



# K News from KSU Animal Sciences

✍ **Developing and Implementing Your Company's HACCP Plan** for meat, poultry, and juice processors will be September 29-October 1, 2021, in Olathe, KS. Information and registration for the 2.5-day International HACCP Alliance accredited workshop is online at <http://bit.ly/HACCPCourse>. For more information, contact Dr. Liz Boyle at [lboyle@ksu.edu](mailto:lboyle@ksu.edu) or 785-532-1247.

✍ **KSU Beef Stocker Field Day to be hosted September 30, 2021** – Come and help us celebrate the 22<sup>nd</sup> KSU Beef Stocker Field Day which will be hosted Thursday, September 30, at the KSU Beef Stocker Unit in Manhattan. The day will start at 9:30 a.m. with registration/coffee and conclude with a good old-fashioned Prairie Oyster Fry and Call Hall ice cream at 5:30 p.m. The schedule is as follows:

- 9:30 am Registration/Coffee
- 10:15 am Introductions
- 10:30 am **Results of the 2021 National Stocker Survey –**  
*Wes Ishmael, Cattle Current, and Dale Blasi, K-State*
- 11:15 am **What Has Worked for Us and What We See into the Future**  
*National Beef Stocker Award Recipients:*
  - *Mike Collinge, Hamilton, KS*
  - *Rich Porter, Reading, KS*
  - *Dave Steinbecker, Jr., Perryville, MO*
  - *John Paul Pendergrass, Charleston, AR**Moderated by Wes Ishmael, Cattle Current*
- 12:30 pm Barbecue Brisket Lunch – View posters
- 1:15 pm **Beef Cattle Outlook - Glynn Tonsor, K-State**
- 2:00 pm **Can You Manage BRD and Coccidiosis Effectively with Receiving Rations for Backgrounding Stockers - Joe Dedrickson, Huvepharma Inc.**
- 3:00 pm Break
- 3:30 pm **A Novel Approach to Starting Newly Arrived Calves on Feed - John Richeson, West Texas A&M University**
- 4:15 pm **Comparison of Multiple Castration Methods in Stocker Cattle - AJ Tarpoff, K-State**
- 5:00 pm Cutting Bull's Lament 2021

The day will conclude with a good old-fashioned Prairie Oyster Fry and Call Hall ice cream. Pre-registration is \$25 and has been extended to September 20. For complete details and registration, visit [www.KSUbeef.org](http://www.KSUbeef.org). For more information, contact Dale Blasi ([dblasi@ksu.edu](mailto:dblasi@ksu.edu); 785-532-5427) or Lois Schreiner ([lschrein@ksu.edu](mailto:lschrein@ksu.edu); 785-532-1267).

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September 2021 issue



# UPCOMING EVENTS...

↩ Friday, October 15, 2021, is the date set for the **ASI Family & Friends Reunion**. This year we will be honoring US Premium Beef with the Don L. Good Impact Award. Make plans now to attend. Watch for more details coming soon.

↩ **Make plans now to attend the 2021 KSU Swine Day.** The 2021 KSU Swine Day will be hosted Thursday, November 18, 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, Feed Safety and Feed Processing

*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)

2:00 p.m. Swine Health Improvement Plan

*Dr. Rodger Main, Director at Iowa State University Veterinary Diagnostic Laboratory*

2:30 p.m. Adapting to a Changing Swine Industry Landscape

*Dr. Jon DeJong, President, Pipestone Nutrition, Pipestone, MN*

3:00 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](http://www.KSUswine.org). For more information, contact Lois Schreiner at [lschrein@ksu.edu](mailto:lschrein@ksu.edu) or 785-532-1267.

↩ **Youth for the Quality Care of Animals (YQCA) Instructor Certification** - YQCA is a national, multi-species youth livestock quality assurance program that was launched in 2017. Youth may participate in the program online or through a face-to-face class with a certified instructor. This is a fee-based program, which is \$12/child for the online course or \$3 for a face-to-face session. Kansas has renewed its partnership with the program for 2021-2022, which allows agents and ag teachers to have the opportunity to obtain their certification and teach youth the curriculum through face-to-face sessions. As the fourth program year comes to a close, YQCA will shut down the system in September. So, until October 1, youth will not be able to access the system to complete the training or obtain a number. The system will also be inaccessible to instructors, so no additional certification may be issued, classes created, profiles updated, etc. During this time, the YQCA staff will be uploading the new modules and curriculum for the 2021-2022 year, as well as performing system maintenance. Agents who were certified last year can re-certify beginning on October 1. Details will be distributed directly from YQCA to currently certified instructors.

Any new or additional agents who would like to become certified need to email Lexie Hayes at [adhayes@ksu.edu](mailto:adhayes@ksu.edu) to be added to the approved list for Kansas. New instructors will need to watch their email for a token from YQCA to set-up their instructor account and complete the certification.

Once agents complete the certification process, the YQCA staff will distribute the new materials and their certification will be valid until September 1, 2022. Although a final decision will be confirmed by each respective board, we do anticipate exhibitors will continue to be required to complete annual YQCA certification to participate in the Kansas State Fair Grand Drive and the Kansas Junior Livestock Show.

## CALENDAR OF UPCOMING EVENTS

Date	Event	Location
September 29-October 1, 2021	HACCP Workshop	Olathe, KS
September 30, 2021	KSU Beef Stocker Field Day	Manhattan
October 15, 2021	K-State ASI Family & Friends Reunion	Manhattan
November 18, 2021	K-State Swine Day	Manhattan

# WHAT'S NEW...

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

## *“What’s Your Talent Management Strategy?”*

Good help is truly hard to find and sometimes the best employee or leader is the one you already have. This is essentially the concept of “Talent Management” which is the strategy which an organization or business uses to hire, manage, retain, and develop employees for leadership roles. Many businesses lose exceptionally talented employees because their strengths and talents were not recognized. Additionally, an effective talent management strategy is a mechanism to groom and develop future leaders and managers. Managers play a key role in an organization’s talent management strategy, as they must identify talented, exceptional employees. Managers also serve as mentors, providing coaching and feedback to develop employees. Research conducted by the American Society for Training and Development documented that those organizations with the most successful talent management systems also asked managers to discuss the talents and skills of their most talented employees with other managers and leaders. Discussing the organizations most talented employees creates an internal talent pool that various departments can draw from to fill current positions. Do you have exceptional employees in your organization? What is your talent management strategy? Are you at risk of losing your best employees?

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

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

## *“Drivers of Calf Revenue”*

Many producers are weaning and will be marketing calves in the coming weeks and months. Margins in the cattle industry and agriculture in general are often unfortunately narrow. Maximizing calf revenue is important for cow/calf producers every year. Calf revenue from my academic perspective is driven by three factors, 1) the number of calves sold, 2) sale weight of calves and 3) price received.

Cow/calf producers to some extent have control over the number of calves sold and sale weight. The number of calves sold is essentially a function of stocking rate, cow fertility and/or reproduction on an operation. The sale weight of calves is more complex but is a multi-factorial combination of genetics, calving distribution, calf age, nutrition, management and technology use (implants). Price received is likely the most influential of the three factors that drive calf revenue and is the factor that cow/calf producers often believe they have the least ability to control. Once a set of calves enters the sale ring or appears on the video screen their value is determined by what two prospective buyers are willing to pay. Although it is impossible for producers to directly influence what buyers are willing to pay, I would argue that they are not completely helpless. Cow/calf producers directly control what they will sell (weaned calves, value-added calves or feeders) and determine when they will sell. These are difficult, complex decisions, that shouldn’t necessarily be made based upon weekly cattle sale reports or the thoughts of your favorite livestock market commentator. I am not saying that keeping informed about current market conditions isn’t important. However, that information, when used with resources like Beef Basis ([www.beefbasis.com](http://www.beefbasis.com)) that use data to evaluate different market scenarios, from selling six weight calves the first week of December to seven weights in February, helps producers make the best decision for their operations.

Producers also control what information or data they pass along to the new owner. Data has value in today’s world. I compare marketing calves to selling a beautifully restored pickup. If you were selling a pickup, you would share with a prospective buyer every bit of information you had and the details of the process, from the atmospheric conditions when the truck was painted to the actual sales invoice from 1972. Why should selling a set of calves be any different? Value-added programs and certified sales provide potential buyers with some degree of assurance that cattle were managed within the guidelines of the program. If you don’t participate in a defined program, providing the auctioneer or sales representative with as much information as possible about your cattle only helps them do their job better, which is to get the best price for your cattle.

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

☞ **Assistant or Associate Professor, Extension Cow-Calf Specialist (Job #511436)** - The Department of Animal Sciences and Industry is the largest department (approximately 1,100 undergraduates and 150 graduate students) in Kansas State University’s College of Agriculture. We are seeking applicants for a 12-month, tenure-track position (70% Extension, 30% Research). The position will be at the rank of Assistant or Associate Professor and located in Manhattan, KS. The successful individual is expected to develop an innovative and impactful extension program addressing issues facing the Kansas and U.S. beef cow-calf industry. Research focus will be consistent with the successful individual’s expertise, and participation in interdisciplinary research and extension team efforts is strongly encouraged. Kansas State University cow/calf resources include the Department of Animal Sciences and Industry’s commercial cow/calf and purebred herds located on campus, as well as two commercial herds located at Research and Extension Centers in Hays and Parsons, Kansas. Review of applications begins: October 31, 2021. For more information, contact Dale Blasi, Search Committee Chair, at 785-532-5427 or [dblasi@k-state.edu](mailto:dblasi@k-state.edu). To apply, go to <https://careers.pageuppeople.com/742/cw/en-us/job/511436/assistant-or-associate-professor>.

# WHAT'S NEW...

- ☞ **The Effect of Method of Collection and Number of Sequential Ejaculates on Semen Characteristics of Beef Bulls** - The objective of this study was to determine the effect of collection method and number of sequential ejaculates on beef bull ejaculate characteristics.

Semen collection data from 2008 to 2018 was obtained from the Kansas Artificial Breeding Service Unit and consisted of 11,642 ejaculates from 906 bulls. Bulls were collected twice weekly on Mondays and Thursdays with an artificial vagina. Bulls not receptive to the artificial vagina were subject to electro-ejaculation. A single technician was responsible for all pre-freeze and post-thaw semen analysis. Ejaculates were required to meet quality standards. Progressive motility before freezing was greater for bulls collected with electro-ejaculate compared to artificial vagina. Ejaculate volume for electro-ejaculate collections was greater than those collected with artificial vagina. Percent spermatozoa with secondary abnormalities was greater for bulls collected with electro-ejaculate compared to artificial vagina. Concentration of spermatozoa/mL was less for bulls collected with an electro-ejaculate ( $514 \times 10^6$ ) compared to artificial vagina ( $617 \times 10^6$ ). Total number of straws frozen/ejaculate was less for bulls collected with electro ejaculate (94) compared to artificial vagina (108). The number of ejaculates collected/day was significant for the percent of spermatozoa with secondary abnormalities. As ejaculate number/day increased, the concentration of spermatozoa decreased, and the number of straws frozen/ejaculate decreased.

**The Bottom Line...** Producers and collection facilities should work together to balance collection method and number of ejaculates collected/day to maximize production while maintaining semen quality. More information is available on this experiment in the KSU Cattlemen's Day report at [www.KSUBeef.org](http://www.KSUBeef.org). (This study conducted by A.R. Hartman, M.L. Butler, S.K. Tucker, N.M. Goodenow, J.M. Bormann, and D.M. Grieger.)

- ☞ **Comparison of the Physical Attributes of Plant-Based Ground Beef Alternatives to Ground Beef** - The objective of this study was to evaluate the physical attributes of three different plant-based ground beef alternatives in comparison to ground beef of three different fat percentages.

Ground beef of three different fat percentages, a retail pea protein-based ground beef alternative, and a traditional soy-based ground beef alternative were obtained from retail stores. Samples from 15 lots of a foodservice soy protein-based ground beef alternative were obtained from a foodservice chain. All samples were fabricated into 0.25 lb patties assigned to one of four assays: color analysis, texture profile analysis, shear force, and pressed juice percentage.

When evaluating raw color, traditional ground beef alternative had the highest  $a^*$  value and was redder when compared to all other treatments, with retail ground beef alternative having the lowest  $a^*$  value. Traditional and retail ground beef alternative had the highest  $a^*$  value, while foodservice ground beef alternative, and 30% and 10% fat ground beef had the lowest  $a^*$  value for cooked surface color. For texture attributes, retail and foodservice ground beef alternatives had lower values for cohesiveness, gumminess, hardness, and chewiness, as well as higher values for springiness, than all other treatments evaluated. For shear force, the three ground beef alternatives were more tender than all three ground beef treatments, with foodservice and retail ground beef alternatives being more tender than all treatments. The three ground beef treatments had greater pressed juice percentage values than all ground beef alternatives, indicating the ground beef was juicier than any of the ground beef alternatives evaluated.

**The Bottom Line...** While the ground beef alternative products attempt to mimic ground beef, they provide very different color, texture, tenderness, and cooking characteristics than traditional ground beef. 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 K.M. Harr, S.G. Davis, S.B. Bigger, D.U. Thomson, M.D. Chao, J.L. Vipham, M.D. Apley, S.M. Ensley, M.D. Haub, M.D. Miesner, A.J. Tarpoff, KC Olson, and T.G. O'Quinn.)

- ☞ **Effects of Guanidinoacetic Acid, Creatine, and Choline on Protein Deposition and Creatine Status in Growing Cattle** - This study was conducted to evaluate effects of guanidinoacetic acid and creatine supplementation in the presence or absence of supplemental choline on body creatine status and lean tissue growth.

Six ruminally-cannulated Holstein steers were utilized in an experiment consisting of six 10-day periods, where each steer received one of six treatments in each period. Treatments were abomasal infusion of a saline solution (control), 15 g/day guanidinoacetic acid, or 16.8 g/day creatine, in combination with 0 or 5 g/day choline, with all treatment combinations represented. Complete collection of urine and feces was conducted to calculate nitrogen retention as a measure of protein deposition. Steers were fed a corn-based diet.

**The Bottom Line...** Supplementing 15 g/day guanidinoacetic acid increased lean tissue growth in growing steers fed corn-based diets. 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, M.D. Miesner, and E.C. Titgemeyer.)

# WHAT'S NEW...

## ↪ **Effect of the Pelleting Process on Diet Formulations with Varying Levels of Crystalline Amino Acids and Reducing Sugars on Digestibility in Growing Pigs**

The objective of this study was to determine the effect of thermal processing on the digestibility of amino acids in diets with or without increased concentrations of free amino acids and reducing sugars. To measure AA digestibility, a total of eight individually housed barrows that had a T-cannula installed in the distal ileum were allotted to a replicated 8 × 8 Latin square design with 8 diets and eight 7-d periods. Thus, each pig was fed each diet in one period and no pig received the same diet more than once. Each period lasted 7 days with the initial 5 days being the adaptation period, and ileal digesta was collected for 9 hours on d 6 and 7. Treatments were arranged in a 2 × 2 × 2 factorial with main effects of crystalline AA concentration (low vs. high), reducing sugars (low vs. high), and diet form (mash vs. pellet). There was no feed form × crystalline AA inclusion × RS inclusion interaction standardized ileal digestible (SID) AA. There was a feed form × RS interaction for SID tryptophan. Pigs fed pelleted high RS diets resulted in decreased SID of tryptophan compared to mash high and low RS diets, and pelleted low RS diets. For the main effects of feed form, the SID of total AA, CP, indispensable AA increased in pigs fed pelleted diets compared to those fed mash diets. For the main effects of crystalline AA inclusion, pigs fed low or high crystalline AA inclusion had similar SID of total AA and CP. Pigs fed high crystalline AA had increased SID of tryptophan compared to those fed low crystalline AA diets. The SID of lysine tended to increase in pigs fed high crystalline AA diets compared to those fed low crystalline AA inclusion diets. Pigs fed high crystalline AA had decreased SID histidine compared to those fed low crystalline AA diets. The SID of arginine and isoleucine tended to decrease in pigs fed high crystalline AA. In pigs fed high crystalline AA the SID of serine and glycine decreased compared to those fed low crystalline AA. For the main effects of RS diets, pigs fed high RS diets had decreased SID of total AA, CP, indispensable AA, alanine, aspartic acid, cysteine, glutamic acid and serine.

**In conclusion...** Diets in this experiment were pelleted to achieve a hot pellet temperature of approximately 190°F. There was no evidence of interactions between diet types. Therefore, pelleting diets with increased concentration of crystalline AA or RS at the conditions reported herein did not reduce the AA digestibility. However, pelleting diets resulted in improved AA digestibility. Diets formulated with increased concentrations of crystalline AA had increase SID of tryptophan. Diets formulated with 20% DDGS and 15% bakery (high RS) resulted in decreased AA digestibility compared to the corn soybean-meal-based diets. 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.M. Dunmire, D.A. Lopez, C.J. Fiehler, C.K. Jones, Y. Li, J.C. Woodworth, R.D. Goodband, M.D. Tokach, C.R. Stark, H.H. Stein, and C.B. Paulk.)

↪ **Effect of Dietary Formic Acid and Lignosulfonate on Pellet Quality** - Nursery pig diets are pelleted to improve handling characteristics and pig performance. Feeding good quality pellets is important to achieve the maximum improvements in growth performance. Therefore, it is important to determine how feed additives included in nursery pig diets influence pellet quality. The objective of this study was to determine the effect of formic acid and lignosulfonate (LignoTech USA) inclusion in nursery pig diets on pelleting characteristics, pellet quality, and diet pH. The 5 treatments consisted of a control, or the control plus 2 concentrations of added formic acid (0.36% or 0.60%), or the control plus two combinations of 60% formic acid and 40% lignosulfonate (0.60% or 1.0%). Diets were steam conditioned for approximately 30 sec and pelleted on a 1-ton 30-horsepower pellet mill (1012-2 HD Master Model, California Pellet Mill) with a 3/16 in × 1 ¼ in pellet die. The production rate was set at 1,984 lb/hr. Treatments were pelleted at 3 separate time points to provide 3 replicates per treatment. Samples were collected directly after discharging from the pellet mill and cooled in an experimental counterflow cooler. Pellet samples were analyzed for pellet durability index using the Holmen NHP 100 and standard and modified tumble box methods. Pellet hardness was determined by evaluating the peak amount of force applied before the first signs of fracture. Pellets were crushed perpendicular to their longitudinal axis using a texture analyzer. Pellet samples were analyzed for pH via potentiometer and electrodes. Voltage and amperage data was collected via Supco DVCV Logger and used to calculate pellet mill energy consumption (kWh/ton). Data were analyzed using the MIXED procedure in SAS 9.4, with pelleting run as the experimental unit. Increasing formic acid in the diet decreased pH by 0.6 to 0.8 in low formic acid diets and by 1 point in the high formic acid diets. When adding formic acid or lignosulfonate to the diet, no evidence for differences was observed for pellet mill energy consumption, production rate, hot pellet temperature, or pellet durability regardless of testing method or pellet hardness.

**In conclusion...** Pellet quality was not influenced by formic acid or lignosulfonate, and as expected pH decreased as the level of formic acid increased. 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 G.E. Nichols, C.R. Stark, A.M. Ogles, C.N. Truelock, N.M. Beckman, T.S. Winowiski, and C.B. Paulk.)

# ASI FACULTY SPOTLIGHT...



**Bob Goodband ([goodband@k-state.edu](mailto:goodband@k-state.edu); 785-532-1228)**  
**Professor/Extension Swine Specialist**

Dr. Bob Goodband is originally from Walpole, Massachusetts. He graduated from The Pennsylvania State University in 1984. He obtained his M.S. (1986) and Ph.D. (1989) in Swine Nutrition at Kansas State University and then joined the Department of Animal Sciences and Industry. Today, Bob is involved with Teaching (40%), Extension (40%) and Research (20%). He is part of a progressive swine extension/nutrition team with programs focused on developing, evaluating, and disseminating the latest information to increase the profitability of pork producers. Bob has played an important role in developing an intensive on-farm research program that has conducted numerous on-farm trials in several states across the U.S. His work has resulted in over 400 refereed journal papers, 10 book chapters, over 1,000 research reports and Extension publications.

Bob's current teaching assignment includes ASI 535, Swine Science and ASI 679, Swine Nutrition. The classes cover the basics of modern, sustainable swine production and nutrition. Bob also advises 40 to 50 undergraduate students each year and has helped mentor over 120 M.S. and Ph.D. students



**Jason Woodworth ([jwoodworth@k-state.edu](mailto:jwoodworth@k-state.edu); 785-532-1157)**  
**Research Professor/Swine**

Dr. Jason Woodworth was raised in Sterling, Kansas, on a diversified crop farm. In 1997, Jason completed his B.S Animal Science degree at KSU and during his undergraduate career he worked and lived at the KSU Swine Unit. Jason went on to complete his swine nutrition M.S. and Ph.D. degrees at KSU with his research emphasis related to the vitamin and mineral requirements of nursery pigs and sows.

After completing his degrees, Jason joined Lonza which was the same company that funded his Ph.D. In his 11+ year tenure at Lonza, Jason's responsibilities transitioned from being the NAFTA Technical Sales & Service Manager, to the NAFTA Business Manager, and finally to the Global Product Manager for some of Lonza's specialty feed ingredients. In this capacity, Jason was responsible for the global research & development initiatives of Lonza's animal nutrition portfolio for all production and companion animal species. Furthermore, he had the global profit/loss responsibility for Lonza's L-Carnitine-based portfolio and spent about 50% of his time traveling internationally to develop the global business.

In June of 2013, Jason re-joined the Applied Swine Nutrition team at KSU and is currently a Research Professor. In this role, Jason contributes to the research objectives of the team and helps with graduate student mentorship and development. Jason serves as the faculty manager of the KSU Swine Teaching and Research Center, KSU early-weaned pig facility, Swine Lab and ASI Analytical Lab. During his tenure at KSU, Jason has been the PI on 69 grants that have generated more than \$3 million in funding and resulted in 144 peer-reviewed journal publications.

Jason lives in Enterprise, KS, with his wife, Brooke, and two sons, Jensen and Carson, where they spend their time at youth sporting and music events, 4-H activities, and on their Angus farm.

# WHAT PRODUCERS SHOULD BE THINKING ABOUT

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

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

#### **Spring Calving Cows**

##### *Cowherd Management*

- Pregnancy check (if not already completed)
- If candidates for culling were not selected in September or October, it should be completed now.
- Consider feeding cull cows to increase body weight, value, and utilize cheap feedstuffs. Value of gain is equal to the difference between the ending value and beginning values divided by the gain. Compare this to cost of gain figures. When cost of gain is less than value of gain, profit will be realized.
- Body Condition Score
  - Provide thin cows (body condition score 3s and 4s) extra feed now. Take advantage of weather, stage of pregnancy, lower nutrient requirements and quality feedstuffs.
- In late fall and early winter, start feeding supplement to mature cows using these guidelines:
  - Dry grass            1½ - 2 lb supplement/day of a 40% CP supplement
  - Dry grass            3 - 4 lb supplement/day of a 20% supplement
  - Dry grass            10 lb good nonlegume hay, no supplement needed
  - Compare supplements on a cost per pound of nutrient basis.
- Utilize crop residues.
  - Average body condition cows can be grazed at 1 to 2 acres/cow for 30 days assuming normal weather. Available forage is directly related to the grain production levels.
  - Limiting nutrients are usually protein, phosphorus, and vitamin A.
  - Strip graze or rotate fields to improve grazing efficiency.
- Discontinue feeding tetracycline if used for anaplasmosis control.

##### *Calf Management*

- Participate in National Level Breed Association Performance Programs CHAPS and(or) other ranch record systems.
- Finalize plans to merchandise calves or to background through yearling or finishing programs.

##### *Forage/Pasture Management*

- Plan winter nutritional program through pasture and forage management.

##### *General Management*

- Document cost of production by participating in Standardized Performance Analysis (SPA) programs.
- Review management decisions, lower your costs on a per unit of production concept.
- Plan your marketing program, including private treaty, consignment sales, test stations, production sales, etc.

*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.*