. I. Lee¹, and I. H. Kim¹, ¹Department of Animal Resource & Science, Dankook University, Cheonan, South Korea, ²Shinhan BioChem Co., Hwaseong, South Korea
Inclusion of a hydrolyzed yeast product in grow/finish pig diets reduced mortality.
C. L. Levesque*, S. Jalukar, N. Gutierrez, and J. F. Patience,
1South Dakota State University, Brookings, 2Arm and Hammer Animal Nutrition, Mason City, IA, 3Iowa State University, Ames

The effects of feeding narasin or virginiamycin on growth and harvest performance of pigs during the grow-finish period.
R. A. Arentson* and J. J. Chewning, 1Elanco, Greenfield, IN, 2Swine Research Services, Inc., Springfield, AR

Growth Performance and Serum IgA Concentrations in Weanling Pigs Fed Dietary Prebiotics.
Y. S. Li*, M. D. Trenhaile, M. M. Lima, K. C. Moore, D. M. van Sambeek, T. E. Burkey, and P. S. Miller, 1University of Nebraska-Lincoln, 2Department of Animal Science, São Paulo State University, Jaboticabal/SP, Brazil

Effects of modified yeast cell wall extract on growth performance and health status of pigs fed diets with low level mycotoxins.
I. Park*, J. Guo, and S. W. Kim, North Carolina State University, Raleigh

Effects of dietary Cu, Zn, and ractopamine-HCl on finishing pig growth performance, carcass characteristics, and antimicrobial susceptibility of enteric bacteria.
J. A. Feldpausch*, R. Amachawadi, M. D. Tokach, H. M. Scott, S. S. Dritz, T. G. Nagaraja, R. D. Goodband, J. C. Woodworth, and J. M. DeRouchey, 1Kansas State University, Manhattan, 2Texas A&M University, College Station

Lactobacillus acidophilus fermentation product modulates inflammatory activity by regulating the TLR4 and NFkB expression in porcine peripheral blood mononuclear cells after lipopolysaccharide challenge.
S. I. Lee*, J. M. Koo, R. X. Lan, and I. H. Kim, 1Department of Animal Resource & Science, Dankook University, Cheonan, South Korea, 2Shinhan BioChem Co., Hwaseong, South Korea

Effects of copper source and level on growth performance and bone mineralization in pigs fed phytase-supplemented diets.
3:45 PM 160 The effect of feeding a phytogenic (Ambitine™FT) with and without added copper on late finishing pig performance.
S. A. Crowder*, T. L. Weeden¹, M. B. Lachmann Sevilla¹, B. De Rodas¹, and T. P. Karnezos², ¹Purina Animal Nutrition LLC, Shoreview, MN, ²PMI Nutritional Additives, Shoreview, MN

4:00 PM 161 Effects of Fiber, a Direct-Fed Microbial, and Feeding Duration on Ileal and Total Tract Digestibility of Energy and Nutrients by Pigs.
N. W. Jaworski*¹, M. C. Walsh¹, and H. H. Stein¹, ¹University of Illinois at Urbana-Champaign, ²Danisco Animal Nutrition, DuPont Industrial Biosciences, Marlborough, UK, United Kingdom

4:15 PM 162 Improved growth performance of nursery pigs fed diets supplemented with a Bacillus subtilis-based direct-fed microbial feed additive.
N. R. Augspurger*¹, J. D. Spencer¹, S. Son¹, J. A. Ley¹, and M. R. King², ¹JBS United, Inc., Sheridan, IN, ²Microbial Discovery Group, Franklin, WI

4:30 PM 265 (Young Scholar) Evaluating the impact of maternal dietary vitamin D supplementation on sow performance, serum 25OHD3, and subsequent pig performance.
J. R. Flohr*¹, J. R. Bergstrom⁴, J. C. Woodworth⁴, M. D. Tokach¹, J. M. DeRouchey¹, S. S. Dritz¹, and R. D. Goodband¹, ¹Kansas State University, Manhattan, ²DSM Nutritional Products, Parsippany, NJ

NONRUMINANT NUTRITION: FEED MANUFACTURING
Chair: Omarh F Mendoza, The Maschhoffs
Sponsor: 316-317

1:30 PM 163 Utilizing feed sequencing to decrease the risk of porcine epidemic diarrhea virus (PEDV) cross-contamination during feed manufacturing.
L. L. Schumacher*¹, R. A. Cochrane¹, J. C. Woodworth¹, A. R. Huss¹, C. R. Stark¹, C. K. Jones¹, Q. Chen³, R. Main², J. Zhang², P. C. Gauger², S. S. Dritz¹, and M. D. Tokach¹, ¹Kansas State University, Manhattan, ²Iowa State University, Ames

1:45 PM 164 Evaluating the effect of manufacturing porcine epidemic diarrhea virus (PEDV)-contaminated feed on subsequent feed mill environmental surface contamination.
L. L. Schumacher*¹, R. A. Cochrane¹, C. E. Evans¹, J. R. Kalivoda¹, J. C. Woodworth¹, A. R. Huss¹, C. R. Stark¹, C. K. Jones¹, Q. Chen³, R. Main², J. Zhang², P. C. Gauger², S. S. Dritz¹, and M. D. Tokach¹, ¹Kansas State University, Manhattan, ²Iowa State University, Ames
To determine if hand held near infrared spectroscopy can be used to measure corn particle size, corn particle distribution and corn moisture.

A. Criado*¹, C. Piotrowski³, P. Wilcock², C. L. Bradley², B. Haberl¹, and B. C. Smith¹, ¹Aunir, Towcester, United Kingdom, ²AB Vista Feed Ingredients, Marlborough, United Kingdom, ³Iowa Select Farms, Iowa Falls

(Young Scholars) Effects of feed truck unloading and swine barn feed line location on pellet quality and nutrient segregation.

J. A. De Jong¹, J. M. DeRouchey¹, M. D. Tokach¹, R. D. Goodband³, J. C. Woodworth¹, C. K. Jones¹, C. R. Stark¹, H. E. Williams*¹, L. McKinney², G. Smith², and B. Haberl³, ¹Kansas State University, Manhattan, ²DFS, Newell, IA, ³Iowa Select Farms, Iowa Falls

Effect of ground corn fractionation on flowability.

J. R. Kalivoda*, C. K. Jones, and C. R. Stark, Kansas State University, Manhattan

The evaluation of liquid disinfectants to reduce Salmonella contamination on animal food manufacturing surfaces.

M. B. Muckey*, A. R. Huss, and C. K. Jones, Kansas State University, Manhattan

REPRODUCTIVE PHYSIOLOGY

Chair: Patrick J. Gunn, Department of Animal Science, Iowa State University
Sponsor:

(Young Scholar) The Effects of the Nitric Oxide (NO) System and Nutritional Plane on Ovarian Function in Sheep.

C. Bass*, D. A. Redmer, and A. T. Grazul, North Dakota State University, Fargo

Rapid fluctuations in ambient temperature before conception reduce fetal viability in replacement gilts.

J. S. Johnson*, K. L. Martin², and K. R. Stewart², ¹USDA-ARS Livestock Behavior Research Unit, West Lafayette, IN, ²Purdue University, West Lafayette, IN
2:15 PM  327  Gonadotropin-releasing hormone II receptor (GnRHR-II) knockdown reduces testis size and decreases testosterone secretion during pubertal development in swine.
A. T. Desaulniers¹, R. A. Cederberg¹, G. A. Mills¹, C. A. Lents², and B. R. White¹, ¹University of Nebraska-Lincoln, ²USDA, ARS, U.S. Meat Animal Research Center; Clay Center, NE

2:30 PM  328  Physiological characteristics of late puberty gilts administered P.G. 600.
E. B. Kennedy³, M. T. Knauer; and W. L. Flowers, North Carolina State University, Raleigh

2:45 PM  329  Effects of feeding melatonin during proestrus and early gestation in gilts and P1 sows to minimize the effects of seasonal infertility.
L. Arend¹, R. V. Knox¹, L. Greiner², A. Graham², and J. Connor³, ¹University of Illinois at Urbana-Champaign, ²Carthage Innovative Swine Solutions, LLC, Carthage, IL, ³Carthage Veterinary Service, Ltd, Carthage, IL

3:00 PM  330  (Young Scholar) Effect of Inducing High or Low Progesterone Concentrations During Ovulatory Follicle Development on Double Ovulation and Fertility of Lactating Dairy Cows.
J. P. N. Martins¹, D. Wang¹², N. Mu¹², A. P. Martini¹³, G. F. Rossi¹⁴, V. R. Martins¹, and J. R. Pursley¹, ¹Department of Animal Science, Michigan State University, East Lansing, MI, ²Shuozhou Vocational and Technical College, Shuozhou City, China, ³Universidade Federal de Santa Maria, Santa Maria, Brazil, ⁴FCAV-UNESP, Jaboticabal, Brazil

3:30 PM  331  Reproducibility of Heat Stress Susceptibility and Future Reproductive Success During Heat Stress in Pigs.
J. T. Seibert¹, K. L. Graves, T. Johnson, A. F. Keating, L. H. Baumgard, and J. W. Ross, Iowa State University, Ames

3:45 PM  332  Use of an Electronic Activity Detection System to Characterize Estrus Activity in Crossbred Beef Heifers Differing in Follicle Number.
R. A. Cushman¹, S. C. Tenley², M. Soares³, A. K. McNeel¹, R. S. Gomes², R. G. Tait, Jr.¹, A. S. Cupp², L. A. Kuehn¹, W. M. Snelling², R. M. Thallman¹, G. A. Perry³, and C. C. Chase, Jr.¹, ¹USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE, ²University of Nebraska-Lincoln, ³Federal University of Santa Maria, Santa Maria, Brazil, ⁴USDA, ARS, US MARC, Clay Center, NE, ³Department of Animal Science, South Dakota State University, Brookings
4:00 PM  333  Influence of Vaccination with an Inactivated or Modified Live Viral Reproductive Vaccine on Reproductive Parameters in Beef Cows.
G. A. Perry¹, E. L. Larimore¹, M. R. Crosswhite², B. W. Neville³, V. Cortese⁴, R. F. Daly⁵, G. L. Stokka², J. C. Rodgers⁴, J. T. Seeger⁴, and C. R. Dahlen⁵, ¹Department of Animal Science, South Dakota State University, Brookings, ²Department of Animal Sciences, North Dakota State University, Fargo, ³Central Grasslands REC, North Dakota State University, Streeter, ⁴Beef Veterinary Technical Services, Zoetis, Florham Park, NJ, ⁵Department of Veterinary and Biomedical Sciences, South Dakota State University, Brookings


4:30 PM  335  (Young Scholar) Divergent VEGFA signaling determines spermatogonial stem cell fate.

Ruminant Nutrition
Chair: Kristen E. Hales, USDA - ARS
Sponsor: 308-309

1:30 PM  354  A Pragmatic Challenge of Total Mixed Ration: Time to Contemplate Component Feeding.
A. Nikkhah*, University of Zanjan, Zanjan, Iran

1:45 PM  355  Effects of wintering system on cow and calf performance in a summer-calving intensive production system.
S. E. Gardine*, J. M. Warner¹, C. J. Bittner¹, R. G. Bondurant¹, K. H. Jenkins², R. J. Rasby¹, M. K. Luebbe³, G. E. Erickson¹, and T. J. Klopfenstein¹, ¹University of Nebraska-Lincoln, ²University of Nebraska, Scottsbluff, ³Department of Animal Science, University of Nebraska-Lincoln

2:00 PM  356  Feeding microbially-enhanced soy protein in starter pellets to dairy calves.
N. D. Senevirathne*, J. L. Anderson, and W. R. Gibbons, South Dakota State University, Brookings
<table>
<thead>
<tr>
<th>Time</th>
<th>Session Number</th>
<th>Title</th>
<th>Authors</th>
</tr>
</thead>
<tbody>
<tr>
<td>2:15 PM</td>
<td>357</td>
<td>Seasonal effects and husbandry practices on fat-soluble vitamin status of beef and dairy cows and their offspring.</td>
<td>M. R. O'Neil1*, D. C. Beitz1, and R. L. Stuart2, 1Iowa State University, Ames, 2Stuart Products Inc, Bedford, TX</td>
</tr>
<tr>
<td>2:30 PM</td>
<td>358</td>
<td>Effect of supplementing methionine hydroxy analog on beef cow performance, milk production and reproduction.</td>
<td>A. R. Clements*, F. A. Ireland, and D. W. Shike, University of Illinois at Urbana-Champaign</td>
</tr>
<tr>
<td>2:45 PM</td>
<td>359</td>
<td>Effect of delayed wrapping and wrapping source on intake and digestibility of alfalfa silage in sheep.</td>
<td>V. Niyigena1*, K. P. Coffey2, W. K. Coblenz2, D. Philipp2, A. N. Young1, R. T. Rhein1, and J. K. Clark1, 1Department of Animal Science, University of Arkansas Division of Agriculture, Fayetteville, 2University of Arkansas, Division of Agriculture, Fayetteville, 3US Dairy Forage Research Center, Marshfield, WI</td>
</tr>
<tr>
<td>3:00 PM</td>
<td>360</td>
<td>Effect of winter distillers grains supplementation level on spayed heifer performance.</td>
<td>R. G. Bondurant*, B. L. Nuttelman, C. J. Bittner, J. C. MacDonald, and T. J. Klopfenstein, University of Nebraska-Lincoln</td>
</tr>
<tr>
<td>3:15 PM</td>
<td>361</td>
<td>Effect of Increasing Protein and Fat Inclusion in the Diet of Beef Cows During Gestation and Lactation on Performance, Milk Production, Pregnancy Rate, and Pre-Weaning Progeny Growth.</td>
<td>A. J. C. Nuñez*, R. P. Lemenager, K. R. Stewart, E. G. Taylor, and J. P. Schoonmaker, Purdue University, West Lafayette, IN</td>
</tr>
<tr>
<td>3:30 PM</td>
<td>362</td>
<td>Effects of enzymatically hydrolyzed yeast supplementation and supplementation frequency on nitrogen balance and apparent diet digestibility in periparturient beef cows.</td>
<td>J. E. Swartz1*, D. W. Brake1, E. E. Grings1, E. A. Nelson1, C. L. Wright1, J. A. Walker1, E. J. Blom1, and G. A. Perry2, 1South Dakota State University, Brookings, 2Department of Animal Science, South Dakota State University, Brookings</td>
</tr>
<tr>
<td>3:45 PM</td>
<td>363</td>
<td>Evaluation of rumen bacterial composition in Holstein and Jersey cows under similar dietary conditions using different sampling methods.</td>
<td>H. A. Paz Manzano*, P. J. Kononoff, and S. C. Fernando, University of Nebraska-Lincoln</td>
</tr>
</tbody>
</table>
4:00 PM 364 The influence of grain source and dried corn distiller’s grains plus solubles oil concentration on finishing cattle performance and feeding behavior.

4:15 PM 337 Evaluation of the relative contribution of protein in distillers grains in finishing diets on performance and carcass characteristics.
Z. E. Carlson*, G. E. Erickson, J. C. MacDonald, and M. K. Luebbe, University of Nebraska-Lincoln, University of Nebraska, Scottsbluff

4:30 PM 365 (Young Scholar) Impact of nutrition on the ruminal microbiome and epithelial tissue.
J. C. McCann*, F. C. Cardoso, E. Khafipour, D. W. Shike, and J. J. Loor, Texas A&M University, College Station, University of Illinois at Urbana-Champaign, Department of Medical Microbiology and Infectious Diseases, Winnipeg, MB, Canada

Ruminant Nutrition Symposium
Chair: Phil Cardoso, University of Illinois at Urbana-Champaign
Sponsor: 312-313

1:30 PM Welcoming Remarks.

1:35 PM 391 Veterinary Feed Directive (VFD) and its Practical Considerations for the Beef Industry.

2:20 PM 392 Gut Bacterial Communities and Their Association with Production Parameters in Beef Cattle.

3:05 PM 393 Alternatives to Antibiotics.
J. P. Schoonmaker*, Purdue University, West Lafayette, IN
NONRUMINANT NUTRITION: SOW/BOAR
Chair: Luis Ochoa, Carthage Innovative Swine Solutions, LLC
Sponsor:
316-317

3:15 PM  260  (Young Scholar) Insights into Nutrient Inputs that Affect the Initiation of Bone Lesions in Pigs.
L. A. Amundson*, University of Wisconsin-Madison

3:45 PM  261  The evaluation of increasing lysine or feed amounts in late gestation on piglet birth weights.
L. Greiner1, A. Graham1, K. J. Touchette2, and C. R. Neill3, 1Carthage Innovative Swine Solutions, LLC, Carthage, IL, 2Ajinomoto Heartland, Inc., Chicago, IL, 3Genus PIC, Hendersonville, TN

4:00 PM  262  Effect of natural betaine on estimates of semen quality in mature AI boars during summer heat stress.
F. A. Cabezon1, K. R. Stewart1, A. P. Schinckel1, B. Barnes2, R. D. Boyd3, P. Wilcock4, and J. Woodliff5, 1Purdue University, West Lafayette, IN, 2The Hanor Company Inc, Franklin, KY, 3The Hanor Company, Franklin, KY, 4AB Vista, Plantation, FL

4:15 PM  263  Effect of betaine supplementation during summer on sow lactation performance and subsequent farrowing performance.
F. A. Cabezon1, A. P. Schinckel1, B. T. Richert1, K. R. Stewart1, M. Gandarillas2, and W. A. Peralta3, 1Purdue University, West Lafayette, IN, 2Universidad Austral de Chile, Valdivia, Chile, 3Agrícola Super Ltda, Rancagua, Chile

4:30 PM  264  Effect of altered lysine : energy ratio during gestation on wean pig growth performance.
A. Ampaire* and C. L. Levesque, South Dakota State University, Brookings

4:45 PM  266  Development of precision gestation feeding program using electronic sow feeders and effects on gilt performance.
R. Q. Buis4, D. Wey1, and C. F. M. de Lange2, 1Department of Animal Biosciences, University of Guelph, ON, Canada, 2University of Guelph, ON, Canada
SYMPOSIA AND ORAL SESSIONS
WEDNESDAY, MARCH 16, 2016

ANIMAL BEHAVIOR, HOUSING AND WELL-BEING

Chair: Jennifer A. Brown, Prairie Swine Centre
Sponsor: 312-313

8:30 AM  14  The effect of temperament on pork quality.

8:45 AM  15  Development of equations to predict the influence of floor space on ADG, ADFI, and G:F of finishing pigs.
J. R. Flohr*, J. C. Woodworth, M. D. Tokach, S. S. Dritz, J. M. DeRouchey, and R. D. Goodband, Kansas State University, Manhattan

9:00 AM  16  Evaluating the effects of floor space allowance and pig removal from a group on the growth of finishing pigs.

9:15 AM  17  Effect of lameness on hock angles of replacement gilts.
J. M. Mumm*, K. J. Stalder, J. D. Stock, and J. A. Calderon Diaz, Department of Animal Science, Iowa State University, Ames

9:30 AM  18  Break.

9:45 AM  18  Understanding tail biters and victimized pigs during outbreaks of tail biting.
Y. Li*, J. Anderson*, A. Holten*, A. M. Hilbrands*, J. Holen*, and L. J. Johnston*, 1West Central Research and Outreach Center, University of Minnesota-Morris, 2University of Minnesota-Morris

10:00 AM  19  An assessment of swine marketed through buying stations and development of fitness for transport guidelines.
M. McGee*, A. K. Johnson*, A. M. O’Connor*, K. R. Tapper*†‡, and S. T. Millman†‡, 1Department of Veterinary Diagnostic & Production Animal Medicine, Iowa State University, Ames, 2Iowa State University, Ames, 3Department of Biomedical Science, Iowa State University, Ames
10:15 AM  20  Aversion to CO2 gas in pigs using approach-avoidance and condition place avoidance paradigms.

10:30 AM  21  (Young Scholar) Divergent selection for residual feed intake alters pig behavioral reactivity to novel stimuli tests.
J. D. Colpoys, N. K. Gabler, S. T. Millman, and A. K. Johnson, Truman State University, Kirksville, MO, Iowa State University, Ames

11:00 AM  22  Effects of Transdermal Flunixin Meglumine on Pain Biomarkers at Dehorning.
M. D. Kleinhenz, N. Van Engen, P. J. Gorden, and J. F. Coetzee, Veterinary Diagnostic and Production Animal Medicine, Iowa State University, Ames, Pharmacology Analytical Support Team, Iowa State University College of Veterinary Medicine, Ames

EQUINE WELFARE SYMPOSIUM
Chair: Peggy A. Miller, Iowa State University
Sponsor: 304-305

8:30 AM  Welcoming Remarks.

8:45 AM  52  Equine welfare in a competitive setting...what can 10+ years of research by the Equitation Science community tell us? (And what critical pieces are still missing?).
C. R. Heleski, Michigan State University, East Lansing

9:30 AM  Break.

9:40 AM  53  Equine welfare in a competitive setting: the human role.
K. L. Waite, Ph. D.*, Michigan State University, East Lansing

10:25 AM  54  Perceptions of Equine Well-being in South Dakota.
H. K. Carroll, R. C. Bott, S. L. Mastellar, L. R. McNeill, and G. D. Djira, South Dakota State University, Brookings

10:40 AM  Break.

10:50 AM  Discussion.

11:20 AM  Concluding Remarks.
### SYMPOSIA AND ORAL SESSIONS / WEDNESDAY, MARCH 16, 2016

**EXTENSION - SWINE**

**Chair:** R. D. Goodband, Kansas State University  
**Sponsor:** 314-315

<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
</tr>
</thead>
</table>
| 8:30 AM  | 74      | Birth weight threshold for identifying piglets at-risk for pre-weaning mortality.  
| 8:45 AM  | 73      | Impact of piglet birth weight increase on survivability and days to market, a simulation model.  
**J. Jourquin**, J. Morales, C. D. Bokenkroger, 1 Elanco, Antwerpen, Belgium, 2 PigCHAMP Pro Europa, Segovia, Spain, 3 Elanco Animal Health, Greenfield, IN |
| 9:00 AM  | 75      | Early predictors of puberty in gilts.  
**G. M. See** and M. T. Knauer, North Carolina State University, Raleigh |
| 9:15 AM  | 76      | Using boar feeding patterns and classification trees to predict performance.  
**C. E. Abell**, A. Prochaska, M. Anderson, and T. Rathje, DNA Genetics, Columbus, NE |
| 9:30 AM  | 77      | Enterobacteriaceae counts from livestock truck wash stations offering different service levels located in Iowa.  
**A. M. Danielson**, S. Azarpajouh, R. B. Baker, C. J. Rademacher, J. S. Dickson, A. K. Johnson, L. A. Karriker, T. T. Bigelow, and K. J. Stalder, 1 Department of Animal Science, Iowa State University, Ames, 2 Department of Vet Diagnostic and Production Animal Medicine, Iowa State University, Ames, 3 Swine Medicine Education Center, Department of Vet Diagnostic & Production Animal Medicine, Ames, IA, 4 Iowa State University, Ames, 5 USDA,APHIS, Des Moines, IA |
| 9:45 AM  | 78      | Probabilities of Producing Feed Under Nutrient Threshold.  
**L. Fabà**, D. Solà-Oriol, L. Blavi, M. Farré, and J. Gasa, 1 Animal Nutrition and Welfare Service, Department of Animal and Food Science, Universitat Autònoma de Barcelona, Bellaterra (08193), Spain, 2 Animal Nutrition and Welfare Service, Department of Animal and Food Sciences, Universitat Autònoma de Barcelona, Bellaterra (08193), Spain, 3 Department of Mathematics, Universitat Autònoma de Barcelona, Bellaterra (08193), Spain. **Bellaterra (08193), Spain** |
10:00 AM  79  Identification of the range of hock angles in replacement gilts.  
J. M. Mumm*1, K. J. Stalder1, J. D. Stock1, J. C. M. Dekkers2, and J. A. Calderon Diaz3, 1Department of Animal Science, Iowa State University, Ames, 2Iowa State University, Ames

EXTENSION – BEEF/SMALL RUMINANT  
Chair: J. E. Held, South Dakota State University  
Sponsor: 318-319

8:30 AM  164  Evaluation of distillers grains components singly or in combination for finishing calf feds.  
R. A. Oglesbee*1, C. J. Bittner1, F. H. Hilscher1, G. E. Erickson1, J. C. MacDonald1, and M. K. Luebbe3, 1University of Nebraska-Lincoln, 2University of Nebraska, Scottsbluff

8:45 AM  162  Determination of climatologically suitable places in Midwest for feedlot cattle production by using the comprehensive climate index model.  
H. Koknaroglu*1, J. A. Harrington Jr2, and T. L. Mader3, 1Suleyman Demirel University, Isparta, Turkey, 2Kansas State University, Manhattan, 3Mader Consulting, LLC, Gretna, NE

9:00 AM  163  Breed and gender interact to affect the sale price of beef calves sold through video auctions from 2010 through 2014.  
E. D. McCabe*1, M. E. King1, K. E. Fike1, K. L. Hill2, G. M. Rogers3, and K. G. Odde1, 1Kansas State University, Manhattan, 2Merck Animal Health, Kaysville, UT, 3Grassy Ridge Consulting, Aledo, TX

9:15 AM  61  Perceptions of crop consultants and producers in Nebraska on grazing corn residue.  
J. L. Cox*1, K. M. Ulmer1, M. Rakkar2, L. Franzen-Castle3, H. Blanco-Canqui2, M. E. Drewnoski1, J. C. MacDonald1, and R. J. Rasby1, 1Department of Animal Science, University of Nebraska-Lincoln, 2Department of Agronomy and Horticulture, University of Nebraska-Lincoln, 3Department of Nutrition and Health Sciences, University of Nebraska-Lincoln
NONRUMINANT NUTRITION: GROW/FINISH II

Chair: William T. Oliver; Ferdinando N Almeida, USDA, ARS, U.S. Meat Animal Research Center; Novus International, Inc.

Sponsor:
306-307

8:30 AM  231  Superdosing phytase fed to mature boars improves semen concentration and reproductive efficiency.
K. R. Stewart¹, C. L. Bradley¹,², P. Wilcock³, F. Domingues⁴, M. Kleve-Feld⁵, and J. Hundley⁶. ¹Purdue University, West Lafayette, IN, ²AB Vista Feed Ingredients, Marlborough, United Kingdom, ³PIC North America, Hendersonville, TN, ⁴PIC Deutschland GmbH, Hannover, Germany, ⁵Birchwood Genetics, West Manchester, OH

8:45 AM  232  Xylanase effects on apparent total tract digestibility of energy and dry matter with or without DDGS at 46, 54 and 70 kg bodyweight.
S. Weiland* and J. F. Patience, Iowa State University, Ames

9:00 AM  229  Amino Acid Digestibility in Six Sources of Meat and Bone Meal fed to Growing Pigs.
D. M. D. L. Navarro*, N. W. Jaworski, and H. H. Stein, University of Illinois at Urbana-Champaign

9:15 AM  234  Effects of exogenous xylanase on digestibility of dry matter, organic matter, neutral detergent fiber, and energy and the concentrations of digestible and metabolizable energy in rice co-products fed to weanling pigs.
G. A. Casas*¹,² and H. H. Stein². ¹Universidad Nacional de Colombia, Bogota, Colombia, ²University of Illinois at Urbana-Champaign

9:30 AM  235  Xylanase solubilization of corn and wheat arabinoxylans in mixed growing pig diets subjected to upper gut in-vitro digestion and in ileal digesta.
M. C. Walsh*¹, E. Kiarie², L. Romero³, and S. Arent⁴. ¹Danisco Animal Nutrition, DuPont Industrial Biosciences, Marlborough, UK, United Kingdom, ²Department of animal biosciences, University of Guelph, Guelph, ON, Canada, ³Dupont Industrial biosciences - Danisco animal nutrition, Marlborough, United Kingdom, ⁴Dupont, Industrial Biosciences, Brabrand, Denmark

9:45 AM  236  Evaluating the efficacy of a novel phytase source.
J. R. Flohr*, J. M. DeRouchey, M. D. Tokach, S. S. Dritz, J. C. Woodworth, and R. D. Goodband, Kansas State University, Manhattan
10:00 AM 237  Effect of combined xylanase and phytase supplementation on growth performance, carcass characteristics, and apparent total tract digestibility in pigs fed corn-based diets containing multiple by-products.
Y. D. Jang*1, P. Wilcock2, R. D. Boyd3, and M. D. Lindemann1,
1University of Kentucky, Lexington, KY, 2AB Vista Feed Ingredients, Marlborough, United Kingdom, 3The Hanor Company, Inc., Franklin, KY

10:15 AM 238  Impact of super-dosing phytase in diets fed to 40 kg, 60 kg and 80 kg pigs on phytate catabolism.
C. L. Holloway*1, R. D. Boyd2, C. L. Walk3, and J. F. Patience1,
1Iowa State University, Ames, 2The Hanor Company, Franklin, KY, 3AB Vista, Marlborough, United Kingdom

10:30 AM 239  Impact on growth performance and carcass characteristics of “super-dosing” phytase in growing pig diets.
C. L. Holloway*1, R. D. Boyd2, C. E. Zier-Rush2, C. L. Walk3, and J. F. Patience1, 1Iowa State University, Ames, 2The Hanor Company, Inc., Franklin, KY, 3AB Vista, Marlborough, United Kingdom

10:45 AM 240  The effect of microbial phytase on the apparent and standardized total tract digestibility of calcium in feed ingredients of animal origin.
L. A. Merriman*1, C. L. Walk2, and H. H. Stein1, 1University of Illinois at Urbana-Champaign, 2AB Vista, Marlborough, United Kingdom

11:00 AM 241  Stability of commercial phytase products stored under different environmental conditions.
J. A. De Jong*1, J. M. DeRouchey1, M. D. Tokach1, R. D. Goodband1, J. C. Woodworth1, C. K. Jones1, C. R. Stark1, C. L. Bradley2, J. A. Loughmiller3, and J. R. Bergstrom1, 1Kansas State University, Manhattan, 2AB Vista Feed Ingredients, Marlborough, United Kingdom, 3Maverick Nutrition, Fairmont, MN, 4DSM Nutritional Products, Parsippany, NJ

11:15 AM 242  Effect of a dry acidulant coating on the palatability of dry extruded dog food.
A. M. Jeffrey*1, G. C. Aldrich1, A. R. Huss1, C. J. Knueven2, and C. K. Jones1, 1Kansas State University, Manhattan, 2Jones-Hamilton Co., Walbridge, OH

11:30 AM 243  Effects of a novel phytase on growth performance and metacarpal bone ash in weanling pigs.
Y. Liu*1, J. C. González-Vega1, M. Vázquez-Añón2, J. Zhao2, J. Escobar2, F. N. Almeida2, and H. H. Stein1, 1University of Illinois at Urbana-Champaign, 2Novus International, Inc., St. Charles, MO
11:45 AM 244  The feed enzyme xylanase improves finish pig viability and carcass feed efficiency.
C. E. Zier-Rush¹, C. Groom¹, M. Tillman¹, J. Remus², and R. D. Boyd¹*
¹The Hanor Company, Inc., Franklin, KY, ²Danisco Animal Nutrition, Spicer, MN

12:00 PM 245  Xylanase Responses on Apparent Ileal Digestibility of Nutrients, Fibre and Energy in Growing Pigs Fed Corn, 30% Corn Co-Products and Soybean Meal Based Diets as Influenced by Microbial Phytase and Acclimatization Period.
E. Kiarie¹, Y. Liu², M. C. Walsh¹, H. H. Stein², and L. Payling²*
¹Danisco Animal Nutrition, DuPont Industrial Biosciences, Marlborough, UK, United Kingdom, ²University of Illinois at Urbana-Champaign

NONRUMINANT NUTRITION: NURSERY PIGS
Chair: Crystal L. Levesque; Ryan S. Samuel, South Dakota State University; Alltech Inc.
Sponsor: 308-309

8:30 AM 246  Sources and routes of administration of copper and vitamins A and D on metabolic status of these micronutrients in suckling piglets.
J. J. Matte¹*, I. Audet¹, B. Ouattara¹, N. Bissonnette¹, G. Talbot¹, J. Lapointe¹, F. Guay², L. Lo Verso², and M. Lessard³,
¹Agriculture and Agri-Food Canada, Sherbrooke, QC, Canada, ²Universite Laval, Quebec City, QC, Canada

8:45 AM 247  Effect of Feeding Protease at Two Soybean Meal Inclusion Rates for Nursery Pigs.
L. Greiner¹*, A. Graham¹, B. Knopf¹, L. Ochoa¹*, R. J. Harrell², and Y. Ma³,
¹Carthage Innovative Swine Solutions, LLC, Carthage, IL, ²Professional Swine Management, Carthage, IL, ³Novus International Inc., St. Charles, MO

9:00 AM 248  Sodium buffered formic acid improves sow and piglet performance when fed during lactation and the nursery periods.
J. A. Jendza¹*, X. Yang², H. Y. Chen¹, A. Tekeste², and S. K. Baidoo³,
¹BASF Corp., Florham Park, NJ, ²Southern Research and Outreach Center, University of Minnesota, Waseca, ³BASF SE, Lampertheim, Germany
9:15 AM 249  High lactose pellets fed from 4 days of age convey lifetime benefits when compared to a standard pre-weaning diet.  
P. Toplis*, I. J. Wellock1, A. Stewart1, M. Bailey4, and L. Salmon5, 1AB Neo, Peterborough, United Kingdom, 2Primary Diets, Melmerby, United Kingdom, 3Harper Adams University, Newport, United Kingdom, 4Bristol Veterinary School, Bristol, United Kingdom, 5Premier Nutrition, Rugeley, United Kingdom

9:30 AM 250  Evaluation of bovine plasma in early nursery pig diets.  
L. Greiner1, A. Graham1*, B. Knopf1, R. J. Harrel2, and J. Connor3, 1Carthage Innovative Swine Solutions, LLC, Carthage, IL, 2Professional Swine Management, Carthage, IL, 3Carthage Veterinary Service, Ltd, Carthage, IL

9:45 AM 251  Effect of a Lactobacillus acidophilus fermentation product and dietary antibiotics, alone or in combination, on nursery pig performance and frequency of medical treatment.  
J. Acosta*, J. W. Frank2, and J. F. Patience1, 1Iowa State University, Ames, 2Diamond V, Cedar Rapids, IA

10:00 AM 252  Oral Salmonella challenge alters feed preference in nursery pigs.  
N. C. Burdick Sanchez*, J. A. Carroll1, P. R. Broadway3, K. M. Yeater2, B. De Rodas3, D. Brown4, and S. D. Lawhon5, 1USDA-ARS, Livestock Issues Research Unit, Lubbock, TX, 2USDA-ARS Plains Area, Fort Collins, CO, 3Land O’Lakes, Gray Summit, MO, 4Purina Animal Nutrition Center, Gray Summit, MO, 5Department of Veterinary Pathobiology, Texas A&M University, College Station

10:15 AM 253  Digestibility of energy and lipids, and metabolic oxidation status in nursery pigs fed various lipids.  
S. C. Lindblom*, G. C. Shurson2, W. A. Dozier3, and B. J. Kerr4, 1Iowa State University, Ames, 2Department of Animal Science, University of Minnesota, St. Paul, 3Auburn University, Auburn, AL, 4USDA - ARS, Ames, IA

10:30 AM 254  Pigs inoculated with Porcine Epidemic Diarrhea Virus have decreased growth performance and tissue accretion compared with Controls after 42 days.  

10:45 AM 256  Determination of Additivity of Acid-binding Capacity in Diets.  
N. Lu*, P. Arnaut, and M. D. Lindemann, University of Kentucky, Lexington
11:00 AM  257  Effects of Porcine Reproductive Respiratory Syndrome (PRRS) status (stable vs active) on the performance of weaned pigs when fed either a complex diet, a simple diet or a simple diet with lactose.
M. R. Bible*, S. J. England, and F. B. Sandberg, Furst McNess Company, Freeport, IL

11:15 AM  258  Effects of supplementation with Aspergillus oryzae derived phytase (Ronozyme® HiPhos) and fiber degrading enzymes (Victus™ Swine Starter) on growth performance, intestinal morphology, leukocyte differential, and nutrient digestibility in nursery pigs.
J. R. Bergstrom*, T. C. Tsai, H. J. Kim, and C. V. Maxwell, 1DSM Nutritional Products, Parsippany, NJ, 2Department of Animal Science, Division of Agriculture, University of Arkansas, Fayetteville

11:30 AM  259  Effect of rearing strategies during lactation on growth performance and the population of innate and adaptive immune cells in pigs from pre-weaning to market.
T. C. Tsai*, H. J. Kim, M. A. Sales, X. Wang, G. F. Erf, E. B. Kegley, F. G. Carbonero, M. van der Merwe, R. K. Buddington, and C. V. Maxwell, 1Department of Animal Science, Division of Agriculture, University of Arkansas, Fayetteville, 2Department of Poultry Science, Division of Agriculture, University of Arkansas, Fayetteville, 3Department of Food Science, Division of Agriculture, University of Arkansas, Fayetteville, 4University of Memphis, TN

PHYSIOLOGY SYMPOSIUM
Chair: Patrick J. Gunn, Department of Animal Science, Iowa State University
Sponsor: 316-317

8:30 AM  Welcoming Remarks.

8:35 AM  322  Fetal and Postnatal Nutritional Programming of Reproductive Performance in Ruminants.
R. A. Cushman*, M. Soares, M. Abedal-Maged, A. S. Cupp, G. A. Perry, and H. C. Freely, 1USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE, 2Federal University of Santa Maria, Santa Maria, Brazil, 3University of Nebraska-Lincoln, 4Department of Animal Science, South Dakota State University, Brookings
9:20 AM  323  Postnatal Programming and Reproductive Development.
F. F. Bartol\textsuperscript{1} and C. A. Bagnell\textsuperscript{2}, \textit{Auburn University, Auburn},
\textsuperscript{2}Rutgers University, New Brunswick, NJ

10:05 AM  324  Recent advances in boar management.
\textit{W. L. Flowers*}, North Carolina State University, Raleigh

**RUMINANT NUTRITION: FEED ADDITIVES**

Chair: Tara L. Felix, Pennsylvania State University

Sponsor: 302-303

8:30 AM  380  Effect of backgrounding system on feedlot performance and carcass characteristics of beef steers.
J. L. Cox\textsuperscript{1}, K. E. Hales\textsuperscript{2}, K. M. Ulmer\textsuperscript{1}, R. J. Rasby\textsuperscript{1}, S. D. Shackelford\textsuperscript{1}, H. C. Freely\textsuperscript{1}, and M. E. Drewnoski\textsuperscript{1}, \textsuperscript{1}Department of Animal Science, University of Nebraska-Lincoln, \textsuperscript{2}USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE

8:45 AM  381  Effects of feeding rumen protected amino acids in finishing cattle diets on performance and carcass characteristics.
C. R. Oney\textsuperscript{1}, A. K. Watson\textsuperscript{1}, C. J. Bittner\textsuperscript{1}, P. W. Rounds\textsuperscript{3}, F. H. Hilscher\textsuperscript{1}, T. J. Klopfenstein\textsuperscript{1}, and G. E. Erickson\textsuperscript{1}, \textsuperscript{1}University of Nebraska-Lincoln, \textsuperscript{2}Department of Animal Science, University of Nebraska-Lincoln, \textsuperscript{3}Kemin Industries, Inc., Des Moines, IA

9:00 AM  382  Effect of energy source, level, and sex on growth and performance of lambs.
J. R. Jaborek\textsuperscript{1}, H. N. Zerby\textsuperscript{1}, and F. L. Fluharty\textsuperscript{2}, \textsuperscript{1}The Ohio State University, Columbus, \textsuperscript{2}The Ohio State University, Wooster

9:15 AM  383  Metabolic and body temperature responses to environmental conditions across seasons in finishing steers.
B. M. Boyd\textsuperscript{1}, T. L. Mader\textsuperscript{2}, C. J. Bittner\textsuperscript{1}, D. B. Burken\textsuperscript{1}, F. H. Hilscher\textsuperscript{1}, G. Wijffels\textsuperscript{1}, J. B. Gaughan\textsuperscript{1}, M. L. Sullivan\textsuperscript{1}, A. J. Cawdell-Smith\textsuperscript{1}, and G. E. Erickson\textsuperscript{1}, \textsuperscript{1}University of Nebraska-Lincoln, \textsuperscript{2}Mader Consulting, LLC, Gretna, NE, \textsuperscript{3}The University of Queensland, Gatton, Australia

9:30 AM  384  The effect of feeding a yeast supplement or finely ground fiber during the summer on body temperature, performance, and blood metabolites of finishing steers.
B. M. Boyd\textsuperscript{1}, T. L. Mader\textsuperscript{2}, C. J. Bittner\textsuperscript{1}, F. H. Hilscher\textsuperscript{1}, G. Wijffels\textsuperscript{1}, J. B. Gaughan\textsuperscript{1}, M. L. Sullivan\textsuperscript{1}, A. J. Cawdell-Smith\textsuperscript{1}, and G. E. Erickson\textsuperscript{1}, \textsuperscript{1}University of Nebraska-Lincoln, \textsuperscript{2}Mader Consulting, LLC, Gretna, NE, \textsuperscript{3}The University of Queensland, Gatton, Australia
9:45 AM 385 Effect of Feeding a Corn Hybrid Containing Alpha Amylase As Dry Rolled or High Moisture Corn on Finishing Performance and Carcass Characteristics. 
M. L. Jolly-Breithaupt*, C. J. Bittner¹, D. B. Burken¹, G. E. Erickson¹, J. C. MacDonald¹, and M. K. Luebbe², ¹University of Nebraska-Lincoln, ²University of Nebraska, Scottsbluff

10:00 AM 386 Effect of a zinc injection on finishing performance and carcass characteristics of Limousin steers. 
E. K. Niedermayer*, O. N. Genther-Schroeder; and S. L. Hansen, Iowa State University, Ames

10:15 AM 387 Impact on Site and Extent of Digestion of Feeding a Corn Hybrid Containing Alpha Amylase in Finishing Cattle Diets. 
M. L. Jolly-Breithaupt*, J. L. Gramkow¹, G. E. Erickson¹, J. C. MacDonald¹, and M. K. Luebbe², ¹University of Nebraska-Lincoln, ²University of Nebraska, Scottsbluff

10:30 AM 388 An initial look at the nutrient requirements of heavy finishing steers. 
N. Kenney-Rambo*¹ and A. DiCostanzo², ¹University of Minnesota, St. Paul, MN, ²University of Minnesota, Saint Paul

10:45 AM 389 Antimicrobial Resistance in Direct-Fed Microbials used in Cattle. 
F. Giok*, D. Pillai¹, G. Peterson², and S. Narayanan¹, ¹Kansas State University, Manhattan, ²University of Kansas, Lawrence

11:00 AM 390 Impact of metabolizable protein source on performance and carcass quality in finishing cattle fed dry-rolled corn-based diets. 
M. R. Fiene*, D. W. Brake, and M. R. McDaniel, South Dakota State University, Brookings

11:15 AM 338 Enhancing the feeding value of corn residues to improve beef cattle production. 
P. H. V. Carvalho*¹, W. T. Meteer¹, A. R. Schroeder¹, A. DiCostanzo², T. L. Felix¹, ¹University of Illinois at Urbana-Champaign, ²University of Minnesota, Saint Paul

11:30 AM 339 Effects of supplement type and forage quality on ruminal metabolism and diet digestibility of cattle. 
M. R. Stierwalt*², H. M. Blalock², T. L. Felix¹ ¹University of Illinois at Urbana-Champaign, ²Quality Liquid Feeds, Dodgeville, WI
## TEACHING SYMPOSIUM:
### EVOLVING THE ANIMAL SCIENCE CURRICULUM

Chair: Bryon R. Wiegand, University of Missouri  
Sponsor:  
401

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:30 AM</td>
<td>Welcoming Remarks.</td>
</tr>
<tr>
<td>8:35 AM</td>
<td>394 Evaluation and Subsequent Modification of a Traditional,</td>
</tr>
<tr>
<td></td>
<td>Land Grant Animal Sciences Curriculum.</td>
</tr>
<tr>
<td></td>
<td>Wiegand, University of Missouri, Columbia</td>
</tr>
<tr>
<td>9:05 AM</td>
<td>395 Changing Animal Science Curriculum at a Non-Land Grant University.</td>
</tr>
<tr>
<td></td>
<td>J. W. Rickard*, Illinois State University, Normal</td>
</tr>
<tr>
<td>9:35 AM</td>
<td>Break.</td>
</tr>
<tr>
<td>9:50 AM</td>
<td>396 The Next Generation of Animal Science Students: Changing</td>
</tr>
<tr>
<td></td>
<td>Demographics Dictate Curriculum Changes.</td>
</tr>
<tr>
<td></td>
<td>J. A. Sterle* and H. D. Tyler, Iowa State University, Ames</td>
</tr>
<tr>
<td>10:20 AM</td>
<td>397 An administrator’s perspective on meeting changing</td>
</tr>
<tr>
<td></td>
<td>curriculum needs with limited resources.</td>
</tr>
<tr>
<td></td>
<td>G. P. Lardy*, North Dakota State University, Fargo</td>
</tr>
<tr>
<td>10:50 AM</td>
<td>Panel Discussion.</td>
</tr>
<tr>
<td>11:05 AM</td>
<td>398 Evaluation of case-based reasoning to promote learning and</td>
</tr>
<tr>
<td></td>
<td>swine industry interest in an undergraduate reproductive physiology</td>
</tr>
<tr>
<td></td>
<td>course.</td>
</tr>
<tr>
<td></td>
<td>A. T. Desaulniers*, R. M. McFee, and B. R. White, University of</td>
</tr>
<tr>
<td></td>
<td>Nebraska-Lincoln</td>
</tr>
<tr>
<td>11:20 AM</td>
<td>399 Integrating Experiential Learning Into Animal Science Curriculum</td>
</tr>
<tr>
<td></td>
<td>Through a Hands-On Beef Cattle Management and Marketing Contest.</td>
</tr>
<tr>
<td></td>
<td>University, Normal</td>
</tr>
</tbody>
</table>
### POSTER SESSION I

Grand Ballroom – Foyer
Presentation Time: 12:45 pm – 1:30 pm

### GRADUATE STUDENT POSTER COMPETITION-M.S

| 114 S01 | Alterations of the rumen bacterial and archaeal communities in growing and finishing beef cattle and its effects on methane emissions.  
| A. L. Knoell*, C. L. Anderson, A. C. Pesta, G. E. Erickson, T. J. Klopfenstein, and S. C. Fernando, University of Nebraska-Lincoln |

| 115 S02 | Effects of stocking density on finishing pig growth performance.  

| 116 S03 | Improving the feeding value of corn stover to enhance cattle performance in a backgrounding phase.  
| K. Nenn*, P. H. V. Carvalho, E. Mouse, G. A. Bridges, S. L. Bird, T. L. Felix, and A. DiCostanzo, University of Minnesota, Saint Paul, University of Illinois at Urbana-Champaign, University of Minnesota, Grand Rapids |

| 117 S04 | Effect of milk yield genotype on lipidomic profiles of multiparous Holstein cows during the first 9-weeks of lactation.  
| F. Ding*, G. T. Cousillas, W. J. Weber, B. A. Crooker, and C. Chen, Department of Food Science and Nutrition, University of Minnesota, St. Paul, Department of Animal Science, University of Minnesota, St. Paul |

| 118 S05 | Mob grazing effects on cattle performance in Southeast Arkansas.  
| H. L. Bartimus, T. G. Montgomery, D. Philipp, J. Cater, K. P. Coffey, and B. C. Shanks, University of Arkansas, Division of Agriculture, Fayetteville, AR, Lincoln University, Jefferson City, University of Arkansas-Monticello |

| 119 S06 | Cortisol agonist improves growth performance and subsides systemic inflammation in newly weaned pigs.  
| H. Wooten*, J. J. McGlone, M. Wachtel, and A. Rakhshandeh, Texas Tech University, Lubbock, Texas Tech University Health Sciences Center, Lubbock |
140 S07 Effects of M. hyopneumoniae vaccination program and water-delivered antibiotic programs on growth performance and morbidity and mortality in wean-to-finish pigs.
N. M. Stas1, M. Ellis1, J. E. Estrada1, B. A. Peterson2, C. M. Shull2, E. Parr3, and C. Johnson1, 1University of Illinois at Urbana-Champaign, 2The Maschhoffs, LLC, Carlyle, IL

141 S08 Effects of Reduced-Fat Modified Distillers Grains with Solubles in Finishing Diets of Feedlot Steers on Carcass Characteristics, Fresh and Processed Beef Quality.
M. A. Nelson*, C. Fehrman, A. A. Hohertz, A. DiCostanzo, and R. B. Cox, University of Minnesota, Saint Paul

142 S09 Diets with organic trace minerals Bioplex®) and yeast Protein (NuPro®) improved the water-holding capacity of pork loin meat.

143 S10 Predicting pork color scores using machine vision and support vector machine technologies.

144 S11 Using machine vision technology to determine pork intramuscular fat percentage.

145 S12 Cutability, nutrient content, and comparison of harvested big game species at progressive stages of processing.
D. D. Reed*, E. P. Berg, M. J. Marchello, W. D. Slanger, and P. T. Berg, North Dakota State University, Fargo

146 S13 Use of Plasma Orosomucoid in Newborn Piglets to Predict Preweaning Growth Performance and its Potential Mechanism of Action.
T. G. Ramsay1, L. A. Blomberg1, J. L. Vallet2, and T. J. Caperna1, 1USDA, ARS, BARC, Beltsville, MD, 2USDA, ARS, US MARC, Clay Center, NE
**Effects of feeding calcium hydroxide treated corn stover during backgrounding on carcass characteristics and beef quality.**
C. Fehrman\(^1\), E. Mousel\(^2\), A. DiCostanzo\(^1\), and R. B. Cox\(^1\), \(^1\)University of Minnesota, Saint Paul, \(^2\)University of Minnesota, Grand Rapids

**Effects of Late Gestational Cow Tall Fescue Forage System on Steer Offspring Carcass Characteristics.**
Z. D. Callahan\(^2\), K. N. Niederecker\(^1\), J. M. Larson\(^1\), B. R. Wiegand\(^2\), and A. M. Meyer\(^2\), \(^1\)Division of Animal Sciences, University of Missouri, Columbia, \(^2\)University of Missouri, Columbia

**Evaluation of glycated albumin as a metabolic marker for marbling in commercial feeder cattle.**
M. Alkhuriji\(^*\), S. Vetter, K. C. Swanson, and E. P. Berg, North Dakota State University, Fargo

**PHYSIOLOGY**

**A technique to ovariohysterectomize cattle for use in gestational research.**
K. J. McLean\(^1\), C. R. Dahlen\(^1\), P. P. Borowicz\(^1\), L. P. Reynolds\(^1\), B. W. Neville\(^3\), and J. S. Caton\(^1\), \(^1\)North Dakota State University, Fargo, \(^3\)Center for Nutrition and Pregnancy, Fargo, ND, \(^2\)Central Grasslands REC, North Dakota State University, Streeter

**Relationship Between Ovarian Reserve and Preovulatory Estradiol During a Fixed-Time AI Protocol in Beef Heifers.**
M. Soares\(^1\), R. A. Cushman\(^2\), E. J. Northrop\(^3\), E. L. Larimore\(^4\), and G. A. Perry\(^5\), \(^1\)Federal University of Santa Maria, Santa Maria, Brazil, \(^2\)USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE, \(^3\)Department of Animal Science, South Dakota State University, Brookings, \(^4\)South Dakota State University, Brookings, \(^5\)Department of Animal Science, South Dakota State University, Brookings

**Does Sampling Time Matter? Relationships of Circulating Metabolites at Various Neonatal Sampling Times in Beef Calves.**
J. M. Larson\(^1\), B. L. Vander Ley\(^2\), S. M. Bolen\(^1\), N. B. Duncan\(^1\), and A. M. Meyer\(^3\), \(^1\)Division of Animal Sciences, University of Missouri, Columbia, \(^2\)Department of Veterinary Medicine and Surgery, University of Missouri, Columbia, \(^3\)University of Missouri, Columbia

**Relationships between pig birth weight and expression of the immediate early gene EGR-1 in umbilical cord Wharton’s jelly.**
J. M. Morton\(^*\), T. Rathbun, and D. L. Davis, Kansas State University, Manhattan
Impact of cyclical heat stress during follicular development on ovarian TLR4, PI3K and steroidogenic proteins in synchronized post-pubertal gilts.
A. A. Al-Shaibi*, B. J. Hale, C. L. Hager, J. W. Ross, L. H. Baumgard, and A. F. Keating, Iowa State University, Ames

The protective effects of Butipearl™ Z during heat stress as measured through in vitro studies with swine intestinal epithelial cells and an in vivo swine trial.
V. Mani†, J. K. Rubach†, D. A. Koltes², N. K. Gabler³, and M. J. Poss¹, ¹Kemin Industries, Des Moines, IA, ²University of Arkansas, Fayetteville, ³Iowa State University, Ames

Effect of Hot Temperature and Drinker Type on Growth Performance of and Water Disappearance by Growing-Finishing Pigs.
K. Vande Pol¹, N. S. Grohmann¹, T. E. Weber², M. J. Ritter², and M. Ellis¹, ¹University of Illinois at Urbana-Champaign, ²Elanco Animal Health, Greenfield, IN

Effects of Room Temperature on Ear Surface Temperature of Late-Finishing Pigs.
M. Hayes†, K. Vande Pol¹, T. E. Weber², M. J. Ritter², and M. Ellis¹, ¹University of Illinois at Urbana-Champaign, ²Elanco Animal Health, Greenfield, IN

Characterizing body temperature and movement differences at the onset of estrus in replacement gilts.
K. A. Shade†, K. R. Stewart², and J. S. Johnson¹, ¹USDA-ARS Livestock Behavior Research Unit, West Lafayette, IN, ²Purdue University, West Lafayette, IN

The Effects of Nursery Environmental Enrichments on Subsequent Finishing Hogs.
D. J. Shawk*, P. L. Deeter, and B. D. Whitaker; The University of Findlay, OH

Effects of PMSG Dosage on Reproductive Performance of Farm-Raised Whitetail Deer.
W. M. Haslag², B. C. Shanks¹, J. D. Caldwell², D. R. Hill³, and N. L. Forsythe³, ¹Department of Agriculture and Environmental Science, Lincoln University, Jefferson City, MO, ²Purina Animal Nutrition Center LLC, Gray Summit, MO, ³Oak Creek Whitetail Ranch, Bland, MO
418 S29  Corpus luteum blood flow correlation with circulating progesterone during the bovine estrous cycle.
A. Egloff*, Purdue University, West Lafayette, IN

419 S30  Effects of Diets Containing Psyllium Seed Husks on Carcass Composition, Fatty Acid Profile, and Cholesterol of Rabbits.
K. M. Jones*1, B. C. Shanks1, J. D. Caldwell2, J. A. Apple3, B. R. Wiegand4, L. S. Wilbers1, T. M. Johnson1, A. L. Bax1, C. L. Thomas1, K. L. Basinger1,3, and J. W. S. Yancey1, 1Department of Agriculture and Environmental Science, Lincoln University, Jefferson City, MO, 2Purina Animal Nutrition Center LLC, Gray Summit, MO, 3Department of Animal Science, University of Arkansas, Fayetteville, 4University of Missouri, Columbia

POSTER SESSION II
Grand Ballroom – Foyer
Presentation Time: 5:00pm – 5:45pm

GRADUATE STUDENT POSTER COMPETITION-PH.D

120 S01  Characterization of nutrient content, yield, and gross return to cattle feeding at three corn crop endpoints.
H. E. Larson*1, A. A. Hohertz, M. Lostetter2, and A. DiCostanzo, 1University of Minnesota, St. Paul, 2University of Minnesota Rosemount Research and Outreach Center, Rosemount

121 S02  Carcass gain, efficiency, quality, and profitability in steers at extended days on feed.
R. G. Bondurant1, J. C. MacDonald1, G. E. Erickson1, K. Brooks1, K. W. Bruns2, and R. N. Funston3, 1University of Nebraska-Lincoln, 2University of Nebraska-Lincoln, West Central Research & Extension Center, North Platte, 3University of Nebraska, North Platte

122 S04  Weaned pig responses to Escherichia coli lipopolysaccharide challenge when receiving dietary yeast-based nucleotides.
S. M. Waititu*1, M. C. Nyachoti1, F. Yin1, R. Patterson2, and J. C. Rodriguez-Lecompte3, 1University of Manitoba, Winnipeg, MB, Canada, 2Canadian Biosystems, Calgary, AB, Canada, 3University of Prince Edward Island, Charlottetown, PE, Canada
123  S05  Dietary lysine affected the expression of genes related to ubiquitin-proteasome protein degradation pathway in skeletal muscle of finishing pigs.
T. Wang*, N. Regmi, J. M. Feugang, M. A. Crenshaw, J. R. Blanton, and S. F. Liao, Mississippi State University, Mississippi State

124  S06  Impacts of early weaning and winter feeding strategy on cow-calf performance.
J. J. Kincheloe*, K. C. Olson¹, P. S. Johnson¹, R. N. Gates¹, D. Landblom², H. A. Richter³, and A. V. Grove⁴, ¹South Dakota State University, Rapid City, ²North Dakota State University, Dickinson, ³Natural Resources Conservation Service, Pierre, SD, ⁴AG Research, LLC, White Sulphur Springs, MT

125  S07  Influence of growing phase feed efficiency classification on finishing phase growth performance and carcass characteristics of beef steers fed different diet types.
J. R. Russell*, E. L. Lundy¹, N. O. Minton², W. J. Sexten², M. Kerley², and S. L. Hansen¹, ¹Iowa State University, Ames, ²University of Missouri, Columbia

126  S08  Effects of grinding corn through a 2-, 3-, or 4-high roller mill on milling characteristics, and finishing pig growth performance and carcass characteristics.
J. T. Gebhardt*, M. D. Tokach¹, J. C. Woodworth¹, J. M. DeRouchey¹, R. D. Goodband¹, K. F. Coble², C. R. Stark¹, C. K. Jones¹, and S. S. Dritz¹, ¹Kansas State University, Manhattan, ²New Fashion Pork, Jackson, MN

NONRUMINANT NUTRITION I

169  S09  Effects of lactic acid bacteria complex and Enterococcus faecium DSM 7134 in weanling pigs.
P. Y. Zhao*, H. N. Tran, H. Y. Shin, and I. H. Kim, Department of Animal Resource & Science, Dankook University, Cheonan, South Korea

170  S10  Effects of complex direct-fed microbial supplementation in different basal diets on growth performance, nutrient digestibility, blood profiles, fecal microbial shedding and noxious gas emission in growing pigs.
W. C. Liu¹, Y. H. Kim¹, M. G. Jung¹, J. H. Cho², and I. H. Kim¹, ¹Department of Animal Resource & Science, Dankook University, Cheonan, South Korea, ²Department of Animal Science, Chungbuk National University, Cheongju, South Korea
C. L. Levesque\textsuperscript{1}, S. Jalukar\textsuperscript{2}, S. Gould\textsuperscript{3}, and J. F. Patience\textsuperscript{4}, \textsuperscript{1}South Dakota State University, Brookings, \textsuperscript{2}Arm and Hammer Animal Nutrition, Mason City, IA, \textsuperscript{3}Iowa State University, Ames

172 S12 Tri-strain probiotics improves performance, excreta microbial shedding and reduces noxious gas emission in broilers.
M. M. Hossain\textsuperscript{1}, M. Begum\textsuperscript{1}, J. H. Cho\textsuperscript{2}, Y. H. Kim\textsuperscript{1}, and I. H. Kim\textsuperscript{1}, \textsuperscript{1}Department of Animal Resource & Science, Dankook University, Cheonan, South Korea, \textsuperscript{2}Department of Animal Science, Chungbuk National University, Cheongju, South Korea

173 S13 Potentials of probiotics B. subtilis RX7 and B. methylotrophicus C14 strains as an alternative to antibiotics in Salmonella challenged weaning pigs.
S. D. Upadhaya\textsuperscript{1}, S. Mohana Devi, S. I. Lee, and I. H. Kim, Department of Animal Resource & Science, Dankook University, Cheonan, South Korea

174 S14 Efficacy of probiotics B. subtilis RX7 and B. methylotrophicus C14 strains as an alternative to antibiotics in weaned pigs.
S. D. Upadhaya\textsuperscript{1}, W. C. Liu, Y. H. Liu, and I. H. Kim, Department of Animal Resource & Science, Dankook University, Cheonan, South Korea

175 S15 Effects of Lactobacillus acidophilus fermentation product on growth performance, nutrient digestibility, and fecal microbiota in weanling pigs.
R. X. Lan\textsuperscript{1}, J. M. Koo\textsuperscript{2}, S. I. Lee\textsuperscript{1}, J. H. Cho\textsuperscript{3}, and I. H. Kim\textsuperscript{1}, \textsuperscript{1}Department of Animal Resource & Science, Dankook University, Cheonan, South Korea, \textsuperscript{2}Shinhan BioChem Co., Hwaseong, South Korea, \textsuperscript{3}Department of Animal Science, Chungbuk National University, Cheongju, South Korea

176 S16 The effects of feeding 15 or 30 ppm of narasin on the growth performance of pigs during the grower period.
R. A. Arentson\textsuperscript{1}, S. Fry\textsuperscript{1}, T. A. Marsteller\textsuperscript{1}, and E. L. Christianson\textsuperscript{2}, \textsuperscript{1}Elanco, Greenfield, IN, \textsuperscript{2}Elanco Animal Health, Greenfield, IN

177 S17 Determining the impact of By-O-Reg+ in diets with or without feed grade antibiotic on growth performance of nursery pigs.
L. L. Thomas\textsuperscript{1}, J. C. Woodworth, R. D. Goodband, J. M. DeRouchey, M. D. Tokach, and S. S. Dritz, Kansas State University, Manhattan
X. Wang1, T. C. Tsai1, M. A. Sales1, C. V. Maxwell1, K. Novak1, and E. Davis1, 1Department of Animal Science, Division of Agriculture, University of Arkansas, Fayetteville, 2DuPont Nutrition and Health, Waukesha, WI, 3Danisco A/S, Waukesha, WI

179 S19 Effect of Topsoil Exposure during Lactation on Subsequent Performance and Abundance of Innate and Adaptive Immune Cells in Pigs. 
T. C. Tsai1, H. J. Kim1, M. A. Sales1, X. Wang1, G. F. Erf2, E. B. Kegley1, F. G. Carbonero3, M. van der Merwe4, R. K. Buddington4, and C. V. Maxwell1, 1Department of Animal Science, Division of Agriculture, University of Arkansas, Fayetteville, AR, 2Department of Poultry Science, Division of Agriculture, University of Arkansas, Fayetteville, 3Department of Food Science, Division of Agriculture, University of Arkansas, Fayetteville, 4University of Memphis, TN

180 S20 Effect of a 3-Strain Bacillus-Based Direct-Fed Microbial on Relative Tissue Gene Expression in Nursery and Finishing Pigs Fed Low- or High-Fiber Diets. 
N. W. Jaworski1, M. C. Walsh2, and H. H. Stein1, 1University of Illinois at Urbana-Champaign, 2Danisco Animal Nutrition, DuPont Industrial Biosciences, Marlborough, UK, United Kingdom

UNDERGRADUATE STUDENT POSTER COMPETITION II

420 S21 Electrical impedance correlations to pork quality. 

421 S22 Development of an imaging technique using clinical CT-scans to detect osteochondritic-like lesions in femoral growth plates of growing pigs. 
N. Gross*, S. Oldenburg, J. Lawinger, M. Grez, and T. D. Crenshaw, University of Wisconsin-Madison

422 S23 Evaluation of perennial switchgrass as a replacement for cornstalks in high sulfur beef cattle diets. 
A. K. Reis*, R. Ostrem1, K. J. Heiderscheit1, O. N. Genther-Schroeder1, C. A. Clark2, D. D. Loy1, and S. L. Hansen1, 1Iowa State University, Ames, 2Armstrong Memorial Research and Demonstration Farm, Iowa State University, Lewis
423  S24  College Student Perceptions of Animal Welfare and Production Agriculture Practices at a Small Historical Black University.  
J. D. Rippeto*, K. A. Cash¹, B. C. Shanks¹, J. D. Caldwell², and M. S. Aruguete¹, ¹Lincoln University, Jefferson City, MO, ²Purina Animal Nutrition Center, Grays Summit, MO

424  S25  Effects of level of soybean meal and Yucca schidigera addition to diets on growth performance of nursery pigs.  
C. V. Cooper*, S. D. Carter, S. Schaaf, and S. L. Becker, Oklahoma State University, Stillwater

427  S25  Relationship of frame size and body measurements with feed efficiency traits in heifers.  

425  S27  Effects of foliar fungicide application on the growing corn plant.  
K. Robinson*, C. Kalebich¹, G. M. Fellows², and F. C. Cardoso¹, ¹University of Illinois at Urbana-Champaign, ²BASF Corporation, Research Triangle Park, NC

426  S28  Determine nutritional and anti-parasitic benefits of Cleome gynandra for goats.  
J. Kirk*, R. Lawrence², O. Gekara², J. Onyilagha², and U. Adamu², ¹University of Arkansas At Pine Bluff, Pine Bluff, ²University of Arkansas at Pine Bluff
181 S01  Effects of standardized ileal digestible isoleucine and valine:lysine ratio on growth performance of 12 to 25 kg nursery pigs.

182 S02  Use of Wheat Gluten as an Alternative Protein Source in Nursery Diets.
C. M. De Mille*, D. J. Bloxham†, C. R. Dove†, S. Bassi‡, and M. J. Azain†, †University of Georgia, Athens, GA, ‡Manildra Group USA, Shawnee Mission, KS

183 S03  Interactive effect of dietary fermented corn and nutrient density of diets on growth performance, nutrient digestibility, ileal microorganisms and fecal noxious gas emission in growing pigs.
H. L. Li*, P. Y. Zhao, J. H. Park, and I. H. Kim, Department of Animal Resource & Science, Dankook University, Cheonan, South Korea

184 S04  Interactive effect of dietary fermented oat and density of diets on growth performance, nutrient digestibility, and ileal microorganisms in weaning pigs.
H. L. Li*, T. S. Li†, J. H. Cho†, S. Kathannan†, and I. H. Kim†, †Department of Animal Resource & Science, Dankook University, Cheonan, South Korea, ‡Department of Animal Science, Chungbuk National University, Cheongju, South Korea

185 S05  Evaluation of SID lysine to energy ratio based on NRC or National Swine Nutrition Guide on pig performance.
X. Yang*, A. Tekeste, D. P. Pangeni, H. Manu, P. Ren, and S. K. Baidoo, Southern Research and Outreach Center, University of Minnesota, Waseca
186 S06 Effects of dietary tryptophan:lysine ratio on the reproductive performance of primiparous and multiparous lactating sows.
Z. Fan1,2,3, X. Yang1, J. Kim1, D. Menon1, and S. K. Baidoo1, 1Southern Research and Outreach Center, University of Minnesota, Waseca, 2Institute of Animal Nutrition, Hunan Agricultural University, Changsha, China, 3State Key Laboratory of Animal Nutrition, Beijing, China

187 S07 Effects of dietary inclusion level of distillers dried grains with solubles (DDGS) and high-protein distillers dried grains (HP-DDG) on the growth performance and carcass characteristics of wean-to-finish pigs.
A. Rojo1, M. Ellis1, E. B. Gaspar1, A. M. Gaines2, B. A. Peterson2, F. K. McKeith1, and J. Killefer1,1 University of Illinois at Urbana-Champaign, 2The Maschhoffs, LLC, Carlyle, IL

188 S08 Effects of low dietary inclusion levels of soybean meal and non-essential amino acid supplementation on the growth performance of late-finishing pigs.
A. Rojo1, M. Ellis1, E. B. Gaspar1, A. M. Gaines2, F. K. McKeith1, and J. Killefer1, University of Illinois at Urbana-Champaign, 2The Maschhoffs, LLC, Carlyle, IL

189 S09 Effect of dietary inclusion level of high-protein distillers grains (HP-DDG) and of dietary excesses of branched chain amino acids (BCAA) on the growth performance of pigs.
A. Rojo1, M. Ellis1, E. B. Gaspar1, A. M. Gaines2, F. K. McKeith1, and J. Killefer1, University of Illinois at Urbana-Champaign, 2The Maschhoffs, LLC, Carlyle, IL

190 S10 Efficacy of soybean meal in reducing the effects of a PRRSv challenge in weaned pigs.
M. R. Fiene1 and R. C. Thaler, South Dakota State University, Brookings

191 S11 Impact of dietary protein and dried citrus pulp contents on gut morphology of weanling pigs.
V. V. Almeida1, A. J. C. Nuñez1, P. V. A. Alvarenga2, F. R. Castelini2, Y. V. Silva-Guillen2, and M. C. Thomaz2, 1Department of Animal Sciences, Purdue University, West Lafayette, IN, 2Department of Animal Science, São Paulo State University, Jaboricabal/SP, Brazil

192 S12 High Inclusion of Distillers Dried Grains with Solubles as a Dietary Fiber Source Reduces Cytokine Levels in Growing-finishing Pigs.
M. Ferrandis Vila1, Z. Huang, P. E. Urriola, G. C. Shurson, and M. Saqui-Salces, Department of Animal Science, University of Minnesota, St. Paul
Total body amino acid composition of two genetic lines of barrows and gilts from twenty to one hundred twenty-five kilograms of body weight.

P. Xue1, A. P. Schinckel1, O. Adeola2, T. Wiseman1, and D. C. Mahan4,
1Purdue University, West Lafayette, IN, 2Department of Animal Sciences, Purdue University, West Lafayette, IN, 3Ohio State University Extension Perry County, Somerset, 4The Ohio State University, Delaware

Supplementation of feed grade essential and non-essential amino acids to control levels in pigs fed reduced crude protein (RCP) diets meeting the SID His:Lys ratio requirement maintained growth performance and carcass composition in growing/finishing swine.

C. V. Maxwell1, T. C. Tsai1, H. J. Kim1, J. K. Apple2, K. J. Touchette3, and J. J. Chewning4, 1Department of Animal Science, Division of Agriculture, University of Arkansas, Fayetteville, 2Department of Animal Science, University of Arkansas Division of Agriculture, Fayetteville, 3Ajinomoto Heartland, Inc., Chicago, IL, 4Swine Research Services, Inc., Springdale, AR

Effect of energy restriction on feed efficiency, nutrient digestibility, and immune biomarkers of growing/finishing pigs.

S. M. Barnett1, K. C. Moore, M. D. Trenhaile, A. T. Desaulniers, Y. S. Li, D. M. van Sambeek, H. Tran, B. R. White, and T. E. Burkey, University of Nebraska-Lincoln

Effects of feed grade L-methionine on intestinal redox status, intestinal development, and growth performance of turkey poultés compared with conventional DL-methionine.

I. Park1, T. J. Pasquetti, R. D. Malheiros, L. Zheng, P. Ferket, and S. W. Kim, North Carolina State University, Raleigh

Diet nutrient digestibility and growth performance of weaned pigs fed chickpea.

Y. Han1, L. F. Wang1, E. Beltranena2, and R. T. Zijlstra1, 1Department of Agricultural, Food and Nutritional Science, University of Alberta, Edmonton, AB, Canada, 2Alberta Agriculture and Forestry, Edmonton, AB, Canada

Effects of aggressive feed-grade amino acid supplementation in reduced CP diets formulated on ME or NE basis on growth performance of nursery pigs.

H. J. Kim1, T. C. Tsai1, J. J. Chewning2, J. K. Apple3, K. J. Touchette4, J. E. Thomson5, J. Less6, and C. V. Maxwell7, 1Department of Animal Science, Division of Agriculture, University of Arkansas, Fayetteville, 2Swine Research Services, Inc., Springdale, AR, 3Department of Animal Science, University of Arkansas Division of Agriculture, Fayetteville, 4Ajinomoto Heartland, Inc., Chicago, IL, 5Evonik Degussa Corp, Kennesaw, GA, 6ADM Animal Nutrition, Decatur, IL
Effect of Fish Meal Source on Nursery Pig Performance.
A. M. Jones*, J. C. Woodworth, R. D. Goodband, M. D. Tokach, S. S. Dritz, and J. M. DeRouchey, Kansas State University, Manhattan

Effect of corn germ meal inclusion level on the growth performance and carcass characteristics of wean-to-finish pigs.
J. E. Estrada*, M. Ellis, A. M. Gaines, B. A. Peterson, and O. F. Mendoza, 1University of Illinois at Urbana-Champaign, 2The Machshoffs, LLC, Carlyle, IL

Lysine requirement titration for barrows and gilts from 25- to 75-kg.
J. L. Landero, M. G. Young, K. J. Touchette, M. J. Stevenson, A. B. Clark, M. A. D. Gonçalves, and S. S. Dritz, 1Gowans Feed Consulting, Wainwright, AB, Canada, 2Ajinomoto Heartland, Inc., Chicago, IL, 3Halchemix Canada Inc, Port Perry, ON, Canada, 4Kansas State University, Manhattan

High levels of soybean meal reduces medical treatment in nursery pigs affected by PRRS.

Performance responses of weaned pigs when fermented soybean meal (NF8) was replaced with a modified grain by-product (Gold Pro).
F. B. Sandberg*, S. J. England, and M. R. Bible, Furst McNess Company, Freeport, IL

Responses to feeding higher levels of Dried Distiller Grains and Solubles (DDGS) of gilts and barrows, when supplemented with plant extracts (Lean Fuel).
F. B. Sandberg*, S. J. England, and M. R. Bible, Furst McNess Company, Freeport, IL

Effect of increasing sow feeding level in late gestation on piglet quality and sow body condition.
M. T. Knauer, North Carolina State University, Raleigh

Ruminant Nutrition I

Rumen Microbial Protein Synthesis in Multigrain and Barley Fed lactating Dairy Cows.
A. Nikkhah*, University of Zanjan, Zanjan, Iran
341 S27 Influence of dry-rolled corn processing and distillers grain inclusion rate on ruminal digestive enzyme activity.
F. E. Keomanivong*, M. C. Ruch, J. D. Kirsch, C. R. Dahlen, M. L. Bauer, and K. C. Swanson, North Dakota State University, Fargo

342 S28 Nutrient Variability of Distillers Grains with Solubles.
K. J. Herrick and B. J. Breitling*, POET Research, Inc., Sioux Falls, SD

343 S29 Effects of whole or rolled corn and 20 or 40 percent grass hay levels on finishing performance of yearling steers.
C. L. Engel*, A. Taylor2, C. S. Schauer3, R. J. Maddock4, and K. C. Olson5, 1North Dakota State University, Carrington Research Extension Center, Carrington, 2Cargill Nutrition Animal Innovation Campus, Elk River, MN, 3North Dakota State University, Hettinger Research Extension Center, Hettinger, 4North Dakota State University, Fargo, 5South Dakota State University, Rapid City

344 S30 Effects of different strategies for feeding alfalfa hay on productive performance, rumen fermentation and carcass characteristics of growing lambs.
M. M. Abdelrahman*, I. A. Alhidary1, and A. H. Alyemm2, 1King Saud University, Riyadh, Saudi Arabia, 2ARASCO company, Riyadh, Saudi Arabia

ANIMAL BEHAVIOR, HOUSING AND WELL-BEING

1 S01 Evaluation of the behavioral differences between physically and immunologically castrated male pigs.
A. Keller*, B. Lemmer1, S. Getty1, B. Post1, M. Nickel1, F. Baier1, D. Wagner1, and K. Vogel1, 1University of Wisconsin - River Falls, 2North Carolina State University, Raleigh, 3Iowa State University, Ames, 4Colorado State University, Fort Collins

2 S02 Differential Postprandial Eating Behavior of Morning and Evening Fed Dairy Cows.
A. Nikkhah*, University of Zanjan, Zanjan, Iran

3 S03 Eating Behavior Patterns of Multigrain and Barley Fed Lactating Dairy Cows.
A. Nikkhah*, University of Zanjan, Zanjan, Iran
4 S04 The effect of corrective claw trimming on gait analysis of the sow.  
A. Tinkle1, K. J. Duberstein1, M. E. Wilson2, M. A. Parsley3, M. K. Beckman3, M. J. Azain1, and C. R. Dove1, 1University of Georgia, Athens, GA, 2Zinpro Corporation, Eden Prairie, MN, 3Zinpro Corporation, Sheridan, IN

5 S05 The impact of gestation housing system (Individual vs. Group) on the reproductive performance of sows.  
A. L. Laudwig1, M. Ellis1, A. M. Gaines2, and B. A. Peterson2, 1University of Illinois at Urbana-Champaign, 2The Maschhoffs, LLC, Carlyle, IL

6 S06 The effect of farrowing pen size on pre-weaning mortality.  
A. L. Laudwig1, M. Ellis1, A. M. Gaines2, and B. A. Peterson2, 1University of Illinois at Urbana-Champaign, 2The Maschhoffs, LLC, Carlyle, IL

7 S07 Effect of water treatment on drinking preferences of dairy heifers.  
N. D. Senevirathne*, J. L. Anderson, and M. Rovai, South Dakota State University, Brookings

8 S08 Development of Acclimation to Reduce Flooring Novelty in Nursery Pigs.  
F. Baier*, A. Keller, A. Munger, and K. Vogel, University of Wisconsin - River Falls

9 S09 Effects of feeder space allowance on behavior of slow growing pigs during the nursery period.  
Y. He1, S. Cui2*, J. Deen3, G. C. Shurson4, and Y. Li5, 1Dept. of Animal Science, University of Minnesota, St. Paul, MN, 2West Central Research and Outreach Center, University of Minnesota, Morris, 3Dept. of Veterinary Population Medicine, University of Minnesota, St. Paul, 4Department of Animal Science, University of Minnesota, St. Paul

EXTENSION - SWINE

80 S10 Evaluation of the inter-scorer reliability of body and leg conformation traits in replacement gilts.  
S. Azarpajouh*, J. M. Mumm1, and J. A. Calderon-Diaz2, 1Department of Animal Science, Iowa State University, Ames, 2Iowa State University, Ames

81 S11 Comparison of digestible amino acids databases: relationship between amino acid digestibility and concentration in swine.  
D. J. Bloxham*, M. J. Azain, and G. M. Pesti, University of Georgia, Athens
82 S12 Blood parameters as piglet health biomarkers in an experimental infection with Salmonella spp.
E. Barba-Vidal¹, V. F. Buttow², E. G. Manzanilla¹, L. Blavi³, C. Torrente³, J. F. Pérez¹, and S. M. Martín-Orúe¹, ¹Animal Nutrition and Welfare Service, Department of Animal and Food Sciences, Universitat Autònoma de Barcelona, Bellaterra (08193), Spain, ²Department of Animal Science, Faculty of Agronomy Eliseu Maciel, Federal University of Pelotas, Pelotas (96010-900), Brazil, ³Servei d’Emergències i Cures Intensives de la Fundació Hospital Clínic Veterinari-UAB, Departament de Medicina i Cirurgia Animal, Universitat Autònoma de Barcelona, Bellaterra (08193), Spain

83 S13 Initial use of statistics to be used to quantify the magnitude errors in the sorting on three finishing barns.
Y. Que*, F. A. Cabezón, and A. P. Schinckel, Purdue University, West Lafayette, IN

84 S14 Evaluation of statistics to be used to quantify the magnitude errors in the sorting of pigs for market via simulation.
F. A. Cabezón, A. P. Schinckel*, and Y. Que, Purdue University, West Lafayette, IN

85 S15 Analysis of lactation feed intakes for sows including data on environmental temperatures and humidity.
F. A. Cabezón*,¹, A. P. Schinckel¹, B. T. Richert¹, K. R. Stewart¹, M. Gandarillas², and W. A. Peralta³, ¹Purdue University, West Lafayette, IN, ²Universidad Austral de Chile, Valdivia, Chile, ³Agrícola Super Ltda, Rancagua, Chile

86 S16 Alternative method to accurately predict the sows’ body weight in early gestation.
S. López-Vergé, L. Blavi*, D. Solà-Oriol, and J. Gasa, Animal Nutrition and Welfare Service, Department of Animal and Food Sciences, Universitat Autònoma de Barcelona, Bellaterra (08193), Spain

87 S17 Influence of Amaferm® Digest More® on Swine Lactation Performance.
S. J. Moeller* and M. B. Hess, The Ohio State University, Columbus

88 S18 Evaluation of medium-chain fatty acid salts or Enterococcus faecium in front of a Salmonella Typhimurium challenge in piglets.
J. J. Mallo*, Norel SA, Madrid, Spain
NONRUMINANT NUTRITION III

295  S19  Effects of tribasic copper chloride (TBCC), Saccharomyces cerevisiae fermentation product (YFP), and narasin (NAR) supplementation on growth performance of 12 to 25 kg pigs.
E. D. Fruge*, E. Hansen¹, S. Hansen³, A. J. Gerhart⁴, J. L. Usry⁵, and C. W. Hastad⁶, ¹Hubbard Feeds, Inc., Mankato, MN, ²Hubbard Feeds Inc., Mankato, MN, ³Hubbard Feeds Inc, Mankato, MN, ⁴Hubbard Feeds, Mankato, MN, ⁵Micronutrients, Indianapolis, IN, ⁶New Fashion Pork, Jackson, MN

296  S20  Evaluation of interactive effects of vitamin E and linseed oil as a source of omega-3 fatty acids on growth performance, blood characteristics and meat quality of finishing pigs.
S. D. Upadhaya*, T. S. Li, Y. M. Kim, and I. H. Kim, Department of Animal Resource & Science, Dankook University, Cheonan, South Korea

297  S21  Effects of dietary zinc source and level on nursery pig performance.
K. E. Jordan¹, K. M. Gourley²*, M. D. Tokach¹, R. D. Goodband⁴, S. S. Dritz³, J. M. DeRouchey¹, J. C. Woodworth¹, and J. L. Usry², ¹Kansas State University, Manhattan, ²Micronutrients, Indianapolis, IN

298  S22  Could Zinc Citrate supplementation during lactation increase the serum Zn levels at weaning?.
L. Blavi*, D. Solà-Oriol, and J. F. Pérez, Animal Nutrition and Welfare Service, Department of Animal and Food Sciences, Universitat Autònoma de Barcelona, Bellaterra (08193), Spain

299  S23  Effect of diet type and added copper on growth performance, carcass characteristics, total tract digestibility, gut morphology, and mucosal mRNA expression of finishing pigs.
K. Coble²*, D. Burnett¹, R. D. Goodband¹, J. M. Gonzalez¹, J. L. Usry², M. D. Tokach¹, J. Pluske², J. M. DeRouchey¹, J. C. Woodworth¹, S. S. Dritz¹, J. R. Flohr¹, and M. A. Vaughn¹, ¹Kansas State University, Manhattan, ²Micronutrients, Indianapolis, IN, ³Murdoch University, Western Australia, Australia

300  S24  Low calcium levels improve growth in piglets after weaning.
L. Blavi*, D. Solà-Oriol, and J. F. Pérez, Animal Nutrition and Welfare Service, Department of Animal and Food Sciences, Universitat Autònoma de Barcelona, Bellaterra (08193), Spain
Effects of increasing zinc from zinc sulfate or zinc hydroxychloride on finishing pig growth performance and carcass characteristics.
C. B. Carpenter\textsuperscript{1}, K. Coble\textsuperscript{1}, J. C. Woodworth\textsuperscript{1}, J. M. DeRouchey\textsuperscript{1}, M. D. Tokach\textsuperscript{1}, R. D. Goodband\textsuperscript{1}, S. S. Dritz\textsuperscript{1}, and J. L. Usry\textsuperscript{2}, \textsuperscript{1}Kansas State University, Manhattan, \textsuperscript{2}Micronutrients, Indianapolis, IN

Effects of dietary calcium concentrations on the apparent total tract digestibility and the balance of calcium, phosphorus, and nitrogen in growing pigs.
Y. She\textsuperscript{*}, University of Illinois at Urbana-Champaign

Effects of proteinate complex zinc on trace elements concentrations, oxidative stress and immune functions in weaned piglets.
Y. She\textsuperscript{*}, University of Illinois at Urbana-Champaign

Efficiency of Ca and P retention in growing pigs fed diets with different Ca:P ratios provided by monocalcium phosphate or phytase supplementation.
M. Grez\textsuperscript{*} and T. D. Crenshaw, University of Wisconsin-Madison,

A study to examine the relationship between uterine pathology and depletion of oxytetracycline in plasma and milk after intra-uterine infusion.
P. J. Gorden\textsuperscript{*}, J. Ydstie\textsuperscript{1}, M. D. Kleinhenz\textsuperscript{2}, L. W. Wulf\textsuperscript{3}, R. Gehring\textsuperscript{2}, C. Wang\textsuperscript{1}, and J. F. Coetzee\textsuperscript{1}, \textsuperscript{1}Iowa State University, Ames, \textsuperscript{2}Veterinary Diagnostic and Production Animal Medicine, Iowa State University, Ames, \textsuperscript{3}Pharmacology Analytical Support Team, Iowa State University College of Veterinary Medicine, Ames, \textsuperscript{4}Kansas State University, Manhatten

Using corn co-products in post-partum diets of beef cows to optimize reproductive performance.
E. G. Taylor\textsuperscript{*}, R. P. Lemenager, and K. R. Stewart, Purdue University, West Lafayette, IN
Cultural energy analysis of cool- and warm-season grass pasturing systems into cattle finishing Programs.
H. Koknaroglu1, O. Koskan1, R. A. Edler2, and M. P. Hoffman2, 1Suleyman Demirel University, Isparta, Turkey, 2Iowa State University, Ames

Cultural energy analyses of climatologically suitable places in Turkey for feedlot cattle production determined by using the comprehensive climate index model.
H. Koknaroglu1, J. A. Harrington Jr2, and T. L. Mader3, 1Suleyman Demirel University, Isparta, Turkey, 2Kansas State University, Manhattan, 3Mader Consulting, LLC, Gretna, NE

Determination of suitable sample size and number of simulation for predicting dry matter intake of feedlot cattle.
O. Koskan1, H. Koknaroglu1, D. D. Loy2, and M. P. Hoffman2, 1Suleyman Demirel University, Isparta, Turkey, 2Iowa State University, Ames

The Effect of Age, Plane of Nutrition and Progesterone Pre-treatment on Lambing Rate in Nulliparous Females Bred During the Breeding Season.

Evaluating results of pre-breeding reproductive examinations in yearling and mature beef bulls via the BullTest data reporting system.
S. R. Underdahl*, C. L. Stoltenow1, and C. R. Dahlen1,2, 1North Dakota State University, Fargo, 2Center for Nutrition and Pregnancy, Fargo

Effects of extracted of rice bran supplementation on production performance, feed intake, egg quality and fecal microflora in laying hens.
D. H. Nguyen1, J. H. Cho2, H. S. Kim1, H. N. Tran1, and I. H. Kim1, 1Department of Animal Resource & Science, Dankook University, Cheonan, South Korea, 2Department of Animal Science, Chungbuk National University, Cheongju, South Korea

Evaluating the effects of microencapsulated blends of phytobiotics in the diet of broiler chickens.
M. Mohammadi Gheisar*, J. W. Park, S. Mohana Devi, and I. H. Kim, Department of Animal Resource & Science, Dankook University, Cheonan, South Korea
POSTER PRESENTATIONS / TUESDAY, MARCH 15, 2016

211 S10 Effect of Soybean Cultivar on Growth Performance of Broilers. G. Hosotani*, M. S. Kerley, and M. C. Shannon, Division of Animal Sciences, University of Missouri, Columbia

212 S11 Effect of crumbled diet on growth performance, market day age and meat quality of growing-finishing pigs. D. H. Nguyen*, S. Kathannan, Y. H. Liu, and I. H. Kim, Department of Animal Resource & Science, Dankook University, Cheonan, South Korea


216 S15 Coating dog kibble with a commercial liquid acidifier reduces the risk of Salmonella cross-contamination. A. R. Huss*, A. Deliephan, J. C. Fuller, Jr., and C. K. Jones, 1Kansas State University, Manhattan, 2Metabolic Technologies Inc, Ames

345  S17  A comparison of bale feeder types on forage waste by beef cows. K. Nenn¹, N. Kenney-Rambo², and A. DiCostanzo¹, ¹University of Minnesota, Saint Paul, ²University of Minnesota, St. Paul


347  S19  Evaluation of a Commercial Genetic Test to Determine Tolerance to Fescue Toxicity in Beef Cattle. M. M. Masier¹, C. A. Roberts², M. S. Kerley², and R. L. Kallenbach², ¹University of Missouri, Columbia, ²AgBotanica, LLC, Columbia

348  S20  Stocking management effects on forage composition, cow methane emissions, and soil properties of cool season pastures. J. R. Russell¹, J. Bisinger¹, and W. J. Powers², ¹Iowa State University, Ames, ²Michigan State University, East Lansing

349  S21  Dimorphic chronological development of ruminant digestive system supports development of equivalent muscle fatty acid profiles in continuously suckled and weaned Katahdin lambs. Q. S. Baptiste¹, M. Knights², A. K. Redhead², and E. Felton³, ¹Berea College, Berea, KY, ²West Virginia University, Morgantown, ³Division of Animal and Nutritional Sciences, West Virginia University, Morgantown

350  S22  Estimates of Duodenal Microbial Protein in Free Housed Dairy Cows fed Total Mixed Ration vs. Component Diet. A. Nikkhah*, University of Zanjan, Zanjan, Iran

351  S23  Energy Metabolism Peripheral Indicators in Total Mixed Ration vs. Component Fed Dairy Cows in a Competitive Environment. A. Nikkhah*, University of Zanjan, Zanjan, Iran

352  S24  Improving Milk Production through Evening Feeding of Dairy Cows. A. Nikkhah*, University of Zanjan, Zanjan, Iran

353  S25  Optimizing Dairy Cow Production through Multisource Starch Feeding. A. Nikkhah*, University of Zanjan, Zanjan, Iran
273 S01 Dietary kapok seed meal supplementation improved meat quality without adverse effects on growth performance in finishing pigs. H. L. Li*, H. M. Yun, J. K. Kim, and I. H. Kim, Department of Animal Resource & Science, Dankook University, Cheonan, South Korea

274 S02 Dietary Levan-type fructan improved growth performance of lactating sows and their offspring and reduced fecal noxious gas emission. H. L. Li*, H. S. Kim¹, J. H. Cho², D. H. Nguyen¹, and I. H. Kim¹, ¹Department of Animal Resource & Science, Dankook University, Cheonan, South Korea, ²Department of Animal Science, Chungbuk National University, Cheongju, South Korea

275 S03 Effect of dietary enzyme complex on growth performance, nutrient digestibility, and fecal noxious gas emission in growing pigs. P. Y. Zhao*, H. L. Li¹, J. S. Jeong¹, J. H. Cho¹, and I. H. Kim¹, ¹Department of Animal Resource & Science, Dankook University, Cheonan, South Korea

276 S04 Essential oil and emulsifier in low energy density diets increase growth performance and meat quality of finishing pigs. P. Y. Zhao*, J. H. Cho², B. Balasubramanian¹, S. Kathannan¹, and I. H. Kim¹, ¹Department of Animal Resource & Science, Dankook University, Cheonan, South Korea, ²Department of Animal Science, Chungbuk National University, Cheongju, South Korea

277 S05 Effect of protease and anti-inflammatory supplementation with low nutrient diets on growth performance, nutrient digestibility, blood profile and fecal noxious gas in growing-finishing pigs. D. H. Nguyen*, J. K. Kim, S. Shanmugam, and I. H. Kim, Department of Animal Resource & Science, Dankook University, Cheonan, South Korea
278 S06 Bacillus subtilis, essential oil, chromium and glucose as sow pack are related to performance, immune and (or) stress of sows and piglets.
D. H. Nguyen*, R. X. Lan, W. C. Liu, and I. H. Kim, Department of Animal Resource & Science, Dankook University, Cheonan, South Korea

279 S07 Effects of xylanase on growth performance and digestibility of fiber and energy in growing pigs fed corn, corn DDGS and soybean meal based diet supplemented with phytase.
X. Yang1, M. C. Walsh2, E. Kiariie1,4,5, A. Tekeste1, and S. K. Baidoo1, 1Southern Research and Outreach Center, University of Minnesota, Waseca, MN, 2Danisco Animal Nutrition, DuPont Industrial Biosciences, Marlborough, UK, United Kingdom, 3DuPont Industrial Biosciences - Danisco Animal Nutrition, Marlborough, United Kingdom, 4University of Guelph, ON, Canada, 5University of Manitoba, Winnipeg, MB, Canada

280 S08 Dietary effect of lactose on growth performance of nursery pigs on a liquid feeding system.
X. Yang*, J. Kim, and S. K. Baidoo, Southern Research and Outreach Center, University of Minnesota, Waseca

281 S09 The interactive effects of fenugreek seed extract supplementation and dietary metabolizable energy levels in growing pigs.
M. Begum1, J. H. Cho2, R. X. Lan1, M. M. Hossain1, and I. H. Kim1, 1Department of Animal Resource & Science, Dankook University, Cheonan, South Korea, 2Department of Animal Science, Chungbuk National University, Cheongju, South Korea

282 S10 Effects of δ-aminolevulinic acid, and lactulose supplements in weaning piglets.
M. M. Hossain*, M. Begum, P. Y. Zhao, and I. H. Kim, Department of Animal Resource & Science, Dankook University, Cheonan, South Korea

283 S11 Role of emulsifier as fat replacer in low density diet for growing and finishing pigs.
S. D. Upadhaya*, J. H. Park, H. M. Yun, and I. H. Kim, Department of Animal Resource & Science, Dankook University, Cheonan, South Korea

284 S12 Effects of a xylanase and an emulsifier in diets with dried yeast on nursery pig performance.
285 S13  Spray dried plasma compared to alternative specialty proteins in weanling pig diets.
J. M. Campbell*, J. D. Crenshaw, and J. Polo, APC, Inc., Ankeny, IA

286 S14  Effect of Saccharomyces cerevisiae fermentation product supplementation in late gestation and lactation on sow and litter performance, milk components, and fecal Clostridium perfringens.
T. C. Tsai1*, H. J. Kim1, X. Wang1, B. E. Bass2, J. W. Frank2, and C. V. Maxwell1, 1Department of Animal Science, Division of Agriculture, University of Arkansas, Fayetteville, 2Diamond V, Cedar Rapids, IA

287 S15  Effects of Herbiotic FS Supplementation in weanling pigs.
S. Mohana Devi*, B. Balasubramanian, Y. M. Kim, and I. H. Kim, Department of Animal Resource & Science, Dankook University, Cheonan, South Korea

288 S16  Evaluation of the Effects of a Formaldehyde-based Feed Additive on Free Lysine.
C. Rude*, D. Mellick, A. Lamptey, and M. Bienhoff, Kemin Industries, Des Moines

289 S17  The effects of egg yolk on nursery pig growth performance.
K. C. Moore*, S. M. Barnett, Y. Li, M. D. Trenhaile, T. E. Burkey, P. S. Miller, and S. C. Fernando, University of Nebraska-Lincoln

290 S18  Effect of feeding grower-finisher pig diets containing 20% soybean hulls with or without enzyme supplementation.
L. J. Schertz1, G. A. Apgar2, L. A. Lekatz1, and P. J. Lammers3*, 1Illinois State University, Normal, 2Southern Illinois University, Carbondale, 3Univeristy of Wisconsin–Platteville

291 S19  Sow performance in response to natural betaine fed during lactation and weaning-to-35 d post-insemination during non-summer months.
S. M. Mendoza1*, G. Martinez1, M. Knauer1, E. van Heugten1, P. Wilcock2, D. S. Rosero1, and R. D. Boyd1,3, 1Department of Animal Science, North Carolina State University, Raleigh, 2AB Vista Feed Ingredients, Marlborough, United Kingdom, 3Hanor Company, Inc., Franklin, KY

292 S20  Responses of growing-finisher pigs to two levels of a multi-enzyme blend (Natuzyme) as compared to pigs fed a lower energy-higher fiber, or a higher energy-lower fiber diet.
F. B. Sandberg*, S. J. England, and M. R. Bible, Furst McNess Company, Freeport, IL
293 S21 Impact of lipid peroxidation and antioxidants on nursery pig performance and health.
P. L. Chang* and E. van Heugten, Department of Animal Science, North Carolina State University, Raleigh

294 S22 Alteration of fecal bacterial communities in weanling pigs fed diets supplemented with chicory, mannan oligosaccharides, or chitosan.
Y. S. Li*, S. C. Fernando, P. S. Miller, and T. E. Burkey, University of Nebraska-Lincoln

ODOR AND NUTRIENT MANAGEMENT

303 S23 Effect of feeding grower-finisher pig diets containing 20% soybean hulls with or without enzyme supplementation.
L. J. Schertz1, G. A. Apgar2, L. A. Lekatz1, and P. J. Lammers3, 1Illi-nois State University, Normal, 2Southern Illinois University, Carbon-dale, 3Univeristy of Wisconsin–Platteville

304 S24 A comparison of antibiotic-free and conventional management on nutrient excretion in swine.
C. E. Vonderohe1, K. M. Mills3, A. M. Jones2, M. D. Asmus3, E. R. Otto-Tice1, J. Ni1, B. T. Richert1, and J. S. Radcliffe1, 1Purdue University, West Lafayette, IN, 2Kansas State University, Manhattan
MIDWEST SECTION ADSA/ASAS
Committee Assignment

PROGRAM COMMITTEES

Animal behavior, Housing and Well-being
J. Brown, Chair
D. Lay
A. DeDecker
K. Vogel

Breeding and Genetics
J. Steibel, Chair
J. Decker
L. Hanna

Extension – Beef/Small Ruminant
A. Radunz, Chair
J. Held
B. Doran

Extension – Dairy
J. Anderson, Chair
K. Mjourn
B. Heins

Extension – Equine
P. Miller, Chair
T. Douthit
D. Smarch

Extension – Swine
R. Goodband, Chair
M. Rinker

Growth, Development, Muscle Biology and Meat Science
D. Boler, Chair
J. Rickard
C. Stahl

Nonruminant Nutrition
T. Burkey, Chair
C. Levensque
V. Perez
W. Oliver
Odor and Nutrient Management
R. Thaler, Chair
M. Brouk
A. DiCostanzo

Physiology
P. Gunn, Chair
C. Lents
T. Wilmoth

Ruminant Nutrition
P. Cardoso, Chair
K. Hales
T. Felix
M. Drewnowski

Teaching and Undergraduate Education
B. Wiegand, Chair
J. Bormann
J. Sterle

SPECIAL COMMITTEES

ADSA Nominations
D. B. Carlson
T. Nennich

ASAS Nominations
A. G. Mathew
J. K. Apple

Academic Quadrathlon
T. J. Safranski
C. G. Jackson
C. T. Jobsis
A. R. Cobb
K. E. Fike
J. S. Radcliffe
R. A. Nold
A. J. Seykora
B. D. Whitaker
T. E. Burkey
G. W. Onan
J. N. Tembei
M. E. Wilson
AWARD COMMITTEES

Outstanding Early Career Agribusiness Award
J. M. DeFrain
A. E. Wertz-Lutz
M. Wolfe
J. Jedzha

Innovation in Dairy Research Award
D. B. Carlson
T. D. Nennich
D. M. Spurlock
F. C. Cardoso

Outstanding Young Extension Specialist Award
R. L. Weaber
W. J. Sexten
J. W. Waggoner
J. K. Apple
M. L. Spangler

National Pork Board Award Swine Innovation
C. Hostetler
A. G. Mathew
J. K. Apple
P. S. Miller
T. Kellner

Outstanding Young Researcher Award
J. P. Steibel
N. K. Gabler
G. A. Perry
K. A. Vonnahme

Tim S. Stahly Award
N. L. Horn
J. S. Moneque
C. A. Jones
J. P. Schoonmaker
R. B. Hinson

Outstanding Young Teacher Award
T. L. Douthit
J. M. Bormann
T. A. Strauch
B. D. Whitaker
J. M. Kouba
PREVIOUS 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. Nelssen, 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. Shaver, University of Wisconsin – Madison
1997  R. D. Goodband, Kansas State University
1998  Not given
1999  M. D. Tokach, Kansas State University
2000  J. F. Smith, Kansas State University
2001  W. O. Herring, University of Missouri
2002  M. J. Brouk, Kansas State University
2003  W. J. Powers, Iowa State University
2004  S. J. Moeller, The Ohio State University
2005  K. J. Stalder, Iowa State University
2006  P. M. Fricke, University of Wisconsin
2007  G. C. Lamb, University of Minnesota
2008  J. M. DeRouchey, Kansas State University
2009  P. S. Kuber, The Ohio State University
2010  C. L. Wright, South Dakota State University
2011  G. A. Perry, South Dakota State University
2012  W. J. Sexten, University of Missouri
2013  R. L. Weaber, Kansas State University
2014  G. K. Rentfrow, University of Kentucky
2015  M. L. Spangler, University of Nebraska
<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>University/Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1971</td>
<td>D. H. Baker</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1972</td>
<td>C. E. Allen</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>1974</td>
<td>F. N. Owens</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1976</td>
<td>W. G. Bergen</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>1977</td>
<td>D. E. Bauman</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1978</td>
<td>G. L. Allee</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>1979</td>
<td>S. E. Curtis</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1980</td>
<td>T. L. Veum</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>1982</td>
<td>B. D. Schanbacher</td>
<td>Roman L. Hruska U.S. Meat Animal Research Center</td>
</tr>
<tr>
<td>1983</td>
<td>H. A. Garverick</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>1984</td>
<td>G. C. Fahey, Jr.</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1985</td>
<td>J. J. Ford</td>
<td>Roman L. Hruska U.S. Meat Animal Research Center</td>
</tr>
<tr>
<td>1986</td>
<td>C. L. Ferrell</td>
<td>Roman L. Hruska U.S. Meat Animal Research Center</td>
</tr>
<tr>
<td>1987</td>
<td>D. Gianola</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1988</td>
<td>S. P. Ford</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>1989</td>
<td>L. L. Berger</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1990</td>
<td>M. F. Rothschild</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>1991</td>
<td>M. F. Smith</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>1992</td>
<td>D. L. Harmon</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>1993</td>
<td>M. Koohmaraie</td>
<td>Roman L. Hruska, U.S. Meat Animal Research Center</td>
</tr>
<tr>
<td>1994</td>
<td>L. G. Sheffield</td>
<td>University of Wisconsin – Madison</td>
</tr>
<tr>
<td>1995</td>
<td>J. Odle</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1996</td>
<td>J. L. Nelssen</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>1997</td>
<td>R. S. Prather</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>1998</td>
<td>D. Pomp</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1999</td>
<td>R. W. Johnson</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>2000</td>
<td>M. C. Lucy</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>2001</td>
<td>C. K. Tuggle</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>2002</td>
<td>M. Morrison</td>
<td>Ohio State University</td>
</tr>
<tr>
<td>2003</td>
<td>T. P. L. Smith</td>
<td>USDA, NE</td>
</tr>
<tr>
<td>2004</td>
<td>C. W. Ernst</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>2005</td>
<td>E. Huff-Lonergan</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>2006</td>
<td>A. S. Cupp</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>2007</td>
<td>J. C. Matthews</td>
<td>University of Kentucky</td>
</tr>
<tr>
<td>2008</td>
<td>J. M. Recy</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>2009</td>
<td>G. E. Erickson</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>2010</td>
<td>J. DeRouchey</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>2011</td>
<td>K. A. Vonnahme</td>
<td>North Dakota State University</td>
</tr>
<tr>
<td>2012</td>
<td>G. A. Perry</td>
<td>South Dakota State University</td>
</tr>
<tr>
<td>2013</td>
<td>J. P. Steibel</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>2014</td>
<td>L. A. Kuehn</td>
<td>USDA-ARS</td>
</tr>
<tr>
<td>2015</td>
<td>N. K. Gabler</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>Year</td>
<td>Name</td>
<td>University</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------</td>
<td>---------------------------------</td>
</tr>
<tr>
<td>1971</td>
<td>B. G. Harmon</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1972</td>
<td>R. E. Hunsley</td>
<td>Purdue University</td>
</tr>
<tr>
<td>1974</td>
<td>D. H. Gee</td>
<td>South Dakota State University</td>
</tr>
<tr>
<td>1976</td>
<td>T. R. Cline</td>
<td>Purdue University</td>
</tr>
<tr>
<td>1977</td>
<td>P. J. Cunningham</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1978</td>
<td>B. D. Moser</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1979</td>
<td>C. L. Hausler</td>
<td>Southern Illinois University</td>
</tr>
<tr>
<td>1980</td>
<td>T. R. Carr</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1981</td>
<td>M. E. Dikeman</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>1982</td>
<td>R. E. Morrow</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>1983</td>
<td>D. J. Kesler</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1984</td>
<td>R. A. Easter</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1985</td>
<td>D. F. Parrett</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1986</td>
<td>J. G. Sebranek</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>1987</td>
<td>D. R. Brink</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1988</td>
<td>K. M. Irvin</td>
<td>The Ohio State University</td>
</tr>
<tr>
<td>1989</td>
<td>R. P. Lemenager</td>
<td>Purdue University</td>
</tr>
<tr>
<td>1990</td>
<td>B. R. Skaar</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>1991</td>
<td>D. A. Nichols</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>1992</td>
<td>M. A. Russell</td>
<td>Purdue University</td>
</tr>
<tr>
<td>1993</td>
<td>D. K. Combs</td>
<td>University of Wisconsin – Madison</td>
</tr>
<tr>
<td>1994</td>
<td>L. C. Martin</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>1995</td>
<td>M. E. Benson</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>1996</td>
<td>B. D. Banks</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>1997</td>
<td>H. D. Tyler</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>1998</td>
<td>C. R. Youngs</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>1999</td>
<td>J. N. Spain</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>2000</td>
<td>M. E. Doumit</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>2001</td>
<td>S. M. Lonergan</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>2002</td>
<td>W. N. Osburn</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>2003</td>
<td>S. C. Kelm</td>
<td>University of Wisconsin-River Falls</td>
</tr>
<tr>
<td>2004</td>
<td>M. S. Weber Nielsen</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>2005</td>
<td>B. D. Nielsen</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>2006</td>
<td>B. A. Reiling</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>2007</td>
<td>K. W. Bruns</td>
<td>South Dakota State University</td>
</tr>
<tr>
<td>2008</td>
<td>H. N. Zerby</td>
<td>The Ohio State University</td>
</tr>
<tr>
<td>2009</td>
<td>B. R. Wiegand</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>2010</td>
<td>K. A. Vonnahme</td>
<td>North Dakota State University</td>
</tr>
<tr>
<td>2011</td>
<td>S. A. Wagner</td>
<td>North Dakota State University</td>
</tr>
<tr>
<td>2012</td>
<td>J. M. Kouba</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>2013</td>
<td>J. Minick Bormann</td>
<td>Kansas State University</td>
</tr>
<tr>
<td></td>
<td>T. A. Strauch</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>2014</td>
<td>T. Douthit</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>2015</td>
<td>B. Whitaker</td>
<td>University of Findlay</td>
</tr>
</tbody>
</table>
### OUTSTANDING EARLY CAREER AGRIBUSINESS AWARD

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Company/Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>J. A. Barmore</td>
<td>Vita Plus Corp.</td>
</tr>
<tr>
<td>1997</td>
<td>D. E. Dill</td>
<td>Dairy Strategies</td>
</tr>
<tr>
<td>1998</td>
<td>C. M. Luhman</td>
<td>Land O’lakes Research Farm</td>
</tr>
<tr>
<td>1999</td>
<td>Not Given</td>
<td></td>
</tr>
<tr>
<td>2000</td>
<td>D. L. Hancock</td>
<td>Elanco Animal Health</td>
</tr>
<tr>
<td>2002</td>
<td>Not Given</td>
<td></td>
</tr>
<tr>
<td>2003</td>
<td>J. M. Campbell</td>
<td>APC, Inc.</td>
</tr>
<tr>
<td>2004</td>
<td>D. M. Webel</td>
<td>United Feeds</td>
</tr>
<tr>
<td>2005</td>
<td>T. A. Rathje</td>
<td>Danbred North America</td>
</tr>
<tr>
<td>2006</td>
<td>T. E. Sauber</td>
<td>Pioneer, A Dupont Company</td>
</tr>
<tr>
<td>2007</td>
<td>M. J. Pettitt</td>
<td>Prairie Swine Centre, LLC, Canada</td>
</tr>
<tr>
<td>2008</td>
<td>J. C. Woodworth</td>
<td>Lonza Inc.</td>
</tr>
<tr>
<td>2009</td>
<td>Not given</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>D. H. Kleinschmit</td>
<td>Agri-King, Inc.</td>
</tr>
<tr>
<td>2011</td>
<td>J. Spencer</td>
<td>JBS United Inc.</td>
</tr>
<tr>
<td>2012</td>
<td>A. M. Gaines</td>
<td>The Maschhoffs</td>
</tr>
<tr>
<td>2013</td>
<td>C. R. Schwab</td>
<td>National Swine Registry</td>
</tr>
<tr>
<td>2014</td>
<td>T. Loy</td>
<td>Adams Land and Cattle, Co.</td>
</tr>
<tr>
<td>2015</td>
<td>A. Brackenridge</td>
<td>Cargill</td>
</tr>
</tbody>
</table>

### INNOVATION IN DAIRY RESEARCH AWARD

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>2007</td>
<td>D. B. Carlson</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>2008</td>
<td>A. Bettegowda</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>2009</td>
<td>R. A. Natikov</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>2010</td>
<td>S. Fredin</td>
<td>University of Wisconsin – Madison</td>
</tr>
<tr>
<td>2011</td>
<td>D. E. Graugnard</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>2012</td>
<td>Not given</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>J. S. Osorio</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>2014</td>
<td>Not given</td>
<td></td>
</tr>
<tr>
<td>2015</td>
<td>L. J. Wilsdorf</td>
<td></td>
</tr>
</tbody>
</table>
## NATIONAL PORK BOARD INNOVATION AWARD

<table>
<thead>
<tr>
<th>Year</th>
<th>Name(s) and Institution(s)</th>
</tr>
</thead>
</table>
| 2006 | M. C. Brumm, University of Nebraska*  
N. L. Berry, Iowa State University**  
T. V. Serenius, Iowa State University** |
| 2007 | T. Safranski, University of Missouri*  
J. S. Bates, University of Nebraska**  
G. Xu, University of Minnesota** |
| 2008 | S. A. Cutler, Iowa State University**  
G. Xu, University of Minnesota** |
| 2009 | P. V. Anderson, Iowa State University**  
N. Boddicker, Iowa State University**  
P. J. Lammers, Iowa State University* |
| 2010 | E. Kiarie, University of Manitoba**  
M. E. Johnston, The Hanor Company**  
M. T. See, North Carolina State University* |
| 2011 | Education Not Given  
A. E. DeDecker, University of Illinois**  
M.-P. L. Montminy, Agriculture and Agri-Food Canada** |
| 2012 | Y. Liu, University of Illinois, Champaign-Urbana* |
| 2013 | K. J. Stalder, Iowa State University*  
N. J. Boddicker, Iowa State University**  
L. J. Johnston, University of Minnesota** |
| 2014 | B. D. Whitaker, University of Findlay*  
N. V. L. Serão, Iowa State University** |
| 2015 | D. S. Rosero, North Carolina State University**  
J. A. Brown, Prairie Swine Centre**  
M. Walugembe, Iowa State University* |

*Education  
**Research
# Past Winners of Invitational Competitive Research Paper Awards

## Undergraduate Students - Oral

<table>
<thead>
<tr>
<th>Year</th>
<th>Winner</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>R. E. Raw</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>1988</td>
<td>J. A. Ragains</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>1989</td>
<td>G. L. Ambrose</td>
<td>South Dakota State University</td>
</tr>
<tr>
<td>1990</td>
<td>C. N. Kemper</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>1991</td>
<td>T. R. Eberle</td>
<td>North Dakota State University</td>
</tr>
<tr>
<td>1992</td>
<td>B. J. MacDonald</td>
<td>North Dakota State University</td>
</tr>
<tr>
<td>1993</td>
<td>B. L. Dunn</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>1994</td>
<td>S. M. Nelson</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1995</td>
<td>L. J. Trinity</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>1996</td>
<td>M. E. Cunningham</td>
<td>Oklahoma State University</td>
</tr>
<tr>
<td>1997</td>
<td>C. E. Sorenson</td>
<td>South Dakota State University</td>
</tr>
<tr>
<td>1998</td>
<td>J. L. Strickland</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1999</td>
<td>B. A. DeMontigny</td>
<td>North Dakota State University</td>
</tr>
<tr>
<td>2000</td>
<td>K. S. Freise</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>2001</td>
<td>K. R. Nollette</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>2002</td>
<td>B. Meyer</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>2003</td>
<td>A. Harvey</td>
<td>South Dakota State University</td>
</tr>
<tr>
<td>2004</td>
<td>L. H. Bach</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>2005</td>
<td>A. M. Meyer</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>2006</td>
<td>L. D. Holmes</td>
<td>Southern Illinois University</td>
</tr>
<tr>
<td></td>
<td>R. Schnobrich</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>2007</td>
<td>B. H. Godsey</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>2008</td>
<td>B. L. Varnes</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>2009</td>
<td>H. L. Frobose</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>2010</td>
<td>S. L. Fry</td>
<td>North Dakota State University</td>
</tr>
<tr>
<td>2011</td>
<td>R. L. Wangler</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>2012</td>
<td>E. A. Nore</td>
<td>North Dakota State University</td>
</tr>
<tr>
<td>2013</td>
<td>B. Abramovitz</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>2014</td>
<td>K. M. Gourley</td>
<td>Kansas State University</td>
</tr>
<tr>
<td></td>
<td>B. O. Fleming</td>
<td>Mississippi State University</td>
</tr>
<tr>
<td>2015</td>
<td>J. T. Gebhardt</td>
<td>Michigan State University</td>
</tr>
</tbody>
</table>

## Undergraduate Students - Poster

<table>
<thead>
<tr>
<th>Year</th>
<th>Winner</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>E. I. Ince</td>
<td>University of Wisconsin</td>
</tr>
<tr>
<td>2010</td>
<td>D. P. Strassburg</td>
<td>University of Wisconsin</td>
</tr>
<tr>
<td>2011</td>
<td>S. J. Morine</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>2012</td>
<td>E. J. Cretney</td>
<td>University of Wisconsin</td>
</tr>
<tr>
<td>2013</td>
<td>Z. E. Carlson</td>
<td>North Dakota State University</td>
</tr>
<tr>
<td>2014</td>
<td>E. G. Groose</td>
<td>Lincoln University</td>
</tr>
<tr>
<td>2015</td>
<td>C. D. Evans</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>Year</td>
<td>Name</td>
<td>University</td>
</tr>
<tr>
<td>------</td>
<td>-----------------------------</td>
<td>-----------------------------------</td>
</tr>
<tr>
<td>1976</td>
<td>D. G. Haught</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>1977</td>
<td>L. L. Berger</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1978</td>
<td>G. F. Collings</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>1979</td>
<td>R. D. Boyd</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1980</td>
<td>D. G. Cieslak</td>
<td>University of Wisconsin</td>
</tr>
<tr>
<td>1981</td>
<td>W. F. Pope</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1982</td>
<td>P. F. Saenger</td>
<td>Purdue University</td>
</tr>
<tr>
<td>1983</td>
<td>D. A. Redmer</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>1984</td>
<td>W. F. Brown</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1985</td>
<td>J. H. Brendemuhl</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1986</td>
<td>P. L. Houghton</td>
<td>Purdue University</td>
</tr>
<tr>
<td>1987</td>
<td>M. H. Wilde</td>
<td>The Ohio State University</td>
</tr>
<tr>
<td>1988</td>
<td>T. R. Radke</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1989</td>
<td>K. K. Kreikemeier</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>1990</td>
<td>R. A. Nold</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>1991</td>
<td>M. D. Tokach</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>1992</td>
<td>G. F. Louis</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1993</td>
<td>B. T. Larson</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>1994</td>
<td>L. H. Anderson</td>
<td>The Ohio State University</td>
</tr>
<tr>
<td>1995</td>
<td>M. L. Augensteine</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>1996</td>
<td>D. D. Koehler</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>1997</td>
<td>R. A. Nold</td>
<td>South Dakota State University</td>
</tr>
<tr>
<td>1998</td>
<td>K. J. Rozeboom</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>1999</td>
<td>L. A. Averette</td>
<td>North Carolina State University</td>
</tr>
<tr>
<td>2000</td>
<td>T. A. Armstrong</td>
<td>North Carolina State University</td>
</tr>
<tr>
<td>2001</td>
<td>T. G. McDaneld</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td></td>
<td>J. H. Hampton</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>2002</td>
<td>K. M. Hargrave</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td></td>
<td>M. J. Hersom</td>
<td>Oklahoma State University</td>
</tr>
<tr>
<td>2003</td>
<td>J. Luther</td>
<td>North Dakota State University</td>
</tr>
<tr>
<td></td>
<td>R. Main</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>2004</td>
<td>R. C. Bott</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td></td>
<td>M. M. Martinez</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>2005</td>
<td>J. M. Koch</td>
<td>West Virginia University</td>
</tr>
<tr>
<td></td>
<td>N. D. Fastinger</td>
<td>The Ohio State University</td>
</tr>
<tr>
<td>2006</td>
<td>D. M. Larson</td>
<td>North Dakota State University</td>
</tr>
<tr>
<td></td>
<td>M. Gorocica-Buenfil</td>
<td>The Ohio State University</td>
</tr>
<tr>
<td>2007</td>
<td>P. E. Urriola</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td></td>
<td>R. N. Dilger</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>2008</td>
<td>J. M. Mapes</td>
<td>Michigan State University</td>
</tr>
<tr>
<td></td>
<td>E. Kiariie</td>
<td>University of Manitoba, Winnipeg, Canada</td>
</tr>
<tr>
<td>2009</td>
<td>L. A. Lekatz</td>
<td>North Dakota State University</td>
</tr>
<tr>
<td></td>
<td>D. M. Gorbach</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>2010</td>
<td>H. L. Evans</td>
<td>University of Missouri</td>
</tr>
<tr>
<td></td>
<td>R. C. Sulabo</td>
<td>Kansas State University</td>
</tr>
</tbody>
</table>
2011  J. Bishop, North Carolina State University*
       Y. Zhao, North Carolina State University**
2012  J. Flohr, Kansas State University*
       J. K. Farney, Kansas State University**
2013  K. L. Gillespie, University of Nebraska*
       D. B. Burken, University of Nebraska**
2014  F. Wu, University of Minnesota*
       B. Mordhorst, North Dakota State University*
       E. K. Harris, University of Minnesota**
       H. L. Frobose, Kansas State University**
2015  J. G. Wiegert, Virginia Tech*
       K. N. Niederecker, University of Missouri*
       J. R. Russell, Iowa State University**

**GRADUATE STUDENTS - POSTER**

2007  P. L. Nester, North Dakota State University*
       N. DiLorenzo, University of Minnesota**
2008  N. R. Bork, North Dakota State University*
       B. A. Peterson, University of Illinois**
2009  P. Gunn, Purdue University*
       C. O. Lemley, West Virginia University**
2010  N. S. Schmetz, Purdue University*
       L. Senaratne, University of Nebraska**
2011  K. E. Boesche, Purdue University*
       P. J. Gunn, Purdue University*
2012  M. Berg, University of Wisconsin – Madison*
       X. J. Li, University of Minnesota**
2013  B. M. Bohrer, The Ohio State University*
       L. E. Camacho, North Dakota State University**
2014  J. L. Peine, North Dakota State University*
       J. D. Colpoys, Iowa State University**
2015  R. S. Stokes, Iowa State University*
       K. F. Coble, Kansas State University**

*M.S. Division
**Ph.D. Division

**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
1999  L. Becker, University of Minnesota
2000  R. Hawkins, North Dakota State University
2001  Discontinued
<table>
<thead>
<tr>
<th>Year</th>
<th>Young Dairy Scholars</th>
</tr>
</thead>
</table>
| 2006 | B. J. Bradford, Michigan State University  
N. Litherland, University of Illinois  
W. Miller, Kansas State University  
R. Rastani, University of Wisconsin  |
| 2007 | M. Abdelqader, South Dakota State University  
D. B. Carlson, University of Illinois  
M. Carriquiry, University of Minnesota  
M. Geha, University of Nebraska  
N. A. Janovick-Guretzky, University of Illinois  
D. H. Kleinschmit, South Dakota State University  
E. D. Reid, University of Illinois  
P. J. Ross, Michigan State University  |
| 2008 | A. Bettegowda, Michigan State University  
J. M. Bewley, Purdue University  
E. L. Karcher, Iowa State University  
K. M. Moyes, University of Illinois  
B. W. Pamp, South Dakota State University  
M. L. Raeth-Knight, University of Minnesota  |
| 2009 | R. A. Nafikov, Iowa State University  |
| 2010 | B. J. Heins, University of Minnesota  
C. O. Lemley, West Virginia University  
C. D. Mikolayunas, University of Wisconsin  
K. Mjoun, South Dakota State University  |
| 2011 | M. J. Aguerre, University of Wisconsin – Madison  
N. M. Bello, Kansas State University  
G. L. Golombeski, University of Minnesota  
D. E. Graugnard, University of Illinois  
H. M. White, Indiana University School of Medicine  |
| 2012 | M. Akins, University of Wisconsin  
M. Osman, Iowa State University  
S. Ranathunga, South Dakota State University  |
| 2013 | R. Cabral, University of New Hampshire  
K. Herrick, South Dakota State University  
J. Anderson, South Dakota State University  
H. Tucker, Purdue University  
J. Farney, Kansas State University  
D. Koltes, Iowa State University  
E. Castillo Lopez, University of Nebraska  
J. Osorio, University of Illinois  |
| 2014 | K. Yuan, Kansas State University  
P. Piantoni, Michigan State University  |
| 2015 | J. Boerman, Cargill Animal Nutrition  
T. Dennis, Provimi  
L. Ferraretto, University of Wisconsin  
J. Laporta, University of Florida  |
2010
J. Atkins, University of Missouri
T. M. Che, University of Illinois
S. Hooda, University of Alberta
J. A. Jendza, Purdue University
J. S. Jennings, South Dakota State University
V. G. Perez, University of Illinois
R. Poletto, Purdue University

2011
J. R. Bergstrom, Kansas State University
D. D. Boler, University of Illinois
A. E. DeDecker, University of Illinois
M. R. P. Elmore, University of Illinois
A. M. Meyer, North Dakota State University
B. W. Neville, North Dakota State University
C. E. Phillips, University of Minnesota
P. E. Urriola, Cargill Animal Nutrition

2012
R. Leach, USDA-ARS, US Meat Animal Research Center
J. Kelzer, University of Minnesota
R. Manjarin, Michigan State University
M. Song, University of Illinois
Y. Liu, University of Illinois
I. S. Choi, USDA
S. Cervantes-Pahm, University of Illinois
M. Weber, Cargill

2013
Y. Shen, North Carolina State University
L. Mack, Purdue University
F. Almeida, University of Illinois
A. Hanson, University of Minnesota
E. Bobeck, Iowa State University
A. Summers, University of Nebraska
D. Brake, Kansas State University
N. Boddicker, Iowa State University

2014
S. M. Cruzen, Iowa State University
E. K. Harris, University of Minnesota
J. L. Zambito, West Virginia University
M. V. Sanz Fernandez, Iowa State University
L. E. Camacho, North Dakota State University
C. M. Pilcher, Iowa State University
C. B. Paulk, Kansas State University
J. K. Grubbs, Iowa State University
C. L. Daigle, Michigan State University
D. Gonzalez-Pena Fundora, University of Illinois

2015
A. S. Bhatnagar, University of Nebraska-Lincoln
K. F. Coble, Kansas State University
B. W. Daigneault, University of Illinois
M. Erasmus, Michigan State University
O. N. Genther, Iowa State University
N. A. Gutierrez, Iowa State University
L. D. Prezotto, North Dakota State University
O. J. Rojas, University of Illinois
D. S. Rosero, Tapia, North Carolina State University
A. R. Taylor, South Dakota State University
L. Wang, University of Alberta
A. K. Watson, University of Nebraska-Lincoln

**TIM S. STAHLY OUTSTANDING SWINE NUTRITION MIDWEST GRADUATE STUDENT AWARD**

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>T. M. Che</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>2010</td>
<td>R. Hinson</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>2011</td>
<td>J. R. Bergstrom</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>2012</td>
<td>Cassandra Jones</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>2013</td>
<td>S. Monegue</td>
<td>University of Kentucky</td>
</tr>
<tr>
<td>2014</td>
<td>N. Horn</td>
<td>Purdue University</td>
</tr>
<tr>
<td>2015</td>
<td>N. A. Gutierrez</td>
<td>Iowa State University</td>
</tr>
</tbody>
</table>

**ASAS MIDWESTERN SECTION PRESIDENTS**

<table>
<thead>
<tr>
<th>Year</th>
<th>Name</th>
<th>University</th>
</tr>
</thead>
<tbody>
<tr>
<td>1963</td>
<td>O. G. Bentley</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1964-65</td>
<td>R. H. Grummer</td>
<td>University of Wisconsin</td>
</tr>
<tr>
<td>1966-67</td>
<td>G. R. Johnson</td>
<td>The Ohio State University</td>
</tr>
<tr>
<td>1968</td>
<td>R. J. Meade</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>1969</td>
<td>J. A. Hoefer</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>1970-71</td>
<td>W. E. Dinusson</td>
<td>North Dakota State University</td>
</tr>
<tr>
<td>1972</td>
<td>J. F. Lasley</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>1973</td>
<td>U. S. Garrigus</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1974-75</td>
<td>V. C. Speer</td>
<td>Iowa State University</td>
</tr>
<tr>
<td>1976</td>
<td>H. S. Teague</td>
<td>The Ohio State University</td>
</tr>
<tr>
<td>1977</td>
<td>R. M. Luther</td>
<td>South Dakota State University</td>
</tr>
<tr>
<td>1978</td>
<td>B. N. Day</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>1979-80</td>
<td>D. R. Zimmerman</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1981</td>
<td>A. L. Pope</td>
<td>University of Wisconsin</td>
</tr>
<tr>
<td>1982</td>
<td>R. D. Goodrich</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>1983</td>
<td>E. R. Miller</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>1984</td>
<td>W. R. Woods</td>
<td>Purdue University</td>
</tr>
<tr>
<td>1985</td>
<td>L. R. Corah</td>
<td>Kansas State University</td>
</tr>
<tr>
<td>1986</td>
<td>B. D. Moser</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>1987</td>
<td>S. E. Curtis</td>
<td>University of Illinois</td>
</tr>
<tr>
<td>1988</td>
<td>R. G. Zimbelman</td>
<td>Upjohn; D. J. Meisinger, Indiana</td>
</tr>
<tr>
<td>1989</td>
<td>T. J. Klopfenstein</td>
<td>University of Nebraska</td>
</tr>
<tr>
<td>1990</td>
<td>J. R. Romans</td>
<td>South Dakota State University</td>
</tr>
<tr>
<td>1991</td>
<td>J. E. Pettigrew</td>
<td>University of Minnesota</td>
</tr>
<tr>
<td>1992</td>
<td>C. E. Sasse</td>
<td>Cenex/Land O’Lakes</td>
</tr>
<tr>
<td>1993</td>
<td>M. G. Hogberg</td>
<td>Michigan State University</td>
</tr>
<tr>
<td>1994</td>
<td>G. L. Allee</td>
<td>University of Missouri</td>
</tr>
<tr>
<td>1995</td>
<td>S. K. Webel</td>
<td>Purina Mills</td>
</tr>
</tbody>
</table>
1996  D. L. Meeker, National Pork Producers Council
1997  T. S. Stahly, Iowa State University
1998  R. P. Lemenager, Purdue University
1999  S. P. Ford, Iowa State University
2000  J. R. Males, Oregon State University
2001  M. L. Day, The Ohio State University
2002  R. K. Johnson, University of Nebraska
2003  C. L. Ferrell, USDA, Clay Center
2004  G. C. Shurson, University of Minnesota
2005  A. L. Grant, Purdue University
2006  D. L. Hancock, Elanco Animal Health
2007  R. L. Moser, JBS United, Inc.
2008  M. K. Nielsen, University of Nebraska
2009  M. E. Spurlock, Iowa State University
2010  T. D. Crenshaw, University of Wisconsin
2011  C. W. Ernest, Michigan State University
2012  J. S. Radcliffe, Purdue University
2013  J. F. Patience, Iowa State University
2014  B. R. Wiegand, University of Missouri
2015  A. G. Mathew, Purdue University
2016  J. K. Apple, University of Arkansas

**ADSA MIDWEST BRANCH PRESIDENTS**

1992  J. F. Keown, University of Nebraska
1993  J. G. Linn, University of Minnesota
1994  D. J. Schingoethe, South Dakota State University
1995  J. L. Morrill, Kansas State University
1996  M. F. Hutjens, University of Illinois
1997  M. A. Faust, Iowa State University
1998  J. K. Drackley, University of Illinois
1999  R. D. Shaver, University of Wisconsin
2000  R. J. Grant, University of Nebraska
2001  M. L. Eastridge, The Ohio State University
2002  J. D. Quigley III, APC, Inc.
2003  S. T. Franklin, University of Kentucky
2004  D. K. Combs, University of Wisconsin
2005  L. L. Timms, Iowa State University
2006  P. Hoffman, University of Wisconsin - Madison
2007  M. M. Schutz, Purdue University
2008  J. R. Pursley, Michigan State University
2009  C. M. Luhman, Long View Animal Nutrition
2010  H. Chester-Jones, University of Minnesota
2011  D. P. Casper, Agri-King, Inc.
2012  K. F. Kalscheur, South Dakota State University
2013  L. H. Baumgard, Iowa State University
2014  M. J. Brouk, Kansas State University
2015  D. B. Carlson, Milk Products LLC
2016  T. D. Nennich, Famo Feeds
LEVEL 3

Meeting Room Level
Community Choice Credit Union Convention Center
LEVEL 1

Meeting Room Level
Hy-Vee Hall
3 THINGS YOU SHOULD KNOW

#1. Areas of our skywalk system are closed because we are building a new, 330-room convention center hotel. Come back and check it out in 2018!

#2. If you are headed to the Convention Center/Arena, exit points 1-4 will get you there.

#3. Lean on locals. If you have questions, stop someone passing by!

IMPORTANT INFO TO NOTE

- Exit Points 1, 2 and 3 are ADA accessible
- Closest elevator to Exit Point 4 is at Exit Point 3

WALKING DISTANCE/DIRECTIONS

Exit Point 1
3.5 blocks to the Convention Center/Arena
Once at street level, head East on Grand Avenue. Turn left/North on 4th Street and proceed 3 blocks to the Convention Center/Arena

Exit Point 2
4 blocks to the Convention Center/Arena
Once at street level, head East on Grand Avenue. Turn left/North on 4th Street and proceed 3 blocks to the Convention Center/Arena

Exit Point 3
3.5 blocks to the Convention Center/Arena
Once at street level, exit parking garage onto 5th Avenue. Turn right/North on 5th Avenue. Turn right/East on Watson Powell Jr Way. Then turn left/North on 4th Street and proceed 1 block to the Convention Center/Arena

Exit Point 4
3 blocks to the Convention Center/Arena
Once at street level, head East on Watson Powell Jr Way. Then turn left/North on 4th Street and proceed 1 block to the Convention Center/Arena

SkywalkDSM App available for download on iOS and Android