News from KSU Animal Sciences

Season's Greetings,

No doubt 2020 will go down as one of the most unique years in our lifetime. The challenges and changes that 2020 has levied against us can easily distract from the many positive aspects of our livestock and food industries. The generally good weather across Kansas, above average crop and forage yields, as well the ability for youth to play fall sports, have county fairs and exhibit at 4-H livestock shows, and other activities allowed us to find positive memories to reflect on this past year.

We continue to learn and adapt and through Extension programming. Our Kansas livestock producers received more information than ever from state and local sources to assist with their operations this past year. Our Extension specialists delivered information face-to-face when possible and expanded video delivery that reached not only Kansas stakeholders but those in other states and countries as well.

As we look to 2021, we encourage all livestock producers to utilize the vast resources available through county, area and state Extension personnel. K-State will always be open for business; we are here to serve you anyway possible to meet your needs.

Thank you and have a Merry Christmas and Prosperous New Year!
Joel DeRouchey, Extension State Leader, Animal Sciences and Industry

- **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 2021 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 31, 2020, with small livestock tag orders being due January 29, 2021. 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/). There is an alternate meat goat tag option this year, which is a round tag. The new tag or the previous ribbon tag will be accepted for state shows. Payment is required to accompany the completed order form for it to be accepted. Counties 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 or 785-532-1264.

- A series of **KSU Calving Schools** has been planned for January 2021 in anticipation of calving season. The program will outline overall calving management that includes stages of the normal calving process as well as tips to handle difficult calving situations. The goals of the event are to increase knowledge, practical skills and the number of live calves born if they need assistance. Dates and locations for the 2021 calving schools include:
  January 6 – Emporia, KS; Contact Brian Rees, Lyon County Extension, brees@k-state.edu
  January 11 – Winfield, KS; Contact Kelsey Nordyke, Cowley County Extension, klnordyke@ksu.edu.
  January 13 – Blue Rapids, KS; Contact Anastasia Meyer, Marshall County Extension, anastasia@ksu.edu.
  January 21 – Dodge City, KS; Contact Andrea Burns, Ford County Extension, aburns@ksu.edu
  Visit www.KSUBeef.org for more details and registration information. For questions, contact A.J. Tarpoff (tarpoff@ksu.edu; 785-532-1255).

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

- **K-State Winter Ranch Management Seminar Series** - The 2021 Winter Ranch Management Seminar Series will be a face-to-face meeting with a series of presentations focused on enhancing profit in beef production and a 'Town Hall' question-and-answer session when producers can ask questions to local/ district and state extension specialists. Dates and locations for the seminars include:

  January 28, 2021, 6 - 9 pm – Agricultural Research Center Auditorium, Hays
  February 16, 2021, 1 - 3 pm – Beaumont Depot Community Center, Beaumont
  February 16, 2021, 6 - 9 pm – Morris County Community Building, Council Grove

  Please RSVP to selected location contacts by close of business one week before the event. A maximum of 40 attendees will be allowed at each location. Online updates about the series can be found at www.KSUBeef.org. For more information, contact Dale Blasi (dblasi@ksu.edu; 785-532-5427) or Lois Schreiner (lschrein@ksu.edu; 785-532-1267).

- **Kansas Junior Swine Producer Week** - This year the junior producer days will be hosted virtually as a week-long educational series. A few sessions will be held on weeknight evenings, with the program wrapping up on Saturday morning. Junior Swine Producer Week is scheduled for February 15-20, 2021. All ages and knowledge levels are invited! K-State faculty members, graduate students and guest speakers will cover topics including selection, nutrition and feeding, meat science, health, grooming and clipping, showmanship, and the state livestock nomination process. The program will be free this year, but all attendees, including youth and adults, must register online (https://bit.ly/KSUJrSwineWeek). For more information, contact Lexie Hayes at adhayes@ksu.edu or 785-532-1264.

- Watch for more details coming soon on the **2021 KSU Cattlemen's Day** to be hosted on Friday, March 5, 2021. For more information, contact Dale Blasi (dblasi@ksu.edu; 785-532-5427) or Ken Odde (kenodde@ksu.edu; 785-532-1227).

- **Kansas Junior Meat Goat Producer Week** - This year the junior producer days will be hosted virtually as a week-long educational series. A few sessions will be held on weeknight evenings, with the program wrapping up on Saturday morning. Junior Meat Goat Producer Week is scheduled for March 15-20, 2021. All ages and knowledge levels are invited! K-State faculty members, graduate students and guest speakers will cover topics including selection, nutrition and feeding, livestock guardian dogs, health, grooming and clipping, showmanship, and the state livestock nomination process. The program will be free this year, but all attendees, including youth and adults, must register online (https://bit.ly/KSUJrMeatGoatWeek). For more information, contact Lexie Hayes at adhayes@ksu.edu or 785-532-1264.

CALENDAR OF UPCOMING EVENTS

Date	Event	Location
January 6, 2021	KSU Calving School	Emporia, KS
January 11, 2021	KSU Calving School	Winfield, KS
January 13, 2021	KSU Calving School	Blue Rapids, KS
January 21, 2021	KSU Calving School	Dodge City, KS
January 28, 2021	K-State Winer Ranch Management Seminar	Hays. KS
February 15-20, 2021	Junior Swine Producer Week – Virtual event	
February 16, 2021	K-State Winter Ranch Management Seminar	Beaumont, KS
February 16, 2021	K-State Winter Ranch Management Seminar	Council Grove, KS
March 5, 2021	KSU Cattlemen's Day	
March 15-20, 2021	Junior Meat Goat Producer Week – Virtual event	

What's New…..

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

"Reflection"

The current year will soon be ending. This is a great time for individuals and organizations to reflect back on the events of the past 12 months. The value of reflection within an organization dramatically increases if it is used as a tool to evaluate not only where the organization has been but also where it is headed. A few basic questions may be used to guide the process.

What did you or the business succeed at?
What were your failures?
What was learned from those successes and failures?
What would you like to do more of or what generated positive outcomes for the organization?
What should you stop doing?

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

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

"Cold Stress in Cattle"

Most cattle producers appreciate that cold weather increases nutrient requirements. However, what increases? And by how much?

Cattle are most comfortable within the thermoneutral zone when temperatures are neither too warm nor cold. The upper and lower boundaries of the thermoneutral zone are referred to as the upper and lower critical temperature. During the winter months, cattle experience cold stress anytime the effective ambient temperature, which takes into account wind chill, humidity, etc., drops below the lower critical temperature. The lower critical temperature is influenced by both environmental and animal factors including hair coat and tissue insulation (body condition). The table below lists the estimated lower critical temperatures of cattle in good body condition with different hair coats. In wet conditions cattle can begin experiencing cold stress at 59°F, which would be a relatively mild winter day. However, if cattle have time to develop a sufficient winter coat the estimated lower critical temperature under dry conditions is 18°F.

Estimated lower critical temperatures for beef cattle	
Coat Condition	Critical Temperature
Wet or summer coat	59°F
Dry fall coat	45°F
Dry winter coat	32°F
Dry heavy winter coat	18°F

Cold stress increases maintenance energy requirements but does not impact protein, mineral or vitamin requirements. The general rule of thumb (for a cow in good body condition, BCS = 5 or greater) is to increase the energy density of the ration by 1% for each degree (Fahrenheit) below the lower critical temperature. The classic response to cold stress in confinement situations is an increase in voluntary intake. However, it has been documented that cattle maintained in extensive environments (native range, wheat pasture, corn stalks) may spend less time grazing as temperatures decline below freezing, which reduces forage intake (Adams et al., 1986) and makes the challenge of meeting the cow's nutrient requirements even greater. In many cases feeding a greater amount of low-quality hay will replace grazed forages but may not provide sufficient energy. Therefore, providing additional energy by feeding a higher-quality hay or fiber-based supplement (DDGS, Corn gluten feed, or Soybean Hulls) may be required.

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

- **Effect of Crude Protein Level and Coarse Wheat Bran on Nursery Pig Growth Performance** - Two experiments were conducted to determine the effect of adding coarse wheat bran with reduced crude protein level on the growth performance and fecal dry matter of nursery pigs in diets without pharmacological levels of zinc oxide. A total of 300 and 350 pigs, initially 15.4 and 13.7 lb body weight (BW), were used in Exp. 1 and 2, respectively. There were 5 pigs per pen and 12 and 14 replicates per treatment in Exp. 1 and 2, respectively. After weaning, pigs were fed a common pelleted diet with pharmacological levels (3,000 ppm Zn) from ZnO for 10 d in Exp. 1, and without pharmacological levels of ZnO for 14 d in Exp. 2. Then, pens were assigned to one of 5 dietary treatments in a randomized complete block design with BW as the blocking factor. In Exp. 1 and 2, treatment diets were offered in mash form and in one dietary phase. All dietary treatments contained 4% coarse wheat bran and consisted of: 1) positive control with ZnO (2,000 ppm Zn) and 21% crude protein (CP) formulated to 1.35% standardized ileal digestible (SID) lysine; 2) a diet with 110 ppm added Zn and 21% CP (1.35% SID lysine); 3) a diet with 110 ppm added Zn formulated to 18% CP (1.20% SID lysine); 4) an 18% diet with 110 ppm added Zn formulated to 1.35% SID lysine by the addition of feed grade amino acids; and 5) diet 4 with the addition of non-essential amino acids (glycine and glutamic acid). A common post-treatment pelleted diet was fed for 14 d in Exp. 2 but not in Exp. 1. Data were analyzed using the lmer function from the lme4 package in R. In Exp. 1, pigs fed diets with 21% CP had increased ADG and heavier final BW, however treatment means did not separate when Tukey adjustment was applied during statistical analysis. Pigs fed diets with 21% CP had improved feed efficiency similarly to pigs fed 18% CP diets with the addition of non-essential amino acids. During the experimental period in Exp. 2, pigs fed high CP diets with ZnO had increased ADG compared to pigs fed the 18% CP diet with 1.2% SID lysine and the 18% CP diet with high levels of feed grade essential amino acids. Feed efficiency was improved for pigs fed the 18% CP diet with added non-essential amino acids and pigs fed both 21% CP diets compared to the other 18% CP diets without ZnO. Compared to pigs fed 18% CP diets, pigs fed diets with 21% CP had increased d 13 BW. Visual fecal score was decreased for pigs fed the 18% CP diets compared to pigs fed 21% CP without added ZnO in Exp. 1 and pigs fed the 21% CP diet without ZnO experienced increased visual fecal score in Exp. 2. No evidence for differences in fecal dry matter were observed throughout either trial; however, when Exp. 1 and Exp. 2 were combined, increased fecal dry matter was observed for pigs fed the 1.2% SID lysine diet compared to pigs fed 21% CP diets on d 6. Fecal dry matter was increased on d 13 for pigs fed the reduced Lys (1.2% SID lysine) diet compared to pigs fed 21% CP without ZnO.

  In conclusion… Results from these experiments suggest that reducing crude protein decreases growth performance compared to pigs fed high crude protein diets. Adding glycine and glutamine to the low CP diets improved feed efficiency, but not daily gain. More information is available on this experiment and others in the KSU Swine Day report at www.KSUswine.org. (This study conducted by K.L. Batson, H.I. Calderón, M.D. Tokach, J.C. Woodworth, R.D. Goodband, S.S. Dritz, and J.M. DeRouchey.)

- **Evaluation of Cellulose in Diets with and without added ZnO on Nursery Pig Performance** - A total of 1,296 pigs were used in a 42-d study to evaluate the addition of cellulose in diets with and without the inclusion of pharmacological levels of Zn on nursery pig growth performance. Pigs were weaned at approximately 20 d of age and randomly allotted to pens in a randomized complete block design by body weight (BW). Pens of pigs were allotted to 1 of 4 dietary treatments with 27 pigs per pen and 12 replications per treatment. Dietary treatments were arranged in a 2 × 2 factorial with main effects of cellulose (0 vs. 1%;) and Zn (200 ppm vs. 3,000 ppm in phase 1 diets and 110 ppm vs. 2,000 ppm in phase 2 diets with added zinc provided by zinc oxide). Treatment diets were formulated in two dietary phases which were fed from approximately d 0 to 7 and 7 to 21 with a common phase 3 diet fed from d 21 to 42 post-weaning. Pig weights and feed disappearance were collected weekly to determine average daily gain (ADG), average daily feed intake (ADFI), and feed efficiency (F/G). On day 16 or 17, fecal samples were collected from 3 pigs per pen to determine fecal DM and all pens were visually evaluated for fecal consistency. There were no Zn × cellulose interactions observed. For the experimental period (d 0 to 21), pigs fed diets containing added Zn had increased ADG, ADFI, and BW and improved F/G while those that were fed cellulose had decreased ADG. For fecal dry matter, there was no evidence for difference between any of the four dietary treatments but those fed added ZnO had visually firmer feces. When pigs were fed a common diet (d 21 to 42), pigs previously fed diets containing added ZnO had increased ADG and improved F/G. For the overall period (d 0 to 42), pigs who had been fed added Zn had increased ADG, ADFI, and BW and improved F/G, while those who had been fed cellulose had decreased ADG.

  In conclusion… there were no interactive effects between added cellulose and Zn. The addition of cellulose reduced ADG, but did not affect F/G, while the inclusion of pharmacological levels of Zn improved all growth criteria. More information is available on this experiment and others in the KSU Swine Day report at www.KSUswine.org. (This study conducted by *J.A. Chance, M.D. Tokach, H.I. Calderón, J.C. Woodworth, J.M. DeRouchey, and R.D. Goodband*.)

- **Evaluation of AviPlus on Growth Performance of Nursery and Growing-Finishing Pigs** - This experiment was conducted to determine the effect of AviPlus on growth performance during the wean-to-finish period in a commercial research environment. A total of 1,215 pigs were used in a 156-d wean-to-finish experiment. Pigs were weaned at approximately 21 d of age and placed in pens based on initial body weight (BW) with 27 pigs per pen in a randomized complete block design. During the 42-day nursery period, pigs were allotted to 1 of 2 treatments in an unbalanced treatment structure with 15 pens (replications) fed the control diet and 30 pens (replications) fed diets containing AviPlus at 6 lb/ton from d 0 to 21 and 2 lb/ton from d 21 to 42. On d 42, pigs were transported as intact pens from the nursery to the commercial finishing facility. During the finishing period, 3 treatments were applied which included: 1) pigs on the control diet in nursery remained on control diets; 2) 50% of pigs in nursery provided AviPlus were then fed 1 lb AviPlus throughout finishing, and 3) 50% of pigs in nursery provided AviPlus were then fed the control diet throughout finishing. All pens on finishing treatments 2 and 3 were allotted based on ending nursery BW to the finishing treatment. There were 15 replications per treatment in the finishing period. From d 0 to 21, pigs fed diets with AviPlus had a tendency for improved F/G when compared to pigs fed the control diet; however, there was no evidence of difference for ADG, ADFI, or d 21 BW. From d 21 to 42, there was no evidence of difference for ADG, ADFI, or F/G. For the overall nursery period (d 0 to 42), pigs fed diets with AviPlus had improved F/G when compared to pigs fed the control diet, but there was no evidence of difference for d 42 BW, ADG, or ADFI between treatments. From d 42 to 106, there was no evidence of difference for ADG, ADFI, and F/G. However, from d 106 to 156, pigs fed diets containing AviPlus in both the nursery and finishing periods had decreased ADG when compared to pigs fed the control diet and pigs receiving AviPlus only in the nursery with no evidence of difference for other growth responses. For the overall finishing period (d 42 to 156) and overall experimental period (d 0 to 156), there was no evidence of difference for BW, ADG, ADFI, or F/G. For mortality and removals, there was no evidence of difference observed during the nursery, finishing or overall.

  In conclusion… providing AviPlus during the nursery phase improved early and overall nursery F/G, but there was no effect on overall wean-to-finish performance. More information is available on this experiment and others in the KSU Swine Day report at www.KSUswine.org. (This study conducted by *W.M. Hutchens, M.D. Tokach, J.C. Woodworth, J.M. DeRouchey, R.D. Goodband, H.I. Cartagena, K. Keppy, K. Stephens, and P. Maynard.)*

- **Effects of Different Corn Protein Sources and Level on Nursery Pig Growth Performance and Feed Efficiency** - This experiment was conducted to determine the effects of 3 corn protein sources added at the expense of other specialty protein sources or corn on nursery pig growth performance and feed efficiency, and economic return. A total of 315 pigs were used in a 35-d growth trial. There were 5 pigs per pen and 9 replicates per treatment. The treatments were structured as a randomized complete block design and arranged in a 3×2+1 factorial with main effects of corn protein source and level (5 or 10%) plus a control diet. Treatment diets were fed in 2 phases (phase 1: d 0 to 7; phase 2: d 7 to 21) with a common diet fed from d 21 to 35. In phase 1, protein sources were added at the expense of fish meal in the 5% inclusion diets and replaced both fish meal and enzymatically treated soybean meal (HP300) for the 10% inclusion diets. In phase 2, protein sources were added at the expense of fish meal in the 5% inclusion diets, and both fish meal and corn in the 10% inclusion diets. All diets were fed in pellet form throughout the trial. In the treatment period (d 0 to 21), increasing corn protein sources decreased ADG and ADFI. Feed efficiency worsened when pigs were fed increasing CP1 or CP2 and tended to worsen when fed increasing CP3. The growth performance was poorest when the 10% level of the corn protein sources were fed with the 5% level of CP2 or CP3 eliciting similar performance to the control-fed pigs. Pigs fed CP1 had decreased ADG and ADFI compared to those fed CP2 or CP3. The poorer growth performance of pigs fed CP1 resulted in lower d 21 BW compared to those fed CP2 or CP3. There was no evidence of difference between pigs fed CP2 and CP3 on all growth performance criteria throughout the treatment period. In the common period (d 21 to 35), compensatory growth and feed intake were observed, but final BW was still lower when pigs were fed diets with any of the corn protein sources compared to pigs fed the control diet.

  In conclusion…increasing amounts of these three corn protein sources, at the expense of specialty protein sources such as fishmeal, decreased growth performance in nursery pigs; however, the magnitude of impact differed between corn protein sources and level with 5% inclusion of CP2 and CP3 eliciting similar performance to the control. Additional research should be conducted to further compare corn protein sources and help identify why some sources influence performance differently than others. More information is available on this experiment and others in the KSU Swine Day report at www.KSUswine.org. (This study conducted by *Z.X. Rao, J. Woodworth, M. Tokach, S. Dritz, J. DeRouchey, R. Goodband, H.I. Cartagena, and K. Mertz.)*

ASI Faculty Spotlight

Jessie Vipham (jessiev@k-state.edu; 785-532-3486)
Assistant Professor

Jessie was raised on a registered Angus ranch in Northeastern Nevada. Growing up in a rural part of the country, Jessie was highly active in 4-H and FFA and held several offices at the local, county, and state level for both organizations. Her major focus was her beef and sheep projects, but she also participated in livestock judging and public speaking. Jessie graduated from Kansas State University with a B.S. in Agricultural Business in 2009. She decided to extend her education and received her M.S. (2011; Meat Science) and PhD (2015; Animal Science) from Texas Tech University. In her time at Texas Tech, Jessie discovered a passion for international research, and began to focus her efforts on food security research in Latin America. Jessie joined the College of Ag Feed and Future Innovation Lab in 2015 and moved to the Department of Animal Science and Industry at Kansas State University in 2019.

Jessie's graduate training is in food microbiology and food safety. As a graduate student her research focused on applied meat safety—including pre- and post-harvest interventions, pathogen monitoring and control, and pathogen baseline research—and food security. She has been involved in food security research in Central America, South America, Africa and Asia. Jessie's research at KSU focuses on investigating and improving food safety systems in low- and middle-income countries and creating capacity building and training programs. This research aims to provide scientific resources and data to improve the safety of food produced in various production systems, support the production and consumption of nutritious food, to increase involvement and empowerment of women in agricultural production and processing, to prevent food loss and waste due to unsafe food.

Jessie is a country girl at heart and enjoys spending time on her family's ranch as much as possible. She maintains her own small herd of registered Angus mother cows there as well. She also enjoys traveling both international and domestic, cooking, and spending time with her adorable dogs, Gus and Newt.

Casy Winn (ccwinn@k-state.edu; 785-532-5044)
Instructor/Rodeo Coach

Casy was raised in Nephi, Utah. He grew up working on the family horse and cattle ranch. He also worked on a local dairy farm. Upon graduation from Utah State University in 1993, he began a teaching and coaching career in Lake Los Angeles, California, then to Duchesne County Utah, and eventually to his hometown at Juab High School.

In high school Casy was actively involved in 4-H, FFA, wrestling, and rodeo. He was the 1981 Juab County Beef Carcass Contest winner, 1982 Utah state 4-H champion horseman, 1984 state champion FFA individual soil judge, on the 1985 region champion wrestling team, and a 1985 NHSRA national finals qualifier in the bull riding. He also served on the 4-H youth council, FFA officer team, and in leadership positions with his church youth group.

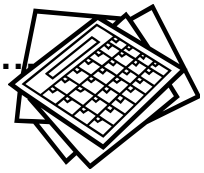
At Utah State University, Casy was a member of the rodeo team, twice earning a year-end 3rd place position in tbull riding and finishing among the top 10 team ropers. Casy also competed in open and professional events, earning reserve champion in the RMRA bull riding in 1988.

Casy along with his wife Wendy and their children - Dixon, Shad, and Kyleigh - spend their time training horses, practicing for, and competing in rodeos. They own Winn Rodeo Livestock raising rodeo cattle and training horses. Along with this they have produced, managed, and contracted stock for several junior rodeo associations. Casy served as the director for the Utah State 5th and under Rodeo Association and on the UHSRA livestock committee. He has also judged Jr. High, high school, and open rodeos.

Casy joined Kansas State University in the summer of 2015 as the Rodeo Coach and Equine Instructor.

What Producers Should Be Thinking About…..

WHAT PRODUCERS SHOULD BE THINKING ABOUT IN FEBRUARY…..



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

- ☑ Historically, cull cow prices are beginning to rise. Finish culling cows in order of priority:
  1. Those that fall within the "Four-O Rule" (Open, Old, Onry, Oddball).
  2. Those with physical/structure problems (feet and legs, eyes, teeth, etc.).
  3. Poor producers.
- ☑ Continue feeding or grazing programs started in early winter. Fully utilize grain sorghum and cornstalk fields. Severe winter weather may begin to limit crop residue utilization. Be prepared to move to other grazing and feeding systems.
- ☑ Supplement to achieve ideal body condition scores (BCS) at calving.
- ☑ Control lice, external parasites will increase feed costs.
- ☑ Provide an adequate water supply. Depending on body size and stage of production, cattle need 5-11 gallons of water per head per day, even in the coldest weather.
- ☑ Sort cows into management groups. Body condition score 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 postpartum 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 to 65% of their mature weight by the start of the breeding season. Thin, light weight heifers may need extra feed for 60 to 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 the association.
- ☑ Provide some protection, such as a windbreak, during severe winter weather to reduce energy requirements. The lower critical temperature (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 (Dry, heavy winter coat = 18 degrees, wet coat = 59 degrees). 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 or phone 785-532-1267.*