



News from KSU Animal Sciences

August, 2017

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UPCOMING EVENTS...

- **Entry Deadline Approaching** - Entries for the Kansas Junior Livestock Show (KJLS) are due by August 15. Only online entries will be accepted. For further entry details and information, please visit the KJLS website (www.kjls.org). Late entries will be accepted through August 31, at double the original entry fee per animal. Please contact KJLS directly with questions regarding show entry.
- Dates have been set for the **2017 KLA/Kansas State University Ranch Management Field Days**. Please mark the following dates on your calendar and see which one works best for you.
 - August 17 – Black Diamond Angus Ranch (Warner Angus Ranch), Spearville, KS*
 - August 22 – Mark Diederich Family Farms, Greenleaf, KS*
 - August 23 – DL Cattle Company, Fredonia, KS*
 The schedule for the Field Days include:

3:30 p.m.	Registration
4:00 p.m.	Welcome & Introductions
4:30 p.m.	Educational Sessions
6:45 p.m.	Dinner

 For more information or questions on the field day, contact the Kansas Livestock Association at 785-273-5115 or wendy@kla.org.
- The **2017 Kansas 4-H Livestock Sweepstakes** will be Aug. 19-20 on the K-State campus in Manhattan. The entry deadline has passed, but correspondence and reminders about the event will be sent directly to the county agents and coaches who entered teams. The weekend will kick off with the quiz bowl qualifying exam at 8 am on Saturday morning, followed by the livestock judging contest, then the skillathon. Sunday will begin with the meat judging contest, followed by the quiz bowl contest, in its entirety. The award ceremony for all events will be Sunday afternoon. Please refer to the youth livestock website (www.asi.k-state.edu/research-and-extension/youth-programs) for a full schedule, rules and details about the event. For more information, contact Lexie Hayes (adhayes@ksu.edu; 785-532-1264).
- It is not too late to register for the 2017 **Applied Reproductive Strategies in Beef Cattle Conference** (ARSBC) that will be hosted August 29-30 at the Hilton Garden Inn and Conference Center, Manhattan, KS. The pre-registration deadline is August 16. The full schedule and registration information are available at www.AppliedReproStrategies.com
 - All conference registrations include proceedings, breaks, breakfast, lunch and steak dinner on Aug. 29 and breakfast on Aug. 30. The laboratory session the afternoon of Aug. 30 is optional and includes a box lunch. This meeting is approved for 9.5 hours of CE contact for veterinarians with an additional one hour of CE contact for those participating in the wet lab.
 - For more information on the Applied Reproductive Strategies in Beef Cattle Workshop, contact Sandy Johnson (sandy@ksu.edu; 785-462-6281) or Katie Golemboski (kgolembo@k-state.edu; 785-462-6281).



↪ **KSU Beef Stocker Field Day to be hosted September 21** - The 2017 KSU Beef Stocker Field Day will be Thursday, September 21, at the KSU Beef Stocker Unit in Manhattan. The schedule is as follows:

- 9:30 a.m. Registration/Coffee
- 10:15 a.m. Introductions
- 10:30 a.m. Beef Cattle Outlook
Dr. Derrell Peel, Oklahoma State University
- 11:15 a.m. Producer Panel – Implementing Cover Crops: How They Have Helped My Operation
Moderator: *Wes Ishmael, Contributing Editor, BEEF magazine*
Dr. Jaymelynn Farney, Kansas State University
Dr. Doug Shoup, Kansas State University
Shawn Tiffany, Herington, KS, Producer
Kelly Novak, Tampa, KS, Producer
Kevin Wellnitz, Neosho Rapids, KS, Producer
Harold Engle, Madison, KS, Producer
- 12:15 p.m. BBQ Brisket Lunch – View posters
- 1:15 p.m. Setting Calves up for Success this Fall
Dr. Peggy Thompson, Boehringer Ingelheim Professional Services
- 2:15 p.m. A Different Intensive Early Stocking Strategy for Optimized Marketing Opportunities
Dr. Keith Harmony, K-State Agricultural Research Center, Hays, KS
- 3:00 p.m. Break
- 3:30 p.m. **Breakout Sessions** (30 minutes/breakout)
Proper Dosing at the Chute - *Dr. A.J. Tarpoff, Kansas State University*
Why Vaccines Sometimes “Seem” to Fail - *Dr. Gregg Hanzlicek, Kansas State University*
Stocker and Backgrounding Budgets - *Robin Reid, Kansas State University*
Cover Crop Decision Tool - *Dr. Jaymelynn Farney and Dr. Doug Shoup*
- 5:30 p.m. Cutting Bull’s Lament 2017

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).

↪ **Developing and Implementing Your Company’s HACCP Plan** for meat, poultry, and juice processors will be held October 4-6, 2017, in Olathe, KS. Information and registration for the 2.5 day International HACCP Alliance accredited workshop is online at <http://haccp.unl.edu>. The workshop fee is \$450 per person, and participants will be presented with a certificate with an International HACCP Alliance seal upon completion of the course. For more information, contact Dr. Liz Boyle at lboyle@ksu.edu or 785-532-1247.

↪ Join us for the 3rd annual **AS&I Family and Friends Reunion on Friday, October 13, 2017**, from 5:30 – 9:30 p.m. at the Stanley Stout Center, 2200 Denison Avenue, Manhattan, Kansas. Last year’s event was truly amazing with more than 1,000 family and friends reuniting at the event. This year the Don L. Good Impact Award will be presented to Sharon Schwartz, long-time pork industry leader and state legislator. Other activities will include great food, live music, Junior Wildcat Barnyard and more surprises!! Watch for more information and a registration form, coming soon to www.asi.ksu.edu/familyandfriends.

CALENDAR OF UPCOMING EVENTS		
Date	Event	Location
August 15, 2017	Kansas Junior Livestock Show Entry Deadline	
August 17, 2017	KLA/KSU Ranch Management Field Day	Spearville
August 19-20, 2017	Kansas Livestock Sweepstakes	Manhattan
August 22, 2017	KLA/KSU Ranch Management Field Day	Greenleaf
August 23, 2017	KLA/KSU Ranch Management Field Day	Fredonia
August 29-30, 2017	Applied Reproductive Strategies in Beef Cattle Conference	Manhattan
September 21, 2017	KSU Beef Stocker Field Day	Manhattan
October 4-6, 2017	Developing and Implementing Your Company’s HACCP Plan	Olathe
October 13, 2017	AS&I Family and Friends Reunion	Manhattan

WHAT'S NEW.....

Management Minute "5 Generations in Today's Workplace"

✦ **Management Minute** – Justin Waggoner, Ph.D., Beef Systems Specialist *"Five Generations in Today's Workplace"*

I recently learned that there are approximately five generations currently in the American workforce. I would add that since farmers and ranchers don't often retire and the kids start doing chores at an early age there could possibly be up to six generations involved in the day-to-day activities of a farm or ranch. These generations are somewhat loosely defined across different sources as:

- 1) WWI and WWII generation (born ~1901-1926)
- 2) Mature or silent generation (born ~1928-1945)
- 3) The Baby Boomers (born ~1946-1965)
- 4) Generation X (born ~1965-1980)
- 5) Millennials (born ~1980-2000)
- 6) Generation Z or Centennials

All of these groups have defining characteristics and ideals that make them unique. There is tremendous amount of differences between these generations, if we consider that Granddad may have been raised in a world with limited electrical conveniences, and the millennial grandson, has never experienced a world without computers or mobile hand-held communication devices.

Have you given any consideration to the different age groups or generations that currently make up your workforce? Have you updated your policies, procedures or verbal expectations to include modern means of communication such as texting? For example, if a family member or an employee is going to be late is it acceptable to send a text. If it is a more formal organization, what about training materials? Millennials and the Generation Z's (coming soon) likely prefer and are more engaged in something they can watch over printed material.

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

Feedlot Facts "Cull Cows: A Disappointing Failure or Marketing Opportunity?"

✦ **Feedlot Facts** – Justin Waggoner, Ph.D., Beef Systems Specialist *"Cull Cows: A Disappointing Failure or Marketing Opportunity?"*

Most cattle operators view open cows, with some degree of disappointment. However, you might be surprised at the amount of revenue that can be realized from cull cow sales. I recently summarized the Kansas Farm Management data on Kansas cow-calf operations from 2010-2015. Participating operations had an average herd size of 126 head, weaned an 84% calf crop, and sold 106 calves and 20 head of breeding stock or cull animals annually.

In the 2015 data, the average gross income of participating operations was \$118,710, the sale of breeding stock or culls generated \$28,453 of that figure. Thus, the sale of cull animals accounted for 24% of the participating operations gross income. Although marketing cull breeding stock/cows is often viewed as a loss, it is a significant source of income that should not be overlooked. Most cull cows are sold through local auction markets. Therefore, understanding the market and making timely marketing decisions is one the most important components of realizing the most dollars out of a cull cow. The figure below illustrates the 15-year average and 2016 slaughter cow prices in Western, Kansas.

Feedlot Facts – “Cull Cows: A Disappointing Failure or Marketing Opportunity?” (cont.)

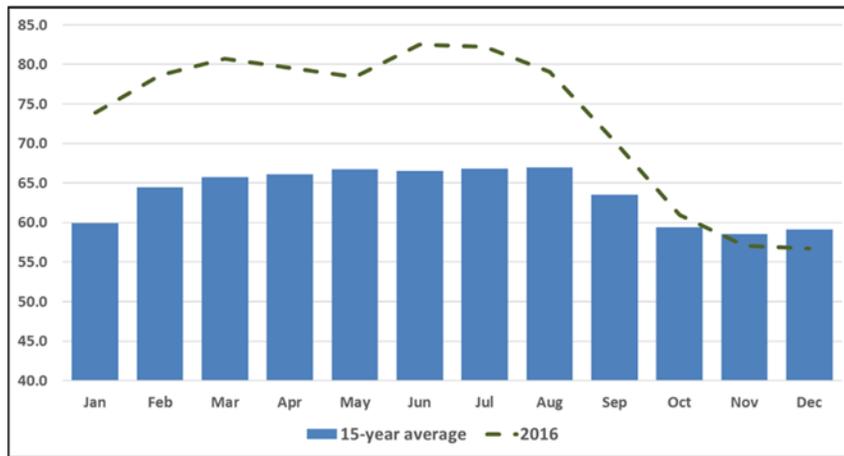


Figure 1: Slaughter Cow Prices, Western KS (Livestock Marketing Information Center, Robin Reid).

Slaughter cow prices tend to be highest and relatively steady from February to August, and then decline rapidly, being lowest in the months of October, November and December. Essentially, the worst time to market a cull cow based on the seasonal nature of the market aligns with pregnancy determination and weaning on most spring-calving operations. Therefore, if open cows are identified in late summer, and are in good condition marketing those animals as soon as possible would likely result in higher price than waiting until later in the fall. If open cows are identified later in the fall, deferring marketing until late winter/early spring and placing cull cows on low-input feeding program that would add additional weight and condition (provided resources are available) might be more advantageous than marketing those animals immediately.

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

Antioxidant Feeding Does Not Impact Incidence or Severity of Liver Abscesses - The objective of this study was to evaluate the impact of antioxidants on feedlot performance, carcass characteristics and incidence and severity of liver abscesses in finishing heifers. Heifers were blocked by initial body weight and then randomly assigned to treatments consisting of Control and Antioxidant treatments. The antioxidant treatment consisted of a combination of vitamin C at 0.25 grams and vitamin E at 100 IU per pound of diet dry matter. No Tylan was included in the diets. Animals were placed into 28 dirt-surfaced pens with 14 heifers per pen (14 pens per treatment) and harvested after 112 days on feed.

Bottom Line... Feeding antioxidants had no impact on incidence or severity of liver abscesses. View the complete research report at www.asi.ksu.edu/cattlemensday. For more information contact, Jim Drouillard (785-532-1204; jdrouill@ksu.edu) or Bob Weaber (785-532-1460; bweaber@ksu.edu).

Differences in Efficacy Between Gamithromycin, Tilmicosin and Tulathromycin as Metaphylactic Treatments in High Risk Calves for Bovine Respiratory Disease – The objective was to compare the efficacy of treating newly received, high-risk feedlot calves with gamithromycin, tulathromycin, and tilmicosin as metaphylactic treatments on health and performance characteristics. Crossbred heifer calves were used in a randomized complete block design to evaluate the effects of three different metaphylactic treatments for Bovine Respiratory Disease in high risk calves upon arrival at the feedlot. The treatments administered consisted of one of the three following antibiotics: 1) tulathromycin (1.13 mg/lb; 192 calves); 2) tilmicosin phosphate (5.99 mg/lb; 193 calves); or 3) gamithromycin (2.72 mg/lb; 194 calves). Thirty pens were filled with approximately 19 to 20 heifers; a total of 572 cattle were used in this study. Individual weights were recorded on day 0 and pen weights recorded at the end of the trial on days 56 to 60. Pen served as the experimental unit. Individual animal health was assessed daily throughout the study.

Bottom Line... There may be differences between antimicrobials with respect to effectiveness in suppressing bovine respiratory disease when used as a mass medication immediately upon arrival. View the complete research report at www.asi.ksu.edu/cattlemensday. For more information contact, Dan Thomson (785-532-4254; dthomson@ksu.edu) or A.J. Tarpoff (785-532-1255; tarpoff@ksu.edu).

Coarse-Marbled Beef is Juicier and More Flavorful Than Fine or Medium-Marbled Beef – The objective of the study was to evaluate the effects of marbling texture on trained sensory panel ratings of beef strip loin steaks of three USDA quality grades and three marbling textures. Top Choice, Low Choice and Select strip loins were selected based on a visual marbling texture scale into fine, medium, and coarse textured groups. Steaks were prepared to a medium (160°F) degree of doneness and served to groups of eight trained

panelists. Each panelist rated samples for initial and sustained juiciness, myofibrillar and overall tenderness, connective tissue amount, and beef flavor intensity.

Bottom Line... Coarse marbled steaks were juicier and had greater beef flavor intensity than fine and medium marbled steaks, indicating that coarse marbled beef should not be discriminated against, allowing for increased profits for packers and wholesalers. For more information contact, Travis O'Quinn (785-532-3469; travisquinn@ksu.edu).

↪ **Evaluation of Elarom SES in Nursery Diets with or without the Inclusion of High Zinc Oxide or Feed**

Antimicrobials - A total of 360 weaned pigs (DNA 200 × 400; initially 11.5 lb BW) were used in a 42-d study evaluating the effects of feeding Elarom SES in combination with high levels of ZnO and/or antimicrobials on nursery pig performance and fecal consistency. Elarom SES (Trouw Nutrition USA, Highland, IL) is a commercially available blend of short chain fatty acids (SCFAs), medium chain fatty acids (MCFAs) and slow release organic acids designed to enhance growth performance and gut health. Pigs were weaned at approximately 21 d and allotted to pens based on initial BW in a completely randomized design. Experimental treatments were arranged as a 2 × 2 × 2 factorial. The 8 treatment diets included: Elarom SES (none vs. 4 lb/ton), additional ZnO (none vs. 3,000 ppm in phase 1, 2,000 ppm in phase 2, and none in phase 3), and antimicrobial regimen (none vs. 400 g/ton CTC and 35 g/ton Denagard in Phase 1 and 50 g/ton Mecadox in Phases 2 and 3). Experimental diets were fed in 3 phases (Phase 1, d 0 to 7; Phase 2, d 7 to 21; and Phase 3, d 21 to 42 post-weaning) and fed in meal form. Overall, an Elarom SES × ZnO × antimicrobial interaction was observed for ADG and F/G. The ADG interaction was the result of poorer ADG when Elarom SES or ZnO were added alone compared to when feed antimicrobials were added alone or when Elarom SES was added in combination with ZnO or ZnO was added in combination with antimicrobials. The F/G interaction was a result of the poorest F/G observed when all three additives were added in combination, compared to the control diet with Elarom SES or antimicrobials only and the diet with Elarom SES and ZnO in combination or the diet with ZnO and antimicrobial in combination. Adding antibiotics to the diet increased ADG and ADFI, but there were no main effects of ZnO or Elarom SES observed. There were no individual or overall treatment effects, or treatment × day interactions observed for fecal consistency.

Bottom Line... Overall, we observed some benefits in performance when adding combinations of ingredients compared to including them as stand alone products. More research should be conducted to confirm this response. More information is available on this experiment in the KSU Swine Day Report at www.KSUswine.org. (This study conducted by H.E. Williams, J.C. Woodworth, J.M. DeRouchey, S.S. Dritz, M.D. Tokach, and R.D. Goodband.)

↪ **Evaluating the Effect of Superdosing Natuphos E 5,000 G Phytase on Nursery Pig Performance** – A total of 360 nursery pigs were used in a 42-d growth trial to determine the effect of superdosing a novel phytase source (Natuphos E 5000 G, BASF Corporation, Florham Park, NJ). Pigs were randomly allotted to pens at weaning in a randomized complete block design to one of eight dietary treatments. There were five pigs per pen and nine pens per treatment. Diets were fed in three phases from day 0 to 7, 7 to 21, and 21 to 42. Dietary treatments were a negative control (NC) with 0.40, 0.30, or 0.25% aP from inorganic P for Phases 1, 2, and 3, respectively; and the NC with increasing phytase levels of 500, 1,000, 2,000, 3,000, or 4,000 phytase units (FTU)/kg. There was also a positive control (PC) with 0.55, 0.45, or 0.40% aP from inorganic P for Phases 1, 2, and 3, respectively, or the PC with 2,000 FTU/kg. On d 42, one pig per pen was euthanized and the right fibula was removed for bone ash analysis. From d 0 to 42, pigs fed increasing phytase in the negative control diet tended to have increased ADG resulting in heavier ending BW and improved F/G. Adding 2,000 FTU/kg phytase to the positive control diet did not influence ADG or ADFI, but tended to improve F/G. The NC diet with 500 FTU/kg and PC diets were formulated to be equivalent in available Ca and P. When comparing the two diets, pigs fed the positive control diet had increased ADFI; however, pigs fed the NC with 500 FTU/kg phytase diets had improved F/G. Bone ash weights were increased for pigs fed increasing phytase in the NC diets. Additionally, percentage bone ash values increased as phytase increased in the NC and PC diets. There was a tendency for the PC diet to have greater percentage bone ash when compared to the NC diet with 500 FTU/kg of phytase.

Bottom Line... In summary, this study shows that increasing dietary phytase increased percentage bone ash values, and a tendency for improved F/G as phytase was added to the positive control diet with P and Ca formulated at NRC (2012) recommendations. However, there was no further improvement in growth performance when phytase was included above 1,000 FTU/kg. More information is available on this experiment and others in the KSU Swine Day Report at www.KSUswine.org. (This study conducted by K.M. Gourley, J.C. Woodworth, J.M. DeRouchey, M.D. Tokach, S.S. Dritz, and R.D. Goodband.)

AS&I Faculty Spotlight



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



Duane Davis (davis@k-state.edu; 785-532-1224)
Professor/Swine Reproductive Physiology

Duane Davis is a native of Atlanta Kansas and has been on the Animal Science Faculty since 1977. After receiving a BS and MS from Kansas State University he traveled to the University of Missouri where he earned a PhD in Reproductive Physiology. His current appointment is 70% research and 30% teaching and he is the faculty coordinator for the Swine Teaching and Research Unit in the department.

Davis' research focuses on stem cells in pregnancy and the effects of intrauterine growth restriction on pigs. Current projects address the use of stem cells in the umbilical cord as models for the effects of intrauterine competition for nutrients and methods to improve production outcomes for low birth weight pigs. He teaches courses in the reproductive physiology of farm animals, stem cell biotechnology, and Introduction to Research in Animal Science to undergraduate and graduate students.

Duane enjoys spending free time with his wife Pam with their cattle, horses, and pets.

What Producers Should Be Thinking About.....

WHAT PRODUCERS SHOULD BE THINKING ABOUT IN OCTOBER.....



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

Cowherd 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 3's and 4's) 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.
 - ◆ KSU research has reported early winter supplementation is not necessary if grazing forage supplies are adequate. Third trimester cows have had the ability to achieve their target calving weights with supplementation.
- 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.

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.
- Forage analyze 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.*