ASAS Midwestern Section and ADSA® Midwest Branch
Scientific Sessions & Business Meeting
Des Moines, IA • March 17-19

2014
## FUTURE MEETINGS

<table>
<thead>
<tr>
<th>Year</th>
<th>Date</th>
<th>Location</th>
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<tbody>
<tr>
<td>2015</td>
<td>March 15-18</td>
<td>Des Moines</td>
</tr>
<tr>
<td>2016</td>
<td>March 13-16</td>
<td>Des Moines</td>
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</tbody>
</table>
AMERICAN SOCIETY OF ANIMAL SCIENCE

OFFICERS 2013-2014

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Dr. Debra K. Aaron, President-Elect
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OFFICERS 2013-2014

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Wake Forest, NC

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American Society of Animal Science, Champaign, IL

Mrs. Jacelyn Hemmelgarn, Chief Operations Officer
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University of Wisconsin, Madison, WI

Dr. Rafael Jimenez-Flores, Director
California Polytechnic State University, San Luis Obispo, CA

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

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

Dr. Cindie Luhman, Foundation Chair
Land O’Lakes Purina Feed, Gray Summit, MO

Ms. Amanda Sterrett, GSD President
University of Kentucky, Lexington, KY

Mr. Jason Zimmerman, SAD President
Virginia Tech, Blacksburg, VA

Mr. Peter Studney, Executive Director
American Dairy Science Association, Champaign, IL
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OFFICERS 2013-2014

Dr. Michael J. Brouk, President
Kansas State University, Manhattan, KS

Dr. David B. Carlson, Vice President
Elanco Animal Health, Waukesha, WI

Dr. Tamilee Nennich, Secretary
Purdue University, West Lafayette, IN

Dr. Lance H. Baumgard, Past President
Iowa State University, Ames, IA

Dr. Dan Illg, ADSA Director
Standard Dairy Consultants, Omaha, NE

Dr. Daryl Kleinschmit, ASAS/ADSA Director-at-Large
Agri-King, Inc., Fulton, IL

INNOVATE 2014: Global Food Security
Innovations in Protein Production
to Meet the Global Demands of 2050

October 5–7, 2014
Madden’s On
Gull Lake
Brainerd, MN

asas.org/innovate2014
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REGISTRATION
Iowa Events Center, Lobby
Sunday, March 16, 3:00 PM – 5:00 PM
Monday, March 17, 7:00 AM – 7:30 PM
Tuesday, March 18, 7:00 AM – 4:00 PM
Wednesday, March 19, 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 and Iowa Events Center

<table>
<thead>
<tr>
<th></th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
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</thead>
<tbody>
<tr>
<td>Shuttle 1</td>
<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>
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<tr>
<td></td>
<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>
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</tbody>
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SHUTTLE 2
Embassy Suites – Holiday Inn Downtown and Iowa Events Center

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<tr>
<th></th>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
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<tbody>
<tr>
<td>Shuttle 2</td>
<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>
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<tr>
<td></td>
<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>
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<tr>
<td></td>
<td>4:00 PM to 7:30 PM</td>
<td>6:00 PM to 8:00 PM</td>
<td></td>
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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
JOB RESOURCE CENTER

Continuing in 2014: The traditional Job Resource Center will be located in the Exhibit Hall, Ballroom of 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 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 in Des Moines beginning at noon on Monday, March 17, 2014.

ARPAS CONTINUING EDUCATION UNITS

The 2014 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.

EMPLOYERS

Here, employers and recruiters can access the most qualified talent pool with relevant work experience to fulfill staffing needs.

JOB SEEKERS

This site offers job seekers the opportunity to get information out to potential employers and search job postings all in one location with a single login.

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

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

**Changes To The Schedule**

Please note that in response to Midwest Membership request, we have made a number of schedule changes. Most notably, we have moved the Poster Presentations to Tuesday and Wednesday morning with donuts and coffee available, we have moved the Business Meeting and Awards from a Wednesday breakfast to Tuesday evening at 5:00 pm with a substantial reception following and we have added a number of snack breaks throughout the meeting.

### MONDAY, MARCH 17, 2014

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>7:30 AM</td>
<td>2014 Breakfast to kick off AQ Activities, Grand Ballroom Foyer</td>
</tr>
<tr>
<td>8:00 AM</td>
<td>AQ Written Exams, Community Choice Credit Union Convention Center (See AQ organizer for room assignments)</td>
</tr>
<tr>
<td>8:30 AM</td>
<td>Gary Allee Symposium: Feeding Sick Pigs, Grand Ballroom</td>
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<tr>
<td>10:00 AM</td>
<td>AQ Quiz Bowl Preliminary Rounds, 302/303, 304/305, and 306/307</td>
</tr>
<tr>
<td>1:00 PM</td>
<td>David H. Baker Amino Acid Symposium, 318/319/320</td>
</tr>
<tr>
<td>2:00 PM</td>
<td>Graduate Student Competition MS Oral I, 302/303</td>
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<tr>
<td>2:00 PM</td>
<td>Graduate Student Competition MS Oral II, 304/305</td>
</tr>
<tr>
<td>2:00 PM</td>
<td>Graduate Student Competition PhD Oral I, 312/313</td>
</tr>
<tr>
<td>2:00 PM</td>
<td>Graduate Student Competition PhD Oral II, 314/315</td>
</tr>
<tr>
<td>2:00 PM</td>
<td>Undergraduate Student Competition Oral I, 306/307</td>
</tr>
<tr>
<td>1:00 PM</td>
<td>Undergraduate Student Competition Oral II, 308/309</td>
</tr>
<tr>
<td>5:30 PM</td>
<td>Reception &amp; Recognition of Young Scholar Winners, Grand Ballroom</td>
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<tr>
<td>7:00 PM</td>
<td>Final AQ Quiz Bowl Competition and Awards Presentation, Grand Ballroom</td>
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<tr>
<td>7:15 PM</td>
<td>Graduate Student Dinner and Learn, 101/102</td>
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<tr>
<td>8:30 PM</td>
<td>Program Committee Reception, Renaissance Savery Hotel</td>
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<tr>
<td>9:00 PM</td>
<td>Graduate Student Social, Marriott, Hall of Cities</td>
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### TUESDAY, MARCH 18, 2014 / MORNING

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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<tbody>
<tr>
<td>7:30 AM</td>
<td>Poster Presentations with Donuts and Coffee, Grand Ballroom</td>
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<tr>
<td>7:30 AM</td>
<td>Graduate Student Poster Competition, Grand Ballroom</td>
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<tr>
<td>7:30 AM</td>
<td>Undergraduate Student Poster Competition, Grand Ballroom</td>
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<tr>
<td>8:30 AM</td>
<td>Growth, Development, Muscle Biology, and Meat Science Symposium: Insulin Revisited, 306/307</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>Animal Behavior, Housing, &amp; Well-Being Symposium: What Does This Study Say About Well-Being? Caveats and Considerations, 308/309</td>
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<tr>
<td>9:00 AM</td>
<td>Breeding and Genetics I, 312/313</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>David Schingoethe Symposium: Heifer Nutrition and the Future, 302/303</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>Nonruminant Nutrition: Grow-Finish Management and Nutrition, 314/315</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>Nonruminant Nutrition: Nursery Management and Nutrition, 316/317</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>Nonruminant Nutrition: Sow Management and Nutrition, 318/319</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>Ruminant Nutrition: Coproducts, 304/305</td>
</tr>
</tbody>
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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 Secretary.

11:00 AM Extension – Swine, 318/319
12:30 PM Bentley Symposium and Lunch, Speaker: Dr. Jeff Wood, Bristol University, Grand Ballroom
12:30 PM AQ Lunch, 101/102

TUESDAY, MARCH 18, 2014 / AFTERNOON

1:30 PM Animal Behavior, Housing and Well-Being I, 318/319
1:30 PM Breeding & Genetics Symposium: Analysis of Next Generation Sequencing (NGS) Data, 308/309
1:30 PM Equine, 401
1:30 PM Extension – Diary Symposium: Strategies To Increase Fiber Digestibility In Lactating Dairy Cows, 302/303
1:30 PM Growth and Development, Muscle Biology and Meat Science, 312/313
1:30 PM Nonruminant Nutrition: Feed Processing, Ingredients, and Additives, 316/317
1:30 PM Nonruminant Nutrition: Gut Health and Disease: Nutritional and Metabolic Impacts, 314/315
1:30 PM Physiology Symposium: A Lifetime of Metabolites, 306/307
1:30 PM Ruminant Nutrition: General, 304/305
5:30 PM* Business Meeting and Awards Program, Grand Ballroom
7:00 PM* Reception, Grand Ballroom

WEDNESDAY, MARCH 19, 2014

7:30 AM Poster Presentations with Donuts and Coffee, Grand Ballroom
9:00 AM Breeding and Genetics II, 306/307
9:00 AM Harlan Ritchie Beef Cattle Symposium: Today’s and Tomorrow’s Beef Industry, 304/305
9:00 AM Nonruminant Nutrition: Co-Products, 312/313
9:00 AM Nonruminant Nutrition: Minerals and Vitamins, 308/309
9:00 AM Physiology, 314/315
9:00 AM Ruminant Nutrition Symposium: Amino Acids, 302/303
11:30 AM Midwestern Section ASAS Post-Meeting Symposium: Evaluating, Optimizing and Utilizing Technologies To Improve PigPerformance (Sponsored by Zoetis), Grand Ballroom
12:00 PM ADSA/ASAS Midwest Board of Directors, Boardroom 2

*Please note the new time of the Business Meeting and Awards Program.
A SPECIAL THANK YOU

From the American Society of Animal Science Midwestern Section and the American Dairy Science Midwest Branch for support of the 2014 meeting to the following companies:

Outstanding Young Scientist Awards
Extension Award – Land O’Lakes Purina Feed LLC
Research Award – DSM Nutritional Products Inc.
Teaching Award – Alliance Nutrition

National Pork Board Swine Innovation (Abstract) Awards
Research – National Pork Board
Education – National Pork Board

Agribusiness Award
BASF Plant Science

Student Competition Paper Awards
Graduate Oral, Ph.D. – Akey
Graduate Poster, M.S. – ADSA ASAS MW Board
Graduate Poster, Ph.D. – ADSA ASAS MW Board
Undergraduate Oral – ADSA ASAS MW Board
Undergraduate Poster – ADSA ASAS MW Board

The Tim S. Stahly Outstanding Swine Nutrition Midwest Graduate Student Award
The Tim S. Stahly Memorial and Tribute Fund

Academic Quadrathalon
Agri-King
ASAS Foundation
Iowa State University
2014 MIDWEST MEETING SPONSORS

PLATINUM LEVEL
Alltech Inc.
American Society of Animal Science
ASAS Foundation
Zoetis

GOLD LEVEL
BASF
Diamond V Mills, Inc.
Kemin Industries
National Pork Board
NutriQuest

SILVER LEVEL
AB Vista
Agri-King Inc.
ADM
Alliance Nutrition
Akey
Catch Des Moines (Greater Des Moines Convention and Visitors Bureau)
DSM Nutritional Products Inc.
DPP-NA
Dupont
Elanco Animal Health
Zinpro Performance Minerals

BRONZE LEVEL
Iowa State University
JBS United Inc.

FRIEND LEVEL
American Dairy Science Association (ADSA)
American Meat Science Association (AMSA)
American Registry of Professional Animal Scientists (ARPAS)
**POSTER SCHEDULE**

**NEW** Poster presentations will take place on Tuesday and Wednesday MORNING from 7:30 am to 9:00 am. Donuts and coffee will be available to presenters and attendees starting at 7:00 am each morning.

All posters will be in the Grand Ballroom and will be in place from Monday at 1:00 pm until Wednesday at noon. Authors are to be present on their assigned day from 7:30 am to 9:00 am. Authors are welcome to man posters during the evening receptions to enhance visibility, however it is not required. Posters entered in Graduate and Undergraduate Research Paper Competitions have been incorporated into their appropriate disciplinary sections. Judging of student competition posters will take place on TUESDAY morning.

**Tuesday, March 18, 2014**

*All authors present from 7:30 am to 9:00 am*

- Graduate Student Poster Competition-M.S.
- Graduate Student Poster Competition-Ph.D.
- Undergraduate Student Poster Competition
- Animal Behavior, Housing, & Well-Being:
  - Nonruminant Nutrition–Supplements and Alternative Feedstuffs
  - Extension - Beef/Small Ruminant
  - Nonruminant Nutrition: Amino Acids
  - Nonruminant Nutrition: Feed Additives and Ingredients
- Nonruminant Nutrition: Nutritional Technologies and Feeding Strategies
- Physiology
- Teaching

**Wednesday, March 19, 2014**

*All authors present from 7:30 am to 9:00 am*

- Animal Behavior, Housing, & Well-Being
- Breeding and Genetics
- Extension - Swine
- Growth, Development, Muscle Biology, and Meat Science
- Nonruminant Nutrition: Grow-Finish Nutrition and Management
- Nonruminant Nutrition: Nutrition and Management of Sows
- Nonruminant Nutrition: Weaned Pig Nutrition and Management
- Ruminant Nutrition
SPECIAL EVENTS

Reception & Recognition of Young Scholar Winners
Monday, March 17 • 5:30 PM • Grand Ballroom
Join us for the opening reception of the 2014 Midwest Meeting. This is a great time to catch up with colleagues. We will also take the time to recognize the 2014 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 17 – 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 meeting in Kansas City. Following the Quiz Bowl final the AQ Awards will be presented. Please come out and support our undergraduates.

Graduate Student Dinner and Learn
Monday, March 17 • 7:15-9:00 PM • Room 101-102
The objective of the Student Dinner and Learn is to provide undergraduate and graduate students with opportunities for professional development and networking. This year each table/topic will have a company sponsor. The topics will involve discussion on career preparation, job search, and effective scientific communication in the areas of Industry Research & Development, and Industry Technical Consulting/Sales. Each company will send a professional to represent their topic and students will be assigned to a table based on their area of interest. Join us and take advantage of the opportunity to discuss your interests with professionals in the field. Preregistration is required. Registration fee is $5.00.

Graduate Student Mixer
Monday, March 17 • 9:00 PM • Marriott, Hall of Cities
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 $5.00.
Bentley Lecture  
**Tuesday, March 18 • 12:30 PM • Grand Ballroom**  
**Fat Deposition And Meat Quality In Food Animals**  
*Jeff Wood, Professor Emeritus, Bristol University, UK*  
Considered by many to be the foremost global authority on fat deposition, fattening patterns, and fat quality in food animals. Dr. Wood has developed a prolific research career in his field and is sought after by many to speak on the topics related to fat in food producing animals. Bringing an appealing discussion for many disciplines in Animal Science, we are very proud to sponsor Dr. Wood as the second annual Bentley Lecturer at the 2014 Midwest Annual Meeting.  
*Sponsored by: ASAS Midwestern Section / ADSA® Midwestern Branch Joint Board*  
*Registration is required; attendance is limited to the first 400 registrants.*

Business Meeting and Awards Program  
**Tuesday, March 18 • 5:30 PM • Grand Ballroom**  
Please join the ADSA Midwest Branch/ASAS Midwestern Section for the annual Business Meeting and 2014 Awards Program. Immediately following the Awards Program everyone is invited to come to the final reception of the 2014 meeting.

Reception  
**Tuesday, March 18 • 7:00 PM • Grand Ballroom**  
Come join us after the Business Meeting and Awards Program to celebrate and congratulate all of the 2014 award recipients.

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**AnimalSmart.org** presents scientific and agriculturally important information about animals to the public. Visitors of any age can learn about animal science, companion animals, and animal production.  
**AnimalSmart.org** has the answers to big questions about animals large and small.  
**AnimalSmart.org** is outreach with an impact.
Monday, March 17, 2014
SYMPOSIA AND ORAL PRESENTATIONS

GARY ALLEE SYMPOSIUM: FEEDING SICK PIGS
Chair: K. J. Touchette, Ajinomoto Heartland, Inc.
Sponsor: Gary Allee Appreciation Club, ASAS Foundation
Grand Ballroom

8:00 AM  Introductory Remarks
8:10 AM  60  (Invited) The longitudinal impact of PRRS on metabolism, whole body protein accretion and feed efficiency in grow-finisher pigs.
            N. K. Gabler*, Iowa State University, Ames
8:40 AM  62  (Invited) Metabolic and Physiological Ramifications of Immune Activation.
            R. N. Dilger*, University of Illinois, Urbana
9:10 AM  Break
            T. J. Loula*, Swine Vet Center, Saint Peter, MN
10:20 AM  Break
10:30 AM  PEDv and Panel Discussion

DAVID BAKER AMINO ACIDS SYMPOSIUM
Chair: Hans H. Stein, University of Illinois at Urbana-Champaign
Sponsor: David Baker Appreciation Club, ASAS Foundation, DPP-NA
318/319/320

1:00 PM  Introductory Remarks
1:05 PM  34  (Invited) A Short History of Ideal Protein.
            N. R. Augspurger*, JBS United, Inc., Sheridan, IN
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Authors</th>
</tr>
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<tbody>
<tr>
<td>1:25 PM</td>
<td>35</td>
<td>(Invited) Current knowledge about ideal protein for growing pigs.</td>
<td>J. van Milgen*¹, N. Le Floc’h¹, E. Corrent² and M. Gloaguen¹, ¹INRA, Saint Gilles, France, ²Ajinomoto Eurolysine, Paris, France</td>
</tr>
<tr>
<td>2:10 PM</td>
<td>36</td>
<td>Validating dietary approach to determine the Trp:Lys ratio for pigs.</td>
<td>M. A. D. Goncalves*¹, M. D. Tokach¹, S. S. Dritz¹, K. J. Touchette², J. M. DeRouchey², J. C. Woodworth¹ and R. D. Goodband¹, ¹Kansas State University, Manhattan, ²Ajinomoto Heartland, Inc., Chicago, IL</td>
</tr>
<tr>
<td>2:25 PM</td>
<td>Break</td>
<td></td>
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<tr>
<td>2:45 PM</td>
<td>37</td>
<td>Effect of feeding reduced CP, amino acid supplemented diets, on dietary nitrogen and energy utilization and volatile fatty acid excretion in wean-to-finish swine.</td>
<td>A. M. Jones*¹, D. T. Kelly¹, B. T. Richert¹, C. V. Maxwell² and J. S. Radcliffe¹, ¹Purdue University, West Lafayette, IN, ²University of Arkansas, Fayetteville</td>
</tr>
<tr>
<td>3:00 PM</td>
<td>38</td>
<td>(Invited) Novel approaches to estimating amino acid requirements and amino acid ratios in diets fed to gestating sows.</td>
<td>S. Moehn* and R. O. Ball, University of Alberta, Edmonton, AB, Canada</td>
</tr>
<tr>
<td>3:45 PM</td>
<td>88</td>
<td>Impact of reduced crude protein diets on lactating sow nitrogen utilization and piglet performance.</td>
<td>L. A. Huber*¹, C. F. M. de Lange², U. Krogh³, D. Chamberlin⁴ and N. L. Trottier⁴, ¹University of Guelph, Guelph, ON, Canada, ²Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada, ³Aarhus University, Foulum, Denmark, ⁴Michigan State University, East Lansing</td>
</tr>
<tr>
<td>4:00 PM</td>
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<td>(Invited) Use of Ideal Protein in practical diet formulation for pigs.</td>
<td>J. D. Hahn*, Murphy Brown, LLC, Ames, IA</td>
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<tr>
<td>4:45 PM</td>
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<td>Concluding Remarks</td>
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<td>Time</td>
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<tr>
<td>2:00 PM</td>
<td>64</td>
<td>Efficacy of yeast cell wall based feed additive in prevention of mycotoxicoses in pigs fed a diet with aflatoxin under the EU regulatory levels.</td>
<td>Y. Sun*, J. Guo, I. Park and S. W. Kim, North Carolina State University, Raleigh</td>
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<tr>
<td>2:15 PM</td>
<td>65</td>
<td>Expression of cationic amino acid transporters mRNA in the jejunum of high and low efficiency steers.</td>
<td>H. C. Cunningham*1, Z. T. L. Gray1, S. I. Paisley1, K. J. Austin1, K. M. Cammack1 and A. M. Meyer2, 1Department of Animal Science, University of Wyoming, Laramie, 2Division of Animal Sciences, University of Missouri, Columbia</td>
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<tr>
<td>2:30 PM</td>
<td>66</td>
<td>Effects of Calcium Oxide Treatment of Dry and Modified Wet Distillers Grains with Solubles on Economics, Feed Intake Pattern, and Growth and Carcass Performance of Feedlot Steers.</td>
<td>A. R. Schroeder*1, M. J. Duckworth1, D. W. Shike1, J. P. Schoonmaker2 and T. L. Felix1, 1University of Illinois at Urbana-Champaign, Urbana, 2Purdue University, West Lafayette, IN</td>
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<tr>
<td>3:00 PM</td>
<td>68</td>
<td>Effect of α-galactosidase and citric acid on nursery pig growth performance.</td>
<td>E. K. Pegg* and P. J. Lammers, Illinois State University, Normal</td>
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<td>3:30 PM</td>
<td>69</td>
<td>Fat quality of pigs is altered when 20% DDGS are fed over three industry standard marketing cuts.</td>
<td>K. E. Shircliff*, Z. D. Callahan1, T. A. Wilmoth1, R. C. Johnson2 and B. R. Wiegand2, 1University of Missouri, Columbia, 2Farmland Foods, Denison, IA</td>
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<td>3:45 PM</td>
<td>70</td>
<td>Validation of ME prediction equations and the impact of feeding diets containing corn distillers dried grain with solubles (DDGS) with variable oil content on growth performance of growing-finishing pigs.</td>
<td>F. Wu\textsuperscript{1}, L. J. Johnston\textsuperscript{2}, P. E. Urriola\textsuperscript{1}, A. M. Hilbrands\textsuperscript{3} and G. C. Shurson\textsuperscript{1}, \textsuperscript{1}Department of Animal Science, University of Minnesota, St. Paul, \textsuperscript{2}West Central Research and Outreach Center, University of Minnesota, Morris</td>
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<td>4:00 PM</td>
<td>71</td>
<td>Effects of dietary calcium and phosphorus on reproductive performance and bone turnover of sows housed in stalls or group.</td>
<td>F. P. Tan\textsuperscript{1,2} and A. D. Beaulieu\textsuperscript{1}, \textsuperscript{1}Prairie Swine Centre Inc., Saskatoon, SK, Canada, \textsuperscript{2}Department of Animal &amp; Poultry Science, University of Saskatchewan, Saskatoon, SK, Canada</td>
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<td>4:15 PM</td>
<td>72</td>
<td>Assessing the interaction of stocking density and dietary energy concentration on finishing pig performance.</td>
<td>G. N. Rozeboom\textsuperscript{1,2}, D. Gillis\textsuperscript{2} and D. Beaulieu\textsuperscript{2}, \textsuperscript{1}University of Saskatchewan, Saskatoon, SK, Canada, \textsuperscript{2}Prairie Swine Centre Inc., Saskatoon, SK, Canada</td>
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**GRADUATE STUDENT COMPETITION: MASTER ORAL II**  
Chair: Kenneth Odde, Kansas State University  
304/305

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<tr>
<td>2:00 PM</td>
<td>73</td>
<td>Translactational analgesia technology for the improvement of swine welfare during castration and tail docking.</td>
<td>J. L. Bates\textsuperscript{1}, L. A. Karriker\textsuperscript{1}, J. F. Coetzee\textsuperscript{2}, M. L. Stock\textsuperscript{3}, K. M. Pertzborn\textsuperscript{1} and L. G. Baldwin\textsuperscript{1}, \textsuperscript{1}Swine Medicine Education Center, Iowa State University College of Veterinary Medicine, Ames, \textsuperscript{2}Pharmacology Analytical Support Team, Iowa State University College of Veterinary Medicine, Ames, \textsuperscript{3}Iowa State University College of Veterinary Medicine, Department of Veterinary Diagnostic and Production Animal Medicine, Ames</td>
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<td>2:15 PM</td>
<td>74</td>
<td>Surface enlargement factor of rumen papillae and expression of genes involved in dermatological diseases and their relationships with feed intake in beef steers.</td>
<td>R. J. Kern\textsuperscript{1}, A. K. Lindholm-Perry\textsuperscript{2}, H. C. Freely\textsuperscript{2}, W. M. Snelling\textsuperscript{2}, J. R. Miles\textsuperscript{2} and P. A. Ludden\textsuperscript{1}, \textsuperscript{1}University of Wyoming, Laramie, \textsuperscript{2}USDA, ARS, US MARC, Clay Center, NE</td>
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</table>
The effect of cross fostering on PRRS transmission and litter performance.  
B. Mason*1, A. E. DeDecker2, J. L. Seate3 and M. F. Billing3, 1University of Illinois, Champaign, 2Murphy-Brown LLC, Rose Hill, NC, 3Murphy Brown LLC, Rose Hill, NC

Effect of feeding ractopamine hydrochloride (Optaflexx) with or without supplemental zinc and chromium propionate on growth performance, carcass characteristics, and LM quality of finishing steers.  
B. M. Bohrer*1, B. M. Edenburn2, S. C. Loerch1, D. D. Boler1, A. C. Dilger2 and T. L. Felix2, 1The Ohio State University, Columbus, 2University of Illinois at Urbana-Champaign, Urbana, 4The Ohio State University, Wooster

Influence of early gestational nutrient restriction on vascularity of beef cow placentomes.  
B. Mordhorst*1, L. E. Camacho1, C. O. Lemley2, D. A. Redmer1 and K. A. Vonnahme1, 1North Dakota State University, Fargo, 2Mississippi State University, Mississippi State

Break

Effects of dietary melatonin supplementation during late gestation on uterine artery hemodynamics in Holstein heifers.  
K. E. Brockus*, C. G. Hart, L. J. Grossner, S. H. Ward, J. E. Larson and C. O. Lemley, Mississippi State University, Mississippi State

Yield, Forage Nutritive Value, and Preference of Spring Planted Annual Grasses under Horse Grazing.  
A. M. Grev*, K. L. Martinson and C. C. Sheaffer, University of Minnesota, Saint Paul

Effect of maternal nutrition and regrouping on lamb behavior.  
N. Chapel*, M. Orr and S. Wagner, North Dakota State University, Fargo

Small intestinal morphological integrity in horses suffering from pituitary pars intermedia dysfunction.  
J. L. De Vries*1, H. C. Schott II1, J. Lubitz1, D. Chamberlin1, L. A. Huber2 and N. L. Trottier1, 1Michigan State University, East Lansing, 2University of Guelph, Guelph, ON, Canada
PRRSv reduces feed efficiency and tissue accretion rates in grow-finisher pigs.

W. P. Schweer*1, J. F. Patience1, L. A. Karriker2, J. C. Sparks1, G. G. Gourley4, M. FitzSimmons5, K. Schwartz6, T. E. Burkey7 and N. K. Gabler1, 1Iowa State University, Ames, 2Swine Medicine Education Center, Iowa State University College of Veterinary Medicine, Ames, 3Choice Genetics, Alden, IA, 4Swine Graphics Enterprises, Webster City, IA, 5MAF Veterinary Services, Mapleton, MN, 6Veterinary Diagnostic & Production Animal Medicine, Iowa State University College of Veterinary Medicine, Ames, 7University of Nebraska, Lincoln

GRADUATE STUDENT COMPETITION: PHD ORAL I
Chair: Allison Meyer, University of Missouri
Sponsor: Akey
312/313

Effects of microbial phytase on apparent and standardized total tract digestibility of calcium in calcium supplements fed to growing pigs.

J. C. Gonzalez-Vega*1, C. L. Walk2 and H. H. Stein3, 1University of Illinois, Urbana, 2AB Vista Feed Ingredients, Marlborough, United Kingdom, 3University of Illinois at Urbana-Champaign, Urbana

Effects of dietary soybean meal concentration on growth performance and immune response of pigs during a porcine reproductive and respiratory syndrome virus challenge.

S. J. Rochell*1, L. S. Alexander1, R. D. Boyd2, W. G. Van Alstine1, J. Pettigrew1 and R. N. Dilger1, 1University of Illinois, Urbana, 2The Hanor Company, Inc., Franklin, KY, 3Purdue University, West Lafayette, IN

Impacts of high nursing intensity on sow performance during a subsequent lactation.

J. Guo*1, G. Voilque1, Y. Sun1, A. E. DeDecker2, M. T. Coffey2 and S. W. Kim1, 1North Carolina State University, Raleigh, 2Murphy-Brown LLC, Rose Hill, NC

Effects of withdrawing high-fiber ingredients prior to market on finishing pig growth performance, carcass characteristics, intestinal weights, and carcass fat quality.

K. F. Coble*1, J. M. DeRouchey1, M. D. Tokach1, R. D. Goodband1, S. S. Dritz1, T. A. Houser1, B. Goehring1 and M. J. Azain1, 1Kansas State University, Manhattan, 2Rhodes Center for Animal & Dairy Science, Athens, GA
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<td>3:00 PM</td>
<td>87</td>
<td>Energy values of bermudagrass, forage sorghum, and sweet sorghum to pigs and the use of carbohydrases to enhance energy utilization.</td>
<td>A. A. Passos¹, C. Andrade¹², M. Veal¹, C. E. Phillips¹, M. T. Coffey² and S. W. Kim¹, ¹North Carolina State University, Raleigh, ²Sao Paulo State University, Piracicaba, Brazil, ³Murphy-Brown LLC, Rose Hill, NC</td>
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<td>3:30 PM</td>
<td>88</td>
<td>Impact of reduced crude protein diets on lactating sow nitrogen utilization and piglet performance.</td>
<td>L. A. Huber¹, C. F. M. de Lange², U. Krogh¹, D. Chamberlin¹ and N. L. Trotter², ¹University of Guelph, Guelph, ON, Canada, ²Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada, ³Aarhus University, Foulum, Denmark, ⁴Michigan State University, East Lansing</td>
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<td>3:45 PM</td>
<td>89</td>
<td>Dietary peroxidized corn oil reduces growth performance of nursery pigs.</td>
<td>A. R. Hanson¹, P. E. Urriola¹, L. J. Johnston¹, S. Baidoo¹, C. Chen¹, B. J. Kerr⁴ and G. C. Shurson¹, ¹University of Minnesota, Saint Paul, ²University of Minnesota, West Central Research and Outreach Center, Morris, ³Southern Research and Outreach Center, University of Minnesota, Waseca, ⁴USDA - ARS, Ames, IA</td>
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<td>4:00 PM</td>
<td>90</td>
<td>Nutrient Digestibility of Solvent-extracted B. napus and B. juncea Canola Meals and Their Air-classified Fractions Fed to Ileal-cannulated Grower Pigs.</td>
<td>X. Zhou¹, R. T. Zijlstra¹ and E. Beltranena¹², ¹University of Alberta, Edmonton, AB, Canada, ²Alberta Agriculture and Rural Development, Edmonton, AB, Canada</td>
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<td>4:15 PM</td>
<td>91</td>
<td>Optimum sulfur amino acid to lysine ratio for weaner pigs infected with enterotoxigenic E.coli.</td>
<td>M. M. Capozzalo¹, J. W. Resink², J. K. Htoo¹, J. C. Kim¹, C. F. M. de Lange², C. F. Hansen⁴, B. Mullan⁴ and J. Pluske¹, ¹Murdoch University, Western Australia, Australia, ²Nutreco, Boxmeer, Netherlands, ³Evonik Industries AG, Hanau-Wolfgang, Germany, ⁴Department of Agriculture and Food, Western Australia, Australia, ⁵Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada, ⁶Department of Large Animal Sciences, University of Copenhagen, Copenhagen, Denmark</td>
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</table>
### Effect of dried distiller grains with solubles (DDGS) feeding strategies on growth and feed intake responses of immunologically castrated pigs harvested at 9, 7 or 5 weeks post-second Improvest dose.

E. K. Harris\(^1\), M. A. Mellencamp\(^2\), L. J. Johnston\(^1\) and G. C. Shurson\(^1\), \(^1\)University of Minnesota, St. Paul, \(^2\)Zoetis, Inc, Florham Park, NJ, \(^3\)West Central Research and Outreach Center, University of Minnesota, Morris

### GRADUATE STUDENT COMPETITION: PHD ORAL II

**Chair: J. Scott Radcliffe, Purdue University**

**Sponsor: Akey**

**314/315**

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<tr>
<td>2:00 PM</td>
<td>93</td>
<td>Stimulation of Estrus and Ovulation in Lactating Sows.</td>
<td>H. L. Frobose(^\ast), K. M. Gourley, M. D. Tokach, J. M. DeRouchey, S. S. Dritz, R. D. Goodband, J. L. Nelssen and D. L. Davis, Kansas State University, Manhattan</td>
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<tr>
<td>2:15 PM</td>
<td>94</td>
<td>Predicting Swine MHC Haplotypes from High-Density SNP Genotypes.</td>
<td>J. Dunkelberger(^\ast), Iowa State University, Ames</td>
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<tr>
<td>2:30 PM</td>
<td>95</td>
<td>Effects of in utero heat stress and core body temperature on tissue accretion during the growing phase (30 to 60 kg) in pigs.</td>
<td>J. S. Johnson(^\ast), M. V. Sanz Fernandez(^\dag), J. F. Patience(^\dag), J. W. Ross(^\dag), N. K. Gabler(^\dag), M. C. Lucy(^\dag), T. J. Safranski(^\dag), R. P. Rhoads(^\dag) and L. H. Baumgard(^\dag), (^\dag)Iowa State University, Ames, (^\dag)University of Missouri, Columbia, (^\dag)Virginia Tech, Blacksburg</td>
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<tr>
<td>3:00 PM</td>
<td>97</td>
<td>Comparison of Four Perennial Forage Finishing Systems and a Limit-Fed Corn-Based Finishing System on Lamb Growth and Carcass Characteristics.</td>
<td>J. S. McCutcheon(^\ast), H. N. Zerby(^\dag), S. C. Loerch(^\dag) and F. L. Fluharty(^\dag), (^\ast)The Ohio State University, Mount Gilead, OH, (^\dag)The Ohio State University, Columbus, OH, (^\dag)The Ohio State University, Wooster</td>
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</table>
Interactive effects of zinc and zilpaterol hydrochloride on the bovine β-adrenergic receptors.  
J. E. Hergenreder*,1, J. O. Baggerman*, A. D. Hosford*, M. E. Branine2 and B. J. Johnson*,  
1Texas Tech University, Lubbock, TX, 2Zinpro Corporation, Eden Prairie, MN

Effect of a supplemental zinc complex and ractopamine hydrochloride on blood markers of the immune and beta-adrenergic responses in beef steers.  
O. N. Genther*,1, M. E. Branine2 and S. L. Hansen*,  
1Iowa State University, Ames, 2Zinpro Corporation, Eden Prairie, MN

Growth performance, carcass characteristics and serum cholesterol and progesterone concentrations of heifers fed different energy sources on pasture.  
1North Dakota State University, Fargo, 2Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil,  
3Universidade Federal do Rio Grande Do Sul, Porto Alegre, Brazil, 4North Dakota State University, Fargo

Effects of calf age at weaning on cow and calf performance and feed utilization in an intensive production system.  
1University of Nebraska, Lincoln, 2University of Nebraska, Scottsbluff, NE, 3University of Nebraska-Lincoln, Lincoln
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<td>2:00 PM</td>
<td>228</td>
<td>Performance and Carcass Measurements by Fall-Born Calves Weaned in the Morning or Evening Using Either Fenceline or Traditional Weaning Methods.</td>
<td>H. L. Bartimus*, J. D. Caldwell¹, B. C. Shanks¹, K. P. Coffey², D. S. Hubbell, III¹, J. D. Tucker¹, C. R. Krebriel¹ and C. L. Maxwell¹.</td>
<td>¹Department of Agriculture and Environmental Sciences, Lincoln University, Jefferson City, MO, ²Department of Animal Science, University of Arkansas Division of Agriculture, Fayetteville, AR, ³Livestock and Forestry Research Station, University of Arkansas Division of Agriculture, Batesville, AR, ⁴Oklahoma State University, Stillwater, OK</td>
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<td>2:15 PM</td>
<td>229</td>
<td>Performance by Dorper-Katahdin Crossbred Lambs Weaned Using Two Different Weaning Methods.</td>
<td>J. K. Hanlin*, J. D. Caldwell¹, B. C. Shanks¹, T. Wuliji¹, E. A. Backes² and A. L. Bax¹.</td>
<td>¹Department of Agriculture and Environmental Sciences, Lincoln University, Jefferson City, MO, ²University of Arkansas, Fayetteville</td>
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<td>3:00 PM</td>
<td>232</td>
<td>In utero heat stress alters body temperature and loin eye area in barrows.</td>
<td>M. C. Shane*, T. A. Wilmoth, Z. D. Callahan, T. J. Safranski and B. R. Wiegand.</td>
<td>University of Missouri, Columbia</td>
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<td>3:30 PM</td>
<td>233</td>
<td>The effects of glucuronic acid and N-acetyl-D-glucosamine on the in vitro fertilization of pigs.</td>
<td>C. L. Durfey*, K. Schmidt¹ and B. D. Whitaker².</td>
<td>¹The University of Findlay, Findlay, OH, ²University of Findlay, Findlay, OH</td>
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<td>3:45 PM</td>
<td>234</td>
<td>Effects of drought-affected corn and non-starch polysaccharide enzymes on nursery pig performance.</td>
<td>E. L. Frantz*, H. L. Frobose¹, J. M. DeRouchey¹, R. D. Goodband¹, J. R. Bergstrom² and C. K. Jones¹. Kansas State University, Manhattan, ²DSM Nutritional Products, North America, Marshall, MO</td>
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<td>4:00 PM</td>
<td>235</td>
<td>The Effects of an Altered Suckling Treatment on Piglet Performance during Late Lactation and the Nursery Period.</td>
<td>K. M. Gourley*, H. L. Frobose, M. D. Tokach, J. M. DeRouchey, S. S. Dritz, R. D. Goodband, J. L. Nelssen and D. L. Davis, Kansas State University, Manhattan</td>
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<td>4:15 PM</td>
<td>236</td>
<td>Effect of Diet Choices on Feed Consumption Behavior of Cattle.</td>
<td>E. VenJohn*, K. A. Miller, C. L. Van Bibber-Krueger and J. S. Drouillard, Kansas State University, Manhattan</td>
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**UNDERGRADUATE STUDENT COMPETITION ORAL II**

**Chair: Justin Rickard**

**308-309**

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<tr>
<td>2:00 PM</td>
<td>237</td>
<td>Effect of human interaction on standing behavior and health parameters of individually-housed dairy calves.</td>
<td>T. M. Ray* and J. D. Allen, Northwest Missouri State University, Maryville</td>
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<tr>
<td>2:15 PM</td>
<td>238</td>
<td>An Investigation of <em>Cryptosporidium parvum</em> and <em>Giardia lamblia</em> and Environmental Stressors in Dairy Calves.</td>
<td>S. M. Waibel*, F. D. McCarthy, and B. Henderson-Dean, The University of Findlay, Findlay, OH</td>
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<td>2:30 PM</td>
<td>239</td>
<td>The effects of socializing piglets prior to weaning on lactating sows.</td>
<td>C. Shilling*, N. Diefenbacher, B. P. Bennett, K. Ledergerber and B. D. Whitaker, University of Findlay, Findlay, OH</td>
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<td>2:45 PM</td>
<td>240</td>
<td>The effects of environmental enrichments on behavior and performance of weanling pigs.</td>
<td>N. Diefenbacher*, C. Shilling, B. P. Bennett, K. Ledergerber and B. D. Whitaker, University of Findlay, Findlay, OH</td>
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3:00 PM 241 Nonstructural Carbohydrate Content of Weeds Commonly Found in Drylots.
D. L. Gunder\(^1\), J. Wilson\(^2\) and K. L. Martinson\(^3\),
\(^1\)University of Minnesota, St. Paul, \(^2\)Turner Wilson Equine Consulting LLC., Stillwater, MN, \(^3\)University of Minnesota, Saint Paul

3:15 PM Break

3:30 PM 242 Effect of Weight Loss on Markers of Oxidant Status in the Mature Horse.
E. H. Hoblitzell\(^1\), J. L. Zambito\(^1\), H. S. Spooner\(^2\) and K. M. Barnes\(^1\), \(^1\)West Virginia University, Morgantown, \(^2\)Middle Tennessee State University, Murfreesboro

3:45 PM 243 Implications of drought stress on corn or sorghum utilization in broiler chicks.
A. D. Yoder\(^*\), C. W. Ross, C. K. Jones, A. C. Bingham, R. S. Beyer and G. Aldrich, Kansas State University, Manhattan

4:00 PM 244 Effects of dietary melatonin supplementation on total serum nitrites and antioxidant capacity of late gestating Holstein heifers.
B. O. Fleming\(^*\), K. E. Brockus, C. G. Hart and C. O. Lemley, Mississippi State University, Mississippi State

4:15 PM 245 Development of a Scholarship Program to Support Future Swine Professionals.
C. Hostetler\(^1\) and A. R. Clements\(^2\), \(^1\)National Pork Board, Des Moines, IA, \(^2\)University of Tennessee, Knoxville

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Tuesday, March 18, 2014

POSTER PRESENTATIONS
7:30 – 9:00 AM • Grand Ballroom

PLEASE SEE POSTER MAP ON PAGE 100

GRADUATE STUDENT COMPETITION: MASTER POSTER

C. L. Thomas\(^*\), B. C. Shanks, J. D. Caldwell, L. S. Wilbers and K. L. Basinger, Department of Agriculture and Environmental Sciences, Lincoln University, Jefferson City, MO
278 (EBSR) The North Dakota Beef Industry Survey I. Demographics, Challenges, and Opportunities. 
D. N. Black, M. R. Schook, J. C. Hadrich, G. P. Lardy and C. R. Dahlen, 1North Dakota State University, Fargo, 2Colorado State University, Fort Collins

279 (EBSR) The North Dakota Beef Industry Survey II. Comparing herd management and production practices among producers planning to exit the industry and producers planning to remain in production. 
M. R. Schook, D. N. Black, J. C. Hadrich, G. P. Lardy and C. R. Dahlen, 1North Dakota State University, Fargo, 2Colorado State University, Fort Collins

287 (ES) The effect of cross fostering on PRRS transmission and litter performance. 
B. Mason, J. L. Seate, A. E. DeDecker and M. F. Billing, 1University of Illinois, Champaign, IL, 2Murphy Brown LLC, Rose Hill, NC, 3Murphy-Brown LLC, Rose Hill, NC

304 (GDMM) Comparison of red meat versus high carbohydrate diet using the gilt biomedical model: Blood chemistry. 
L. L. Baranko, K. R. Wellnitz, K. A. Vonnahme and E. P. Berg, 1North Dakota State University, Fargo, 2North Dakota State University, Fargo

341 (NR) Effect of adding minimally refined cottonseed oil or crude glycerol to diets containing 40% distillers dried grains with solubles (DDGS) on carcass fat firmness of growing-finishing pigs. 
C. C. E. J. Villela, R. Cox, G. C. Shurson, K. M. Compart, P. E. Urriola and L. J. Johnston, 1University of Minnesota, Saint Paul, 2University of Minnesota, West Central Research and Outreach Center, Morris

343 (NR) Selenium-Enriched Probiotics Improves Antioxidant Status and Immune Function of Piglets Raised in a High-Temperature Environment. 
F. Gan, N. Regmi, X. Chen, C. Lv, F. Ren, G. Ye, C. Pan, J. Shi, X. Shi, H. Zhou, S. F. Liao and K. Huang, 1Nanjing Agricultural University, Nanjing, Jiangsu, China, 2Mississippi State University, Mississippi State

378 (RN) Effects of maternal nutrient restriction and rumen-protected arginine supplementation of ewes on carotid artery hemodynamics during gestation and lamb birth weights. 
J. L. Peine, K. R. Wellnitz, G. Q. Jia, A. M. Meyer, L. P. Reynolds and J. S. Caton, 1North Dakota State University, Fargo, 2Division of Animal Sciences, University of Missouri, Columbia
402 (RN) Effects of postruminal amino acid supply on growth performance and feed cost of beef steers. M. M. Masiero*, M. S. Kerley and W. J. Sexten, University of Missouri, Columbia

405 (TEACH) Utilization of a modified Delphi method to perform a needs assessment and curriculum revision of a senior-level beef systems management course. E. L. Lundy*, D. D. Loy and P. J. Gunn, Iowa State University, Ames

GRADUATE STUDENT COMPETITION: PHD POSTER

273 (BG) Combined effect of sow deep intrauterine insemination and boar frozen semen on economic indicators. D. Gonzalez-Peña Fundora*, R. V. Knox, J. Pettigrew and S. L. Rodriguez Zas, ¹University of Illinois at Urbana-Champaign, Urbana, ²University of Illinois, Urbana

282 (EBSR) Impact of oral meloxicam on circulating physiological biomarkers of stress and inflammation in beef steers after long distance transportation. N. Van Engen*, Iowa State University, Ames

336 (NR) Influence of dietary fiber concentrations on the basal endogenous loss of phosphorus in growing pigs. A. R. Son* and B. G. Kim, Konkuk University, Seoul, South Korea

350 (NR) Interactive effects of different energy intake during periods of gestation and housing system on sow performance. P. Ren*, R. Railton, J. Jendza and S. Baidoo, ¹University of Minnesota Southern Research and Outreach Center, Waseca, ²Southern Research and Outreach Center, Waseca, ³Southern Research and Outreach Center, University of Minnesota, Waseca

361 (ONM) Effect of Micro-Aid® Supplementation on Nitrogen Losses from Cattle Manure. A. K. Watson*, G. E. Erickson, T. J. Klopfenstein and M. J. Rincker, ¹University of Nebraska-Lincoln, Lincoln, ²DPI GLOBAL, Berea, KY

363 (PHY)  Response of swine divergently selected for feed efficiency to a glucose tolerance test.
J. D. Colpoys¹, D. M. van Sambeek¹, L. L. Anderson¹, J. C. M. Dekkers¹, A. K. Johnson¹, F. R. Dunshea² and N. K. Gabler¹,
¹Iowa State University, Ames, ²The University of Melbourne, Parkville, Australia

UNDERGRADUATE STUDENT COMPETITION POSTER

257 (ABHWB)  The effects of socializing piglets prior to weaning on nursery performance and behavior.
B. P. Bennett⁶, K. Ledergerber, C. Shilling, N. Diefenbacher and B. D. Whitaker, University of Findlay, Findlay, OH

258 (ABHWB)  The effects of socializing piglets prior to weaning on piglet performance.
K. Ledergerber⁶, B. P. Bennett, N. Diefenbacher, C. Shilling and B. D. Whitaker, University of Findlay, Findlay, OH

259 (ABHWB)  Gilt approachability to a human when selected for feed efficiency.
J. F. Sholar¹, J. D. Colpoys¹, N. K. Gabler¹, A. F. Keating¹, S. T. Millman¹, J. M. Siegfried² and A. K. Johnson¹, ¹Iowa State University, Ames, ²Michigan State University, East Lansing

264 (ABHWB)  Evaluating changes to lying and standing in lame sows administered flunixin meglumine.
M. M. Righi⁶, M. D. Pairis-Garcia, S. T. Millman and A. K. Butters-Johnson, Iowa State University, Ames

269 (ABHWB)  Effects of repeated electroejaculation on bull behavior and serum cortisol concentrations.

275 (BG)  Effect of Pre-Breeding Boar Exposure on Gilt Estrus.
T. Kelsay⁶, M. D. Lindemann, H. J. Monegue and J. S. Monegue, University of Kentucky, Lexington

301 (GDMM)  Expression Patterns of ABLIM1 and ATF4 During Skeletal Muscle Development of Yorkshire-Landrace Crossbred Pigs.

E. K. Hogan⁶, D. L. Clark and A. C. Dilger, University of Illinois at Urbana-Champaign, Urbana
321 (NR)  
Comparison of Fermented Soybean Meal Processing Methods on Nursery Pig Growth Performance.

370 (PHY)  
Effects of PMSG Dosage on Reproductive Efficiency of Artificially Inseminated, Farm-Raised White-Tailed (Odocoileus virginianus) Deer.
W. M. Haslag1, B. C. Shanks1, J. D. Caldwell1, D. R. Hill2 and N. L. Forsythe2, 1Department of Agriculture and Environmental Sciences, Lincoln University, Jefferson City, MO, 2Oak Creek Whitetail Ranch, Bland, MO

375 (RN)  
Effects of Corn Silage Diets on Intestinal Morphology in Dairy Calves.
T. J. Pogreba* and S. I. Kehoe, University of Wisconsin-River Falls, River Falls

381 (RN)  
Performance by Katahdin Ewes Supplemented With Different Levels of Raw Whole Soybeans While Grazing Stockpiled Tall Fescue - One Year Summary.
K. A. Vandeloecht*, J. D. Caldwell, B. C. Shanks and A. L. Bax, Department of Agriculture and Environmental Sciences, Lincoln University, Jefferson City, MO

383 (RN)  
Effects of Dietary Glycerin on Rumen Metabolism of Beef Cattle Fed 50% Dried Distillers Grains with Solubles.
C. J. Long* and T. L. Felix, University of Illinois at Urbana-Champaign, Urbana

385 (RN)  
Effects of Pyrethroid and Pyrethrin Insecticides on Beef Bull Reproductive Parameters.

388 (RN)  
Determination of forage quality and in situ digestibility of miscanthus over time.
N. F. Reitz*, E. J. Sacks and T. L. Felix, University of Illinois at Urbana-Champaign, Urbana

400 (RN)  
The Effects of Fenceline Weaning With or Without the Presence of Companion Goats on Performance and Behavior Measurements of Fall-Born Calves.
E. G. Groose1*, J. D. Caldwell1, B. C. Shanks1, C. A. Clifford-Rathert1, E. A. Backes1, C. L. Boeckmann1 and C. A. DeOrnellis1, 1Department of Agriculture and Environmental Sciences, Lincoln University, Jefferson City, MO, 2University of Arkansas, Fayetteville
ANIMAL BEHAVIOR, HOUSING, & WELL-BEING: NONRUMINANT NUTRITION-SUPPLEMENTS AND ALTERNATIVE FEEDSTUFFS

246 The Effect of Fermented Soybean Meal Supplementation on Nutrient Apparent Total Tract Digestibility and Ileal Digestibility in Weanling Pigs.
H. L. Li, D. Jung and I. H. Kim*, Dankook University, Cheonan, South Korea

247 Evaluation of Extruded Rice as a Replacement for Dried Whey in Weanling Pigs.
Y. Lei, S. Kim and I. H. Kim*, Dankook University, Cheonan, South Korea

248 Productivity Assessment Based on Animal Protein Sources in Weanling Pigs.
J. H. Cho, H. Beak and I. H. Kim*, Dankook University, Cheonan, South Korea

249 Effect of Supplementation of Evening Primrose Extract on Growth Performance, Nutrient Digestibility, Blood Characteristics, Fecal Microbiota and Fecal Score in Weanling Pigs.
H. C. Jang, H. Beak and I. H. Kim*, Dankook University, Cheonan, South Korea

250 Effect of Vitality Mineral Liquid Complex on Growth Performance, Nutrient Digestibility, Blood Profile, Fecal Microbiota and Fecal Mineral Content in Weanling Pigs.
H. C. Jang, D. Jung and I. H. Kim*, Dankook University, Cheonan, South Korea

251 Dietary Supplementation of Curcuma Longa by Bioconversion Technology Improved Growth Performance and Digestibility in Weanling Pigs.
Y. Lei, J. H. Cho and I. H. Kim*, Dankook University, Cheonan, South Korea

252 Effect of Bioconversion Natural Complex on Growth Performance, Nutrient Digestibility, Blood Characteristics, and Fecal Microbiota in Weanling Pigs.
S. Kim, D. Jung and I. H. Kim*, Dankook University, Cheonan, South Korea

J. Li, H. L. Li and I. H. Kim*, Dankook University, Cheonan, South Korea
Y. J. Jang, Y. Lei and I. H. Kim*, Dankook University, Cheonan, South Korea

Effect of Supplementary Feeding of Italian Ryegrass on Reproductive Performance, Blood Profiles, and Rectum Temperature in the 2nd Parity Sows.
M. Mohammadi Gheisar, J. P. Lee and I. H. Kim*, Dankook University, Cheonan, South Korea

Effects of Supplementary Feeding of Italian Ryegrass on the Reproductive Performance, Levels of Stress Hormones, Body Temperature, Fecal Score and Fecal Microbiota in Primiparous Sows and in Piglets.
E. Balolong Jr., S. D. Upadhaya and I. H. Kim*, Dankook University, Cheonan, South Korea

EXTENSION – BEEF/SMALL RUMINANT

Ohio Livestock Producer Perceptions of Producing and Marketing of Grass-Based Beef and Lamb.
J. S. McCutcheon1, L. W. Morton2, H. N. Zerby3, S. C. Loerch4, L. Miller4 and F. L. Fluharty4, 1The Ohio State University, Mount Gilead, 2Iowa State University, Ames, 3The Ohio State University, Columbus, 4The Ohio State University, Wooster; 5Small Farm Institute, Millersburg, OH

Effects of internal parasite infection at feedlot arrival on performance and carcass characteristics in beef steers.
C. A. Clark1, B. J. Dedrickson1, J. L. Sorensen2 and P. J. Gunn3, 1Armstrong Memorial Research and Demonstration Farm, Iowa State University, Lewis, 2Merial, Duluth, GA, 3Iowa State University, Ames

Impact of oral meloxicam on circulating physiological biomarkers of stress and inflammation in beef steers after long distance transportation.
N. Van Engen*, Iowa State University, Ames

An economic analysis of conventional and alternative cow-calf production systems.
J. M. Warner*1, K. H. Jenkins2, R. J. Rasby1, K. Brooks3 and T. J. Klopfenstein4, 1University of Nebraska, Lincoln, 2University of Nebraska - Scottsbluff, 3University of Nebraska - Lincoln, Lincoln, 4University of Nebraska-Lincoln, Lincoln
Effect of surplus L-Ile plus L-Val in a wheat-based diet with excess Leu on performance and serum concentration of amino acids of growing pigs.
N. Arce¹, A. Morales¹, H. García¹, B. A. Araiza¹, J. K. Htoo² and M. Cervantes³, ¹ICA, Universidad Autónoma de Baja California, Mexicali, Mexico, ²Evonik Industries AG, Hanau-Wolfgang, Germany, ³ICA, Universidad Autónoma de Baja California, Mexicali, Mexico

Supplementation of L-methionine has beneficial effects on intestinal morphology, redox status, and growth performance of broiler chicks compared with DL-methionine.
Y. Shen*, P. Ferket, I. Park, R. D. Malheiros and S. W. Kim, North Carolina State University, Raleigh

Dynamic estimation of digestible lysine levels to maximize weight gain and protein deposition in two lines of growing-finishing pigs.
L. Cloutier*¹-², M. P. Létourneau Montminy³, J. F. Bernier², J. Pomar⁴ and C. Pomar⁴, ¹Agriculture and Agri-Food Canada, Sherbrooke, QC, Canada, ²Université Laval, Québec, QC, Canada, ³Université Laval, Quebec, QC, Canada, ⁴Universitat de Lleida, Lleida, Spain

Phase feeding of lactating sow on ideal amino acid basis.
D. P. Pangeni*, J. Kim, X. Yang and S. Baidoo, Southern Research and Outreach Center, University of Minnesota, Waseca

Docosahexaenoic acid (DHA) algal supplement for newly weaned pigs.
R. S. Samuel*¹, B. W. James² and R. A. Timmons¹, ¹Alltech, Inc., Nicholasville, KY, ²Kalmbach Feeds, Inc., Upper Sandusky, OH

Influence of increasing pharmacological ZnO dose to 2500 ppm and superdoses of phytase on piglet growth performance from d 0 to 21 post-weaning.
I. J. Wellock²*, P. Wilcock², P. Toplis¹, J. J. Chewning¹ and C. L. Walk², ¹Primary Diets, Melmerby, United Kingdom, ²AB Vista Feed Ingredients, Marlborough, United Kingdom, ³Swine Research Services, Inc., Springdale, AR

Composite analysis of pharmacological ZnO and superdoses of phytase on piglet fecal scores from d 1 to 10 post-weaning.
C. L. Walk*¹, I. J. Wellock², P. Toplis², C. L. Bradley¹ and P. Wilcock¹, ¹AB Vista Feed Ingredients, Marlborough, United Kingdom, ²Primary Diets, Melmerby, United Kingdom
Digestible phosphorus in canola meal, 00-rapeseed meal, and 00-rapeseed expellers without and with microbial phytase fed to nursery pigs.
T. Maison1 and H. H. Stein*2, 1University of Illinois, Urbana,
2University of Illinois at Urbana-Champaign, Urbana

Comparison of Fermented Soybean Meal Processing Methods on Nursery Pig Growth Performance.

Evaluation of increasing peptone blend on nursery pig performance.

Effects of Bacillus spp direct-fed microbial supplementation on the nutrient digestibility by weanling pigs.
A. Owusu-Asiedu1, N. W. Jaworski2, A. A. Awati1 and H. H. Stein2,
1DuPont Industrial Biosciences - Danisco Animal Nutrition,
Marlborough, Wiltshire, United Kingdom, 2University of Illinois at Urbana-Champaign, Urbana

Effect of supplementation of Bacillus spp. strains with high enzymatic activities on energy efficiency and growth performance in grow-finish pigs fed corn-soybean meal based diet.
A. Owusu-Asiedu1, A. Awati1, Y. D. Jang2 and M. D. Lindemann2,
1DuPont Industrial Biosciences - Danisco Animal Nutrition,
Marlborough, Wiltshire, United Kingdom, 2University of Kentucky, Lexington

Bioefficacy of high enzyme producing Bacillus spp. strains in nursery and grow-finish pigs fed corn-soybean based diets containing high co-products.
A. Owusu-Asiedu1, D. Petri2, S. Baidoo3, G. Jones4, M. D. Lindemann5
and E. van Heugten6, 1DuPont Industrial Biosciences - Danisco Animal Nutrition, Marlborough, Wiltshire, United Kingdom, 2BioControl Development - DuPont Nutrition & Health, Waukesha, WI, 3Southern Research and Outreach Center, University of Minnesota, Waseca, 4Danisco USA Inc, Cedar Rapids, IA, 5University of Kentucky, Lexington, 6North Carolina State University, Raleigh

Peroxide value (PV) and thiobarbituric acid reactive substances (TBARS) as indicators of dietary lipid peroxidation, reduced growth performance, and metabolic oxidation status when feeding peroxidized lipids to pigs and broilers.
A. R. Hanson*, P. E. Urriola and G. C. Shurson, University of Minnesota, Saint Paul
Comparison of lipid peroxidation measures for corn oil subjected to different heating times and temperatures.
A. R. Hanson*, L. Wang¹, C. Chen¹, B. J. Kerr² and G. C. Shurson¹,
¹University of Minnesota, Saint Paul, ²USDA - ARS, Ames, IA

Content of Soluble Non-Starch Polysaccharides β-Mannan and Xylan in Legume Meals, Non-Legume Meals, and Cereal Grains or Cereal Grain by-products.
J. E. Ferrel*, D. M. Anderson and H. Y. Hsiao, Elanco Animal Health, Greenfield, IN

Effects of feeding a proprietary yeast blend on growth performance of commercial nursery pigs.
R. Song, K. W. Purser, R. E. Musser and C. D. Hagen*, NUTRIQUEST, Mason City, IA

A novel procedure for predicting energy digestibility in feedstuffs fed to pigs.
S. A. Lee*, C. S. Park and B. G. Kim, Konkuk University, Seoul, South Korea

The effects of withdrawing high-fiber ingredients prior to market on growth and carcass characteristics in commercial finishing pigs.
K. F. Coble*, J. M. DeRouchey, S. S. Dritz, M. D. Tokach and R. D. Goodband, Kansas State University, Manhattan

I. Andretta¹, C. Pomar²*, J. Rivest¹, J. Pomar², P. A. Lovatto¹ and J. Radünz Neto¹, ¹Universidade Federal de Santa Maria, Santa Maria, Brazil, ²Agriculture and Agri-Food Canada, Sherbrooke, QC, Canada, ³Centre de Développement du Porc du Québec, Quebec, QC, Canada, ⁴Universitat de Lleida, Lleida, Spain

Characterizing the feed intake pattern of immunologically castrated male pigs following administration of the second anti-GnRF injection.
A. J. Elsbernd¹*, C. F. M. de Lange² and J. F. Patience¹, ¹Iowa State University, Ames, ²Department of Animal and Poultry Science, University of Guelph, Guelph, ON, Canada

Impact of Ractopamine on Whole-Body and Carcass Growth and Efficiency in Pigs Reared Under Moderate Heat Stress.
C. E. Zier-Rush¹, M. McGrath¹, R. Palan¹, A. Vaske², K. D. Haydon² and R. D. Boyd³, ¹The Hanor Company, Inc., Franklin, KY, ²Elanco Animal Health, Greenfield, IN
Effect of Feed Form (Mash vs. Pellets) and Ractopamine on Pork Fat Quality.
N. Matthews*1, L. Greiner2, C. R. Neill1, S. Jungst1, B. Fields1, R. C. Johnson1 and A. Sosnicki1, 1Genus PIC, Hendersonville, TN, 2Carthage Innovative Swine Solutions, Carthage, IL, 3Farmland Foods, Denison, IA

Changes in the cattle cervical transcriptome between estrus and metestrus.
D. Gonzalez-Peña Fundora1*, K. Caetano-Anollés1, P. Cardoso2, M. B. Wheeler1 and S. L. Rodriguez Zas1, 1University of Illinois at Urbana-Champaign, Urbana, 2University of Illinois at Urbana-Champaign, Urbana, 3University of Illinois, Urbana

Orchestration of circadian peripheral non-esterified fatty acids rhythms in dairy cows: feeding timing and diet effects.
A. Nikkhah*, University of Zanjan, Zanjan, Iran

Circadian rhythms of peripheral ß-hydroxybutyrate in morning and evening fed lactating cows.
A. Nikkhah*, University of Zanjan, Zanjan, Iran

Prepartum somatotropin injections affects gene expression in granulosa cells of the first postpartum dominant follicle in late pregnant Holstein heifers.
D. A. Velasco Acosta*1,2, A. Schneider2, C. Bespalhok Jacometo2, P. Cardoso1 and M. Nunes Corrêa2, 1University of Illinois at Urbana-Champaign, Urbana, IL, 2Federal University of Pelotas, Pelotas, Rio Grande do Sul, Brazil

Hepatic peroxisome proliferator activated receptor alpha (PPARα) is increased during mid- to late gestation in beef cows.
C. G. Hart*1, L. J. Grossner1, L. E. Camacho2, K. C. Swanson2, K. A. Vonnahme2 and C. O. Lemley1, 1Mississippi State University, Mississippi State, 2North Dakota State University, Fargo

Maternal metabolizable protein restriction during late gestation leads to greater gravid uterine uptake of total serum nitrites in sheep.
L. A. Lekatz1*, M. L. Van Emon2, L. E. Camacho3, C. S. Schauer2, K. R. Maddock Carlin4 and K. A. Vonnahme5, 1Department of Agriuculture, Illinois State University, Normal, IL, 2Hettinger Research Extension Center, North Dakota State University, Hettinger, ND, 3North Dakota State University, Fargo, 4Department of Animal Sciences, North Dakota State University, Fargo
Effects of PMSG Dosage on Reproductive Efficiency of Artificially Inseminated, Farm-Raised White-Tailed (Odocoileus virginianus) Deer.
W. M. Haslag*, B. C. Shanks*, J. D. Caldwell*, D. R. Hill2 and N. L. Forsythe2, 1Department of Agriculture and Environmental Sciences, Lincoln University, Jefferson City, MO, 2Oak Creek Whitetail Ranch, Bland, MO

Effects of maintenance energy requirements of gestating beef cows on calf performance.
B. H. Boehmer*, K. J. McLean, T. A. Pye and R. P. Wettemann, Oklahoma Agricultural Experiment Station, Stillwater, OK

Effects of maternal nutrient restriction followed by realimentation during early and mid-gestation on maternal jugular serum, umbilical cord serum, and amniotic fluid metabolite concentrations in beef cows.
L. E. Camacho*, C. O. Lemley2, J. Haring1, K. C. Swanson1 and K. A. Vonnahme1, 1North Dakota State University, Fargo, 2Mississippi State University, Mississippi State

TEACHING

Educational Outcomes of an Online Course; Pharmaceutical Use in Cattle.
E. Blythe*, West Texas A&M University, Canyon

Utilization of a modified Delphi method to perform a needs assessment and curriculum revision of a senior-level beef systems management course.
E. L. Lundy*, D. D. Loy and P. J. Gunn, Iowa State University, Ames

Temporal changes in undergraduate students’ self-reported perceptions of motivation of learning, grade anxiety, and instructor effectiveness in animal science courses.
J. D. Allen* and G. A. Becker2, 1Northwest Missouri State, Maryville, 2Northwest Missouri State University, Maryville

Development and implementation of a lean hog futures trading game to enhance student engagement and learning.
B. D. Whitaker* and G. W. Arburn, University of Findlay, Findlay, OH
### GROWTH, DEVELOPMENT, MUSCLE BIOLOGY, AND MEAT SCIENCE SYMPOSIUM: INSULIN REVISITED

**Chair:** Lance H. Baumgard, Iowa State University  
**Sponsor:** American Meat Science Association  
306-307

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Nr</th>
<th>Title</th>
<th>Authors/Institution</th>
</tr>
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<tbody>
<tr>
<td>8:30 AM</td>
<td>102</td>
<td>(Invited ASAS Animal Science Young Scholar) Insulin: Secretagogues and Nutrient Partitioning.</td>
<td>M. V. Sanz Fernandez and L. H. Baumgard*, Iowa State University, Ames</td>
</tr>
<tr>
<td>9:10 AM</td>
<td>103</td>
<td>(Invited) The influence of insulin on adipose tissue differentiation, metabolism and adipokine secretion.</td>
<td>G. J. Hausman*, University of Georgia, Athens</td>
</tr>
<tr>
<td>9:50 AM</td>
<td>104</td>
<td>(Invited) Mechanisms underlying insulin supported skeletal muscle growth.</td>
<td>R. P. Rhoads¹ and L. H. Baumgard², ¹Virginia Tech, Blacksburg, ²Iowa State University, Ames</td>
</tr>
<tr>
<td>10:30 AM</td>
<td>Break</td>
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<tr>
<td>10:40 AM</td>
<td>105</td>
<td>(Invited) Effects of heat stress on post-absorptive metabolism.</td>
<td>M. V. Sanz Fernandez¹, J. S. Johnson¹, R. P. Rhoads² and L. H. Baumgard², ¹Iowa State University, Ames, ²Virginia Tech, Blacksburg</td>
</tr>
<tr>
<td>11:10 AM</td>
<td>106</td>
<td>(Invited) Impact of insulin on ovarian function.</td>
<td>A. F. Keating*, Iowa State University, Ames</td>
</tr>
</tbody>
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### ANIMAL BEHAVIOR, HOUSING, & WELL-BEING SYMPOSIUM: WHAT DOES THIS STUDY SAY ABOUT WELL-BEING? CAVEATS AND CONSIDERATIONS

**Chair:** Courtney L. Daigle, Michigan State University  
308-309

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<th>Time</th>
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<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Speaker(s)</th>
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<tbody>
<tr>
<td>9:45 AM</td>
<td>2</td>
<td>(Invited) Scientifically Evaluating the Impact of Nutritional Management on Animal Welfare.</td>
<td>T. DeVries*, University of Guelph, Kemptville, ON, Canada</td>
</tr>
<tr>
<td>10:15 AM</td>
<td>3</td>
<td>(Invited) Considerations for Applying Electronic Measurements in Animal Welfare Research.</td>
<td>A. R. Green*, University of Illinois at Urbana-Champaign, Urbana</td>
</tr>
<tr>
<td>10:45 AM</td>
<td>4</td>
<td>(Invited) Where’s Waldo? Using sickness behavior to find the sick animal in the crowd.</td>
<td>A. L. Stanton*, University of Wisconsin-Madison, Madison</td>
</tr>
<tr>
<td>11:15 AM</td>
<td>5</td>
<td>(Invited) Relating Economics to Animal Welfare.</td>
<td>G. T. Tonsor*, Kansas State University, Manhattan</td>
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<tr>
<td>11:45 AM</td>
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<td>Discussion</td>
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**BREEDING AND GENETICS I**

Chair: Michael G. Gonda, South Dakota State University

**312-313**

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<th>Time</th>
<th>Session</th>
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<th>Speaker(s)</th>
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<tr>
<td>9:00 AM</td>
<td>14</td>
<td>Improving accuracies of genomic predictions by enriching 50K genotypes with markers from 770K genotypes at QTL regions.</td>
<td>M. Saatchi* and D. J. Garrick, Iowa State University, Ames</td>
</tr>
<tr>
<td>9:30 AM</td>
<td>16</td>
<td>Comparison of genomic breeding values based on single or multiple breed reference populations in US Maine-Anjou beef cattle.</td>
<td>J. Lee*, M. Saatchi and D. J. Garrick, Iowa State University, Ames</td>
</tr>
<tr>
<td>9:45 AM</td>
<td>17</td>
<td>Improving the Accuracy of Genomic Prediction of Milk Fat Yield in the New Zealand Holstein Friesian Population.</td>
<td>M. K. Hayr*1, M. Saatchi1, D. Johnson2 and D. J. Garrick, Iowa State University, Ames</td>
</tr>
<tr>
<td>10:00 AM</td>
<td>18</td>
<td>Heritability Estimation for Escherichia coli O157:H7 Vaccine Response in Beef Cattle.</td>
<td>K. Marley*1, L. A. Kuehn2, J. Keele2, B. Wileman1,4 and M. G. Gonda1, South Dakota State University, Brookings, SD, USDA-ARS, Clay Center, NE, Epitopix LLC, Willmar, MN, Kansas State University, Manhattan</td>
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<tr>
<th>Time</th>
<th>Session</th>
<th>Title</th>
<th>Presenters</th>
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<tbody>
<tr>
<td>10:15 AM</td>
<td>19</td>
<td>Genotype by environment interaction in Red Angus cattle in the United States.</td>
<td>W. R. Lamberson¹, D. Fennewald², R. L. Weaber³ and M. Kaps⁴, ¹University of Missouri, Columbia, ²University of Missouri, Columbia, ³Kansas State University, Manhattan, ⁴University of Zagreb, Zagreb, Croatia</td>
</tr>
<tr>
<td>9:00 AM</td>
<td>302-303</td>
<td><strong>DAVID SCHINGOE THE SYMPOSIUM:</strong> HEIFER NUTRITION AND THE FUTURE</td>
<td></td>
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<tr>
<td>9:05 AM</td>
<td>40</td>
<td>Introductory Remarks</td>
<td></td>
</tr>
<tr>
<td>9:05 AM</td>
<td>40</td>
<td>(Invited) Future Perspective on Accelerated Milk Replacer Feeding.</td>
<td>J. G. Linn* and N. B. Litherland, University of Minnesota, St. Paul</td>
</tr>
<tr>
<td>10:25 AM</td>
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<td>Break</td>
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</tr>
<tr>
<td>11:20 AM</td>
<td>43</td>
<td>(Invited) How much dietary fat should growing prepubertal dairy heifers be fed?</td>
<td>J. L. Anderson*, South Dakota State University, Brookings, SD</td>
</tr>
<tr>
<td>12:00 PM</td>
<td>44</td>
<td>(Invited) Finding the future now – health, genomics, and calves.</td>
<td>A. L. Stanton*, University of Wisconsin-Madison, Madison</td>
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<tr>
<td>12:40 PM</td>
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<td>Concluding Remarks</td>
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| 9:00 AM| 117     | Comparison of the lysine requirement of immunologically versus physically castrated male pigs.  
A. J. Elsbernd\textsuperscript{1,} C. F. M. de Lange\textsuperscript{2}, K. J. Stalder\textsuperscript{1} and J. F. Patience\textsuperscript{1}, \textsuperscript{1}Iowa State University, Ames, \textsuperscript{2}University of Guelph, Guelph, ON, Canada |
| 9:15 AM| 118     | Effects of reducing the particle size of corn on growth performance and carcass characteristics of growing-finishing pigs.  
O. J. Rojas\textsuperscript{*} and H. H. Stein, University of Illinois at Urbana-Champaign, Urbana |
| 9:30 AM| 119     | Prediction of loin, belly and jowl IV based on diet composition versus daily fatty acid intake.  
T. A. Kellner\textsuperscript{*}, K. J. Prusa and J. F. Patience, Iowa State University, Ames |
| 9:45 AM| 120     | Regression Analysis to Predict Growth Performance from Dietary Net Energy in Growing-Finishing Pigs.  
S. Nitikanchana\textsuperscript{*}, S. S. Dritz, M. D. Tokach, J. M. DeRouchey, R. D. Goodband, B. J. White and J. L. Nelssen, Kansas State University, Manhattan |
| 10:00 AM| 121     | Effect of Two Net Energy Feeding Programs in Combination with Ractopamine on Grow-finish Pig Growth Performance and Carcass Characteristics.  
W. Steyn\textsuperscript{*1,} E. C. Allen\textsuperscript{2,} C. A. P. Garbossa\textsuperscript{2,} A. P. Schinckel\textsuperscript{2,} J. M. Eggert\textsuperscript{1} and B. T. Richert\textsuperscript{2}, \textsuperscript{1}TOPIGS, Helvoirt, Netherlands, \textsuperscript{2}Purdue University, West Lafayette, IN, \textsuperscript{3}Federal University of Lavras, Lavras, Brazil, \textsuperscript{4}TOPIGS USA, Demotte, IN |
M. D. Asmus\textsuperscript{*1,} K. D. Haydon\textsuperscript{2}, T. A. Marsteller\textsuperscript{2,} J. E. Ferrel\textsuperscript{2} and B. T. Richert\textsuperscript{4}, \textsuperscript{1}Purdue University, West Lafayette, IN, \textsuperscript{2}Elanco Animal Health, Greenfield, IN |
| 10:30 AM|         | Break |
10:45 AM 123

Effects of corn particle size and diet form on finishing pig growth performance and carcass characteristics.
1 Kansas State University, Manhattan, 2 New Fashion Pork, Jackson, MN

11:00 AM 124

In utero heat stress alters body composition during the early finishing phase (60 to 80 kg) in pigs.
1 Iowa State University, Ames, 2 University of Missouri, Columbia, 3 Virginia Tech, Blacksburg

11:15 AM 125

Evaluation of prediction equations to estimate the concentration of GE, DE, and ME content of corn dried distillers grains with solubles (DDGS) based on variable chemical composition for growing pigs.
P. E. Urriola*, M. Li, B. J. Kerr and G. C. Shurson
1 University of Minnesota, Saint Paul, 2 USDA - ARS, Ames, IA

11:30 AM 126

Effect of wheat middling and multiple enzyme products on growth performance and carcass characteristics in nursery and finisher pigs.
1 University of Arkansas, Fayetteville, 2 DSM Nutritional Products, North America, Marshall, MO, 3 Swine Research Services, Inc., Springdale, AR

11:45 AM 127

Effect of Bacillus spp. direct-fed microbials on fecal VFA concentrations, growth performance, and carcass characteristics of growing-finishing pigs.
N. W. Jaworski*, A. Owusu-Asiedu, A. A. Awati and H. H. Stein
1 University of Illinois at Urbana-Champaign, Urbana, 2 DuPont Industrial Biosciences - Danisco Animal Nutrition, Marlborough, Wiltshire, United Kingdom

12:00 PM 128

Effect of dietary supplementation of the osmolyte betaine on growing pig performance and metabolic status during thermo-neutral and heat-stressed conditions.
S. M. Mendoza*, E. van Heugten and R. D. Boyd
1 North Carolina State University, Raleigh, 2 The Hanor Company, Inc., Franklin, KY
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<th>Time</th>
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<tr>
<td>9:00 AM</td>
<td>129</td>
<td>Effect of nursery diet protein quality and fish oil supplementation on growth performance, immune response, and gut morphology in starter pigs.</td>
<td>S. Hooda*, N. Richmond, N. A. Karrow and C. F. M. de Lange, Department of Animal and Poultry Science, Guelph, ON, Canada</td>
</tr>
<tr>
<td>9:15 AM</td>
<td>130</td>
<td>Effects of high levels of phytase in low lysine diets on the growth performance of nursery pigs.</td>
<td>J. R. Flohr*1, R. D. Goodband1, M. D. Tokach1, S. S. Dritz1, J. M. DeRouchey1, J. Woodworth1, K. B. Langbein1 and J. R. Bergstrom2, Kansas State University, Manhattan1, DSM Nutritional Products, North America, Marshall, MO</td>
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<tr>
<td>9:30 AM</td>
<td>131</td>
<td>Effects of diet complexity, antibiotics, and benzoic acid on nursery pig growth performance.</td>
<td>J. E. Nemechek2, M. D. Tokach1, J. R. Bergstrom2, J. M. DeRouchey1, S. S. Dritz1 and R. D. Goodband1, Kansas State University, Manhattan1, DSM Nutritional Products, North America, Marshall, MO</td>
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<tr>
<td>9:45 AM</td>
<td>132</td>
<td>Soluble fibre and insoluble fibre sources added to enterotoxigenic Escherichia coli-challenged pigs after weaning influence production and β–hemolytic E. coli excretion.</td>
<td>J. Pluske*1 and J. C. Kim2, Murdoch University, Australia, Australia, Department of Agriculture and Food, Western Australia, Australia</td>
</tr>
<tr>
<td>10:00 AM</td>
<td>133</td>
<td>Effects of corn particle size, complete diet grinding, and diet form on 11- to 20-kg nursery pig growth performance and caloric efficiency.</td>
<td>J. A. De Jong*1, J. M. DeRouchey1, M. D. Tokach1, R. D. Goodband1, S. S. Dritz1 and C. W. Hastad2, Kansas State University, Manhattan1, New Fashion Pork, Jackson, MN</td>
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<td>10:15 AM</td>
<td>134</td>
<td>Efficacy of xylanase on growth performance, nutrients digestibility and digesta fermentation metabolites in nursery pigs fed wheat based diets.</td>
<td>M. C. Walsh*1, E. Kiarie2, H. Bentol, H. Simmins1 and M. Nyachoti1, DuPont Industrial Biosciences - Danisco Animal Nutrition, Marlborough, United Kingdom, DuPont Industrial Biosciences - Danisco Animal Nutrition, Waukesha, WI, University of Manitoba, Winnipeg, MB, Canada</td>
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<td>10:45 AM</td>
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<td>11:45 AM</td>
<td>139</td>
<td>Effects of high-protein canola meals fed to weanling pigs on growth performance, organ weights, bone ash, and blood parameters.</td>
<td>C. K. Parr*, Y. Liu*, C. M. Parsons* and H. H. Stein*, 1University of Illinois, Urbana, 2University of Illinois at Urbana-Champaign, Urbana</td>
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<tr>
<td>12:00 PM</td>
<td>140</td>
<td>Protease supplementation improved growth performance and profitability of nursery pigs consuming a corn-soybean meal based diet.</td>
<td>Y. Ma*, N. Odetallah, M. Vazquez-Anon and J. Escobar, Novus International Inc., St. Charles, MO</td>
</tr>
<tr>
<td>12:15 PM</td>
<td>141</td>
<td>Pharmacological ZnO dose and superdoses of phytase on piglet growth performance and cost of gain from d 0 to 21 post-weaning.</td>
<td>C. L. Bradley*, C. L. Walk, G. Cordero and P. Wilcock, AB Vista Feed Ingredients, Marlborough, United Kingdom</td>
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## NONRUMINANT NUTRITION: SOW MANAGEMENT AND NUTRITION
**Chair: Crystal L. Levesque, South Dakota State University**

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<td>9:00 AM</td>
<td>142</td>
<td>Determination of the impact of housing system on the determination of apparent total tract digestibility of energy and dry matter.</td>
<td>C. L. Holloway* and J. F. Patience, Iowa State University, Ames</td>
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<td>9:15 AM</td>
<td>143</td>
<td>Supplementing sows or their litters with a direct fed microbial feed additive decreases fecal shedding of bacterial pathogens and increases litter performance in sows naturally infected with porcine reproductive and respiratory syndrome virus (PRRS).</td>
<td>P. K. Brown*, D. A. Spangler, K. M. Foerder, J. C. Coomer, D. F. Jones and R. J. Hall, Agri-King, Inc., Fulton, IL</td>
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<tr>
<td>9:30 AM</td>
<td>144</td>
<td>Response of sow and progeny to supplementation of dietary essential fatty acids during lactation.</td>
<td>D. S. Rosero Tapia*, E. van Heugten*, J. Odle†, M. McCulley‡ and R. D. Boyd‡, †North Carolina State University, Raleigh, ‡The Hanor Company, Inc., Franklin, KY</td>
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<tr>
<td>9:45 AM</td>
<td>145</td>
<td>The impact of supplemental choice white grease on sows and litter performance when fed during lactation.</td>
<td>C. R. Little*, T. N. Kessie and R. Hinson†, †JBS United Inc., Sheridan, IN, ‡JBS United, Inc., Sheridan, IN, §JBS United, Sheridan, IN</td>
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## RUMINANT NUTRITION: COPRODUCTS
**Chair: Stephanie L. Hansen, Iowa State University**

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<td>9:00 AM</td>
<td>205</td>
<td>Effects of Feeding Dry or Modified Wet Distillers Grains with Solubles with or without Supplemental Calcium Oxide on Ruminal Metabolism and Microbial Enzymatic Activity in Beef Cattle.</td>
<td>A. R. Schroeder*, M. Iakiviak, I. K. O. Cann and T. L. Felix, University of Illinois at Urbana-Champaign, Urbana</td>
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</table>
9:15 AM  | 206  | Optimum inclusions of alkaline treated cornstalks and distillers grains fed to calf-fed steers.  
S. J. Peterson*¹, B. L. Nuttelman², C. J. Schneider¹, D. B. Burken², J. C. MacDonald² and G. E. Erickson², ¹University of Nebraska, Lincoln, ²University of Nebraska-Lincoln, Lincoln

9:30 AM  | 207  | Effect of distillers grains on average daily gain of cattle grazing corn residue.  
M. Jones*, J. C. MacDonald, T. J. Klopfenstein, G. E. Erickson and A. K. Watson, University of Nebraska-Lincoln, Lincoln

9:45 AM  | 208  | Feeding Elevated Levels of Corn Silage and MDGS in Finishing Diets.  
D. B. Burken*, B. L. Nuttelman, C. J. Bittner, G. E. Erickson and T. J. Klopfenstein, University of Nebraska-Lincoln, Lincoln

10:00 AM | 209  | Energy value of de-oiled modified distillers grains plus solubles in a forage-based diet.  
M. L. Bremer*, D. B. Burken, A. K. Watson, J. C. MacDonald and G. E. Erickson, University of Nebraska-Lincoln, Lincoln

10:15 AM | 210  | Digestion of finishing diets containing modified distillers grains plus solubles and condensed distillers solubles with and without oil extraction.  
M. L. Jolly*, A. L. Shreck, J. L. Harding, G. E. Erickson, J. C. MacDonald and T. J. Klopfenstein, University of Nebraska-Lincoln, Lincoln

10:30 AM | 211  | Energy value of de-oiled modified distillers grains plus solubles in beef feedlot diets.  
M. L. Bremer*, B. L. Nuttelman, C. J. Bittner; D. B. Burken, G. E. Erickson, J. C. MacDonald and T. J. Klopfenstein, University of Nebraska-Lincoln, Lincoln

10:45 AM | 212  | Energy value of de-oiled wet distillers grains plus solubles relative to corn processing method of steam-flaked or dry-rolled.  
M. L. Bremer*¹, M. K. Luebbe², K. H. Jenkins² and G. E. Erickson¹, ¹University of Nebraska-Lincoln, Lincoln, ²University of Nebraska, Scottsbluff, NE

11:00 AM | 213  | Influence of Prepartum Dietary Protein Concentration on Beef Cow Performance and Calf Growth, Carcass Characteristics, and Plasma Glucose and Insulin Concentrations.  
T. B. Wilson*¹, N. M. Long², D. B. Faulkner¹ and D. W. Shike³, ¹University of Illinois, Urbana-Champaign, IL, ²Clemson University, Clemson, SC, ³University of Illinois at Urbana-Champaign, Urbana
## EXTENSION – SWINE

**Chair: Brian T. Richert, Purdue University**

**318-319**

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| 11:00 AM     | 54      | Effects of Skycis® and Stafac® on growth and carcass performance of finishing pigs – A meta analysis.  
R. A. Arentson1, J. J. Chewning2, S. N. Carr3, G. L. Allee4, M. C. Brumm1 and E. G. McMillan6, 1Elanco, Greenfield, IN, 2Swine Research Services, Inc., Springdale, AR, 3Elanco Animal Health, Greenfield, IN, 4Pork Tech, LLC, Columbia, MO, 5Brumm Swine Consultancy, Inc., Mankato, MN, 6Nutreco Canada Agresearch, Burford, ON, Canada |
| 11:15 AM     | 55      | The effect of regrinding DDGS and SBM on pellet quality in swine finishing diets.  
W. J. Pacheco1, M. Knauer1, E. van Heugten1, C. R. Stark1, A. C. Fahrenholz1 and C. E. Phillips2, 1North Carolina State University, Raleigh, 2Murphy-Brown LLC, Rose Hill, NC |
| 11:30 AM     | 56      | The effect of cross fostering on PRRS transmission and litter performance.  
B. Mason1, A. E. DeDecker2, J. L. Seate3 and M. F. Billing3, 1University of Illinois, Champaign, 2Murphy-Brown LLC, Rose Hill, NC, 3Murphy Brown LLC, Rose Hill, NC |
| 11:45 AM     | 57      | Effects of suckling history of mammary glands on teat order and growth of nursing piglets during a subsequent lactation.  
J. Guo1, G. Voilque1, Y. Sun1, A. E. DeDecker2, M. T. Coffey2 and S. W. Kim1, 1North Carolina State University, Raleigh, 2Murphy-Brown LLC, Rose Hill, NC |
| 12:00 PM     | 58      | Can animal welfare assessment at the farm be a good tool to control pork quality variation?  
L. M. Rocha1,2, A. Dalmau3, A. Velarde3, L. Saucier2 and L. Faucitano1,2, 1Agriculture & Agri-Food Canada, Sherbrooke, QC, Canada, 2Université Laval, Quebec, QC, Canada, 3IRTA, Animal Welfare Group, Monells, Spain |
| 12:15 PM     | 59      | Relationships between sow body condition with subsequent reproductive performance.  
M. Bryan1 and M. Knauer, North Carolina State University, Raleigh |
**BREEDING AND GENETICS SYMPOSIUM: ANALYSIS OF NEXT GENERATION SEQUENCING (NGS) DATA**  
*Chair: Juan P. Steibel, Michigan State University*

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<tr>
<td>1:30 PM</td>
<td>Introductory Remarks</td>
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| 1:40 PM  | (Invited) Utilization of Sequence on Relatives to Improve Analysis of Individuals’ Low-coverage NGS data.  
* R. M. Thallman$^1$ and T. S. Kalbfleisch$^2$, $^1$USDA, Agricultural Research Service, U.S. Meat Animal Research Center, Clay Center, NE, $^2$Intrepid Bioinformatics, Louisville, KY |
| 2:25 PM  | (Invited) Applications of High-Throughput Sequencing for Fertility, Demography, and Genome Improvement.  
* J. E. Decker*, R. D. Schnabel and J. F. Taylor, University of Missouri, Columbia |
| 3:10 PM  | Break                                                                 |
* H. Wang*, Michigan State University, East Lansing |
| 4:10 PM  | (Invited) Computational resources to facilitate variant discovery and analysis.  
* J. M. Reecy$^1$, C. Baes$^{2,3}$, E. Fritz-Waters$^4$, J. E. Koltes$^1$, M. Dolezal$^4$, B. Bapst$^1$, C. Flury$^2$, H. Signer-Hasler$^3$, C. Stricker$^1$, R. L. Fernando$^1$, D. J. Garrick$^1$, F. Schmitz-Hsu$^6$, B. Gredler$^2$ and M. Vaugh, $^1$Iowa State University, Ames, $^2$Bern University of Applied Sciences, Zollikofen, Switzerland, $^3$Qualitas AG, Zug, Switzerland, $^4$Università degli Studi di Milano, Milano, Italy, $^5$agn Genetics GmbH, Davos, Switzerland, $^6$Swissgenetics, Zollikofen, Switzerland, $^7$Texas Advance Computing Center, University of Texas, Austin |
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<td>2:00 PM</td>
<td>7</td>
<td>Timing of ration delivery regulates periprandial eating behavior of dairy cows.</td>
<td>A. Nikkhah, University of Zanjan, Zanjan, Iran</td>
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<td>2:45 PM</td>
<td>10</td>
<td>Associations between sow body lesions with body condition and reproductive performance.</td>
<td>M. Bryan and M. Knauer, North Carolina State University, Raleigh</td>
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<tr>
<td>3:00 PM</td>
<td>11</td>
<td>Effect of the farm system on the behavioral response preslaughter and on meat quality variation in pigs.</td>
<td>L. M. Rocha, A. Dalmau, A. Velarde, L. Saucier and L. Faucitano, Université Laval, Quebec, QC, Canada, Agriculture &amp; Agri-Food Canada, Sherbrooke, QC, Canada, IRTA, Animal Welfare Group, Monells, Spain</td>
</tr>
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</table>
Identifying characteristics of slow-growing pigs from birth to 9 weeks of age and growth performance responses to feeder space post-weaning.

Y. He*1, J. Deen1, G. C. Shurson2 and Y. Li3, 1University of Minnesota, St. Paul, 2University of Minnesota, Saint Paul, 3University of Minnesota, West Central Research and Outreach Center, Morris, MN

EXTENSION – DAIRY SYMPOSIUM: STRATEGIES TO INCREASE FIBER DIGESTIBILITY IN LACTATING DAIRY COWS.

Chairs: Noah B Litherland, University of Minnesota and J. A. Salfer, University of Minnesota

1:30 PM Introductory Remarks

1:40 PM (Invited) Agronomic practices that impact the digestibility of fiber by lactating cows.

F. N. Owens*, DuPont Pioneer, Johnston, IA

2:20 PM (Invited) TTNDFD: A new approach to evaluate forage fiber digestibility.

D. K. Combs* and F. Lopes, University of Wisconsin, Madison

3:00 PM Break

3:15 PM (Invited) Measuring forage quality of corn silage and understanding the impacts on rumen fermentation in lactating dairy cattle.

P. J. Kononoff*, University of Nebraska-Lincoln, Lincoln

3:55 PM (Invited) The Impact of Non-Forage Fiber Sources on Fiber Digestibility.

B. Bradford*, Kansas State University, Manhattan

4:35 PM Discussion

EQUINE

Chairs: Rebecca C. Bott, South Dakota State University and Emily Glunk, University of Minnesota


K. D. Bump*, Cazenovia College, Cazenovia, NY; National Association of Equine Affiliated Academics, Cazenovia, NY
| Time     | Session Number | Title                                                                                      | Authors                                                                                           | Affiliations                                                                                   |
|----------|----------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| 2:15 PM  | 46             | Development of an Undergraduate Online Horse Management Course.                              | K. L. Martinson*, M. Palmer, M. Hathaway and E. Glunk, University of Minnesota, Saint Paul         |
| 2:30 PM  | 47             | Comparative Analysis of State 4-H Horse Programs.                                           | F. C. Camargo*, A. Lawyer, C. Willis, R. C. Bott, University of Kentucky, Lexington, South Dakota State University, Brookings, SD |
| 2:45 PM  | 48             | (Invited ASAS Animal Science Young Scholar) Influence of Weight Loss on Skeletal Muscle Mitochondrial Function and Metabolism in the Mature Horse. | J. L. Zambito, H. S. Spooner, C. E. Nichols, R. M. Hoffman, J. M. Hollander, K. M. Barnes, West Virginia University, Morgantown, Middle Tennessee State University, Murfreesboro |
| 3:15 PM  | 49             | The Interaction of Grazing Muzzle Use and Grass Species on Forage Intake Of Horses.         | E. Glunk*, C. C. Sheaffer, M. Hathaway and K. L. Martinson, University of Minnesota, Saint Paul    |

**GROWTH, DEVELOPMENT, MUSCLE BIOLOGY, AND MEAT SCIENCE**  
Chair: Scott N. Carr, Elanco Animal Health  
312-313

<p>| Time     | Session Number | Title                                                                                      | Authors                                                                                           | Affiliations                                                                                   |
|----------|----------------|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| 1:30 PM  | 108            | (Invited ASAS Animal Science Young Scholar) Contribution of the calpain system to muscle protein accretion and growth in cattle and swine models. | S. M. Cruzen*, Iowa State University, Ames                                                      |
| 2:00 PM  | 109            | (Invited ASAS Animal Science Young Scholar) Investigating the role of reactive oxygen species and mitochondria protein profile differences in pigs divergently selected for residual feed intake. | J. K. Grubbs*, Iowa State University, Ames                                                      |</p>
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<td>3:00 PM</td>
<td>111</td>
<td>Dietary L-arginine supplementation enhance myofiber hyperplasia.</td>
<td>G. Bee¹, C. E. Pardo¹ and M. Kreuzer², Agroscope, Posieux, Switzerland, ETH Zurich, Zurich, Switzerland</td>
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<td>3:15 PM</td>
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<td>Break</td>
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<tr>
<td>3:30 PM</td>
<td>112</td>
<td>Effects of Feeding Distillers Grains in a Yearling Beef System on Meat Quality.</td>
<td>K. M. Sudbeck¹, J. C. MacDonald¹, C. R. Calkins², G. E. Erickson¹, T. P. Carr¹ and K. Varnold², University of Nebraska-Lincoln, Lincoln, University of Nebraska, Lincoln</td>
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<td>3:45 PM</td>
<td>113</td>
<td>Differential expression of Cyclin G2, Cyclin dependent kinase inhibitor 2C and peripheral myelin protein 22 genes during adipogenesis.</td>
<td>J. Zhang¹, Y. Suh, Y. M. Choi, M. E. Davis and K. Lee, The Ohio State University, Columbus</td>
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<td>4:00 PM</td>
<td>114</td>
<td>Lysozyme as an alternative to antibiotics improves growth performance and tumor necrosis factor-α levels during an indirect immune challenge.</td>
<td>W. T. Oliver¹, J. E. Wells¹ and C. V. Maxwell¹, USDA/ARS U.S. Meat Animal Research Center, Clay Center, NE, University of Arkansas, Fayetteville</td>
</tr>
<tr>
<td>4:15 PM</td>
<td>115</td>
<td>Interactive effects of gestational heat stress, Paylean and lysine improve carcass and pork quality.</td>
<td>Z. D. Callahan¹, T. A. Wilmoth, M. C. Shane, T. J. Safranski and B. R. Wiegand, University of Missouri, Columbia</td>
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<td>4:30 PM</td>
<td>116</td>
<td>In utero heat stress negatively affects the growth performance of barrows.</td>
<td>T. A. Wilmoth¹, Z. D. Callahan, M. C. Shane, T. J. Safranski and B. R. Wiegand, University of Missouri, Columbia</td>
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**NONRUMINANT NUTRITION:**

**FEED PROCESSING, INGREDIENTS, AND ADDITIVES**

*Chairs: Jonathan R Bergstrom, DSM Nutritional Products, North America and Ryan N. Dilger, University of Illinois 316-317*

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<td>1:30 PM</td>
<td>147</td>
<td>Effects of different feed enzyme combinations on apparent total tract digestibility of DM, N, phytate, DE, and ME in corn-soybean meal-DDGS based diets fed to pigs.</td>
<td>A. A. Passos¹ and S. W. Kim, North Carolina State University, Raleigh</td>
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<tr>
<td>1:45 PM</td>
<td>148</td>
<td>Commercial xylanase-products appear to be more efficient towards degradation of arabinoxylan in wheat than in rye. H. N. Lærke1, S. Arent2, K. E. B. Knudsen1 and S. Dalsgaard2, 1Aarhus University, Department of Animal Science, Tjele, Denmark, 2Dupont, Industrial Biosciences, Brabrand, Denmark</td>
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<tr>
<td>2:00 PM</td>
<td>149</td>
<td>Efficacy of a NSP enzyme blend Easyzyme to improve pig performance depends on dietary ME concentration. V. G. Perez*, K. T. Soltwedel, T. R. Radke and D. P. Holzgrafe, ADM Alliance Nutrition Inc., Quincy, IL</td>
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<tr>
<td>2:15 PM</td>
<td>150</td>
<td>Effects of dietary supplementation of xylanase on apparent ileal digestibility of ADF and NDF, and viscosity of digesta in nursery pigs fed corn and soybean meal based diets. A. A. Passos* and S. W. Kim, North Carolina State University, Raleigh</td>
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<td>2:30 PM</td>
<td>151</td>
<td>Effects of microbial phytase on apparent and standardized total tract digestibility of calcium in calcium supplements fed to growing pigs. J. C. Gonzalez-Vega*, C. L. Walk2 and H. H. Stein3, 1University of Illinois, Urbana, 2AB Vista Feed Ingredients, Marlborough, United Kingdom, 3University of Illinois at Urbana-Champaign, Urbana</td>
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<td>2:45 PM</td>
<td>152</td>
<td>The Effects of Feeding Diets Supplemented with β-mannanase or β-mannanase and 1,3-glucanase on Apparent Total Tract and Apparent Ileal Digestibilities in Pigs. J. S. Radcliffe*, B. T. Richert1 and J. E. Ferrel3, 1Purdue University, West Lafayette, IN, 2Elanco Animal Health, Greenfield, IN</td>
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<td>3:00 PM</td>
<td>153</td>
<td>Impact of level of soybean meal and β-mannanase in nursery diets on two genetic populations of pigs selected for soybean meal allergic response. M. Ferreira1, A. P. Schinckel3, J. E. Ferrel4, B. T. Richert1, J. S. Radcliffe2 and T. S. Stewart1, 1Federal University of Larvas, Department of Veterinary Medicine, Larvas, Brazil, 2CAPES Foundation, Brasilia, Brazil, 3Purdue University, West Lafayette, IN, 4Elanco Animal Health, Greenfield, IN</td>
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53
3:30 PM 154 The Effect of β-mannanase and a β-glucanase Combined with β-mannanase in Corn-Soybean Meal-DDGS Diets on Grower Pig Growth, Feed Intake and Feed Efficiency Performance in a Commercial Setting.
J. E. Ferrel* and D. M. Anderson, Elanco Animal Health, Greenfield, IN

3:45 PM 155 Concentrations of digestible and metabolizable and net energy in soybean meal produced throughout the United States and fed to pigs.
K. M. Sotak*1 and H. H. Stein2, 1University of Illinois at Urbana-Champaign, Champaign, 2University of Illinois at Urbana-Champaign, Urbana

4:00 PM 156 Corn grown under drought-stressed conditions does not have lower energy content than corn grown in a previous “normal” year.
M. A. Newman*, C. R. Hurburgh and J. F. Patience, Iowa State University, Ames

4:15 PM 157 Effects of Conditioning Motor Speed and Diet Form on growth performance of 12-21 kg nursery pigs.
L. L. Lewis*1, C. K. Jones1, A. C. Fahrenholz2, C. R. Stark1, M. A. Goncalves1 and J. M. DeRouchey1, 1Kansas State University, Manhattan, 2North Carolina State University, Raleigh

4:30 PM 158 Effects of corn particle size and diet form on growth performance of 6-22 kg nursery pigs.
G. E. Bokelman*, C. K. Jones, J. R. Kalivoda, M. D. Tokach, J. M. DeRouchey and C. R. Stark, Kansas State University, Manhattan

4:45 PM 159 Influence of the zinc to phytate ratio and superdoses of phytase on piglet growth performance.
C. L. Walk*1, J. J. Chewning2 and P. Wilcock1, 1AB Vista Feed Ingredients, Marlborough, United Kingdom, 2Swine Research Services, Inc., Springdale, AR

5:00 PM 160 The effect of feeding β-mannanase in starter diets on nursery pig growth, feed intake and feed efficiency performance in a commercial wean-finish setting.
S. A. Crowder*1, T. L. Weeden1, W. I. Snyder*1, T. A. Meyer1, C. C. Hankins1, R. A. Arentson2 and J. E. Ferrel2, 1Purina Animal Nutrition LLC, Shoreview, MN, 2Elanco Animal Health, Greenfield, IN
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<th>Time</th>
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<tr>
<td>1:30 PM</td>
<td>161</td>
<td>Effect of Bacillus-based direct-fed microbial feed supplementation on growth performance, carcass characteristics and fecal microbial enumeration of wean to finish pigs.</td>
<td>H. Manu*, X. Yang, D. P. Pangeni, P. Ren, W. Meried and S. Baidoo, University of Minnesota Southern Research and Outreach Center, Waseca, Southern Research and Outreach Center, University of Minnesota, Waseca</td>
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<tr>
<td>1:45 PM</td>
<td>162</td>
<td>Diet Complexity Affects Post-weaning Performance and Immune Response to Porcine Circovirus 2 (PCV2) Infection in Nursery Pigs.</td>
<td>G. A. Mastromano*, Y. S. Li, H. Tran, J. W. Bundy, D. C. Ciobanu, P. S. Miller and T. E. Burkey, University of Nebraska, Lincoln</td>
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<td>2:00 PM</td>
<td>163</td>
<td>Effect of deoxynivalenol (DON) ingestion on expression of genes involved in intestinal integrity and immune response.</td>
<td>M. Lessard*, K. Deschêne, C. Savard, F. Guay, J. Lapointe and Y. Chorfi, Agriculture and Agri-Food Canada, Sherbrooke, QC, Canada, Université de Montréal, Faculté de médecine vétérinaire, St-Hyacinthe, QC, Canada, Universite Laval, Quebec, Quebec, QC, Canada</td>
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<td>2:45 PM</td>
<td>166</td>
<td>Relations among enterotoxigenic <em>Escherichia coli</em>, net fluid absorption, and cytokine expression in piglet jejunal segments infused with customized glycans. A. D. Woodward*, X. Chen, M. G. Gänzle and R. T. Zijlstra, University of Alberta, Edmonton, AB, Canada</td>
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<td>3:15 PM</td>
<td>167</td>
<td>Effect of Yeast Rare Earth on Growth Performance, Nutrient Digestibility, Blood Profiles, Meat Quality, and Fecal Microbiota in Finishing Pigs. S. D. Upadhaya, L. Cai and I. H. Kim*, Dankook University, Cheonan, South Korea</td>
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<td>3:30 PM</td>
<td>168</td>
<td>Immune System Stimulation of Finishing Pigs is Positively Altered with Vitamin E and Poly Unsaturated Fatty Acid Supplements. S. D. Upadhaya¹, J. C. Kim², J. Pluske³ and I. H. Kim⁴*, ¹Dankook University, Cheonan, South Korea, ²Department of Agriculture and Food, Western Australia, Australia, ³Murdoch University, Western Australia, Australia</td>
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<td>3:45 PM</td>
<td>169</td>
<td>Effects of Dietary Fermented Aged Garlic Supplementation on Growth Performance, Digestibility, Blood Profiles, Gas Emissions and Microbiota in Weanling Pigs. M. M. Hossain, J. H. Cho and I. H. Kim*, Dankook University, Cheonan, South Korea</td>
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<td>4:00 PM</td>
<td>170</td>
<td>Evaluation of Lactulose on Growth Performance, Nutrient Digestibility, Hematological Characteristics, Targeted E. coli Colony, Fecal Score, Moisture and Noxious Gas Emissions in Weaning Pigs. M. M. Hossain, J. H. Cho and I. H. Kim*, Dankook University, Cheonan, South Korea</td>
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**PHYSIOLOGY SYMPOSIUM: A LIFETIME OF METABOLITES**

Chair: Lea A. Rempel, USMARC, ARS, USDA  
306-307

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<tr>
<th>Time</th>
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<tr>
<td>1:30 PM</td>
<td>192</td>
<td>(Invited) Energy dynamics during fetal to neonatal transition and the influence of perinatal energy stores on early neonatal survival. J. R. Miles*, USDA, ARS, US MARC, Clay Center, NE</td>
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<tr>
<td>2:10 PM</td>
<td>193</td>
<td>(Invited) NutriPhysioGenomics of Dairy Cattle: A Step towards Integrative Systems Physiology. J. J. Loor*, University of Illinois, Urbana</td>
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<td>Time</td>
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<td>2:50 PM</td>
<td>(Invited ADSA Young Dairy Scholar)</td>
<td>Metabolic inflammation and immunomodulation in transition dairy cows.</td>
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<td>K. Yuan* and B. Bradford, Kansas</td>
<td>State University, Manhattan</td>
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<td>3:30 PM</td>
<td>Impact of two heat stress models on</td>
<td>Performance and immune parameters of weaned pigs.</td>
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<td>B. E. Bass*1, M. Bandrick2, J. W.</td>
<td>Frank3, T. Looft2, H. K. Allen3, T. Casey2 and T. B. Stanton2, 1Diamond</td>
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<td>W. Frank3, T. Looft2, H. K. Allen3, T.</td>
<td>V, Cedar Rapids, IA, 2USDA National Animal Disease Center, Ames, IA</td>
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<td>Casey2 and T. B. Stanton2, 1Diamond</td>
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<td>V, Cedar Rapids, IA, 2USDA National</td>
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<td>3:45 PM</td>
<td>(Invited) Impact of disease on</td>
<td>metabolism.</td>
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<td>T. E. Burkey* and P. S. Miller,</td>
<td>University of Nebraska, Lincoln</td>
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<td>4:25 PM</td>
<td>(Invited) Vitamin E metabolism in</td>
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<td>M. P. Richards*1, D. Perez1, R. S.</td>
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<td>Parker2, M. E. Berres1 and M. Sifri3,</td>
<td>1University of Wisconsin-Madison, Madison, 2Cornell, Ithaca, NY, 3ADM,</td>
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<td>1University of Wisconsin-Madison,</td>
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<td>1:30 PM</td>
<td>(Invited ADSA Young Dairy Scholar)</td>
<td>Use of long-chain saturated fatty acid supplements in lactating dairy</td>
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<td>P. Piantoni*, A. L. Lock and M. S.</td>
<td>cows.</td>
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<td>Allen, Michigan State University,</td>
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<td>Effects of rumen-protected choline</td>
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<td>on plasma, milk yield and composition</td>
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<td>of middle and late lactation Holstein</td>
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<td>cows.</td>
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<td>A. Pineda* and P. Cardoso, University</td>
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<td>of Illinois at Urbana-Champaign,</td>
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<td>Understanding phage-bacterial</td>
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<td>interactions and their role in the</td>
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<td>Erickson2, T. J. Klopfenstein2 and S.</td>
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<td>C. Fernando*, 1University of</td>
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<td>Nebraska, Lincoln, 2University of</td>
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<td>Nebraska-Lincoln, Lincoln</td>
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</table>
Optimizing Design for Gut Microbe Identification by Sequencing.
T. M. Taxis\(^*\), G. C. Conant\(^1\), K. M. Cammack\(^2\) and W. R. Lamberson\(^1\), \(^1\)University of Missouri, Columbia, \(^2\)Department of Animal Science, University of Wyoming, Laramie

Evaluating two rates of monensin fed during the grain adaptation period on cattle performance and carcass characteristics.
M. E. Harris\(^*\), G. E. Erickson\(^2\), K. H. Jenkins\(^3\) and M. K. Luebbe\(^1\), \(^1\)University of Nebraska, Lincoln, \(^2\)University of Nebraska-Lincoln, Lincoln, \(^3\)University of Nebraska, Scottsbluff

Effects of Monensin supplementation on forage intake and performance of steers grazing smooth bromegrass.
T. L. Hasenauer\(^*\), T. J. Klopfenstein, G. E. Erickson and J. C. MacDonald, University of Nebraska-Lincoln, Lincoln

Effects of Diet on Methane, VFA Profile, and Performance of Growing Calves.
A. C. Pesta\(^*\), A. K. Watson\(^2\), S. C. Fernando\(^1\) and G. E. Erickson\(^2\), \(^1\)University of Nebraska, Lincoln, \(^2\)University of Nebraska-Lincoln, Lincoln

Growth adjustment to diet improves profitability within the feedlot.
N. O. Minton\(^*\), W. J. Sexten and M. Kerley, University of Missouri, Columbia

Effects of feeding Next Enhance in finishing diets on performance and carcass characteristics.
C. J. Bittner\(^*\), G. E. Erickson\(^1\), K. H. Jenkins\(^2\), M. K. Luebbe\(^2\) and M. A. Andersen\(^3\), \(^1\)University of Nebraska-Lincoln, Lincoln, \(^2\)University of Nebraska, Scottsbluff, \(^3\)Novus International, Inc., St. Charles, MO

Effect of feeding Enspira\textsuperscript{TM} on fiber digestibility.
J. L. Harding\(^*\), A. L. Shreck, M. L. Jolly, J. C. MacDonald and G. E. Erickson, University of Nebraska-Lincoln, Lincoln

Evaluation of changes in nutritional quality of corn residue throughout grazing period.
M. Jones\(^*\), J. C. MacDonald, T. J. Klopfenstein, G. E. Erickson, K. Glewen and A. K. Watson, University of Nebraska-Lincoln, Lincoln
ANIMAL BEHAVIOR, HOUSING, & WELL-BEING

260  Impact of Management Systems on Reproductive Performance, Hematological Profiles, Rectum Temperature, Fecal Score and Fecal Microbiota in Primiparous Sows. M. Begum, J. W. Park and I. H. Kim*, Dankook University, Cheonan, South Korea

261  Impact of Management Systems on Reproductive Performance, Hematological Profiles, Rectum Temperature, Fecal Score and Fecal Microbiota in the 2nd Parity Sows. A. Hosseindoust, B. R. Lee and I. H. Kim*, Dankook University, Cheonan, South Korea

262  Effects of social rank on agonistic behaviors and associated injuries of gestating sows at mixing. L. Wang, L. J. Johnston and Y. Li*, University of Minnesota, West Central Research and Outreach Center, Morris

263  What determines the social rank of a sow in a group-housing system? L. Wang, L. J. Johnston and Y. Li*, University of Minnesota, West Central Research and Outreach Center, Morris


265  Method of sprinkling trailers during hot weather and effects on transport losses of market weight pigs. R. K. Kephart¹, A. K. Butters-Johnson², K. J. Stalder¹, T. W. Huatt¹, A. Sapkota¹ and J. J. McGlone³, °Iowa State University, Ames, Purdue University, West Lafayette, IN, Texas Tech University, Lubbock

266  Effects of ractopamine level on the growth performance, carcass and meat quality, and blood acid-base and catecholamine responses to handling and transport procedures in finishing pigs. C. L. Puls¹, M. Ellis¹, M. J. Ritter², W. E. Trout² and S. N. Carr², °University of Illinois, Urbana, Elanco Animal Health, Greenfield, IN
Wednesday, March 19, 2014

267 Impact of providing shade on the growth performance of grazing dairy heifers.
M. W. Sahar*, T. S. Dennis, J. E. Tower, A. M. Mosiman and T. D. Nennich, Purdue University, West Lafayette, IN

268 Drylot vs. pasture beef cow/calf production.
V. L. Anderson*, B. Ilse and C. L. Engel, ¹North Dakota State University, Carrington, ²Big Horn County Extension, Montana State University, Hardin, ³Carrington Research Extension Center, North Dakota State University, Carrington

BREEDING AND GENETICS

271 Characterization of the endometrial transcriptome in pregnant and non-pregnant sows.
D. Gonzalez-Peña Fundora*, K. Caetano-Anollés¹, M. B. Wheeler² and S. L. Rodriguez Zas³, ¹University of Illinois at Urbana-Champaign, Urbana, ²University of Illinois, Urbana

272 Effect of feeding level on the growth performance of growing-finishing pigs from two genetic lines.
N. Grohmann*¹, B. Peterson¹, B. F. Wolter² and M. Ellis³, ¹University of Illinois, Champaign-Urbana, ²The Maschhoffs, Carlyle, IL, ³University of Illinois, Urbana

273 (GS-PHD) Combined effect of sow deep intrauterine insemination and boar frozen semen on economic indicators.
D. Gonzalez-Peña Fundora*, R. V. Knox², J. Pettigrew² and S. L. Rodriguez Zas¹, ¹University of Illinois at Urbana-Champaign, Urbana, ²University of Illinois, Urbana

274 Prediction of Porcine Reproductive and Respiratory Syndrome Virus Serum Viral Level Phenotype from Gene Expression Profiles.
D. Velez-Irizarry*, C. W. Ernst¹, J. K. Lunney², N. E. Raney¹ and J. P. Steibel³, ¹Michigan State University, East Lansing, ²USDA, ARS, BARC, APDL, Beltsville, MD

275 (UGS) Effect of Pre-Breeding Boar Exposure on Gilt Estrus.
T. Kelsay*, M. D. Lindemann, H. J. Monegue and J. S. Monegue, University of Kentucky, Lexington

276 Factors Associated with Digestibility in Nursery Pigs under PRRS Infection.
L. C. Hardie*, N. V. L. Serão¹, R. R. R. Rowland², J. F. Patience¹, J. C. M. Dekkers¹ and N. K. Gabler¹, ¹Iowa State University, Ames, ²Kansas State University, Manhattan

277 Effect of Low Energy, High Fiber Diets on Divergent Residual Feed Intake Lines in Swine.
Influence of storage bin design on flowability of DDGS-based pig diets.
A. M. Hilbrands\textsuperscript{*1}, K. A. Rosentrater\textsuperscript{2}, G. C. Shurson\textsuperscript{3} and L. J. Johnston\textsuperscript{4}, \textsuperscript{1}University of Minnesota, Morris, \textsuperscript{2}Iowa State University, Ames, \textsuperscript{3}University of Minnesota, Saint Paul, \textsuperscript{4}University of Minnesota, West Central Research and Outreach Center, Morris

Stocking density and feeder space effects on growth and carcass quality of PIC359 sired pigs.
S. Jungst\textsuperscript{*1}, D. Hanson\textsuperscript{2}, B. Fields\textsuperscript{1}, J. N. Matthews\textsuperscript{1}, M. Semler\textsuperscript{1}, C. Booher\textsuperscript{1}, T. Dreadin\textsuperscript{1}, A. Sosnicki\textsuperscript{1}, C. R. Neill\textsuperscript{2}, S. Dee\textsuperscript{2}, B. Kerkaert\textsuperscript{2}, L. Minion\textsuperscript{2} and J. Nerem\textsuperscript{2}, \textsuperscript{1}Genus PIC, Hendersonville, TN, \textsuperscript{2}Pipestone Systems, Pipestone, MN

Changes on intestinal microbial fermentation pattern of piglets fed diets including different components.
K. Escobar\textsuperscript{*1}, T. Reis\textsuperscript{1}, G. Mariscal\textsuperscript{2}, A. Aguilera\textsuperscript{1}, G. Bernal\textsuperscript{1}, S. Rubio\textsuperscript{1}, J. Gómez\textsuperscript{1} and S. Correa\textsuperscript{3}, \textsuperscript{1}Universidad Autónoma de Querétaro, Querétaro, Mexico, \textsuperscript{2}Instituto Nacional de Investigación Forestal, Agrícola y Pecuaria, Querétaro, Mexico, \textsuperscript{3}synBios SA de CV, Querétaro, Mexico

The effect of cross fostering on PRRS transmission and litter performance.
B. Mason\textsuperscript{*1}, J. L. Seate\textsuperscript{2}, A. E. DeDecker\textsuperscript{3} and M. F. Billing\textsuperscript{2}, \textsuperscript{1}University of Illinois, Champaign, IL, \textsuperscript{2}Murphy Brown LLC, Rose Hill, NC, \textsuperscript{3}Murphy-Brown LLC, Rose Hill, NC

Effect of artificial insemination method and semen dose volume on reproductive performance of multiparous sows.
L. M. Gesing\textsuperscript{*1}, J. E. Estrada\textsuperscript{1}, B. A. Peterson\textsuperscript{1}, D. Hentges\textsuperscript{2} and M. Ellis\textsuperscript{4}, \textsuperscript{1}University of Illinois, Champaign-Urbana, \textsuperscript{2}The Maschhoffs, Carlyle, IL, \textsuperscript{3}University of Illinois, Urbana

Evaluation of the growth performance, feeding and activity patterns, and aggressive behavior of barrows mixed twice during the finishing period.
L. E. Ochoa\textsuperscript{*1}, L. M. Gesing\textsuperscript{2}, B. Peterson\textsuperscript{3} and M. Ellis\textsuperscript{4}, \textsuperscript{1}The University of Illinois, Urbana, \textsuperscript{2}University of Illinois, Champaign-Urbana, \textsuperscript{3}The Maschhoffs, Carlyle, IL, \textsuperscript{4}University of Illinois, Urbana

Performance evaluation of barrows and gilts of three different sire lines.
C. A. P. Garbossa\textsuperscript{*1,2}, A. P. Schinckel\textsuperscript{2}, B. T. Richert\textsuperscript{2}, R. L. Cutshaw Jr\textsuperscript{2}, B. Zhou\textsuperscript{2}, E. C. Allen\textsuperscript{2}, W. Steyn\textsuperscript{3} and J. M. Eggert\textsuperscript{1}, \textsuperscript{1}Federal University of Lavras, Lavras, Brazil, \textsuperscript{2}Purdue University, West Lafayette, IN, \textsuperscript{3}TOPIGS, Helvoirt, Netherlands, \textsuperscript{4}TOPIGS USA, Demotte, IN
Evaluation of the compositional growth and predicted lysine requirements of pigs by three sire lines.

C. A. P. Garbossa\textsuperscript{1}, A. P. Schinckel\textsuperscript{2}, B. T. Richert\textsuperscript{3}, R. L. Cutshaw Jr.\textsuperscript{2}, B. Zhou\textsuperscript{2}, E. C. Allen\textsuperscript{2}, W. Steyn\textsuperscript{3} and J. M. Eggert\textsuperscript{4}, \textsuperscript{1}Federal University of Lavras, Lavras, Brazil, \textsuperscript{2}Purdue University, West Lafayette, IN, \textsuperscript{3}TOPIGS, Helvoirt, Netherlands, \textsuperscript{4}TOPIGS USA, Demotte, IN

GROWTH, DEVELOPMENT, MUSCLE BIOLOGY, AND MEAT SCIENCE

Growth Performance of Pigs Receiving Generic Ractopamine (Engain 9\textsuperscript{®} – Zoetis).

S. L. Wood-Follis\textsuperscript{1}, R. W. Miller\textsuperscript{1}, H. B. Vanimisetti\textsuperscript{1}, C. Puls\textsuperscript{2}, M. Ellis\textsuperscript{3}, A. L. Schroeder\textsuperscript{1} and W. M. Moseley\textsuperscript{1}, \textsuperscript{1}Zoetis, Inc., Kalamazoo, MI, \textsuperscript{2}University of Illinois, Urbana

Can samples be powdered to determine sarcomere length?

R. M. Dolazza and C. L. Lorenzen\textsuperscript{*}, University of Missouri, Columbia

Carcass and Meat Quality Characteristics of Pigs Receiving Generic Ractopamine (Engain 9\textsuperscript{®} – Zoetis).

S. L. Wood-Follis\textsuperscript{1}, R. W. Miller\textsuperscript{1}, H. B. Vanimisetti\textsuperscript{1}, R. Herrick\textsuperscript{2}, A. C. Dilger\textsuperscript{3}, A. L. Schroeder\textsuperscript{1} and W. M. Moseley\textsuperscript{1}, \textsuperscript{1}Zoetis, Inc., Kalamazoo, MI, \textsuperscript{2}University of Illinois, Urbana, \textsuperscript{3}University of Illinois at Urbana-Champaign, Urbana

Effect of gender/castration status on color and lipid oxidation stability of long-term chilled lamb muscles.

Y. H. B. Kim\textsuperscript{1,2}, A. Stuart\textsuperscript{3} and G. Maclemman\textsuperscript{4}, \textsuperscript{1}AgResearch Ltd, Hamilton, New Zealand, \textsuperscript{2}Purdue University, West Lafayette, IN, \textsuperscript{3}AgResearch Ltd., Hamilton, New Zealand, \textsuperscript{4}Alliance Group Ltd., Invercargill, New Zealand

Effects of Breed on Chemical Composition, Quality Attributes and Texture Characteristics of One-Humped Camel Meat.

A. N. Al-Owaimer\textsuperscript{*}, G. M. Suliman and E. S. O. S. Hussein, King Saud University, Riyadh, Saudi Arabia


M. Kipper\textsuperscript{1,2}, C. Pomar\textsuperscript{2} and M. Marcoux\textsuperscript{2}, \textsuperscript{1}Universidade Federal de Santa Maria, Santa Maria, Brazil, \textsuperscript{2}Agriculture and Agri-Food Canada, Sherbrooke, QC, Canada

Effect of dietary zinc and Ractopamine-HCl on pork chop tenderness and shelf-life characteristics.

C. B. Paulk\textsuperscript{1}, M. D. Tokach\textsuperscript{1}, J. L. Nelssen\textsuperscript{1}, D. D. Burneti\textsuperscript{1}, K. J. Phelps\textsuperscript{1}, M. A. Vaughn\textsuperscript{1}, S. S. Dritz\textsuperscript{1}, J. M. DeRouchey\textsuperscript{1}, R. D. Goodband\textsuperscript{1}, T. A. Houser\textsuperscript{1}, K. D. Haydon\textsuperscript{2} and J. M. Gonzalez\textsuperscript{1}, \textsuperscript{1}Kansas State University, Manhattan, \textsuperscript{2}Elanco Animal Health, Greenfield, IN
Effects of Source and Level of Added Zinc on Muscle Fiber Diameter and Skeletal Muscle Protein Turnover of Finishing Pigs Fed Ractopamine HCl.
C. B. Paulk1, M. D. Tokach1, J. L. Nelssen1, D. D. Burnett1, M. A. Vaughn1, K. J. Phelps1, S. S. Dritz1, J. M. DeRouchey1, R. D. Goodband1, T. A. Houser1, K. D. Haydon2 and J. M. Gonzalez3, 1Kansas State University, Manhattan, 2Elanco Animal Health, Greenfield, IN

Influence of Rendement Napole (RN) genotype on growth performance and expression of metabolic genes in crossbred Ossabaw pigs fed different levels of dietary fat.
H. Lu*, M. G. Ward, T. S. Stewart, L. Adeola and K. M. Ajuwon, Purdue University, West Lafayette, IN

Expression Patterns of ABLIM1 and ATF4 During Skeletal Muscle Development of Yorkshire-Landrace Crossbred Pigs.

Comparison of red meat versus high carbohydrate diet using the gilt biomedical model: liver and muscle energy use.
C. H. Pereira1,2, K. R. Wellnitz3, L. Prezotto1, F. E. Doscher1, E. P. Berg4 and K. C. Swanson5, 1North Dakota State University, Fargo, 2Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil, 3North Dakota State University, Fargo

Comparison of red meat versus high carbohydrate diet using the gilt biomedical model: Body composition.
K. R. Wellnitz*, J. D. Crosswhite1 and E. P. Berg2, 1North Dakota State University, Fargo, 2North Dakota State University, Fargo

Comparison of red meat versus high carbohydrate diet using the gilt biomedical model: Blood chemistry.
L. L. Baranko*, K. R. Wellnitz, K. A. Vonnahme and E. P. Berg, 1North Dakota State University, Fargo, 2North Dakota State University, Fargo

Effects of dietary forage concentration in finishing diets on growth and carcass characteristics of beef steers.
K. L. Sorensen*, V. L. Anderson1, K. R. Maddock-Carlin1, C. L. Engel1, C. S. Schauer1, K. C. Olson1 and R. J. Maddock1, 1North Dakota State University, Fargo, 2Carrington Research Extension Center, North Dakota State University, Carrington, ND, 3Hettinger Research Extension Center, North Dakota State University, Hettinger, ND, 4South Dakota State University, Rapid City, SD

Fatty acid composition and iodine value of pork fat from 3 sampling locations in the carcass.
J. E. Estrada*, M. Ellis1, S. J. Hardman1, A. M. Gaines2, B. A. Peterson1 and O. F. Mendoza1, 1University of Illinois, Urbana, 2The Maschhoffs, Carlyle, IL
Comparison of red meat versus high carbohydrate diet using the gilt biomedical model: Myofiber and adipocyte molecular biology.
M. Alkhuriji*1, P. P. Borowicz1, L. L. Baranko1, K. R. Wellnitz1 and E. P. Berg2, 1North Dakota State University, Fargo, 2North Dakota State University, Fargo

Effects of feeding dried distiller grains with solubles (DDGS) to immunologically castrated pigs harvested at 5, 7, or 9 weeks post-second dose of Improvest on lean quality.
E. K. Harris*1, C. Calhoun2, L. J. Johnston3, R. Cox4 and G. C. Shurson5, 1University of Minnesota, St. Paul, 2Zoetis, Inc, Florham Park, NJ, 3West Central Research and Outreach Center, University of Minnesota, Morris, MN

Temporal Postmortem RNA Degradation in Subcutaneous Adipose Tissue in Swine.
E. K. Hogan*, D. L. Clark and A. C. Dilger, University of Illinois at Urbana-Champaign, Urbana

Effect of the Porcine IGF2 Intron3-G3072A Substitution on Carcass Cutability and Meat Quality.
D. L. Clark*, J. E. Beever and A. C. Dilger, University of Illinois at Urbana-Champaign, Urbana

Pork quality characteristics of loins from pigs divergently selected for residual feed intake on high or low energy diets.
E. K. Arkfeld*1, J. E. Berger1, E. R. Hamman1, J. M. Young1, R. C. Johnson2, J. F. Patience4, J. C. M. Dekkers1, N. K. Gabler4, S. M. Lonergan4 and E. Huff-Lonergan1, 1Iowa State University, Ames, 2Farmland Foods, Denison, IA

Effects of time from second Improvest dose to end of growth period on growth performance of immunologically-castrated barrows in comparison to physically-castrated barrows and gilts.
C. L. Puls*1, M. Ellis1, M. A. Mellencamp2, W. Beckman2, A. L. Schroeder2, F. K. McKeith1, B. A. Peterson3, A. M. Gaines3 and C. F. Shipley1, 1University of Illinois, Urbana, 2Zoetis, Kalamazoo, MI, 3The Maschhoffs, Carlyle, IL

Influence of a superdose of phytase on finishing pig performance and carcass characteristics.
J. R. Flohr*, R. D. Goodband, M. D. Tokach, K. B. Langbein, S. S. Dritz, J. M. DeRouche and J. Woodworth, Kansas State University, Manhattan
Influence of copper sulfate and tribasic copper chloride on feed intake preference in finishing pigs.
K. F. Coble1, J. M. DeRouchey1, M. D. Tokach1, J. Woodworth1, R. D. Goodband1, S. S. Dritz1, J. L. Usry2 and K. Card1, 1Kansas State University, Manhattan, 2Micronutrients, Social Circle, GA

Effects of dietary level of distillers dried grains with solubles (DDGS) and pig removal program at harvest on the growth performance, carcass characteristics, and fat quality of growing-finishing pigs.
S. J. Hardman1, A. Gaines2, C. Puls1, J. E. Estrada1, B. Peterson2 and M. Ellis1, 1University of Illinois, Urbana, 2The Maschhoffs, Carlyle, IL

Effect of feeding diets containing 40% distillers dried grains with solubles (DDGS) and supplemented with minimally refined cottonseed oil or crude glycerol on growth performance and carcass composition of growing-finishing pigs.
C. C. E. J. Villela1, R. Cox1, G. C. Shurson1, K. M. Compart1, P. E. Urriola1 and L. J. Johnston2, 1University of Minnesota, Saint Paul, 2University of Minnesota, West Central Research and Outreach Center, Morris, MN

Effect of adding minimally refined cottonseed oil or crude glycerol to diets containing 40% distillers dried grains with solubles (DDGS) on carcass fat firmness of growing-finishing pigs.
C. C. E. J. Villela1, R. Cox1, G. C. Shurson1, K. M. Compart1, P. E. Urriola1 and L. J. Johnston2, 1University of Minnesota, Saint Paul, 2University of Minnesota, West Central Research and Outreach Center, Morris

Prebiotic Effects on Growth Performance and Immune Health in Nursery Pigs.
G. A. Mastromano*, Y. S. Li, H. Tran, J. W. Bundy, P. S. Miller and T. E. Burkey, University of Nebraska, Lincoln

Selenium-Enriched Probiotics Improves Antioxidant Status and Immune Function of Piglets Raised in a High-Temperature Environment.
F. Gan1, N. Regmi2*, X. Chen1, C. Lv1, F. Ren1, G. Ye1, C. Pan1, J. Shi1, X. Shi1, H. Zhou1, S. F. Liao2 and K. Huang1, 1Nanjing Agricultural University, Nanjing, Jiangsu, China, 2Mississippi State University, Mississippi State

Liquid feeding of ethanol industry co-products on growth performance of wean to finish pigs.
S. Baidoo*, J. Jendza, X. Yang and L. Anil, Southern Research and Outreach Center, University of Minnesota, Waseca

Evaluation of pineapple byproduct in finishing pigs feeding.
U. D. S. Ruiz1, T. S. Vasconcelos1, M. C. Thomaz2, V. V. Almeida2, F. R. Castelini2, D. J. Rodrigues2, R. K. Ono1, G. F. Ramos1 and J. A. Oliveira1, 1Univ. Estadual Paulista - UNESP, Dracena, Brazil, 2Univ. Estadual Paulista - UNESP, Jaboticabal, Brazil
346  The perinatal transfer of vitamins and trace elements from sows to piglets.  
J. J. Matte*, I. Audet and C. L. Girard, Agriculture & Agri-Food Canada, Sherbrooke, QC, Canada

347  Effects of the combination of 50 ppm L-carnitine and 200 ppb chromium from chromium picolinate on sow reproductive performance, progeny growth performance and carcass quality.  
T. C. Tsai1, H. J. Kim*1, J. R. Bergstrom2, J. J. Chewning3, J. K. Apple1 and C. V. Maxwell1, 1University of Arkansas, Fayetteville, 2DSM Nutritional Products, North America, Marshall, MO, 3Swine Research Services, Inc., Springdale, AR

348  Effects of Rapeseed Meal Supplementation in Gestation Diets on Reproductive Performance and Thyroid Hormones in Sows.  
H. B. Choi*, S. S. Jin, S. W. Jung and Y. Y. Kim, Seoul National University, Seoul, South Korea

349  Relationship between backfat thickness of sows at d 109 of gestation and performance of sows and suckling pigs.  
J. Kim*1,2, S. Baidoo1 and X. Yang1, 1Southern Research and Outreach Center, University of Minnesota, Waseca, 2Department of Animal Resource Science, Kangwon National University, Chuncheon, South Korea

351  Influence of increasing pharmacological ZnO dose to 3500 ppm and superdoses of phytase on piglet growth performance and fecal scores from d 0 to 21 post-weaning.  
C. L. Walk1, I. J. Wellock2, P. Toplis2, J. J. Chewning1 and P. Wilcock1, 1AB Vista Feed Ingredients, Marlborough, United Kingdom, 2Primary Diets, Melmerby, United Kingdom, 3Swine Research Services, Inc., Springdale, AR

352  Effects of hydrolyzed vegetable protein or hydrolyzed vegetable and meat protein blend on nursery pig performance.  

353  The effects of a combination of a xylanase and multi enzyme non-starch polysaccharide product on growth performance of 12 to 22 kg nursery pigs.  
E. D. Fruge4, E. Hansen1, S. Hansen1, D. M. Compart1 and J. R. Bergstrom4, 1Hubbard Feeds, Inc., Mankato, MN, 2Compart’s Boar Store, Nicollet, MN, 3DSM Nutritional Products, North America, Marshall, MO
Effect of protease on growth performance, intestinal morphology, and inflammatory response of nursery pigs fed corn-soybean meal based diets.
J. Guo*, P. Biggs and S. W. Kim, 1North Carolina State University, Raleigh, 2BioResource International, Inc., Durham, NC

Effects of fine grinding corn or dried distillers grains with solubles (DDGS) and diet form on growth performance and caloric efficiency of 11-22-kg nursery pigs.
J. A. De Jong*, J. M. DeRouchey, M. D. Tokach, R. D. Goodband and S. S. Dritz, Kansas State University, Manhattan

Effects of feeding increasing levels of a proprietary yeast blend on growth performance of commercial nursery pigs.
R. Song*, K. W. Purser, R. E. Musser and C. D. Hagen, NUTRIQUEST, Mason City, IA

The effect of increasing dietary betaine concentration on starter pig performance.
P. Wilcock*, C. L. Walk, C. L. Bradley and T. Santos, AB Vista Feed Ingredients, Marlborough, United Kingdom

Effects of reducing the particle size of corn on growth performance of weanling pigs.
O. J. Rojas* and H. H. Stein, University of Illinois at Urbana-Champaign, Urbana

Effect of dietary inclusion of a beta-mannanase enzyme on growth performance of nursery pigs.
C. L. Puls*, L. E. Ochoa, M. Ellis, J. E. Swan, J. D. Muegge and P. D. Matzat, 1University of Illinois, Urbana, 2Blue River Research Service, Carthage, IN, 3Elanco Animal Health, Greenfield, IN

Influence of protein sources on nursery pig performance.
K. Moran*, E. van Heugten, D. Funderburke and C. Funderburke, 1North Carolina State University, Raleigh, 2Cape Fear Consulting, LLC, Warsaw, NC

### Ruminant Nutrition

Timing of feeding orchestrates periprandial rhythms of circulating glucose in dairy cows.
A. Nikkhah*, University of Zanjan, Zanjan, Iran

Peripheral lactate circadian rhythmicity in dairy cows fed in evening vs. morning.
A. Nikkhah*, University of Zanjan, Zanjan, Iran

Effects of Corn Silage Diets on Intestinal Morphology in Dairy Calves.
T. J. Pogreba* and S. I. Kehoe, University of Wisconsin-River Falls, River Falls
376 Seasonal Variation in Vitamin D Status of Beef Cattle Reared in the Midwest and Fed to NRC Recommendations.
E. Casas¹, T. A. Reinhardt¹, J. D. Lippolis¹ and L. A. Kuehn², ¹USDA, ARS, National Animal Disease Center, Ames, IA, ²USDA-ARS, Clay Center, NE

377 Conjugated linoleic acid in lamb meat as influenced by quebracho tannin and/or sunflower oil.
S. N. Al-Dobaib², M. A. Shehab-El-Deen and H. M. Kamel, Qassim University, Buraidah, Saudi Arabia

378 (GS-MS) Effects of maternal nutrient restriction and rumen-protected arginine supplementation of ewes on carotid artery hemodynamics during gestation and lamb birth weights.
J. L. Peine¹, K. R. Wellnitz¹, G. Q. Jia¹, A. M. Meyer² and J. S. Caton¹, ¹North Dakota State University, Fargo, ²Division of Animal Sciences, University of Missouri, Columbia

379 Impact of diet and arginine supplementation on pancreatic mass and digestive enzyme activity in non-pregnant ewes.
F. E. Doscher², C. Bass, A. Grazul-Bilska, S. Kaminski, D. A. Redmer, J. Kirsch and K. C. Swanson, North Dakota State University, Fargo

380 Influence of feed restriction and feeding time to growing calves on growth performance and feeding behavior.
L. Prezotto¹, T. C. Gilbery, A. Islas, M. L. Bauer and K. C. Swanson, North Dakota State University, Fargo

381 (UGS) Performance by Katahdin Ewes Supplemented With Different Levels of Raw Whole Soybeans While Grazing Stockpiled Tall Fescue - One Year Summary.
K. A. Vandeloecht¹, J. D. Caldwell, B. C. Shanks and A. L. Bax, Department of Agriculture and Environmental Sciences, Lincoln University, Jefferson City, MO

382 Effects of reduced fat distillers grains with solubles and condensed distillers solubles on beef steer performance and carcass characteristics.
P. M. Walker¹, R. L. Atkinson², B. R. Wieand³, L. A. Forster⁴, M. Faulkner¹ and J. L. Veracini³, ¹Illinois State University, Normal, ²Southern Illinois University - Carbondale, Carbondale, ³University of Missouri, Columbia, ⁴ADM, Decatur, IL

383 (UGS) Effects of Dietary Glycerin on Rumen Metabolism of Beef Cattle Fed 50% Dried Distillers Grains with Solubles.
C. J. Long¹ and T. L. Felix, University of Illinois at Urbana-Champaign, Urbana

384 Effects of Diet on Intake and Methane Emissions of Beef Steers.
B. E. Lehman¹, A. R. Green, T. L. Felix, B. C. Ramirez, L. F. Rodriguez and D. W. Shike, University of Illinois at Urbana-Champaign, Urbana
385 (UGS) **Effects of Pyrethroid and Pyrethrin Insecticides on Beef Bull Reproductive Parameters.**

386 **Effect of diet on microbial community composition, and methane emission in growing beef cattle.**
A. L. Knoell, C. L. Anderson, A. C. Pesta, G. E. Erickson, T. J. Klopfenstein and S. C. Fernando, 1University of Nebraska, Lincoln, 2University of Nebraska-Lincoln, Lincoln

387 **The effects of Cellulo-Gest supplement on forage digestibility and feedlot performance for growing steer calves.**
V. L. Anderson, C. L. Engel and R. A. Dvorak, 1North Dakota State University, Carrington, 2Carrington Research Extension Center, North Dakota State University, Carrington, 3Old Mill-Troy, Inc., Overland Park, KS

388 (UGS) **Determination of forage quality and in situ digestibility of miscanthus over time.**
N. F. Reitz, E. J. Sacks and T. L. Felix, University of Illinois at Urbana-Champaign, Urbana

389 **The effects of two dietary protein levels and pen bedding in a summer growing and finishing feedlot trial on steer performance, carcass traits, and pen surface temperatures.**
C. L. Engel and V. L. Anderson, 1Carrington Research Extension Center, North Dakota State University, Carrington, 2North Dakota State University, Carrington

390 **Protection of cottonseed meal protein from rumen degradation using dextrin to create Maillard-type reactions.**
N. F. Johnson* and M. Kerley, University of Missouri, Columbia

391 **Effect of Pelleting on Digestibility of Encapsulated Nutrients Embedded in a Fat Matrix.**
K. J. Herrick, D. A. Sapienza, F. R. Valdez and K. E. Griswold, 1Kemin Industries, Inc., Des Moines, IA, 2Sapienza Analytica, LLC, Slater, IA

392 **Use of treated corn residues in growing diets.**
S. J. Peterson, B. L. Nuttelman, D. B. Burken, J. C. MacDonald and G. E. Erickson, 1University of Nebraska, Lincoln, 2University of Nebraska-Lincoln, Lincoln

393 **Performance Comparisons of Finishing Systems for Yearling Heifers.**
J. M. Mracek, J. M. Warner, B. R. Wetovich, D. E. Bauer, T. T. Marston, J. C. MacDonald and R. J. Rasby, 1University of Nebraska, Lincoln, 2University of Nebraska, Ainsworth, 3University of Nebraska, Norfolk, 4University of Nebraska-Lincoln, Lincoln
Effects of plane of nutrition and arginine supplementation on kidney and liver mass.
C. H. Pereira*1,2, C. Bass1, A. Grazul-Bilska1, S. L. Kaminski1, F. E. Doscher1, D. A. Redmer1, J. Kirsch1 and K. C. Swanson1, 1Universidade Federal do Rio Grande do Sul, Porto Alegre, Brazil, 2North Dakota State University, Fargo, 3North Dakota State University, Fargo

Effect of StoverCal, corn silage, and corn stover in diets containing 60% distillers grains on performance and carcass characteristics of feedlot steers.
J. P. Schoonmaker*, M. C. Claey and R. P. Lemenager; Purdue University, West Lafayette, IN

Effect of zinc and copper source on finishing steer feedlot performance and incidence of footrot.
F. H. Hilscher*1, G. E. Erickson1, S. B. Laudert2, D. J. Jordan1, B. D. Dicke1, R. J. Cooper1 and T. L. Scott1, 1University of Nebraska-Lincoln, Lincoln, 2Micronutrients, Indianapolis, IN, 3Cattlemen’s Nutrition Services, LLC, Lincoln

Effect of supplementing gestating and lactating beef cows with supranutritional concentrations of vitamin D on feedlot performance and carcass characteristics of the progeny.
J. P. Schoonmaker*1, M. A. Engstrom2 and R. P. Lemenager1, 1Purdue University, West Lafayette, IN, 2DSM, Eden Prairie, MN

Influence of forage source on growth performance and feeding behavior in finishing steers.
Z. E. Carlson*, T. C. Gilbery, A. Islas, M. L. Bauer and K. C. Swanson, North Dakota State University, Fargo

Pre- and post weaning performance and health of calves fed texturized calf starters with different additives during the nursery phase.
H. Chester-Jones*1, B. Ziegler2, D. Schimek2 and D. Ziegler4, 1University of Minnesota Southern Research and Outreach Center, Waseca, 2Hubbard Feeds Inc., Mankato, MN

The Effects of Fenceline Weaning With or Without the Presence of Companion Goats on Performance and Behavior Measurements of Fall-Born Calves.
E. G. Groose*1, J. D. Caldwell1, B. C. Shanks1, C. A. Clifford-Rathert1, E. A. Backes2, C. L. Boeckmann1 and C. A. DeOrnellis1, 1Department of Agriculture and Environmental Sciences, Lincoln University, Jefferson City, MO, 2University of Arkansas, Fayetteville

Innovative probiotic and prebiotic combination for early-lactation multiparous cows improves production and starch digestibility.
W. L. Braman* and J. E. Kurtz, Chr. Hansen Animal Health and Nutrition, Milwaukee, WI
402 (GS-MS) Effects of postruminal amino acid supply on growth performance and feed cost of beef steers.
M. M. Masiero*, M. S. Kerley and W. J. Sexten, University of Missouri, Columbia

403 Serum amino acid concentrations in high and low efficiency finishing steers.

Wednesday, March 19, 2014
SYMPOSIA AND ORAL PRESENTATIONS

BREEDING AND GENETICS II
Chair: Catherine W. Ernst, Michigan State University
306-307

9:00 AM 24 Validation of the Effects of a SNP on SSC4 Associated with Viral Load and Weight Gain in Piglets Experimentally Infected with PRRS virus.
A. Hess*, N. Boddicker, R. R. Rowland, J. K. Lunney and J. C. M. Dekkers, Iowa State University, Ames, Genesus, Oakville, MB, Canada, Kansas State University, Manhattan, USDA, ARS, BARC, APDL, Beltsville, MD

D. M. Thekkoot*, R. A. Kemp, M. F. Rothschild, G. Plastow and J. C. M. Dekkers, Iowa State University, Ames, Genesus Inc, Oakville, MB, Canada, University of Alberta, Edmonton, AB, Canada

9:30 AM 26 Meta-analysis genome-wide association of pork quality traits: ultimate pH and shear force.

Variation in host genetics influences PCVAD susceptibility. T. B. Engle, E. E. Jobman, T. W. Moural, A. M. McKnite, S. Y. Barnes, E. H. Davis, J. W. Bundy, T. P. Johnson, J. K. Qiu, J. A. Galeota, S. P. Harris, M. F. Rothschild, R. K. Johnson, G. S. Plastow, D. S. Kachman and D. C. Ciobanu, 1University of Nebraska-Lincoln, Lincoln, 2University of Nebraska, Lincoln, 3Iowa State University, Ames, 4University of Alberta, Edmonton, AB, Canada

Genomic prediction of age at puberty in sows using Bayesian methods. K. L. Lucot, M. L. Spangler, S. D. Kachman and D. C. Ciobanu, University of Nebraska, Lincoln

Variance component estimates for alternative litter size and piglet mortality traits. A. M. Putz, K. A. Gray and M. Knauer, 1North Carolina State University, Raleigh, 2Smithfield Premium Genetics, Rose Hill, NC

Divergent selection for age at puberty impacts sow reproduction. C. L. Ferring and M. Knauer, North Carolina State University, Raleigh

Estimates of variance components for swine litter quality traits. E. B. Cook, M. T. See, K. A. Gray and M. Knauer, 1North Carolina State University, Raleigh, 2Smithfield Premium Genetics, Rose Hill, NC

Genetic Relationships and Inbreeding Coefficients of Swine Breeds. K. Roberts and W. R. Lamberson, University of Missouri, Columbia
### GROWTH, DEVELOPMENT, MUSCLE BIOLOGY AND MEAT SCIENCE: METABOLISM IN MUSCLE IN RESPONSE TO SELECTION FOR IMPROVED GROWTH, USE OF GROWTH PROMOTING AGENTS, AND IN THE CASE OF INFECTION

**Chair:** Bryon Wiegand, Missouri State University

**316/317**

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<td>9:00 AM</td>
<td><strong>Introduction</strong></td>
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<td><em>B. R. Wiegand, University of Missouri, Columbia.</em></td>
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<tr>
<td>9:10 AM</td>
<td>(Invited) <strong>Muscle Metabolism in Response to Selection for Improved Growth</strong></td>
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<td><em>D. E. Gerrard, Virginia Tech, Blacksburg.</em></td>
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<td>9:40 AM</td>
<td>(Invited) <strong>Muscle Metabolism in Response to the Use of Growth Promoting Agents</strong></td>
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<td><em>A. C. Dilger, University of Illinois, Urbana-Champaign.</em></td>
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<td>10:10 AM</td>
<td>(Invited) <strong>Muscle Metabolism in Response to Infection</strong></td>
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<td><em>A. Rakhshandeh, Texas Tech University, Lubbock.</em></td>
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### HARLAN RITCHIE BEEF SYMPOSIUM: TODAY’S AND TOMORROW’S BEEF INDUSTRY

**Chair:** Maynard Hogberg, Iowa State University

**Sponsor:** Harlan Ritchie Appreciation Club, ASAS Foundation

**304-305**

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<tr>
<td>9:00 AM</td>
<td><strong>Introduction</strong></td>
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<td><em>M. Hogberg, Iowa State University</em></td>
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<td>9:10 AM</td>
<td>(Invited) <strong>Today’s and Tomorrow’s Application of DNA Genomics</strong></td>
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<td><em>K. Andersen, Zoetis Animal Genetics</em></td>
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<td>9:55 AM</td>
<td>(Invited) <strong>Tomorrow’s Feedlot Industry</strong></td>
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<td><em>T. Brink, formerly of JBS Five Rivers Cattle Feeding</em></td>
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<td>10:40 AM</td>
<td>(Invited) <strong>Future Applications of Reproductive Technologies in the Beef Industry</strong></td>
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<td><em>G. Seidel, Colorado State University</em></td>
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<td>11:25 AM</td>
<td>(Invited) <strong>Current State of Distillers Utilization</strong></td>
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<td><em>G. Erickson, University of Nebraska-Lincoln</em></td>
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*WEDNESDAY, MARCH 19, 2014*
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| 10:30 AM      | 176     | Digestibility of energy and nitrogen retention of diets with increasing proportions of co-product ingredients and formulated using the NE system. | J. A. Acosta Camargo*1, R. D. Boyd2 and J. F. Patience1,  
1Iowa State University, Ames, 2The Hanor Company, Inc., Franklin, KY |
| 10:45 AM      |         | Break                                                                |                                                                        |
| 11:00 AM      | 177     | Effects of condensed distillers solubles to wet distillers grains ratio on the growth performance and carcass characteristics of growing-finishing pigs.  | S. Baidoo, X. Yang*, J. Jendza and D. Hansen, Southern Research and Outreach Center, University of Minnesota, Waseca |
| 11:15 AM      | 178     | Effects of potato chip co-product on starter pig growth.               | D. Chamberlin*, N. Martinec, A. Rogers, E. L. Karcher, 
D. W. Rozeboom, S. N. Woodruff, C. Ylioja, C. V. Vanderson, E. First, K. M. Trottier, A. L. Meyers, 
B. C. Oglesby, J. M. Lubbers, A. J. Anderson and N. L. Trottier, Michigan State University, East Lansing |
| 11:30 AM      | 179     | Effect of feeding increasing inclusion of extruded-pressed Brassica juncea canola meal on growth performance and diet nutrient digestibility in weaned pigs.  | A. M. H. Le*1, J. L. Landero1, E. Beltranena1-2 and R. T. Zijlstra1, 1University of Alberta, Edmonton, AB, Canada,  
2Alberta Agriculture and Rural Development, Edmonton, AB, Canada |
| 11:45 AM      | 180     | Swine energy value of corn germ meal and hominy feed increased in the presence of liquid ingredient corn steep liquor.  | V. G. Perez*, T. R. Radke and D. P. Holzgrafe, ADM Alliance Nutrition Inc., Quincy, IL |
| 12:00 PM      | 181     | Diet nutrient digestibility and growth performance of weaned pigs fed field pea.  | J. L. Landero1, E. Beltranena1-2 and R. T. Zijlstra*1, 1University of Alberta, Edmonton, AB, Canada, 2Alberta Agriculture and Rural Development, Edmonton, AB, Canada |
| 12:15 PM      | 182     | Evaluation of in vitro dry matter digestibility (IVDMD) of high fiber feed ingredients for monogastrics.  | Z. Huang*, I. J. Salfer, P. E. Urriola, M. D. Stern and 
G. C. Shurson, University of Minnesota, Saint Paul |
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<tr>
<td>9:00 AM</td>
<td>183</td>
<td>Effect of Zinc Amino Acid Complex and Ractopamine on Skeletal Muscle Gene and Protein Expression.</td>
<td>Z. J. Rambo\textsuperscript{1,2}, M. Ferreira\textsuperscript{3,4}, B. T. Richert\textsuperscript{2}, J. Waddell\textsuperscript{2}, M. E. Wilson\textsuperscript{1} and J. L. Torrison\textsuperscript{1}, Zinpro Corporation, Eden Prairie, MN, Purdue University, West Lafayette, IN, Federal University of Larvas, Department of Veterinary Medicine, Larvas, Brazil, CAPES Foundation, Brasilia, Brazil</td>
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<td>9:15 AM</td>
<td>184</td>
<td>(Invited ASAS Animal Science Young Scholar) Effects of Added Zn in Diets with Ractopamine HCl on Growth Performance, Carcass Characteristics, Zn Concentrations in Plasma, Loin, and Liver, and Ileal Mucosal Inflammation mRNA Expression of Finishing Pigs.</td>
<td>C. B. Paulk\textsuperscript{1}, M. D. Tokach\textsuperscript{1}, J. L. Nelssen\textsuperscript{1}, J. M. Gonzalez\textsuperscript{1}, J. M. DeRouchey\textsuperscript{1}, R. D. Goodband\textsuperscript{1}, S. S. Dritz\textsuperscript{1}, G. M. Hill\textsuperscript{2} and K. D. Haydon\textsuperscript{3}, Kansas State University, Manhattan, Michigan State University, East Lansing, Elanco Animal Health, Greenfield, IN</td>
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<td>9:45 AM</td>
<td>185</td>
<td>The effects of copper source (tribasic copper chloride or copper sulfate) on growth performance, carcass characteristics, and pen cleanliness in finishing pigs.</td>
<td>K. F. Coble\textsuperscript{1}, S. S. Dritz\textsuperscript{1}, M. D. Tokach\textsuperscript{1}, J. M. DeRouchey\textsuperscript{1}, J. L. Usry\textsuperscript{2} and R. D. Goodband\textsuperscript{1}, Kansas State University, Manhattan, Micronutrients, Social Circle, GA</td>
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<td>10:00 AM</td>
<td>186</td>
<td>Multi-trial analysis of the effects of copper level and source on performance in nursery pigs.</td>
<td>Y. Ma\textsuperscript{1}, G. I. Zanton, J. Zhao, J. Escobar and M. Vazquez-Anon, Novus International Inc., St. Charles, MO</td>
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<td>10:15 AM</td>
<td>187</td>
<td>Effects of cation-anion balance in diets for newly weaned nursery pigs.</td>
<td>I. Park\textsuperscript{1} and S. W. Kim, North Carolina State University, Raleigh</td>
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<td>10:30 AM</td>
<td>188</td>
<td>Effect of reduced dietary level of available phosphorus on performance and bone parameters in growing pigs.</td>
<td>B. B. Pokharel\textsuperscript{1}, C. M. Nyachoti\textsuperscript{1} and W. K. Kim\textsuperscript{2}, Department of Animal Science, University of Manitoba, Winnipeg, MB, Canada, Department of Poultry Science, University of Georgia, Athens</td>
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<td>10:45 AM</td>
<td>189</td>
<td>The effects of dietary supplementation with a stabilized form of vitamin C (Rovimix® Stay-C® 35) on the growth performance and concentrations of plasma ascorbate and serum vitamin D3 metabolites of nursery pigs. J. R. Bergstrom*1 and M. S. Edmonds2, 1DSM Nutritional Products, North America, Marshall, MO, 2Kent Nutrition Group Inc, Muscatine, IA</td>
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<td>11:00 AM</td>
<td>190</td>
<td>Effect of phosphorus and calcium depletion and repletion sequences on growth performance, bone mineralization and endogenous phosphorus losses in pigs. E. Gonzalo*1, M. P. Létourneau Montminy2, A. Narcy3, J. F. Bernier3 and C. Pomar1, 1Agriculture and Agri-Food Canada, Sherbrooke, QC, Canada, 2Université Laval, Québec, QC, Canada, 3INRA, Tours, France</td>
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<td>11:15 AM</td>
<td>191</td>
<td>Effects of increasing the dietary level of vitamin E, without and with a low inclusion level of aspirin, on systemic responses of weaned pigs challenged with haemolytic E. coli. J. C. Kim1, B. Mullan1 and J. Pluske*2, 1Department of Agriculture and Food, Western Australia, Australia, 2Murdoch University, Western Australia, Australia</td>
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**PHYSIOLOGY**  
Chair: Rodney D. Geisert, University of Missouri - Columbia  
314-315

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<td>9:00 AM</td>
<td>198</td>
<td>(Invited ASAS Animal Science Young Scholar) Impacts of beef cow nutrition on conceptus development. L. E. Camacho*1, C. O. Lemley2, K. C. Swanson1 and K. A. Vonnahme1, 1North Dakota State University, Fargo, 2Mississippi State University, Mississippi State</td>
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<td>9:30 AM</td>
<td>199</td>
<td>Physiological response of beef heifers after receiving a reused CIDR processed with different heat-treating methods. C. R. Dahlen*1, S. I. Klein1, G. C. Lamb2, V. R. G. Mercadante3 and P. L. Steichen1, 1North Dakota State University, Fargo, 2University of Florida, Marianna, 3University of Florida - NFREC, Gainesville</td>
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Global Changes in Uterine Protein Secretion Are Associated With Differences in the Number of Antral Follicles in Heifers.
J. L. Vallet¹, R. A. Cushman¹, A. K. McNeel¹, E. C. Wright¹, E. Larimore², J. R. Miles³, C. C. Chase¹, C. A. Lents¹, J. R. Wood¹, A. S. Cupp² and G. A. Perry², ¹USDA, ARS, U.S. Meat Animal Research Center, Clay Center, NE, ²South Dakota State University, Brookings, ³USDA, ARS, US MARC, Clay Center, NE, ⁴University of Nebraska, Lincoln, ⁵University of Nebraska - Lincoln, Lincoln

Dietary bacitracin (Albac® and BMD®) improves ADG and FE in pigs in routine production environments (subjected to mixing and crowding stress).
A. J. Moeser¹, L. L. Edwards¹ and D. A. Nelson², ¹North Carolina State University, Raleigh, ²Zoetis, Howard Lake, MN

Combined effect of sow deep intrauterine insemination and boar frozen semen on economic indicators.
D. Gonzalez-Peña Fundora¹, R. V. Knox², J. Pettigrew² and S. L. Rodriguez Zas¹, ¹University of Illinois at Urbana-Champaign, Urbana, ²University of Illinois, Urbana

Single fixed-time insemination following OvuGel® administration in postpartum sows.
D. K. Bishop¹, M. E. Johnston², S. G. Buysse², M. E. Swanson² and S. K. Webel³, ¹Pike Pig Systems, Pittsfield, IL, ²JBS United, Inc., Sheridan, IN, ³JBS United, Baylis, IL

Use of PG-600™ and OvuGel™ in summer weaned first parity sows.
B. L. Allen*, M. R. Ellersieck and T. J. Safranski, University of Missouri, Columbia

RUMINANT NUTRITION SYMPOSIUM: AMINO ACIDS
Chair: Phil Cardoso, University of Illinois at Urbana-Champaign
Sponsor: Vetagro, Inc.
302-303

Introductory Remarks

(Ruminal) Rumen protected amino acids for dairy cows: past, present and future.
C. G. Schwab*, Schwab Consulting, LLC, Boscobel, WI
(Invited) Varied effects of multifunctional amino acids on reproduction in lactating dairy cows.
M. C. Wiltbank\textsuperscript{1}, M. Z. Toledo\textsuperscript{1}, P. D. Carvalho\textsuperscript{1}, A. H. Souza\textsuperscript{2}, F. Peñagaricano\textsuperscript{1}, G. M. Baez\textsuperscript{1}, R. V. Barletta\textsuperscript{1}, H. Khatib\textsuperscript{1}, D. Luchini\textsuperscript{3} and R. D. Shaver\textsuperscript{1}, 1University of Wisconsin - Madison, Madison, 2University of California, Agriculture and Natural Resources, Tulare, 3Adisseo, Naperville, IL

(Invited) Rumen protected methionine and the genome: Nutrigenomics and beyond.
J. J. Loor*, University of Illinois, Urbana

MIDWESTERN SECTION ASAS POST-MEETING SYMPOSIUM:
EVALUATING, OPTIMIZING AND UTILIZING TECHNOLOGIES TO IMPROVE PIG PERFORMANCE
Chair: Marnie Mellencamp, Zoetis
Sponsor: Zoetis
Grand Ballroom

11:30 AM
Introduction and presentation of gift to World Food Prize Foundation
Gloria Basse, Vice President US Pork Business, Zoetis

11:45 PM
Lunch and Keynote speaker
(Invited) Importance and Value of Technology Across the Globe
Kenneth M. Quinn, Former Ambassador to Cambodia; current President of World Food Prize Foundation

12:15 PM
(Invited) A View of Technology from the Pig
Adam Moeser, Associate Professor of Gastrointestinal Biology and Swine Medicine, NCSU

12:45 PM
(Invited) A View of Technology from the Producer
Beau Peterson, Director R&D, The Maschhoff’s

1:15 PM
(Invited) What Did the FDA Say About Antibiotics in Food Animals?
Jim Pettigrew, Professor Emeritus, University of Illinois

1:30 PM
(Invited) A View of Technology from the Packer
Roger Johnson, Farmland Foods, Inc.

2:00 PM
(Invited) A View of Technology from the Retailer
David Weaber, Delhaize America

2:30 PM
(Invited) A View of Technology from the Economist
Brian Buhr, Professor and Interim Dean of the College of Food, Agricultural and Natural Resource Sciences, University of Minnesota

3:00 PM
(Invited) A View of Technology from 30,000 ft
Ron Prestage, Prestage Farms and Incoming President of NPPC
Animal Behavior, Housing and Well Being
J. M. Siegford, Chair
B. R. Wiegand
Y. Li
J. L. Salak-Johnson

Breeding and Genetics
M. G. Gonda, Chair
C.W. Ernst
J. M. Rumph

Extension - Beef/Small Ruminant
N. A. Pyatt, Chair
J. W. Waggoner
A. E. Radunz

Extension - Dairy
J. A. Salfer, Chair
N. B. Litherland
K. F. Kalscheur
M. M. Schutz

Extension - Equine
R. C. Bott, Chair
K. L. Martinson
P. Miller

Extension - Swine
D. J. Newman, Chair
K. J. Stalder
B. T. Richert
G. M. Hill
Growth, Development, Muscle Biology, and Meat Science
  S. N. Carr, Chair
  D. Boler
  D. Hamilton
  R. Hinson
  F. McKeith
  J. Rickard

Graduate Student Program Committee
  W. J. Powers
  C. Pilcher
  K. McClellan
  L. Prezotto
  A. E. Radunz
  B. R. Wiegand

Nonruminant Nutrition
  Z. Rambo, Chair
  J. W. Frank
  R. N. Dilger

Odor and Nutrient Management
  E. van Heugten, Chair

Ruminant Nutrition
  S. L. Hansen, Chair
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  P. Cardoso

Teaching and Undergraduate Education
  J. M. Siegford, Chair

Physiology
  L. A. Rempel, Chair
  R. D. Geisert
  L. H. Baumgard
### SPECIAL COMMITTEES

**ADSA Nominations**
- D. P. Casper
- K. K. Kalscheur
- L. H. Baumgard

**ASAS Nominations**
- B. R. Wiegand
- N.R. Merchen
- J. Patience

**Academic Quadrathlon**
- P. M. Walker
- C. T. Jobsis
- T. E. Burkey
- M. E. Wilson
- S. I. Kehoe
- B. D. Banks
- A. Cobb
- A. J. Seykora
- K. E. Fike
- G. W. Onan
- S. L. Hansen
- K. Carlin
- M. E. Persia
- J. N. Tembei
- B. D. Whitaker
- A. Woodward
- T. J. Safranski
- P. S. Kuber

**Public Policy**
- H. Chester-Jones

### COMPETITIVE RESEARCH PAPER COMMITTEES

**ASAS Midwestern Section Graduate Student Paper Competition**
- M. E. Wilson
- K. A. Vonnahme

**ASAS Midwestern Section Undergrad Student Paper Competition**
- P. M. Walker
AWARD COMMITTEES

Ad Hoc Awards
   J. Patience
   J. S. Radcliffe
   L. Baumgard
   K. Klascheur
   M. Brouk

Agribusiness
   D. H. Kleinschmit
   J. D. Spencer
   W. J. Powers
   A. M. Gaines

Innovation in Dairy Research Award
   M. Brouk
   D. R. Mertens
   S. M. Fredin
   D. J. Schingoethe
   D. E. Graugnard

Extension
   A. Wertz-Lutz
   C. L. Wright
   A. D. Garcia
   G. A. Perry
   P. C. Hoffman
   D. J. Illg

National Pork Board Award Swine Innovation
   D. Illg
   C. Hostetler
   H. H. Stein
   J. E. Pettigrew
   M. E. Wilson
   A. L. Currie
Research
T. Nennich
M. B. Hall
J. DeRouchey
S. S. Donkin
N. R. Merchen
B. R. Wiegand

Tim. S. Stahly Award
D. Carlson
P. K. Brown
M. G. Hogberg
R. Hinson
J. R. Bergstrom

Teaching
A. Mathew
K. A. Vonnahme
H. A. Maiga
S. C. Kelm
S. A. Wagner
B. R. Wiegand
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NATIONAL PORK BOARD INNOVATION AWARD

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**

*Education  
** Research
# PAST WINNERS OF INVITATIONAL COMPETITIVE RESEARCH PAPER AWARDS

## UNDERGRADUATE STUDENTS - ORAL

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GRADUATE STUDENTS - ORAL

1976  D. G. Haught, Iowa State University
1977  L. L. Berger, University of Nebraska
1978  G. F. Collings, Michigan State University
1979  R. D. Boyd, University of Nebraska
1980  D. G. Cieslak, University of Wisconsin
1981  W. F. Pope, University of Nebraska
1982  P. F. Saenger, Purdue University
1983  D. A. Redmer, University of Missouri
1984  W. F. Brown, University of Nebraska
1985  J. H. Brendemuhl, University of Nebraska
1986  P. L. Houghton, Purdue University
1987  M. H. Wilde, The Ohio State University
1988  T. R. Radke, University of Nebraska
1989  K. K. Kreikemeier, Kansas State University
1990  R. A. Nold, Kansas State University
1991  M. D. Tokach, University of Minnesota
1992  G. F. Louis, University of Nebraska
1993  B. T. Larson, University of Missouri
1994  L. H. Anderson, The Ohio State University
1995  M. L. Augenstein, University of Minnesota
1996  D. D. Koehler, University of Minnesota
1997  R. A. Nold, South Dakota State University
1998  K. J. Rozeboom, University of Minnesota
1999  L. A. Averette, North Carolina State University
2000  T. A. Armstrong, North Carolina State University
2001  T. G. McDaneld, University of Nebraska*
       J. H. Hampton, University of Missouri**
2002  K. M. Hargrave, University of Nebraska*
       M. J. Hersom, Oklahoma State University**
2003  J. Luther, North Dakota State University*
       R. Main, Kansas State University**
2004  R. C. Bott, University of Nebraska*
       M. M. Martinez, Michigan State University**
2005  J. M. Koch, West Virginia University*
       N. D. Fastinger, The Ohio State University**
2006  D. M. Larson, North Dakota State University*
       M. Gorocica-Buenfil, The Ohio State University**
2007  P. E. Urriola, University of Minnesota*
       R. N. Dilger, University of Illinois**
2008  J. M. Mapes, Michigan State University*
       E. Kiarie, University of Manitoba, Winnipeg, Canada**
2009  L. A. Lekatz, North Dakota State University*
       D. M. Gorbach, Iowa State University**
2010  H. L. Evans, University of Missouri*
       R. C. Sulabo, Kansas State University**
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**

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**

*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
YOUNG DAIRY SCHOLARS

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
### ASAS ANIMAL SCIENCE YOUNG SCHOLARS

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

### BENTLEY LECTURER'S

2013
- D. Kelly, University of Aberdeen
TIM S. STAHL OUTSTANDING SWINE NUTRITION MIDWEST GRADUATE STUDENT AWARD

2009  T. M. Che, University of Illinois
2010  R. Hinson, University of Missouri
2011  J. R. Bergstrom, Kansas State University
2012  Cassandra Jones, Iowa State University
2013  S. Monegue, University of Kentucky

ASAS MIDWESTERN SECTION PRESIDENTS

1963  O. G. Bentley, University of Illinois
1964-65  R. H. Grummer, University of Wisconsin
1966-67  G. R. Johnson, The Ohio State University
1968  R. J. Meade, University of Minnesota
1969  J. A. Hoefer, Michigan State University
1970-71  W. E. Dinusson, North Dakota State University
1972  J. F. Lasley, University of Missouri
1973  U. S. Garrigus, University of Illinois
1974-75  V. C. Speer, Iowa State University
1976  H. S. Teague, The Ohio State University
1977  R. M. Luther, South Dakota State University
1978  B. N. Day, University of Missouri
1979-80  D. R. Zimmerman, University of Nebraska
1981  A. L. Pope, University of Wisconsin
1982  R. D. Goodrich, University of Minnesota
1983  E. R. Miller, Michigan State University
1984  W. R. Woods, Purdue University
1985  L. R. Corah, Kansas State University
1986  B. D. Moser, University of Missouri
1987  S. E. Curtis, University of Illinois
1988  R. G. Zimbelman, Upjohn; D. J. Meisinger, Indiana
1989  T. J. Klopfenstein, University of Nebraska
1990  J. R. Romans, South Dakota State University
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