News from KSU Animal Sciences

- **Make plans now to attend the 2022 KSU Swine Day**. The 2022 KSU Swine Day will be hosted Thursday, November 17, at the KSU Alumni Center. The schedule for the day includes:

  8:00 a.m. – 4:00 p.m. Trade Show
  9:15 a.m. Welcome
  Dr. Mike Day, Department Head, Animal Sciences and Industry
  9:30 a.m. Latest Update on K-State Applied Swine Nutrition Research: 15-minute rotation including topics on Swine Nutrition, Management, Feed Processing, and Feed Safety
  K-State Swine Faculty
  11:30 a.m. Lunch with Trade Show
  1:30 p.m. Latest Update on K-State Applied Swine Nutrition Research (continued)
  2:30 p.m. A Look Back While Preparing for the Future of our Industry
  Dr. Steve Pollmann, DSP Consulting LLC
  3:15 p.m. Question and Answer Session
  3:30 p.m. Reception with K-State Ice Cream

  Pre-registration fee is $25 per participant by November 10, with registration at the door $50 per participant. There is no charge for any students if they are pre-registered. The complete schedule and online registration information can be found at www.KSUswine.org. For more information, contact Lois Schreiner at lschrein@ksu.edu or 785-532-1267.

- The **2023 K-State Swine Profitability Conference** has been scheduled for Tuesday, February 7, 2023, at the Stanley Stout Center, Manhattan, KS. Watch for more details coming soon at www.KSUswine.org.

- **IRM Redbooks for Sale** – The 2023 IRM Redbooks are here and will be sold on a first come, first-serve basis. The price is $6.50/book for orders of 10 or more; $6.75/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).

- Watch the **KSU ASI Headlines** for September 2022 and find out the latest happenings in the department. Follow the link at www.youtube.com/watch?v=eacjBgFrojw. For questions about the department, contact Dr. Mike Day, ASI Department Head, at 785-532-1259; mlday@k-state.edu.

CALENDAR OF UPCOMING EVENTS

Date	Event	Location
November 17, 2022	KSU Swine Day	Manhattan
February 7, 2023	K-State Swine Profitability Conference	Manhattan

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Kansas State University Animal Sciences and Industry
K-STATE Research and Extension

WHAT'S NEW…

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

"Managers Versus Leaders"

I recently came across an article that contrasted management and leadership ("Learning for future personal and business success" by Bob Milligan). Many of you, like myself, who always arrive at the most logical conclusion quickly are likely saying "a manager is a leader" and yes that is true. However, there is a difference between the roles and responsibilities of managers and leaders. Leaders give an organization direction. Leaders focus on the future by motivating individuals or groups of individuals. Managers tend to be less focused on the future, and more on the here and now. Managers organize, plan, budget, and ultimately implement the vision of the leader. Are you a leader or manager? Is it possible to be both? As organizations and businesses grow larger structure becomes more important because of the established fact that it is "hard to see tomorrow, when you are buried in today."

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

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

"Forage Analysis: What Numbers Do I Need?"

One the more common questions I receive with regard to analytical testing of forages and other feedstuffs is "I have the sample, now what do I test for or what analysis package should I select?"

The basic components that nutritionists need to evaluate a feedstuff or develop a ration are dry matter or moisture, crude protein, an estimate of the energy content of the feedstuff (Total Digestible Nutrients (**TDN**), Net Energy for Maintenance (**NEm**), Net Energy for gain (**NEg**), and the macro minerals, Calcium and Phosphorous. These are the most basic numbers that are required, but including some additional analyses in the report can give us additional insight into the quality of the feedstuff or improve our ability to predict animal performance, which is the primary reason we analyze feedstuffs. I recommend that the report include acid detergent fiber (**ADF**) and neutral detergent fiber (**NDF**). The amount of NDF in forage reflects the amount of cell wall contents (hemicellulose, cellulose, and lignin) within the sample. The NDF fraction is often associated with the respective bulkiness of forage and is correlated with dry matter intake of the forage or feedstuff. Therefore, the amount of NDF may be used to estimate the expected dry matter intake associated with the forage. The ADF number represents the amount of cellulose and lignin within the forage and is correlated with the respective digestibility of the forage. In general, a higher ADF value is associated with forage that has a greater proportion cellulose and lignin and would likely be more mature. Additionally, the ADF fraction is used to calculate the energy estimates TDN, NEm, and NEg that appear on the report. There are a number of different mathematical equations that the testing laboratory may use to calculate these numbers, based on the type of sample (corn silage, alfalfa, grass hay, etc.). If the ADF is included in the report, the nutritionist can adjust or recalculate the energy estimates, if necessary.

If the forage will be fed in combination with a byproduct feed, such as wet distiller's grain, including an analysis for sulfur can be beneficial if the forage will be used in a growing or feedlot ration. Additionally, if the forage is a known nitrate accumulator (forage sorghums, sudangrass) or may have been stressed due to drought, including a nitrate analysis should always be considered, especially if the forage will be fed to pregnant cows.

Most analytical laboratories have a number of different analysis packages which encompass the most common procedures or numbers that a nutritionist or producer needs to know about their feeds. These packages will typically include the basic procedures (DM, CP, TDN) and then add on specific analyses such NDF, or the Macrominerals (Ca, P, Mg, K, Na, Cl, S). Some laboratories may group analysis packages by the type of sample (forage vs. mixed ration) or production purposes (dairy vs. beef).

The objective of analytical testing of forages and feedstuffs is to improve our ability to meet the animal's nutrient requirements and ultimately predict animal performance. The unequivocal best method of evaluating the quality of a feedstuff is feeding the feedstuff to an animal and evaluating performance over a set period of time, under a specific set of conditions. Since that would not be cost effective or timely, analytically evaluating feedstuffs in a laboratory is the next best thing and, although it is not perfect, it is unequivocally better than the "this looks like really good stuff" method of evaluating feedstuffs.

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

WHAT'S NEW…

- **Instructor and Livestock Judging Team Coach -** (Job #513822) **–** This is a 12-month, non-tenure track, term contract faculty position. The Animal Sciences & Industry Department (ASI) houses the largest undergraduate degree program at Kansas State University with robust academic training for students that includes evaluation teams across species, products, and disciplines, along with undergraduate research, internships, and numerous clubs and organizations. We are seeking applicants for an Instructor in the ASI Department that will serve as head coach of our nationally competitive Livestock Judging Team and contribute to other aspects of our academic mission in areas consistent with the individual's training, interests, and needs of the Department. The position will be located in Manhattan, KS. Review of applications begins: October 15, 2022. For best consideration, apply by October 15, 2022. For more information, contact Chris Mullinix, Search Committee Chair, at cmullinix@ksu.edu or 785-532-1917. To apply, go to https://careers.k-state.edu/cw/en-us/job/513822/instructor-and-livestock-judging-team-coach.

- **An Investigation on the Influence of Various Biochemical Tenderness Factors on Eight Different Bovine Muscles** - Beef tenderness is a complex palatability trait with many tenderness-contributing components. The objective of this study is to understand the relative contribution of each tenderness component to eight different beef muscles. Top sirloin butt, ribeye, brisket, flank, knuckle, eye of round, mock tender, and shoulder clod were collected from 10 U.S. Department of Agriculture high choice beef carcasses and assigned to a 2- or 21-day aging period. Protein degradation, collagen content, mature collagen crosslink density, intramuscular lipid content, pH, shear force, and trained sensory panel analysis were determined. A Pearson correlation analysis was used to determine the relationship between each tenderness contributor measured in this study to the overall tenderness evaluated by the trained panelist. Overall tenderness of ribeye, flank, eye of round, and shoulder clod were largely driven by the protein degradation of muscle fibers (effect of aging). On the other hand, overall tenderness for brisket was determined by collagen content and crosslink density (effect from connective tissue). Finally, overall tenderness of top sirloin butt was strongly correlated with lipid content. When all the cuts were combined together and analyzed as a whole, all of the biochemical measurements conducted in this study played a small but important role as an overall tenderness contributor.

  The Bottom Line: Results from this study filled in some of the knowledge gap on the relative contribution of each tenderness component to the overall perception of tenderness from each cut. The industry can utilize this information to provide tenderness management strategies for each cut as well as improve the robustness of current tenderness predicting technology. More information is available on this experiment and others in the KSU Cattlemen's Day report at www.KSUbeef.org. For more information, contact Michael Chao (785-532-1230; mdchao@ksu.edu) or Liz Boyle (785-532-1247; lboyle@ksu.edu).

- **Trained Sensory Panel Evaluation of the Impact of Bone-In Versus Boneless Cuts on Beef Palatability** - The objective of this study was to determine palatability traits of beef cuts of differing bone status and quality grade. Paired boneless ribeye rolls, export ribs, and short loins were procured. Short loins were fabricated into boneless strip loins with corresponding bone-in tenderloins, or bone-in strip loins with boneless tenderloins. Post-aging, subprimals were fabricated into steaks that were randomly selected for further analysis. A total of eighteen trained sensory panels were conducted at the Kansas State University Meat Science Sensory Lab to determine differences in palatability traits. In totality, bone status had a minimal impact on palatability traits. Nonetheless, bone-in tenderloins and bone-in ribeyes were rated more flavorful than boneless cuts from the same muscle. There were no beef flavor intensity differences observed for bone-in and boneless strip steaks. Bone state had no effect on initial juiciness, myofibrillar tenderness, overall tenderness, or Warner-Bratzler shear force (WBSF) for any cut. Bone-in strip loin samples were rated juicier than tenderloins and boneless ribeye samples. Tenderloin samples were rated higher for myofibrillar and overall tenderness than strip loin and ribeye steaks, which were rated similar by trained panelists. Furthermore, there was no difference in the WBSF values for strips and ribeyes, with tenderloin samples having the lowest average peak force. Lastly, USDA Choice samples were rated higher for all palatability traits and had lower WBSF values than Select samples.

  The Bottom Line: A similar overall eating experience could be derived from a boneless or bone-in steak from the same cut and quality grade. More information is available on this experiment and others in the KSU Cattlemen's Day report at www.KSUbeef.org. For more information, contact Travis O'Quinn (785-532-3469; travisoquinn@ksu.edu) or Liz Boyle (785-532-1247; lboyle@ksu.edu).

WHAT'S NEW…

- **Effects of Standardized Ileal Digestible Lysine on Growth Performance and Economic Return of 200 to 300 lb Grow-Finish Pigs** - A total of 2,099 barrows and gilts were used in a 57-d study to determine the optimal dietary standardized ileal digestible (SID) Lys level for approximately 200 to 300 lb pigs in a commercial setting. Pigs were randomly allotted to one of four dietary treatments with 24 to 27 pigs per pen and twenty replications per treatment. A similar number of barrows and gilts were placed in each pen. Diets were fed over two phases (199 to 233 and 233 to 299 lb, respectively). Dietary treatments were corn-soybean meal-based. Diets were formulated to 85, 93, 100, or 110% of the 2016 PIC SID Lys gilt recommendations with phase 1 SID Lys levels of 0.65, 0.71, 0.77, 0.84%, and phase 2 levels of 0.60, 0.66, 0.71, 0.78%, respectively. Overall (d 0 to 57), increasing SID Lys increased overall market weight, F/G, hot carcass weight, Lys intake/d, and Lys intake/kg of gain with an increase in ADG. For economics (d 0 to 57), feed cost per lb of gain increased with increased SID Lys. Revenue per pig placed and income over feed cost (IOFC) increased as the amount of SID Lys increased, and marginally significant evidence of a quadratic response for feed cost per pig placed. Projecting IOFC for phase 1, the quadratic polynomial (QP) and broken-line linear models estimated the requirement at 110.9% and 96.9%, respectively, to achieve maximum IOFC. For phase 2, the QP estimated the requirement at 96.6% SID Lys to maximize IOFC. In summary, the SID Lys requirement was 97% to 111% of the 2016 PIC recommended Lys requirement for phase 1 and 97% for phase 2 to maximize IOFC. More information is available on this experiment and others in the KSU Swine Day report at www.KSUSwine.org. (*This study conducted by Larissa L. Becker, Emily E. Scholtz, Joel M. DeRouchey, Mike D. Tokach, Jason C. Woodworth, Robert D. Goodband, Jordan T. Gebhardt, Jon A. De Jong, Fangzhou Wu, Kiah M. Gourley, Joe P. Ward, and Casey R. Neill.)*

- **Effects of Standardized Ileal Digestible Lysine Level on Growth Performance in 170 to 220 lb DNA Finishing Pigs** - The objective of this study was to estimate the SID Lys requirement for growth and feed efficiency of 170- to 220-lb finishing pigs. A total of 616 barrows and gilts were used in two separate studies each lasting 21 d. Pens of pigs were blocked by BW and randomly allotted to one of seven dietary treatments with 8 to 10 pigs per pen in a randomized complete block design. A similar number of barrows and gilts were placed in each pen. Dietary treatments were corn-soybean meal-based and formulated to 0.58, 0.65, 0.72, 0.79, 0.86, 0.92, and 1.00% SID Lys. There were eleven replications per treatment for levels of 0.65, 0.72, 0.79, 0.86, and 0.92% SID Lys; six replications for the 0.58% SID Lys treatment; and five replications for the 1.00% SID Lys treatment. Increasing SID Lys increased ADG. Feed efficiency improved, while Lys intake/d, and Lys intake/kg of gain increased with increasing SID Lys. At both high and low ingredient and pig prices, feed cost per pig and feed cost/lb gain increased, and total revenue per pig tended to increase as SID Lys increased. However, at both high and low ingredient and pig prices, there were no differences in income over feed cost (IOFC) among dietary treatments. The broken-line linear model to maximize ADG predicted that there was no further improvement to ADG past 0.83% and for F/G, the quadratic polynomial model predicted a requirement of 0.90% SID Lys. However, similar fitting linear models predicted maximum ADG and F/G greater than 1.00% SID Lys. Income over feed cost at high ingredient and pig prices was predicted by the QP model to be maximized at 0.78% SID Lys. Meanwhile, at low ingredient and pig prices, the BLL model predicted maximum IOFC at 0.76% SID Lys, or lower. In summary, the optimal SID Lys level for finishing pigs from 170 to 220 lb depends upon the response criteria, with growth performance maximized between 0.83 to 0.90% SID Lys. Income over feed cost was maximized at 0.78% SID Lys or lower. More information is available on this experiment and others in the KSU Swine Day report at www.KSUSwine.org. *(This study conducted by Rafe Q. Royall, Robert D. Goodband, Mike D. Tokach, Joel M. DeRouchey, Jordan T. Gebhardt, and Jason C. Woodworth.)*

- **Effects of Reducing the Digestible Lysine and Tryptophan to Lysine Ratio on Growth Performance of Grow-Finish Pigs** - A total of 1,080 finishing pigs were used in a 119-d growth trial to evaluate the effects of reducing the dietary SID Lys and SID Trp:Lys ratio on growth performance to find strategies to reduce growth rate of pigs during the grow-finish period. Pigs were allotted by initial BW and randomly assigned to one of four dietary treatments in a completely randomized block design with twenty-seven pigs per pen and ten pens per treatment. Dietary treatments were corn-soybean meal-based diets with DDGS. Three dietary regimes were formulated to contain either 100, 90, or 80% of the estimated SID Lys requirement for pigs in this facility, and these diets had a SID Trp:Lys ratio of 19%, with the exception of the last dietary phase formulated to 17% SID Trp:Lys. A fourth regime was formulated to 80% SID Lys with a SID Trp:Lys ratio of 16% (80–16% SID Trp:Lys) throughout all phases. Overall, from d 0 to 119, ADG and final BW decreased, and F/G tended to worsen as SID Lys decreased from 100 to 80% of the requirement. Pigs fed the diet with 80–16% SID Trp:Lys also had decreased ADG, and poorer F/G compared with pigs fed 80% of the SID Lys requirement with a high Trp:Lys ratio. In conclusion, reducing SID Lys decreased growth performance and final BW of pigs during the grow-finish period. A further reduction in Trp:Lys ratio also decreased ADG and tended to worsen feed efficiency. This resulted in a 25 lb difference in final BW between pigs fed Lys and Trp at the requirement (100%) compared with pigs fed the 80% SID Lys and 16% Trp:Lys ratio. This study provides alternatives to producers to reduce growth rate of finishing pigs. More information is available on this experiment in the KSU Swine Day report at www.KSUSwine.org. *(This study conducted by Andres Tolosa, Mike Tokach, Robert Goodband, Jason Woodworth, Joel DeRouchey, Jordan Gebhardt, Craig Steck, and Matt Wolfe.)*

ASI FACULTY SPOTLIGHT…

Logan Thompson (thom94@k-state.edu; 785-532-2840)
Assistant Professor, Sustainable Grazing Systems

Logan grew up on a registered horned hereford ranch in central Texas which instilled a passion to improve the sustainability of beef production by developing practical solutions for producers. Through his teaching appointment, he aims to give students the tools necessary to speak and understand the evolving space of sustainability and to be successful as the next generation of farmers and ranchers who will serve as stewards of the Great Plains. Logan started his bachelor's degree at Sam Houston State University in Huntsville, TX, prior to completing his degree at Texas Tech University in 2015. Following this he earned a Master's in beef sustainability at Oklahoma State University in 2017 and a PhD in ruminant nutrition at Michigan State University in 2021. Prior to joining Kansas State University in August of 2022, he served as a post-doctoral fellow at Colorado State University.

Logan's predominate research interest is in measuring greenhouse gas emissions in grazing systems and how grazing management impacts ecosystem function. Of particular interest is how the soil-plant-animal interrelationships are manipulated by management decisions. Additionally, his research examines how management decisions influence nutrient utilization within and across production systems. Logan's wife, Rachel, is also a science nerd and is a Senior Scientist in Ingredient Solutions R&D at MGP Ingredients in Atchison, KS.

A.J. Tarpoff (tarpoff@k-state.edu; 785-532-1255)
Associate Professor/Beef Extension Veterinarian

Anthony John (A.J.) Tarpoff was born and raised in Edwardsville, Illinois. A.J.'s family owned and operated a beef processing plant and a steakhouse. He received his B.S. in Animal Science at Kansas State University in 2010. In 2012, he received his DVM, and M.S. in Biomedical Science at Kansas State University.

After earning his DVM., he accepted an associate feedlot veterinarian position at Alberta Beef Health Solutions in Southern Alberta, Canada. His focus in practice was herd-based cattle production medicine, research field trials, hands on feedlot employee training, disease surveillance and mitigation, and Federal Import/Export duties.

In 2016, he returned to the Department of Animal Sciences and Industry at Kansas State University to serve as an Assistant Professor and Beef Extension Veterinarian. He was promoted to Associate Professor in 2021. A.J. has a 70% extension, 20% research, and 10% teaching appointment. He works closely with producers, practicing veterinarians, and members of industry to bring relevant extension and education that improves cattle health and the productivity of the beef industry.

KSU Cow-Calf Checklist – October 2022

Management Considerations for Beef Cow-Calf Producers – Now and Looking Ahead

By Jason M. Warner, Ph.D., Extension Cow-Calf Specialist

Cow herd management

- ☑ With continued volatility, consider opportunities to lock prices in, if at all possible, for co-products and commodity feeds.
- ☑ Understand what nutrients you are targeting to purchase and price feeds on a cost per unit of nutrient basis.
- ☑ If not already done, take inventory of and test harvested forages for the following:
  - Moisture/dry matter
  - Crude protein
  - Energy (NE_m, NE_g, and/or TDN)
  - Fiber components (ADF, NDF)
  - Macro-minerals (calcium, phosphorus, magnesium, potassium, salt)
  - Nitrates and/or prussic acid when appropriate
  - Starch for silage crops
- ☑ Calculate forage needs based on herd inventory, cattle weight, and days, and develop a plan to ensure that adequate harvested forage is available if grazing is limited.
- ☑ Body condition score cows to develop informed supplementation strategies (both spring and fall-calving herds).
  - Targeted BCS at calving: 5 for mature cows, 6 for young females (2,3, & 4 year olds)
- ☑ Consider utilizing crop residues for late-fall and winter grazing needs. Assess down grain in the field and be aware of nitrates and prussic acid (around the time of frost for sorghums).
- ☑ Check spring-calving herds for pregnancy status and cull the following:
  - Open or late-bred females
  - Females with poor disposition
  - Low milk producing females that wean light calves
  - Females with undesirable teat/udder conformation
  - Unsound females (eyes, feet/legs)
- ☑ Review your marketing strategy for cull cows.
  - Cows with a BCS ≥ 6.0 will likely sell well with current market prices.
  - Look for opportunities to increase value by adding weight prior to market.
- ☑ Ensure bulls undergo breeding soundness exams prior to fall/winter service.
- ☑ Manage young and mature bulls during the offseason to ensure bulls are BCS ≥ 5.0 prior to the next season of use.

Calf management

- ☑ If not already done, make arrangements to wean spring-born calves.
  - Finalize plans to either market calves or retain and add weight post-weaning.
  - If marketing calves, communicate your strategy to prospective buyers in advance.
- ☑ If retaining calves post-weaning:
  - Review your nutrition plan.
  - Ensure you have sufficient forages available to match cowherd needs.
  - Closely observe feed and water intake the first few weeks.
  - Make sure all cattle have sufficient access to feed and water.
- ☑ Review/update your health protocols as needed for either weaned or new-born calves.
- ☑ Consider either supplementing fall-calving pairs or creep feeding fall-born calves to maintain calf performance on low-quality winter forages.
- ☑ For replacement heifers, manage your program to properly develop them prior to your given breeding time.

Forage/Pasture Management

- ☑ Make plans for controlling invasive species for the next growing season.
- ☑ Winterize water sources if applicable.
- ☑ Work on fencing/facility projects as time/weather allows.

General Management

- ☑ Develop and/or review your risk management plans for the coming year.
- ☑ Evaluate your short and long-term herd inventory goals with current conditions.
- ☑ Update lease arrangements as necessary.
- ☑ Schedule an annual meeting with your lender, insurance agent, and extension professional.

*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*