

# K News from KSU Animal Sciences

- ✦ **It is not too late to attend the 2021 KSU Swine Day.** The 2021 KSU Swine Day will be hosted Thursday, November 18, at the KSU Alumni Center. The complete schedule and updated information can be found at [www.KSUswine.org](http://www.KSUswine.org). For more information, contact Lois at [lschrein@ksu.edu](mailto:lschrein@ksu.edu) or 785-532-1267.
- ✦ **A Youth Wool Judging Coaching/Instructional Workshop** will be held for agents/leaders/instructors in counties or schools in the surrounding states that are interested in starting a youth (4H/FFA) team. Dr. Alison Crane, KSU, and Dr. Whit Stewart, University of Wyoming, will host this instructional workshop following the Collegiate Contest on Saturday, December 4<sup>th</sup> at the Stanley Stout Center. We will have coaches/assistant coaches assisting in instructing the workshop. The links to the youth contest rules can be found at <http://www.uwyo.edu/4-h/opportunities/state-contests/wool-judging/index.html> (Mohair is included in the document, however, we will not have Mohair available at the Stout Center). Those interested are asked to register through the workshop link at <https://www.asi.k-state.edu/research-and-extension/sheep-and-goats/index.html>.  
For those in the State of Kansas, please know that K-State Extension will be distributing wool judging totes to help aid in starting these programs throughout the state. They will be housed at district offices throughout the state and include wool samples, youth contest rules, as well as instructional tips. If you have any questions or concerns about this event or the youth programming efforts, please contact Dr. Alison Crane at [arcrane@ksu.edu](mailto:arcrane@ksu.edu).
- ✦ **Kansas 4-H EID Livestock Tag Orders** are now open and can be submitted to the KSU Youth Livestock Program. This process has been transitioned to campus following the retirement of Dave Kehler. All market animals or commercial females that will be nominated for the 2022 Kansas State Fair Grand Drive and/or Kansas Junior Livestock Show (KJLS) must be tagged with an official Kansas 4-H EID tag. Market beef tag orders are due by December 15, 2021, with small livestock tag orders being due January 28, 2021. The beef tag orders are due earlier than usual this year to account for delays that could potentially occur at the manufacturing plant. The order forms and other tagging resources may be found on the KSU Youth Livestock Program, under Kansas 4-H EID Tags (<https://www.asi.k-state.edu/research-and-extension/youth-programs/>). We will be transitioning to the new, round meat goat tags that were piloted last year. If you still have some ribbon tags left, either type will be accepted for state livestock nomination. Payment is required to accompany the completed order form for it to be accepted. Extension Units must designate an agent to be responsible for their tags, as well as keep records of the families in which each tag is applied to a project. For more information, contact Lexie Hayes at [adhayes@ksu.edu](mailto:adhayes@ksu.edu) or 785-532-1264.
- ✦ The **2022 K-State Swine Profitability Conference** has been scheduled for Tuesday, February 8, 2022, at the Stanley Stout Center, Manhattan, KS. Watch for more details coming soon at [www.KSUswine.org](http://www.KSUswine.org).

Department of Animal Sciences and Industry

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November 2021 issue



# UPCOMING EVENTS...

- ↪ **Make plans to attend Cattlemen's Day 2022** –The 109<sup>th</sup> annual Cattlemen's Day will be hosted Friday, March 4, 2022. The trade show and educational exhibits will open at 8 a.m. in Weber Arena.  
Registration for KSU Cattlemen's Day will be \$20 per person in advance or \$30 per person at the door. Morning refreshments and lunch are included with registration. A complete schedule will be coming soon to [www.asi.ksu.edu/cattlemensday](http://www.asi.ksu.edu/cattlemensday) or call 785-532-1267.  
If you are interested in exhibiting at Cattlemen's Day or have any questions, please contact Dale Blasi (dblasi@ksu.edu; 785-532-5427).
- ↪ The **45<sup>th</sup> Annual Legacy Bull and Heifer Sale** will be March 4, 2022, at 4:00 p.m. at the Stanley Stout Center. Visit [www.asiksu.edu/bullsale](http://www.asiksu.edu/bullsale) for more information, as it becomes available, including the sale catalog.
- ↪ **IRM Redbooks for Sale** – The 2022 IRM Redbooks are here 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).

## CALENDAR OF UPCOMING EVENTS

Date	Event	Location
November 18, 2021	K-State Swine Day	Manhattan
December 4, 2021	Youth Wool Judging Coaching Workshop	Manhattan
February 8, 2022	K-State Swine Profitability Conference	Manhattan
March 4, 2022	KSU Cattlemen's Day	Manhattan
March 4, 2022	Legacy Bull and Heifer Sale	Manhattan

# WHAT'S NEW...

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

## *“Traits of Successful Teams in the Workplace”*

Most of us have had some experience with being part of a team or different groups of individuals. Some teams of individuals are highly successful, and some are not. What makes some teams more successful than others? The tech giant “Google” has invested a great deal of time and resources into studying teams and reported (<http://www.businessinsider.com/google-explains-top-traits-of-its-best-teams-2015-11>) that their most successful teams have the following traits.

Successful teams

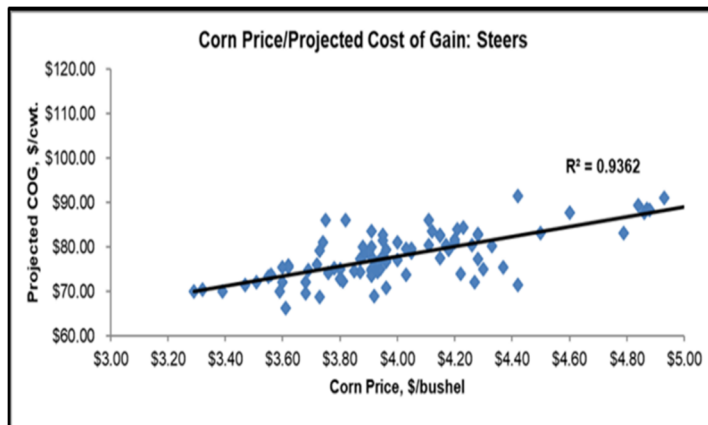
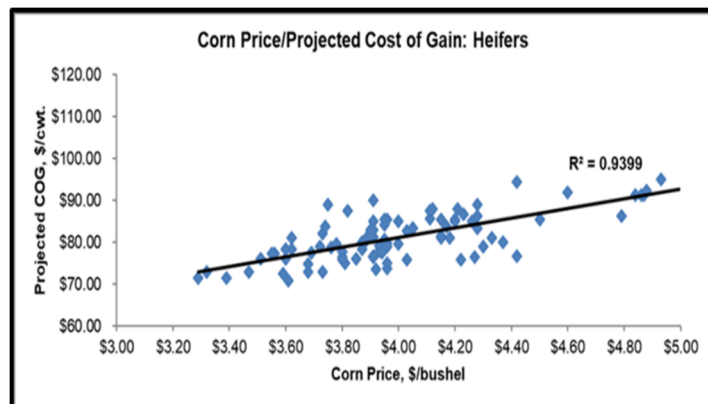
- Establish psychological safety within the team. The team creates an environment where all members of the team feel free to bring new ideas forward to the group.
- Are dependable. The team holds its members accountable, getting things done on time and up to the standards of the group.
- Have structure and clarity. The members of the team know their role in the team and have a clear vision of the team’s structure and the expectations associated with their role on the team.
- Have a purpose. The team members believe that what they are doing matters.

A wealth of information on building teams and characteristics can be found with a simple internet search. For more information, contact Justin Waggoner at [jwaggon@ksu.edu](mailto:jwaggon@ksu.edu).

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

## *“Estimating Placed Cost of Gain using the Focus on Feedlots”*

The K-State Focus on Feedlot has many uses, foremost it provides many of us that are not directly connected with the cattle feeding industry a means of staying abreast of cattle performance and closeout data from commercial feeding operations. The historical data may also be used to build economic budgets for cattle producers considering retaining ownership or placing a group of cattle on feed as commodity and input prices change. One of the simplest ways to estimate placed cost of gain is to look at the relationship between reported corn price and reported projected cost of gain for steers and heifers. The data obtained from the Focus on Feedlots from 2009 to 2019 is shown in the graphs below.



# WHAT'S NEW...

## **Feedlot Facts - Estimating Placed Cost of Gain using the Focus on Feedlots" (cont)**

The relationship between corn price and placed cost of gain is expressed in the following formulas:

$$\text{Projected Steer Cost of Gain (\$/cwt)} = \$33.28 + (\$11.16 \times \text{Corn Price}).$$

$$\text{Projected Heifer Cost of Gain (\$/cwt)} = \$34.83 + (\$11.57 \times \text{Corn Price}).$$

These formulas may be used to forecast the projected cost of gain if corn price is known. The table below lists the projected cost of gain at various corn prices from \$3.00 to \$7.00 per bushel.

**Projected Cost of Gain for Steers and Heifers Based on Corn Price.**

Corn Price (\$/bu.)	Steer Cost of Gain (\$/cwt)	Heifer Cost of Gain (\$/cwt)
\$3.00	\$66.76	\$69.54
\$3.50	\$72.34	\$75.33
\$4.00	\$77.92	\$81.11
\$4.50	\$83.50	\$86.90
\$5.00	\$89.08	\$97.21
\$5.50	\$94.66	\$98.47
\$6.00	\$100.23	\$104.25
\$6.50	\$105.81	\$110.04
\$7.00	\$111.39	\$121.61

There are many factors that influence cost of gain, primarily cattle performance (ADG, Feed conversion, etc.) which is not necessarily taken into account with this method. However, this does provide a simple method that can easily be adjusted up or down to fit specific groups/types of cattle and expected weather conditions during the feeding period.

For more information contact Justin Waggoner at [jwaggon@ksu.edu](mailto:jwaggon@ksu.edu).

↪ **Research Technician, Kansas Artificial Breeding Service Unit (KABSU) (Job #511599)** – This is a full-time unclassified professional staff, term contract position. This position will oversee the daily health and care of facility housed animals and ensure that the facility complies and operates according to USDA APHIS, NAAB, and CSS guidelines. This position will manage IACUC, KDHE, and University safety protocols, supervise the maintenance facility, and assist with the daily bull collection schedule both on the KABSU premise, along with field service. Review of applications begins: Immediately and continues until position is filled. For more information, contact Tom Taul, Search Committee Chair, at 785-539-3554 or [ttaul@ksu.edu](mailto:ttaul@ksu.edu). To apply, go to <https://careers.k-state.edu/cw/en-us/job/511599/research-technician>.

## ↪ **Effects of Choline on Neutrophil Function and Inflammation in Growing Cattle with Modulated Methyl Group**

**Status** - This study was conducted to evaluate the effects of supplemental choline in combination with guanidinoacetic acid or creatine on immune cell function and inflammation in growing cattle.

Six ruminally-cannulated Holstein steers (321 lb) were utilized in an experiment where each steer received each of six treatments. Treatments were given via abomasal infusion of a 0 or 5 g/day of supplemental choline, and either a saline solution (control); 15 g/day guanidinoacetic acid; or 16.8 g/day of creatine, with all treatment combinations represented. Steers were fed a corn-based diet. Blood was collected during each period to measure neutrophil function, plasma haptoglobin, and plasma antioxidant potential.

**The Bottom Line...** Supplementing steers with 5 g/day of choline tended to reduce plasma haptoglobin concentrations, suggesting that choline reduced systemic inflammation. More information is available on this experiment and others in the KSU Cattlemen's Day report at [www.KSUBeef.org](http://www.KSUBeef.org). (This study conducted by M.S. Grant, H.D. Aufdemberge, B.J. Bradford, L.K. Mamedova, and E.C. Titgemeyer.)

# WHAT'S NEW...

☞ **Effect of Fiber Source and Crude Protein Level on Nursery Pig Performance** - A total of 360 pigs were used in a 45-d growth trial to evaluate the effects of fiber source and crude protein level on growth performance and fecal dry matter of nursery pigs. Upon arrival to the nursery research facility, pigs were randomly assigned to pens with 5 pigs per pen and 9 replicate pens per treatment. Dietary treatments were arranged in a 2 × 4 completely randomized factorial with main effects of crude protein (21 or 18% CP) and fiber source (none, coarse wheat bran, oat hulls, or cellulose). Treatment diets were formulated in two dietary phases from d 0 to 10 and 10 to 24, with a common post-treatment diet fed from d 24 to 45. The 21% CP diets contained 1.40% standardized ileal digestible lysine (SID) in phase 1 and 1.35% SID Lys in phase 2. Treatment diets were formulated to a maximum SID Lys:digestible CP level of 6.35%, thus SID Lys decreased in the 18% CP (1.25% SID Lys) diets to maintain the ratio. Diets containing a fiber source were formulated to the level of insoluble fiber provided by 4% coarse wheat bran, resulting in the addition of 1.85% oat hulls and 1.55% cellulose to the respective diets. No fiber source × CP level interactions were observed throughout the study. During the experimental period, decreasing dietary CP (and subsequently SID Lys) decreased ADG, and d 24 BW and worsened F/G. Average daily gain and d 45 BW decreased for pigs fed 18% CP diets compared to pigs fed 21% CP diets overall from 0 to 45. Fecal dry matter on d 17 was increased for pigs fed 18% CP diets compared to pigs fed 21% CP diets. No main effects of fiber source were observed for growth performance throughout the study. However, fecal dry matter percentage increased for pigs fed added cellulose compared to pigs fed no fiber or coarse wheat bran on d 10 and 24 of the trial. Similarly, pigs fed cellulose had increased fecal dry matter compared to pigs fed no fiber with pigs fed coarse wheat bran and oat hulls intermediate.

**In conclusion...** reducing dietary crude protein resulted in decreased growth performance while minimal improvements in fecal dry matter were observed during the experimental period. The source or inclusion of insoluble fiber in nursery diets had no impact on performance. The inclusion of cellulose improved fecal dry matter compared to feeding no dietary fiber or coarse wheat bran. More information is available on this experiment and others in the KSU Swine Day report at [www.KSUswine.org](http://www.KSUswine.org). (This study conducted by *K.L. Batson, H.I. Calderón, M.D. Tokach, J.C. Woodworth, R.D. Goodband, and J.M. DeRouchey*.)

☞ **Improving Performance of Finishing Pigs with Added Val, Ile, and Trp: Validating a Meta-analysis Model** - Based on a recent meta-analysis, we hypothesized that increased dietary Val, Ile, or Trp could correct possible amino acid interactions caused by high dietary Leu in diets containing high levels of corn protein, namely dried distiller's grains with solubles (DDGS). A total of 1,200 pigs (PIC TR4 × (Fast LW × PIC L02); initially 74.0 ± 1.38 lb) were used in a 103-d study. The 6 dietary treatments were corn-soybean meal-DDGS-based diets as follow: low level of Lys-HCl (HSBM), high Lys-HCl and moderate Ile, Val, Trp (NC; AA above NRC 2012 estimates), moderate Lys-HCl and high Ile, Val, Trp (PC), and PC with either increased L-Val (PC+Val), L-Ile (PC+Ile), or L-Trp (PC+Trp). Diets contained 30% DDGS until pigs reached approximately 217 lb and then were fed diets with 20% DDGS until market. Data were analyzed as a randomized complete block design using lmer function in lme4 package in R with pen considered as the experimental unit, body weight and pen location as a blocking factor, and treatment as a fixed effect with 10 replicates/treatment. In the grower period, ADG was greater ( $P < 0.05$ ) for the pigs fed HSBM and PC+Val diets than the NC with PC, PC+Ile, and PC+Trp intermediate. Pigs fed HSBM were more ( $P < 0.05$ ) efficient than the NC and PC with PC+Val, PC+Ile, and PC+Trp intermediate. In the late finisher period, ADG was greater for pigs fed PC+Ile than that of the NC with HSBM, PC, PC+Val, and PC+Trp intermediate. Pigs fed PC+Val had greater ADFI than the NC with HSBM, PC, PC+Ile, and PC+Trp intermediate. However, PC+Ile pigs were more efficient than PC+Val pigs with HSBM, NC, PC, and PC+Trp intermediate. Overall, final BW, ADG, and hot carcass weight (HCW) were greater for pigs fed HSBM, PC+Val, and PC+Ile diets than the NC with PC and PC+Trp intermediate. Pigs fed the PC+Val diet had greater ADFI than the NC with pigs fed HSBM, PC, PC+Ile, and PC+Trp intermediate. No differences were detected between treatments for overall F/G or other carcass characteristics.

**In conclusion...** increasing Val or Ile in high Lys-HCl-DDGS-based diets improved growth performance and final BW compared with pigs fed diets containing high levels of Lys-HCl without added Val and Ile. These results demonstrate that negative effects of high Leu concentrations in corn-DDGS-based diets can be corrected by increasing the ratios of Val and Ile to Lys. More information is available on this experiment and others in the KSU Swine Day report at [www.KSUswine.org](http://www.KSUswine.org). (This study conducted by *H.R. Kerkaert, H.S. Cemin, J.C. Woodworth, J.M. DeRouchey, S.S. Dritz, M.D. Tokach, R.D. Goodband, K.D. Haydon, C. Hastad, and Z. Post*.)



# WHAT'S NEW...

☞ **Determining the Phosphorus Release Curve for Smizyme TS G5 2,500 Phytase in Nursery Pigs** - A total of 280 nursery pigs were used in a 21-d growth trial to determine the available P (aP) release curve for Smizyme TS G5 2,500. Pigs were weaned at approximately 21 d of age, randomly allotted to pens based on initial body weight (BW) and fed common starter diets. On d 21 post-weaning, considered d 0 of the study, pens were blocked by BW and randomly allotted to 1 of 7 dietary treatments with 5 pigs per pen and 8 pens per treatment. Seven 1-ton batches of basal diet were manufactured and subsequently divided to be the major portion of experimental diets. Dietary treatments were formulated to include increasing aP derived from either an inorganic P source (0.11%, 0.19%, or 0.27% from monocalcium P) or increasing phytase (250, 500, 1,000, or 1,500 FTU/kg). Diets were corn-soybean meal-based and contained 1.24% standardized ileal digestible (SID) lysine with other amino acids set to meet or exceed NRC requirement estimates. Prior to beginning the 21-d study, all pigs were fed the negative control diet containing 0.11% aP for a 3-d period (d 18 to 21 post-weaning). Diets containing phytase were submitted for complete phytase analysis using the AOAC official method 2000.12 and analyzed concentrations were 265, 470, 1,000, or 1,450 FTU/kg. On d 21 of the experiment, the pig closest to the mean BW in each pen was euthanized and the right and left fibula were collected to determine bone ash with one fibula defatted and the other not prior to ashing. Overall (d 0 to 21), pigs fed increasing aP from inorganic P had improved performance across all response criteria measured. When using both the defatted and non-defatted bone mineral procedures, pigs fed increasing aP from inorganic P had increased bone ash weights and percentage bone ash. Pigs fed increasing phytase had increased bone ash weights and percentage bone ash. The aP release increased up to the highest phytase dose when using G:F, bone ash weight or defatted percentage bone ash as indicators of release. When using average daily gain and non-defatted percentage bone ash, aP release increased in a linear and quadratic fashion.

**In conclusion...** The magnitude of aP release curves depends on the response criteria measured, but Smizyme TS G5 2,500 appears to have a similar aP release to other commercially available phytase sources. When combining the release values for defatted bones in this experiment with a previous experiment, the aP release equations for Smizyme TS G5 2,500 are:  $aP = (0.197 \times FTU) \div (584.956 + FTU)$ ,  $aP = (0.175 \times FTU) \div (248.348 + FTU)$ , and  $aP = (0.165 \times FTU) \div (178.146 + FTU)$  for ADG, G:F, and percentage bone ash, respectively. More information is available on this experiment in the KSU Swine Day report at [www.KSUswine.org](http://www.KSUswine.org). (This study conducted by M.R. Wensley, J.C. Woodworth, J.M. DeRouchey, S.S. Dritz, M.D. Tokach, R.D. Goodband, H.I. Calderón, J.M. Faser, and B.L. Guo.)

☞ **Evaluating the Distribution of African Swine Fever Virus Within a Feed Mill Environment Following Manufacture of Inoculated Feed** - With the global spread of African swine fever virus (ASFV) and evidence that feed and/or ingredients may be potential vectors for pathogen transmission, it is critical to understand the role the feed manufacturing industry may have in regard to potential distribution of this virus. A pilot-scale feed mill consisting of a mixer, bucket elevator, and relevant spouting was constructed in the Biosafety Level-3 Biosecurity Research Institute. A batch of feed was primed through the system to verify the system was ASFV negative then, a previously inoculated feedstuff contaminated with ASFV was added into the mixer with other, non-infected ingredients. Ingredients were mixed and discharged through the bucket elevator. Subsequently, four additional ASFV-free batches of feed were manufactured. Environmental swabs from 18 locations were collected after each batch of feed was discharged with locations categorized into four zones: A) feed contact surface, B) non-feed contact surface but < 1 meter away from feed, C) non-feed contact surface > 1 meter from feed, and D) transient surfaces such as worker shoes. Environmental swabs were analyzed using qPCR analysis for the P72 viral genome in a laboratory setting to detect ASFV DNA. As expected, no environmental swabs collected prior to inoculation contained detectable ASFV DNA, as reported with Ct value or genomic copy number/mL. Environmental swabs collected after the manufacture of ASFV-inoculated feed resulted in contamination of all zones. There was no evidence of sampling zone × batch interaction. There was no evidence of a difference in the proportion of PCR positive reactions between sampling location or batch of feed throughout the experiment indicating that once ASFV contamination entered the facility the contamination quickly became widespread and persisted on the environmental surfaces even after manufacturing subsequent batches of ASFV non-inoculated feed. Samples from transient surfaces had more detectable ASFV (a lower Ct value) compared to all other surfaces, and samples collected after sequence 3 had less detectable ASFV (a greater Ct value) compared to samples collected immediately following manufacture of the inoculated batch of feed. There was evidence of a sampling zone × batch interaction for the number of genomic copies/mL. For samples collected after manufacture of the inoculated batch of feed, a lower number of genomic copies/mL was observed for swabs collected from non-feed contact surfaces > 1 m from feed contact surfaces compared to feed contact surfaces with other surfaces having no evidence of a difference from either. Following sequence 1, 2, and 3, samples collected from the transient surfaces had a greater number of genomic copies/mL detected compared to other sampling locations. After sequence 4, there was no evidence of a difference in the number of detected genomic copies/mL between sampling locations.

**In conclusion...** Once ASFV was introduced into a feed manufacturing environment, the virus became widely distributed throughout the facility with only minor changes in detection as subsequent batches of feed were produced. More information is available on this experiment at [www.KSUswine.org](http://www.KSUswine.org). (This study conducted by C.G. Elijah, C.K. Jones, J.C. Woodworth, C. B. Paulk, C. R. Stark, N.N. Gaudreault, J.D. Trujillo, J.A. Richt, and J.T. Gebhardt.)

# ASI FACULTY SPOTLIGHT...



**David Grieger** ([dgrieger@k-state.edu](mailto:dgrieger@k-state.edu); 785-532-1229)

## **Professor, Beef Cattle Reproduction**

Dr. David Grieger is from a small town in Indiana. His major teaching and research interests are applied and basic reproductive physiology with an emphasis in cattle.

Dr. G. teaches courses that include topics on estrous synchronization, ultrasonography, pregnancy diagnosis, and calving. He also teaches a course on applications of biotechnology to animal agriculture as well as co-teaches Animal Reproduction with Dr. Davis. He has led two international study tours, one to Costa Rica and one to South Africa. In addition to his teaching responsibilities, he also advises undergraduate students.

His applied research interests focus on estrous synchronization and timed artificial insemination protocols for beef heifers. Dr.G.'s basic research focuses on genes important to reproductive function in livestock. Recently, his lab has worked on developing bovine stem cells for biotechnical applications. He has a 60% Teaching and 40% Research appointment in the department.

Dr. Grieger's applied research emphasis is the development of estrous synchronization and artificial insemination systems for beef heifers. Specifically, studies using timed-insemination to eliminate estrous detection. The objective is to fine-tune different systems that result in acceptable AI conception rates and are practical for producers to use.



**Valentina Trinetta** ([vtrinetta@k-state.edu](mailto:vtrinetta@k-state.edu); 785-532-1667)

## **Associate Professor, Food Microbiology and Safety**

With an emphasis in Food Safety and Microbiology, Dr. Trinetta's research focuses on understanding foodborne pathogens ecology and identifying microbial entry routes into the food supply chain (from farm to fork). Dr. Trinetta also works on the development and implementation of antimicrobial intervention strategies to reduce and control foodborne pathogens on different commodities. Recently, Dr. Trinetta has expanded her research to the international scale with a project focused on evaluating microbial contamination in produce distribution centers for informal markets in Cambodia.

The main microorganisms studied in Dr. Trinetta's lab include *Salmonella monovariant*, *Listeria* and STEC *E. coli*.

Born and raised in Lake of Como area (Italy), Dr. Valentina Trinetta always enjoyed the idea to make an impact for the community, keeping food safe. She obtained her degrees in Food Science and Technology with an emphasis on active packaging and food safety. During her study, she moved to the USA as a visiting scholar (Penn State University). After her post-doctoral training (Purdue University), she worked 4 years at the Research and Development Center of ECOLAB. Dr. Trinetta started her position as an Assistant Professor at KSU in 2016 and she is enjoying Manhattan community with her husband and children, Eleanor and Michael.

# WHAT PRODUCERS SHOULD BE THINKING ABOUT

## WHAT PRODUCERS SHOULD BE THINKING ABOUT IN JANUARY...

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

#### Cow herd management

- ☑ Historically, cull cow prices have increased during the next two or three months. Check your breakevens.
- ☑ Continue feeding or grazing programs started in early winter. Weather conditions may require wrapping up grain sorghum and cornstalk field grazing. Severe winter weather may begin to limit crop residue utilization, so be prepared to move to other grazing and feeding systems
- ☑ Supplement to achieve ideal BCS at calving.
  - ↳ Use this formula to compare the basis of cost per lb. of crude protein (CP):  
Cost of supplement, \$ per hundredweight (cwt.) ÷ (100 X % CP) = cost per lb. of CP.
  - ↳ Use this formula to compare energy sources on basis of cost per lb. of TDN:  
Cost, \$ per ton ÷ [2,000 X % dry matter (DM) X % TDN in DM] = cost per lb. of TDN.
- ☑ Control lice: external parasites could increase feed costs.
- ☑ Provide an adequate water supply. Depending on body size and stage of production, cattle need 5-11 gallons (gal.) of water per head per day, even in the coldest weather.
- ☑ Sort cows into management groups. BCS and age can be used as sorting criteria. If you must mix age groups, put thin and young cows together, and feed separately from the mature, properly conditioned cows.
- ☑ Use information from forage testing to divide forage supplies into quality lots. Higher-quality feedstuffs should be utilized for replacement females, younger cows, and thin cows that may lack condition and that may be more nutritionally stressed.
- ☑ Consult your veterinarian regarding pre- and post-partum vaccination schedules.
- ☑ Continue mineral supplementation. Vitamin A should be supplemented if cows are not grazing green forage.
- ☑ Plan to attend local, state, and regional educational and industry meetings.
- ☑ Develop replacement heifers properly. Weigh them now to calculate necessary average daily gain (ADG) to achieve target breeding weights. Target the heifers to weigh about 60%-65% of their mature weight by the start of the breeding season. Thin, lightweight heifers may need extra feed for 60-80 days to “flush” before breeding.
- ☑ Bull calves to be fed out and sold in the spring as yearlings should be well onto feed. Ultrasound measurements should be taken around one year of age and provided to your breed association.
- ☑ Provide some protection, such as a windbreak, during severe winter weather to reduce energy requirements. The LCT is the temperature at which a cow requires additional energy to simply maintain her current body weight and condition. The LCT for cattle varies with hair coat and body condition. Increase the amount of dietary energy provided 1% for each degree (including wind chill) below the LCT.

*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](mailto:lschrein@ksu.edu) or phone 785-532-1267.*