



WEBER HALL
ANIMAL SCIENCE & INDUSTRY



K News from KSU Animal Sciences

- ✦ **KJLS Entry Deadline Approaching** - The deadline for Kansas Junior Livestock Show entries is August 15. All entries must be made online, using the link on the <http://www.kjls.net/> website. Families need to have their KSU Nomination # and YQCA certification numbers available to complete the process for each child. Agents and FFA advisors will receive instructions regarding approving entries for youth from their respective organization. This will all be done online, similar to last year. All families also need to look at the updated show schedule. Everyone is encouraged to double check the rules for each show prior to entry and arrival to make the check-in process go as smoothly as possible. For more information, contact Lexie Hayes at adhayes@ksu.edu or (785)532-1264.
- ✦ Dates have been set for the **2021 KLA/Kansas State University Ranch Management Field Days**. Deseret Ranches will host the first event August 17 in Southwest Kansas near Satanta. The August 19 field day will be held on Roth Farm and Ranch located near Sterling. Gunbarrel Ranch near Eskridge will be the site of the August 24 event. Each field day will begin at 3:00 p.m. and will include presentations on the history of the host operation and management practices used today, as well as educational sessions and a complimentary beef dinner.
- ✦ **Livestock Sweepstakes** - Livestock Sweepstakes is approaching on August 21-22. The entry deadline has passed, but those who entered youth will be receiving additional details and reminders as the event approaches. The livestock judging contest, livestock skillathon, and quiz bowl qualifying exam will be on Saturday, with the meat judging contest, head-to-head quiz bowl rounds, and awards ceremony being on Sunday. Through these events, the youth who will represent Kansas at the national contests will be selected. We look forward to having Kansas 4-H'ers back on campus! For more information, please contact Lexie Hayes at adhayes@ksu.edu.
- ✦ **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 or 785-532-1247.
- ✦ **Livestock Projects Sold Through County Fair Premium Auctions** – Now that county fair season is wrapping up, this is a reminder that livestock animals sold through a county fair premium sale OR ribbon auction are not eligible to be shown at the Kansas State Fair or the Kansas Junior Livestock Show. This is per the Kansas 4-H Policy, section 10.6 (<https://www.kansas4-h.org/resources/policy-guide/Kansas%204-H%20Policy%20Handbook%20March21.pdf>). So, please refer to the policy guide on the state 4-H website for further details about the policy. As counties complete their fairs, please submit a list of the STATE NOMINATED animals that participated in the premium auction. We only need the state nominated animals, not the entire sale bill/ribbon auction list. Please just email the official KSU nomination family name, specie, and tag #s. A list of animals state nominated from each county may be found on the state livestock nomination reports posted on the KSU Youth Livestock Program website: <https://www.asi.k-state.edu/research-and-extension/youth-programs/nominated-livestock/check-nominated-livestock.html>. This list includes official KSU nomination family names and tag numbers. All lists need to be submitted by September 1. For more information, contact Lexie Hayes at adhayes@ksu.edu or (785)532-1264.

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August 2021 issue



UPCOMING EVENTS...

☞ **KSU Beef Stocker Field Day to be hosted September 30, 2021** – Come and help us celebrate the 22nd 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 Ismael, 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 due by September 15. For complete details and registration, visit www.KSUbeef.org. For more information, contact Dale Blasi (dblasi@ksu.edu; 785-532-5427) or Lois Schreiner (lschrein@ksu.edu; 785-532-1267).

☞ 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.

CALENDAR OF UPCOMING EVENTS		
Date	Event	Location
August 15, 2021	Kansas Junior Livestock Show entries due	
August 17, 2021	KLA/KSU Ranch Management Field Day	Satanta, KS
August 19, 2021	KLA/KSU Ranch Management Field Day	Sterling, KS
August 21-22, 2021	Kansas 4-H Livestock Sweepstakes	Manhattan
August 24, 2021	KLA/KSU Ranch Management Field Day	Eskridge, KS
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

WHAT'S NEW...

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

“How to Be a Better Coach in the Workplace”

Being a manager and managing people aren't easy, especially when an employee or group of employees' performance needs improvement. The goal of coaching is to improve the quality of the work of the employee or group and is not necessarily part of a disciplinary action (although it is often associated with it). Coaching in the workplace can be an effective way to address issues that limit performance. Below are a few tips from www.thebalancecareers.com on coaching in the workplace.

- State the issue or the problem directly. Keep the focus on the issue or problem and not the person.
- Involve the employee in the process. Asking the employee or group for help in creating a solution is a great way to show you have confidence in them.
- Identify what issues or roadblocks exist that limit the employee or group's performance. The most common issues are time, additional training, or resources.
- Come up with a plan that identifies specific actions that need to be done to address the issue by everyone involved (including the manager).
- Schedule time for a follow-up conversation. Feedback is essential but should be positive.

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

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

“Silage Harvest: Think Safety”

One of the busiest, most fast paced operations that occur this time of year is silage harvest. Cutters and choppers in the fields, trucks racing from the field to the pile or bunker, multiple tractors pushing and packing silage. The speed at which we can harvest silage today is amazing, but we should never allow the speed at which we can accomplish a task to compromise safety. In the infamous words of Dr. Keith Bolsen “Every silage accident could have been prevented.” Listed below are a few things to consider during this year's silage harvest.

- *Don't become complacent.* Stay aware of the surroundings. Let's face it, there are a lot of highly repetitive operations in putting up silage. One of the number one factors that lead up to an accident is almost always complacency or lack of situational awareness.
- *Truck drivers should always slow down when approaching houses and intersections on all roads, every time.* Those houses along the road belong to our neighbors and friends, some of which have children. The increased traffic on gravel roads creates dust and the crops are tall, both of which reduce visibility at intersections. Our neighbors should not fear going to their mailbox due to our silage trucks...
- *People (especially children) should never be allowed near a drive over pile or bunker silo during filling.* If people have to approach the area, get on the radio and inform the drivers/operators. Those on the ground in the area should always wear a bright colored orange safety vest.
- *Never fill higher than the top of the bunker wall.* This happens more than it should and creates a dangerous situation from the day the silage is packed until it is removed. The pack tractor cannot see the edge of the bunker well if at all. The silage does not get packed well (which leads to poor silage) and the edge of the silage is unstable and more likely to collapse. *Don't do it.*
- *Be aware of steep slopes.* To reduce the risk of tractor roll-over, a minimum slope of 1 in 3 on the sides and end of piles should be maintained.
- *Never inspect or make repairs to equipment near the bunker or pile.* Equipment should be removed from the area as soon as possible. Repairs almost always involve people on foot and potentially people who may not be familiar with silage activities and the associated risks.

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

WHAT'S NEW...

↪ **Investigating the Contribution of Mature Collagen Crosslinks to Cooked Meat Toughness Using a Stewed Beef Shank Model** - The objective of this study was to investigate mature collagen crosslink densities and their relationship to connective tissue texture using a stewed beef shank model.

Connective tissue texture, Warner-Bratzler shear force, and collagen content and characteristics were measured for six different beef shank cuts from eight U.S. Department of Agriculture Low Choice beef carcasses. Deep digital flexor from the foreshank had the toughest connective tissue texture, greatest Warner-Bratzler shear force value, most cooked collagen content, one of the greatest insoluble collagen percentages, as well as greatest raw and cooked pyridinoline densities among all the beef shank cuts. Correlation analysis showed that cooked collagen content, percent insoluble collagen, as well as raw pyridinoline densities had positive correlations with connective tissue texture and Warner-Bratzler shear force.

The Bottom Line...Pyridinoline is a heat stable collagen crosslink that is difficult to degrade even with extensive heat treatment. As a result, raw pyridinoline density is a good indicator for heat insoluble collagen content, cooked beef connective tissue texture, and ultimately tenderness in beef cuts with high concentration of connective tissue prepared with moist heat cookery. More information is available in the KSU Cattlemen's Day report at www.KSUBeef.org. (This study conducted by W. Wu, A.A. Welter, C.K. Chun, T.G. O'Quinn, G. Magnin-Bissel, and M.D. Chao.)

↪ **A Preliminary Investigation of the Contribution of Different Tenderness Factors to Beef Loin, Tri-tip, and Heel Tenderness** - The objective of this study is to better understand the contribution of each tenderness factor to the perception of tenderness of three specific beef muscles with similar tenderness ratings.

Longissimus lumborum (loin), tensor fascia latae (tri-tip), and gastrocnemius (heel) were collected from ten U.S. Department of Agriculture Choice beef carcasses and assigned to a 5- or 21-day aging period. Steaks from each aging period from each subprimal were assigned to one of three assays: 1) trained sensory analysis; 2) objective tenderness evaluation (Warner-Bratzler shear force); or 3) physiochemical analysis (sarcomere length, proteolysis, intramuscular fat content, collagen crosslink, and content). Sarcomere length, troponin-T degradation, collagen content, mature collagen crosslink density, intramuscular lipid content, and trained panel analysis were measured. Correlation analysis indicated each muscle has a specific tenderness factor that contributed to the overall tenderness evaluated by trained panelists. The equations indicated Longissimus lumborum tenderness was driven by lipid content and that Tensor fascia latae tenderness was driven by collagen content. Gastrocnemius tenderness was driven by proteolysis, and only collagen content can be casually used as an overall tenderness predictor for all three cuts.

The Bottom Line... Each muscle showed a unique tenderness factor profile. Loin is inherently tender and tri-tip has the makings for a tender cut, as seen by our biochemical analysis, yet panelists rated tri-tip to have similar overall tenderness as heel, an inherently tough muscle. More information is available on this experiment and others in the KSU Cattlemen's Day report at www.KSUBeef.org. (This study conducted by C.K. Chun, W. Wu, A.A. Welter, T.G. O'Quinn, G. Magnin-Bissel, D.L. Boyle, and M.D. Chao.)

↪ **Influence of Enogen Feed Corn and Conventional Yellow Dent Corn in Pelleted- or Meal-Based Diets on Finishing Pig Performance and Carcass Characteristics** - A total of 288 pigs were used in a 72-d trial to evaluate the influence of Enogen Feed corn and conventional yellow dent corn in pelleted or meal diets on finishing pig performance and carcass characteristics. Pigs were randomly assigned to pens (8 pigs per pen) and pens were allotted by weight to 1 of 4 dietary treatments in a randomized complete block design with 9 pens per treatment. Treatments were arranged in a 2 × 2 factorial with main effects of corn source (Enogen Feed corn or conventional yellow dent) and diet forms (meal or pellet). Overall, from d 0 to 72, there was a tendency for a difference between corn source for average daily gain and feed efficiency with slightly improved performance for pigs fed conventional yellow dent corn. When diets were fed as pellets, ADG was increased and F/G was improved compared to pigs fed meal diets.

In conclusion... Feeding pellets to pigs increased ADG and improved feed efficiency with no major differences between corn sources on growth performance. More information is available on this experiment and others in the KSU Swine Day report at www.KSUSwine.org. (This study conducted by H.R. Williams, M.D. Tokach, J.C. Woodworth, R.D. Goodband, J.M. DeRouchey, S.S. Dritz, C.B. Paulk, H. Wecker and H.I. Calderón.)

WHAT'S NEW...

☞ **Evaluating the Route of Antibiotic Administration and its Effect on Nursery Pig Growth Performance** - This experiment was conducted to determine the influence of route of antibiotic administration (in-feed vs. in-water) on nursery pig growth performance. A total of 2,592 pigs were used in a 28-d trial. Pigs were weaned at 21 d of age and placed in a commercial research facility with 27 pigs per pen. After a 7-d pre-trial period, pens of pigs were assigned to weight blocks in a randomized complete block design. There were 12 replications per treatment with pen as experimental unit for in-feed medication treatments and a pair of pens as the experimental unit for water medication treatments. The six treatments included a control (no medication), chlortetracycline (CTC) provided via feed or water to achieve 22 mg/kg body weight (BW), tiamulin in feed (5 mg/kg BW) or water (23 mg/kg BW), or a combination of CTC and tiamulin in feed. Experimental treatments were provided for 14-d followed by a 14-d period without medication. For statistical analysis, the interaction of antibiotic type × route of administration was tested in a 2 × 2 factorial with main effect of antibiotic type (CTC or tiamulin) and route of administration (in-feed or in-water). Pairwise comparisons were also made between the control and all individual treatments. From d 0 to 14, d 14 to 28 and d 0 to 28 there was an antibiotic × route of administration interaction observed for ADG. The interactions were a result of pigs fed diets containing CTC having improved ADG compared to CTC in-water, whereas pigs provided tiamulin in-water exhibited improved ADG compared with tiamulin in feed. There was an antibiotic × route of administration interaction observed for F/G from d 0 to 14 and 0 to 28. Pigs provided tiamulin in the feed had the poorest F/G, whereas F/G was not different among the other treatments. Providing CTC in the feed or water or tiamulin in the water improved ADG compared to pigs fed the control diet. Providing either CTC or tiamulin in the feed increased ADFI as compared with providing the antibiotics in water. Pigs fed antibiotics in the feed had increased ADFI compared to the control with those provided antibiotics in the water being marginally greater in ADFI than the control. For ADG (d 0 to 28), pigs provided CTC in feed, tiamulin in the water, or the combination of CTC and tiamulin in the feed during the treatment period had increased ADG compared to pigs fed the control diet. For ADFI, there was no evidence of an interaction or main effects; however, when compared to the control, pigs provided CTC in-feed, tiamulin in-water, or the combination in the feed all had increased ADFI.

In conclusion... Providing CTC in feed with or without tiamulin or tiamulin in the water improved nursery pig growth performance. More information is available in the KSU Swine Day report at www.KSUswine.org. (This study conducted by *W.M. Hutchens, M.D. Tokach, S.S. Dritz, J.C. Woodworth, J.M. DeRouchey, R.D. Goodband, H.I. Calderon-Cartagena, K. Habib, V. Ishengoma, T.G. Nagaraja1, and R.G. Amachawadi.*)

☞ **Effects of Standardized Ileal Digestible Tryptophan:Lysine Ratio on Growth and Carcass Performance of Finishing Pigs Fed Ractopamine HCL** - Recent research has reported that increasing standardized ileal digestible (SID) Trp:Lys ratio above 20% in finishing pigs fed Ractopamine HCL (RAC) resulted in improved growth and carcass performance, however, this response has been inconsistent. Therefore, the objective of this study was to evaluate the effects of feeding high SID Trp:Lys ratios with RAC on growth and carcass performance. A total of 1,791 finishing pigs were used in a 27-d study to evaluate the effects feeding high SID Trp:Lys ratios on growth and carcass performance of pigs fed ractopamine HCL. Pens of 25 or 26 pigs were allotted by initial BW and randomly assigned to 1 of 5 dietary treatments with 14 replications per treatment. The dietary treatments included 5 SID Trp:Lys ratios (20, 22, 24, 26, and 28% of Lys). All diets were formulated to 0.90% SID Lys and contained 10 ppm ractopamine. At d 27, pigs were transported to a commercial packing plant (JBS Swift and Company, Worthington, MN) for processing and carcass data collection. For overall growth performance, increasing SID Trp:Lys ratio increased SID Trp intake and Trp g/kg of gain; however, there was no evidence of a treatment difference for average daily gain or feed efficiency. For carcass characteristics, increasing SID Trp:Lys decreased carcass yield and tended to decrease lean percentage. There was no evidence of treatment differences for hot carcass weight, loin depth, carcass ADG, or carcass feed efficiency. The results from this study showed that grams per day of SID Trp intake ranged from 5.5 to 7.5. Greater feed intakes observed in this study resulted in increased Trp g/d of intake and could potentially be a reason why no evidence for treatment differences were observed.

In conclusion... Increasing SID Trp:Lys ratios above 20% (approximately 5.4 g SID Trp intake per day) in pigs fed RAC did not improve growth or carcass performance. More information is available in the KSU Swine Day report at www.KSUswine.org. (This study conducted by *H.E. Williams, M.D. Tokach, S.S. Dritz, J.M. DeRouchey J.C. Woodworth, R.D. Goodband, and J. Soto.*)

ASI FACULTY SPOTLIGHT...



Liz Boyle (lboyle@k-state.edu; 785-532-1247)

Professor/Extension Meats Specialist

Dr. Liz Boyle is a Professor in Meat Science in the Department of Animal Sciences and Industry at Kansas State University. She received her B.S. in Wildlife Biology from the University of Minnesota, her M.S. in Food Science and Nutrition and Ph.D. in Food Science with a meats emphasis from Colorado State University followed by post-doctorate work in meat science at the University of Kentucky and the University of Minnesota.

Dr. Boyle's focus is to provide scientific and technical assistance to meat processors and trade associations and researching quality and safety of meat products. She is a Lead Instructor with the International HACCP Alliance and the Food Safety Preventive Controls Alliance. Dr. Boyle teaches HACCP workshops nationally and teaches undergraduate and graduate courses in meat processing, HACCP and Preventive Controls, and Advanced HACCP.

In 2016, Dr. Boyle was named a Fellow by the American Meat Science Association and was a recipient of the 2016 AMSA Signal Service Award. Boyle is an internationally known expert in HACCP systems and has dedicated her career to assisting meat

companies with improving processed meat quality and safety, HACCP systems, and food safety plans.



Mike Brouk (mbrouk@k-state.edu; 785-532-1207)

Professor/Extension Dairy Specialist

Micheal J. Brouk was born November 15, 1962, in Franklin County, Missouri. He attended Linn R-2 Schools graduating in May 1981. Following high school graduation, he attended the University of Missouri-Columbia majoring in agronomy and dairy science and received the Bachelor of Science degree in Agriculture in May 1985. From 1976 to 1984, he was also an active partner in the family grain farm located in Osage County, Missouri. The University of Missouri-Columbia employed Mike as a Research Specialist for two years after he completed his undergraduate program. The research projects involved the utilization of dairy processing plant waste as a fertilizer for forage crops and as a protein and mineral supplement for livestock. He then began a Master of Science degree program under Dr. Ron Belyea at the University of Missouri-Columbia. The title of his thesis was "Chewing Behavior and Digestion of Alfalfa Forage." Following completion of his M.S. degree, Mike accepted a position with Cenex/Land O'Lakes in southwestern Minnesota. He worked as a Livestock Production Specialist developing nutrition and

management programs for dairy and beef producers. After two years with LOL, he entered a doctoral program under the direction of Dr. David Schingoethe at South Dakota State University. His dissertation topic was "Net Energy of Lactation and Ruminant Degradability of Wet Corn Distillers Grains." Following completion of the Ph.D. in Animal Sciences he joined the teaching and research staff of South Dakota State University in January 1994. Mike was responsible for teaching undergraduate dairy management, nutrition, breeding and cattle evaluation courses as well as developing a dairy cattle nutrition research project.

Mike returned to the University of Missouri-Columbia in August of 1996 as an Extension Specialist with Commercial Agriculture Program. He was responsible for developing state wide extension programs in the areas of dairy cattle nutrition, forage systems, replacement heifer development and dairy cattle management. He joined the faculty of Kansas State University in December of 1998 as a State Dairy Extension Specialist where he holds a 30% teaching and 70% extension appointment. His current responsibilities include development of programs in dairy cattle nutrition, management, cow comfort, replacement heifer development, dairy expansion and heat stress abatement. He is currently involved in several research projects evaluating various heat stress abatement methods in commercial dairy herds.

WHAT PRODUCERS SHOULD BE THINKING ABOUT

WHAT PRODUCERS SHOULD BE THINKING ABOUT IN OCTOBER...

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

Cow Herd Management

- Given unforeseen weather and market price volatility, price byproducts, grains and other feedstuffs on a per nutrient basis.
- Do you have sufficient harvested forage to encounter a potentially severe winter feeding season? Conduct an inventory of harvested forages and determine if you have an adequate supply on hand.
- Pregnancy check.
- Cull cows because of:
 - ◆ Open.
 - ◆ Late vs. Early calving.
 - ◆ Soundness - udder, feet/legs, eyes, teeth, disposition.
 - ◆ Productivity - Most Probable Producing Ability (from herd performance records).
 - ◆ Disposition.
- 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.
- If body condition scores warrant it, you may want to start feeding supplements in late October 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 (heifers may need more supplement than older cows)
 - ◆ Supplement nutrients that are most deficient.
 - ◆ Compare supplements on a cost per pound of nutrient basis.
 - ◆ Previous KSU research has reported early winter supplementation is not necessary if grazing forage supplies are adequate and cows have at least a 5 BCS. However, given the lower nutrient content of existing forage supplies due to ample rainfall, this year might be advisable to consider supplementing with levels of supplement mentioned above. If cow BCS is marginal, it would be prudent at this time to collect and submit standing forage samples to a laboratory to determine if supplementation during the fall period is necessary.
- Utilize crop residues. Grazing crop aftermath can reduce daily cow costs by 50¢ or more.
 - ◆ Strip graze or rotate fields to improve grazing efficiency.
 - ◆ Average body condition cows can be grazed at 1 to 2 acres/cow for 30 days assuming normal weather.
- Consider feeding cull cows to increase value, body weight and utilize cheap feedstuffs. Seasonal price trends have allowed producers to take advantage of maximum profit opportunities with cull cow feeding programs. Healthy cows can gain extremely well on well balanced diets.
- Check individual identification of cows. Replace lost tags or redo brands.

WHAT PRODUCERS SHOULD BE THINKING ABOUT

Calf Management

- Wean calves:
 - ◆ Reduce stress. Provide a clean, dust-free, comfortable environment.
 - ◆ Provide balanced nutritional program to promote weight gain and health.
 - ◆ Observe feed and water intake. Healthy, problem free calves have large appetites.
 - ◆ Observe calves frequently, early detection of sickness reduces medical costs and lost performance.
 - ◆ Vaccinate calves and control internal/external parasites through veterinary consultation (ideally done prior to weaning).
 - ◆ Vaccinate all replacement heifer candidates for brucellosis if within four to 10 months of age.
 - ◆ Use implants and feed additives to improve efficient animal performance.
- Weigh all calves individually. Allows for correct sorting, herd culling, growing programs, replacement heifer selection and marketing plans.
- Participate in Whole Herd Rewards, Performance Plus, and(or) other ranch record/performance systems.
- Finalize plans to merchandise calves or to background through yearling or finishing programs.
 - ◆ Consider feedstuff availability.
 - ◆ Limit feeding high concentrate diets may be a profitable feeding program.
- Select replacement heifers which are:
 - ◆ Born early in the calving season. This should increase the number of yearling heifers bred during the early days of the subsequent breeding season.
 - ◆ Daughters of above average producing cows. Performance traits are moderately heritable traits.
 - ◆ Of the proper frame size to compliment desired mature size and weight.
 - ◆ Structurally correct. Avoid breeding udder, feet and leg problems into the herd.
- Vaccinate replacement heifers with first round of viral vaccines.
- Plan replacement heifer nutrition program so that heifers will be at their "target weight" (65% of their mature weight) by the start of the breeding season.

Forage/Pasture Management

- Observe pasture weed problems to aid in planning control methods needed next spring.
- Monitor grazing conditions and rotate pastures if possible and(or) practical.
- Plan winter nutritional program through pasture and forage management.
- For stocker cattle and replacement heifers, supplement maturing grasses with an acceptable degradable intake protein/ionophore (feed additive) type supplement.

General Management

- Avoid unnecessary stress. Handle cows and calves to reduce shrink, sustain good health and minimize sickness.
- Analyze forage for nitrate and nutrient content. Use these to develop winter feeding programs.
- Repair, replace and improve facilities.
- 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 or phone 785-532-1267.*