



News from KSU Animal Sciences



Join us for the 2020 KSU Swine Day – Virtual Conference. The 2020 KSU Swine Day will be hosted virtually on Wednesday and Thursday, November 18-19, via Zoom webinar platform from 10 am – 12 noon each day. The program will include updates on KSU research on nutrition, feed safety and feed processing. The schedule includes:

Wednesday November 18 (10 am – 12 noon CST) “Focus on applied swine nutrition”

Introductory comments for the 2020 K-State Swine Industry Day – *Joel DeRouchey*

- Feeding sows immediately before farrowing – What have we learned? – *Jason Woodworth*
- Minimizing disruption in nutrient intake after weaning – *Mike Tokach*
- Preparing for a world without ZnO – *Jordan Gebhardt*
- Additional current K-State swine nutrition and management research – *Bob Goodband*
- Understanding of and influencing factors of pig body weight variation – *Joel DeRouchey*

Interactive question and comment opportunity

Thursday November 19 (10 am – 12 noon CST) “Focus of Feed Safety and Feed Processing”

Feed Safety Main Session (10 – 11 am)

- Feedmill Biosecurity: What have we learned since 2013? - *Jason Woodworth and Chad Paulk*
- New research and information developed at K-State - *Cassie Jones*
- Latest findings from the K-State-Vietnam partnership – *Jordan Gebhardt*
- The future of Feed Safety research - *Everyone*

Interactive question and comment opportunity

Feed Processing Main Session (11 am – 12 noon)

- Adjusting hammermill settings to achieve a target corn particle size - *Charles Stark*
- Key diet composition characteristics that influence pellet quality - *Chad Paulk*
- Can pelleting different diet types influence amino acid digestibility? - *Chad Paulk*

Interactive question and comment opportunity

To register, go to <http://bit.ly/2020SwineDay>. The virtual conference will be complimentary, thanks to the generous support of our sponsors. For updates, visit www.KSUswine.org and follow the 2020 KSU Swine Day link. For more information, contact Joel DeRouchey (jderouch@ksu.edu; 785-532-2280) or Lois Schreiner (lschrein@ksu.edu; 785-532-1267).

CALENDAR OF UPCOMING EVENTS

Date	Event	Location
November 18-19, 2020	KSU Swine Day Virtual Conference	

Department of Animal Sciences and Industry

Kansas State University
218 Weber Hall, 1424 Claflin Road
Manhattan, KS 66506
785-532-6533
www.asi.ksu.edu

October 2020 issue





The national, multi-species youth livestock quality assurance program, **Youth for the Quality Care of Animals (YQCA)**, launched its fourth year of the program on October 1. Therefore, a new set of educational modules are now available for youth to complete. Extension Agents and Ag Teachers who requested to become certified instructors to teach face-to-face classes should have received an email the first week of October. The training is completed entirely online, through an instructor's account. Once the certification process is complete, approved instructors will receive the 2020-2021 curriculum via email and are welcome to begin teaching classes. The YQCA Board released some important reminders for instructors earlier this month. The first being that instructor-led courses may not be taught virtually. Members who would like to participate in an online training should complete the web-based course. Additionally, the junior-only slide deck is being discontinued and will no longer be available. Since Kansas has a special agreement with YQCA regarding 7-year-olds, those youth may participate in an all ages instructor-led course, with a parent/guardian, to receive their certification.

Youth may complete the online training for \$12/child, or participate in an instructor-led session for \$3/child. The test-out option is only available for youth who are 12 or 15 as of January 1. All participants must register and pay through the YQCA site, regardless of the type of training. A young person's YQCA certification is valid for one year, so youth need to re-certify annually.

The Kansas State Fair Grand Drive and KJLS are expected to continue requiring all exhibitors to complete YQCA to be eligible to exhibit in the 2021 shows. For more information, contact Lexie Hayes (adhayes@ksu.edu; 785-532-1264).

What's New.....

Management Minute – Justin Waggoner, Ph.D., Beef Systems Specialist

“Video Conferencing Fatigue”

Video conferencing fatigue (i.e. Zoom Fatigue) is unfortunately become a term that many in the workplace have become familiar with. In today's business environment, we are meeting more virtually than ever before. What exactly is it that makes a two-hour remote meeting more tiresome than the same meeting in person? Experts suggest that video conferencing is more difficult because we have to work harder to stay engaged and some aspects of video conferencing are more stressful than we think. The most common source of distraction is multi-tasking while on a video conference. The platform lends itself to reading emails, and do other things at the same time, but these distractions are more stressful than most realize. Another source of stress is that we become more aware of what is behind our cameras, that pile of papers that need filed on our desk or all the other stuff that accumulates in an office. The third common source of stress is simply that technology often lets us down and the fear of an unstable internet connection or mic failures during a meeting is real. So what can we do to make video conferencing less stressful?

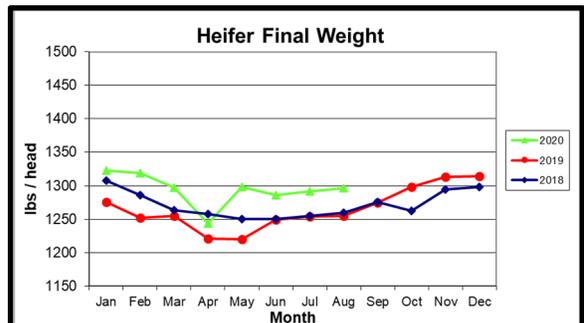
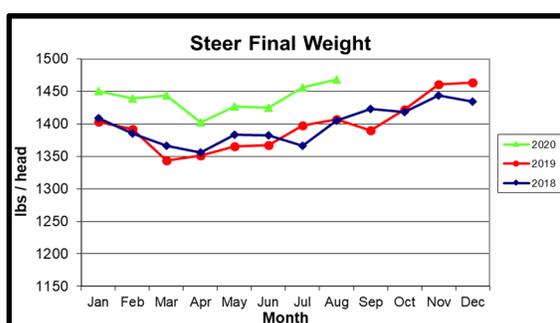
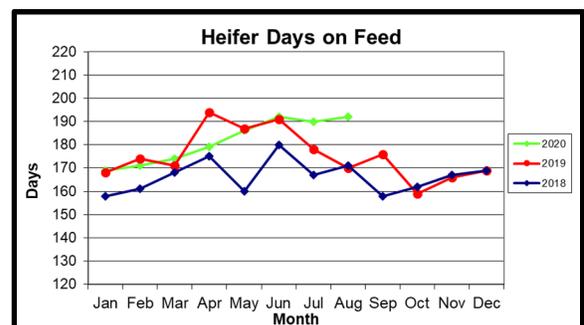
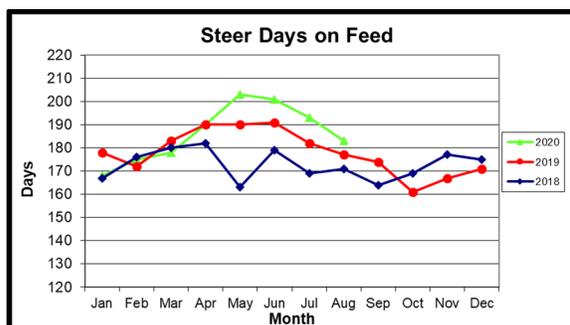
1. Stay engaged in the meeting, take notes just as if you were in a real face-to-face meeting.
2. Don't be afraid to turn off your camera and mute your microphone. Just because it is a video conference does not mean you have to be on camera or that everyone needs to hear your dog barking. Do your part to minimize distractions.
3. Organizers should schedule breaks. We all need mental, physical and visual breaks from our workstations and screens.
4. Have an agenda for the meeting and attempt to make conferences held remotely as short as possible. Consider what you can get accomplished during a 30-minute session when everyone is actively engaged.
5. Don't sweat the small stuff. Things happen - internet connections become unstable, microphones quit working and cell phones still drop calls.

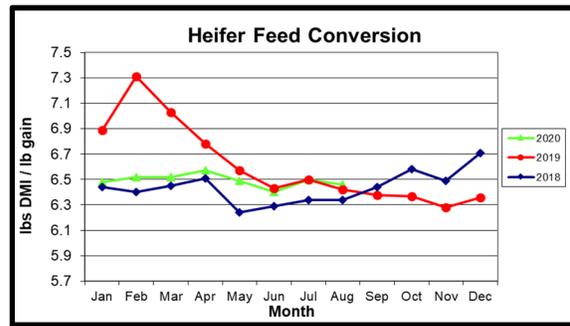
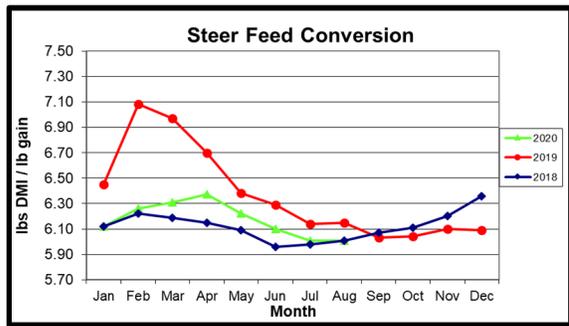
For more information, contact Justin Waggoner at jwaggon@ksu.edu.

Feedlot Facts – Justin Waggoner, Ph.D., Beef Systems Specialist

“Focus on Feedlots: Spring 2020”

There has been considerable interest in the K-State Focus on Feedlots report and more specifically fed cattle performance during the Spring of 2020. The graphs below illustrate average days on feed, final weights and feed conversion of steers and heifers in 2020, 2019 and 2018 in the Focus on Feedlots data.





For more information, contact Justin Waggoner at jwaggon@ksu.edu.

↪ **IRM Redbooks for Sale** – The 2021 IRM Redbooks have been ordered and will be sold on a first-come, first-served basis. The price is \$6.25/book for orders of 10 or more; \$6.50/book for orders of less than 10 which includes postage. To order your supply of redbooks, please contact Lois Schreiner (lschrein@ksu.edu; 785-532-1267).

↪ The Department of Animal Sciences and Industry at Kansas State University is seeking applicants for the position of **Animal Technician II - Dairy Unit (999 Temp)**. This is a part-time, University Support Staff (USS) position and exists to milk, feed and provide care of Dairy Teaching and Research Center dairy herd, which is used for teaching and research purposes. This is a relief milking position in which the candidate must be available 24 hours a day, 7 days a week to be called in to work. Application deadline: Screening begins immediately and will continue until a suitable candidate is identified. For more information, contact Mike Scheffel, search committee chair, at 785-537-0941 or scheffel@k-state.edu. To apply, go to <https://careers.k-state.edu/cw/en-us/job/509658/animal-technician-ii>.

↪ **Evaluating Soybean Meal Quality Using Near-Infrared Reflectance Spectroscopy** - The objective of this study was to establish a range of soybean meal quality to evaluate the correlations between official analytical methods and near-infrared reflectance spectroscopy (NIRS). Crushed soybean white flakes exposed to mechanical oil extraction, but not heat processing, were used in this experiment. Ground samples were put into cotton bags and autoclaved at 262°F for 0, 5, 10, 15, 30, 45, and 60 min at 29 PSI. This was done to simulate varying degrees of heat processing. A total of two samples per treatment were autoclaved in three separate blocks. The duplicate samples were divided and analyzed using NIRS and official analytical analysis (wet chemistry). Crude protein (CP), total lysine (Lys), Lys:CP, available Lys, available Lys:total Lys, protein solubility in potassium hydroxide (KOH), trypsin inhibitor activity (TIA), urease activity index (UAI), individual amino acids (AA), and total AA were analyzed to determine the degree of processing using official analytical methods. The correlation coefficient (R) and coefficient determination (r^2) between NIRS and official analytical methods were established for CP, total Lys, available/reactive Lys, Lys:CP and available/reactive Lys:total Lys. Data were analyzed using the SAS GLIMMIX procedure and the CORR procedure to determine the degree of association of NIRS and official analytical analysis. When measured using official analytical methods, CP, total AA, Ala, Asp, Glu, Gly, Iso, Leu, and Val decreased, whereas available/reactive Lys:total Lys, Lys:CP, available Lys, KOH, trypsin inhibitor, urease, Lys, and Cys decreased with increasing exposure time to the autoclave. There was a positive correlation between official analytical and NIRS results for CP, Lys:CP, available Lys:total Lys, total AA, Ala, Cys, Lys, and a negative correlation for Thr. A linear model was best fit to predict CP using NIRS. A quadratic model was best fit to use NIRS total Lys, reactive Lys, and their ratio to predict official analytical results.

Bottom Line... In conclusion, increasing soybean autoclave exposure time decreased soybean meal quality as measured by crude protein, total Lys, Lys:CP, available Lys, available Lys:total Lys, KOH solubility total AA, and additional AA. In addition, regression models were successful at using NIRS for Lys, reactive Lys, Lys:CP, and reactive Lys:total Lys to predict official analytical results. More information is available on this experiment and others in the KSU Swine Day Report at www.KSUswine.org. (This study conducted by K.M. Dunmire, J. Dhakal, K. Stringfellow, C.R. Stark, and C.B. Paulk)

Region of Origin in the United States Affects Price Premiums Associated with Value-Added Health Protocols of Beef Calf Lots Sold through Summer Video Auctions from 2010 through 2018 - The

The objective was to evaluate the effects of value-added calf health protocols within various regions of the United States on the sale price of beef calf lots sold via summer video auction. Information describing lot factors was obtained through a livestock video auction service. Descriptive characteristics were available over nine years (2010-2018) representing 43,242 lots of beef calves. Data were evaluated to investigate participation in various health programs across regions. A multiple regression model was developed for each region to determine the value associated with health protocols throughout regions of the United States. Evident price advantages were observed throughout all regions, indicating that rigorous vaccination and health management is advantageous for cow-calf producers across the United States. As distance from the highest concentrated area of cattle feeding increased, premiums associated with health protocols were discovered to be greater.

Bottom Line... While variation in the sale price of beef calves across regions suggests evident differences in the recognized value by buyers, results indicate the value associated with the vaccination and management of calves with potentially larger transportation distances from origin to delivery. View the complete research report at www.asi.ksu.edu/cattlemensday. For more information, contact Karol Fike (karol@ksu.edu; 785-532-1104) or Bob Weaver (bweaver@ksu.edu; 785-532-1460).

Effects of Medium Chain Fatty Acid Application in Swine Feed on Porcine Epidemic Diarrhea Virus -

Medium chain fatty acid (MCFA) application has been identified as a promising strategy to decrease viral pathogen transmission in swine feed. Four experiments were conducted to: 1) determine if MCFAs are effective when applied to feed both prior to and after porcine epidemic diarrhea virus (PEDV) inoculation measured by quantitative reverse transcription polymerase chain reaction (qRT-PCR), 2) evaluate the effects of varying amounts and combinations of MCFA measured by qRT-PCR, and 3) evaluate selected MCFA treatments in a bioassay. In Exp. 1, treatments were arranged in a 2 × 2 + 1 factorial with the main effects of chemical treatment (0.3% Sal CURB or 1% MCFA blend of 1:1:1 C6:C8:C10) and timing of chemical treatment (pre or post-inoculation with PEDV), plus a positive control (feed inoculated with PEDV and no chemical treatment). Feed was treated with the respective treatment either before or after inoculation at which point it remained at ambient temperature for 24 h and then was analyzed via qRT-PCR. The analyzed values represent cycle threshold (Ct), for which a lower number indicates greater detection of viral nucleic acid. Results demonstrated that all combinations of chemical treatment and timing increased Ct compared to the positive control. Additionally, treatment of feed pre-PEDV inoculation resulted in increased Ct value compared to post-inoculation treatment and Sal CURB increased Ct in comparison with 1% MCFA. In Exp. 2, the chemical treatments were applied pre-inoculation and consisted of: 1) positive control, 2) 0.3% Sal CURB, 3) 0.125% C6, 4) 0.25% C6, 5) 0.33% C6, 6) 0.125% C8, 7) 0.25% C8, 8) 0.33% C8, 9) 0.125% C10, 10) 0.25% C10, 11) 0.33% C10, 12) 0.125% C5, 13) 0.25% C5, 14) 0.33% C5, and 15) 0.66% C5, which were analyzed via qRT-PCR. Treatment of feed with 0.33% C8 resulted in increased Ct values compared to all other levels of MCFA and the positive control feed. Further, Sal CURB, 0.25% C6, 0.33% C6, all levels of C8, 0.25% C10, 0.33% C10, or 0.66% C5 all had increased Ct values compared to positive control feed. Increasing amounts of each individual MCFA resulted in increased Ct. In Exp. 3, the chemical treatments were applied pre-inoculation and consisted of: 1) positive control; 2) 0.3% Sal CURB; 3) 0.25% MCFA blend; 4) 0.375% MCFA blend; 5) 0.500% MCFA blend; 6) 0.750% MCFA blend; 7) 1.0% MCFA blend; 8) 0.125% C6 + 0.125% C8; 9) 0.25% C6 + 0.25% C8; 10) 0.33% C6 + 0.33% C8; 11) 0.125% C6 + 0.125% C10; 12) 0.25% C6 + 0.25% C10; 13) 0.33% C6 + 0.33% C10; 14) 0.125% C8 + 0.125% C10; 15) 0.25% C8 + 0.25% C10; and 16) 0.33% C8 + 0.33% C10, which were analyzed via qRT-PCR. Treating feed with Sal CURB, 0.500% blend, 0.750% blend, 1.0% blend, all levels of the C6 + C8, 0.25% C6 + 0.25% C10, 0.33% C6 + 0.33% C10, 0.25% C8 + 0.25% C10, or 0.33% C8 + 0.33% C10 resulted in increased Ct compared to the positive control. Lastly, in Exp. 4, feed was treated pre-inoculation with either 1) no treatment (positive control); 2) 0.3% Sal CURB; 3) 0.5% MCFA blend; or 4) 0.3% C8 and samples were analyzed via qRT-PCR and bioassay. Adding either 0.5% MCFA blend or 0.3% C8 resulted in increased Ct compared to the positive control. Further, only the positive control resulted in a positive in vivo bioassay.

Bottom Line... This set of experiments demonstrates that MCFA and Sal CURB are effective at decreasing detection of PEDV in feed both prior to and post-inoculation. Additionally, inclusion of lower levels of MCFA than previously evaluated may provide protection against PEDV transmission through feed. More information is available on this experiment in the KSU Swine Day Report at www.KSUswine.org. (This study conducted by A.B. Lerner, R.A. Cochrane, J.T. Gebhardt, S.S. Dritz, C.K. Jones, J.M. DeRouchey, M.D. Tokach, R.D. Goodband, J. Bai, E. Porter, J. Anderson, P.C. Gauger, D.R. Magstadt, J. Zhang, B. Bass, T.P. Karnezos, B. de Rodas, and J.C. Woodworth)



Effect of Die Retention Time on Pellet Quality and Phytase Stability of a Corn-Soybean Meal Swine

Diet - Phytase is a phosphohydrolytic enzyme that releases phosphorus from phytate in animal feed. However, pelleting is a thermal process that can denature phytase. It is hypothesized that there are many factors that can account for phytase denaturing during the pelleting process, such as pellet mill model, die length to diameter ratio (L:D), steam quality, and residence time in conditioner and die. Therefore, the objective of this experiment was to determine the effect of pellet mill model, die thickness, and die retention time on pellet quality and phytase stability. Treatments were arranged as a completely randomized design to determine the effect of die retention time (RT). Diets were pelleted using either a 1012-2 HD California Pellet Mill (CPM) Master Model or a 3016-4 HD CPM Master Model equipped with a 3/16 × 2 in (10.6 L:D), a 3/16 × 1 1/4 in (6.6 L:D) or a 3/16 × 1 3/4 in (9.3 L:D) with 30 sec conditioning retention time at 185°F with designated production rate. These processing conditions were used to create the following RT treatments: 10.6 L:D with 4.3 sec RT, 10.6 L:D with 2.9 sec RT, 9.3 L:D with 1.7 sec RT, 9.3 L:D with 1.1 sec RT, 6.6 L:D with 2.6 sec RT, and 6.6 L:D with 1.6 sec RT. The pellet mills were run 3 separate times to provide 3 replicates for each treatment. There was an overall effect of treatment on phytase stability in cooled pellets. When using the 1012 PM, phytase was more stable regardless of die retention time when diets were manufactured using the 6.6 L:D die compared to the 10.6 L:D die. The hot pellet temperature of 10.6 L:D die was 195–211°F, while 6.6 L:D die was 184–189°F. However, the phytase stability was similar between the feed pelleted with 1012 PM equipped with 6.6 L:D die and the 3016 PM equipped with 9.3 L:D regardless of retention time. The hot pellet temperature of feed pelleted with the 1012 PM equipped with 6.6 L:D die was 184–189°F, while the feed pelleted with the 3016 die equipped with 9.3 L:D die was 180–183°F. There was also a quadratic decrease in phytase stability as the die L:D increased. Therefore, the pellet mill size or die retention time did not affect phytase stability when the hot pellet temperature was less than 189°F. Pellet quality increased as die L:D increased. The die L:D had greater effects on both PDI methods than the die retention time. However, increased die retention time improved pellet quality when the feed was pelleted with 6.6 L:D, but not when pelleted using the 9.3 or 10.6 L:D.

Bottom Line... In conclusion, the phytase that was produced by *Trichoderma reesei* strain could tolerate hot pellet temperatures up to 189°F, regardless of pellet mill model, die thickness, and die retention time. However, phytase stability was dramatically reduced when hot pellet temperatures ranged from 195–211°F. Therefore, hot pellet temperatures should be measured to monitor phytase stability. Increasing the die L:D had the greatest effect on improving pellet quality. More information is available on this experiment and others in the KSU Swine Day Report at www.KSUswine.org. (This study conducted by M. Saensukjaroenphon, C.E. Evans, C.K. Jones, C.H. Fahrenholz, C.B. Paulk, and C.R. Stark)



Effects of Spray-Dried Lactococcus-Based Fermentation Products on Growth Performance of Nursery Pigs

A total of 720 barrows from two study groups were used in a 42-d growth trial to test the effects of spray-dried Lactococcus-based fermentation products on nursery pig performance. There were 24 replications per treatment and 5 pigs per pen. For both experiments, pens of pigs were randomly allotted to 1 of 6 dietary treatments in a completely randomized design. There were six treatment diets fed in 3 phases. The positive control diet included zinc oxide (phase 1), zinc oxide + chlortetracycline (CTC; phase 2) while the negative control diet did not include zinc oxide or CTC. Treatment diets included the negative control + 1 of 4 fermentation products (C, D, E, or F) added at 5% of the diet. Phase 3 diets contained a common control diet fed to all pigs plus treatment diets (C, D, E, and F). Phase 1 and 2 diets were fed in pelleted form and phase 3 in mash form. From d 0 to 20, there was an overall treatment effect where pigs fed the positive control had increased d 20 weight, average daily gain (ADG), average daily intake (ADFI), and improved feed efficiency (F/G) compared to those fed the negative control and negative control + fermentation product. From d 20 to 42, there was an overall treatment effect for F/G where pigs fed the negative control had improved F/G compared to those fed additive D, E, and F. Overall, there was a treatment effect for pigs fed the positive control having improved ADG and F/G compared to the negative control and negative control + fermentation product. In addition, pigs fed the negative control had improved F/G compared to those fed additive D, E, and F.

Bottom Line... In conclusion, pigs fed the positive control (zinc + CTC) diet had improved performance compared to pigs fed the negative control with or without fermentation product. More information is available on this experiment and others in the KSU Swine Day Report at www.KSUswine.org. (This study conducted by K.M. Dunmire, M.B. Braun, G.E. Nichols, C.E. Evans, M. Saensukjaroenphon, C.N. Truelock, J.C. Woodworth, J. Callura, and C.B. Paulk)

ASI Faculty Spotlight



James Lattimer (jlattimer@k-state.edu; 785-532-2840)
Assistant Professor/Equine Nutrition

Dr. James Lattimer is a native of Newton, Kansas. He graduated with his B.S. in Animal Science from Kansas State University in 2002. He began his graduate career in equine nutrition at Oklahoma State University in the fall of 2002. While at OSU, he was the assistant horse judging team coach and directly involved in the undergraduate teaching program. After completing his M.S. in the summer of 2004, he moved to Ocala, Florida, and taught equine science courses at the College of Central Florida and in the fall of 2005 accepted a horse science instructor position at Black Hawk College in Kewanee, Illinois. In the fall of 2009, Dr. Lattimer came back to K-State to work on his Ph.D. in comparative nutrition. Following graduation in May 2012, he joined Nestle Purina in St. Louis, Missouri, as a Technical Nutritionist.

He returned home to K-State in the spring of 2015 as an Assistant Professor with an 80% teaching and 20% research appointment. His current responsibilities include teaching undergraduate nutrition courses, coaching the Intercollegiate Horse Judging Team, conducting equine and comparative nutrition research and mentoring graduate students who are pursuing advanced degrees with an equine or comparative nutrition emphasis. Additionally, Dr. Lattimer serves as the faculty supervisor for the Horse Teaching and Research Unit.

Dr. Lattimer's research program focuses on digestive physiology of the horse with specific areas in the gut microbiome, post prandial glycemia, and digestibility of feedstuffs. Also, he collaborates across species with his fellow nutritionists to provide his students with a comparative look into animal nutrition.

Dr. Lattimer and his wife, Nichole, have three children, Paige, Payton and Owen. The Lattimer family owns a small livestock operation outside of Wamego, Kansas, where they raise and show club lambs and Boer goats.



Karen Schmidt (kschmidt@k-state.edu; 785-532-1216)
Professor/Dairy Foods

Dr. Karen Schmidt earned a bachelor's degree in Food Science from the Pennsylvania State University. After graduating from Penn State, Karen joined Tony's Pizza Service in Salina, Kansas, as a quality assurance supervisor. After working in quality assurance and research and development with Schwan Sales Enterprises, Karen entered graduate school at the University of Minnesota and completed her Master's and PhD degrees in Food Science.

In January of 1990, Karen joined the University of Georgia in the Departments of Food Science and Technology and Animal Science as an Assistant Professor with research and teaching responsibilities. In 1994, she joined the Department of Animal Sciences and Industry at Kansas State University as an Associate Professor with responsibilities in teaching and research, where she currently holds a 50% teaching and 50% research appointment. In addition, she is a member of Kansas State University's Food Science Institute. Her teaching responsibilities include Fundamentals of Milk Processing, Food Product Evaluation, Dairy Foods Processing and Technology, and Quality Assurance of Food Products and her research program focuses on the processing and quality of dairy and non-dairy foods. Since fall 2016, she is the coordinator of the undergraduate food science program.

What Producers Should Be Thinking About.....

WHAT PRODUCERS SHOULD BE THINKING ABOUT IN DECEMBER....



BEEF -- *Tips by Dale Blasi, Extension Beef Specialist*

Cow herd management for spring-calving cows

- ☑ In late fall and early winter, start feeding supplement to mature cows using these guidelines:
 - Dry grass — 1-2 pounds (lb.) per day of a 40% crude protein (CP) supplement
 - Dry grass — 3-4 lb. per day of a 20% CP supplement
 - Dry grass — 10 lb. good nonlegume hay, no supplement needed
- ☑ Compare supplements based on cost per pound of nutrient.
- ☑ Utilize crop residues.
- ☑ Strip-graze or rotate cattle to improve grazing efficiency.
- ☑ Cows in average body condition can be grazed at 1-2 acres per cow for 30 days, assuming normal weather. Available forage is directly related to grain production levels.
- ☑ Limiting nutrients are usually rumen degradable protein, trace minerals and vitamin A.
- ☑ Control lice.

General management

- ☑ Document your cost of production by participating in Standardized Performance Analysis (SPA) programs.
- ☑ Review management decisions; lower your costs per unit of production.
- ☑ Check your financial management plan and make appropriate adjustments before the end of the year.

*We need your input! If you have any suggestions or comments on **News from KSU Animal Sciences**, please let us know by e-mail to lschrein@ksu.edu or phone 785-532-1267.*