



# K News from KSU Animal Sciences

↪ **State Show Entry Deadlines-** Entries for the Kansas State Fair Grand Drive (4-H/FFA youth livestock show) are currently open and will be due July 17. A complete nomination does not constitute entry; it only makes animals eligible. All exhibitors and animals must be entered directly through the state fair using ShoWorks. Only online entries will be accepted. Families who state nominated livestock will use the exhibitor name and password created for each child during nominations to login and submit each their entries. Late entries will be accepted until July 25, with a late fee. No entries will be accepted after July 25. For more information, visit <https://www.kansasstatefair.com/p/competitions/2020-special-edition-4-h--ffa-grand-drive>. Continuing this year, county agents and ag teachers will login to the ShoWorks system and approve the entries for exhibitors from their county/chapter. The same process will be used as for nominations. The only difference is agents and ag teachers will need to navigate to the entry link for the Grand Drive and login to their Club account using the appropriate password. Entries may be approved between now and July 17. Entries for KJLS will be due by August 15, also using ShoWorks. However, they are separate shows, so families will need to login to each show independently when entering, or use the ShoWorks Passport App. All exhibitors must register online, using the link found on the KJLS website: [www.kjls.net](http://www.kjls.net). Late entries will be accepted until August 25, but will cost double the listed original entry fee amount. Families who plan to show in both state shows will need to enter through each link and pay the appropriate entry fees. So, after entering, they should have a receipt for their Kansas State Fair Grand Drive entries and one for their KJLS entries. Youth who are only showing registered breeding females will submit their YQCA verification at the time of entry.

↪ **Livestock Projects Sold through County Fair Premium Auctions-** As we enter county fair season 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 Kansas 4-H Policy. So, please refer to the policy guide on the state 4-H website for further details. As counties wrap up their county fairs, a list of the STATE NOMINATED animals that participated in the premium auction needs to be submitted. We only need the state nominated animals, not the entire sale bill/ribbon auction list. Please just email the official KSU nomination family name, exhibitor 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/extension/youth-programs/nominated-livestock/check-nominated-livestock.html>. This list includes official KSU nomination family names and tag numbers. The list of state nominated sale animals is due at the conclusion of each county fair and no later than August 15. For more information, contact Lexie Hayes ([adhayes@ksu.edu](mailto:adhayes@ksu.edu) or 785-532-1264.)

↪ **KLA/KSU Ranch Management Field Days Planned for August-** Kansas State University and the Kansas Livestock Association have planned two field days to help cow-calf producers enhance their management strategies. KLA/K-State Ranch Management Field Days are set for Aug. 10, 2023, hosted by Mushrush Red Angus of Strong City, KS, and Aug. 17 hosted by Carpenter Cattle Company of Brewster, KS. At the Mushrush location, topics will include virtual fencing and planning for farm and ranch transitions. Managing weeds after drought and a market outlook will be part of the program at the western location. The event is free to attend and will include a free beef dinner. More details on both programs will be available soon at [KSUBeef.org](http://KSUBeef.org) or [KLA.org](http://KLA.org).

↪ **Livestock Sweepstakes-** Kansas 4-H Livestock Sweepstakes is scheduled for August 19-20 in Manhattan. The 4-H Livestock Sweepstakes event includes the state 4-H livestock judging contest, meat judging contest, livestock skillathon, and livestock quiz bowl. The members who will represent Kansas at the national 4-H contests for each of these events will be selected during the livestock sweepstakes weekend. Registration information is available through local extension units. All entries must be made by the local county extension offices or extension districts using the qualtrics registration link. The entry deadline is August 1. Contest details, including the rules, are available on the KSU Youth Livestock website, under 4-H Livestock Sweepstakes at [https://www.asi.k-state.edu/extension/youth-programs/events/livestock\\_sweepstakes/](https://www.asi.k-state.edu/extension/youth-programs/events/livestock_sweepstakes/). For more information, contact Lexie Hayes ([adhayes@ksu.edu](mailto:adhayes@ksu.edu) or 785-532-1264.)

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July 2023



# UPCOMING EVENTS...

- ✦ **Kansas Ag Growth Summit**- The Kansas Department of Agriculture will host the eighth annual Kansas Governor's Summit on Agricultural Growth on **Thursday, August 17, 2023**, at the Manhattan Conference Center, 410 S. 3rd Street in Manhattan, KS. The Summit involves Kansas farmers, ranchers, and agribusinesses working together in a collaborative setting to discuss growing the agriculture industry in Kansas. We welcome producers, business owners, ag educators, community leaders, and representatives of ag organizations from across the state to join us to talk about how we can work together to expand opportunities for Kansas agriculture. The annual Ag Growth Social will be the evening of August 16. Both the Social and the Summit are FREE, but pre-registration is requested. For more information visit <https://agriculture.ks.gov/aggrowthstrategy/ag-summit-2023>.
- ✦ **KSU Beef Stocker Field Day** is scheduled for Thursday, September 28 at the KSU Beef Stocker Unit. The registration details and a complete schedule will be posted at [asi.ksu.edu/stockerfieldday](http://asi.ksu.edu/stockerfieldday). For more information contact Dale Blasi (dblasi@ksu.edu or 785-532-5427.)
- ✦ **Implementing Your Company's HACCP Plan** will be hosted September 27-29, 2023 in Olathe, KS. This workshop uses curriculum recognized by the International HACCP Alliance for meat and poultry processors. The registration fee is \$450 per person and is available online at <http://bit.ly/HACCPCourse>. For more information, contact Dr. Liz Boyle (lboyle@ksu.edu or 785-532-1247.)
- ✦ Watch for more details coming soon on the **2023 ASI Family and Friends Reunion**. This years date is Saturday, October 7 at the Stanley Stout Center. This year we will be honoring Dr. Larry Corah with the Don L. Good Impact Award. Make plans now to attend. Visit [asi.ksu.edu/familyandfriends](http://asi.ksu.edu/familyandfriends) for more information.
- ✦ **Animal Technician Supervisor—Dairy Teaching and Research Center (Job # 515576)** -This is a full-time, unclassified professional staff, term contract position. This position is critical to the overall operation of the KSU Dairy Teaching and Research Center. It involves supervision of other employees and the care and comfort of the animals housed at the DTRC at Kansas State University. Incumbent functions as the assistant manager of the Dairy Teaching and Research Center and is responsible for ensuring the safety of the cows and other dairy unit employees. Assumes responsibility for operation of the dairy unit in the manager's absence. Incumbent is responsible for milking cows at least two days each week and for making vital animal observations during the milking process. Incumbent is responsible for collecting sterile samples of milk to be tested for antibiotics or bacteria. To apply, go to <https://careers.k-state.edu/cw/en-us/job/515576/animal-technician-supervisor>.
- ✦ **Animal Technician II - Dairy Unit- 2 Positions Available(Job # 512403 & #510744)**- This is a full-time, University Support Staff (USS) position. This position exists to operate and maintain the feed mill facility and feed the milk herd at the Dairy Teaching and Research Center. Review of applicants begins immediately and continues until the position is filled. For more information, contact Mike Brouk, Search Committee Chair ([mbrouk@ksu.edu](mailto:mbrouk@ksu.edu) or 785-532-1207.) To apply, go to <https://careers.pageuppeople.com/742/cw/en-us/job/512403/animal-technician-ii>
- ✦ **Animal Technician II – Dairy Unit (Job # 513849)** – This is a part-time, University Support Staff (USS) position. This position exists to milk, feed, and provide care of Dairy Teaching and Research Center (DTRC) dairy herd, which is used for teaching and research purposes. This is an **AS NEEDED** position. The incumbent could be called to fill in for Emergency situations, 24 hours a day 7 days a week. Review of applications begins immediately and continues until the position is filled. For more information, contact Mike Brouk, Search Committee Chair ([mbrouk@ksu.edu](mailto:mbrouk@ksu.edu) or 785-532-1207.) To apply, go to <https://careers.k-state.edu/cw/en-us/job/513849/animal-technician-ii>.

## CALENDAR OF UPCOMING EVENTS

Date	Event	Location
August 10, 2023	KLA/K-State Ranch Management Field Day	Mushrush Red Angus
August 17, 2023	KLA/K-State Ranch Management Field Day	Carpenter Cattle Co.
August 17, 2023	Kansas Ag Growth Summit	Manhattan
August 19-20, 2023	Livestock Sweepstakes	Manhattan
September 27-29, 2023	HACCP Workshop	Olathe, KS
September 28, 2023	K-State Beef Stocker Field Day	Manhattan
October 7, 2023	K-State ASI Family & Friends Reunion	Manhattan
November 16, 2023	K-State Swine Day	Manhattan

# What's New for Beef Cattle Producers

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

### *“Managing and Leading Change”*

As the saying goes, “the only constant is change” and most people are often resistant to change in general. Change is often viewed as negative, although it can and is often a good thing. The process of initiating, and leading an organization or a group of co-workers through Change can be difficult. Experts suggest that the best way to lead an organization through any type of change is to clearly communicate the “Why” and the vision for “Where are we headed” first and then focus on the “How are we going to get there.” It is also important to recognize informal leaders who can serve as “Change Agents” to champion the process and engage others in the organization at many different levels. Organizational change affects everyone and thus everyone has to be engaged. Lastly, it’s critical to reinforce and reward individuals or teams that are embracing the change. Change is a process and it’s the role of the leader to guide people through the process. Leading through change requires communication, feedback and most importantly letting people be a part of the process.

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

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

### *“Calf Revenue; Time to Start Thinking About Marketing Those Calves This Fall”*

Maximizing calf revenue is important for cattle producers, it’s how they get paid! Just like any business understanding what drives how you get paid is important. 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 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 five weight calves the first week of October, to seven weights December helps producers make the best decision for their operations.

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

# KSU Cow-Calf Checklist – July 2023

## Management considerations for September 2023

By Jason M. Warner, Ph.D., Extension Cow-Calf Specialist

### Cowherd Management

- For spring-calving cow herds:
  - If not already done, make plans for weaning calves.
    - Test your forages and have feedstuffs on hand prior to weaning.
    - Check and clean waterers and prepare weaning/receiving pens.
  - Evaluate cow BCS at weaning.
    - Record scores with the BCS Record Book from KSRE!
    - Use BCS to strategically supplement cows during fall, if needed.
    - Female requirements are lowest at weaning so weight and BCS can be added more easily in early fall rather than waiting until closer to calving.
  - Schedule pregnancy checking and fall health work if not already done.
    - How were pregnancy rates relative to last year?
    - Do we need to re-think our fall/winter nutrition program?
  - Evaluate the cost of gain relative to the value of gain when making feeding and marketing decisions for cull cows.
- For fall-calving cow herds:
  - The final 60 days prior to calving represents the last opportunity to add BCS economically.
  - Ensure mature cows are  $\geq 5.0$  and 2–4-year-old females are  $\geq 6.0$  at calving.
  - Review your calving health protocols as needed.
  - Have calving equipment cleaned and available to use as needed.
  - Plan to adjust your nutrition program to match needs of lactating cows.
  - Use the estrus synchronization planner (<https://www.iowabeefcenter.org/estrussynch.html>) to help plan fall synchronization protocols.
- Plan your mineral supplementation for this coming fall and winter.
  - Record date and amount offered and calculate herd consumption.
  - If consumption is 2X the target intake, then cost will be too!
  - If using fly control products, continue to use them until recommended times (based on date of first frost) for your area.
  - Risk of grass tetany is greatest for lactating cows. Consider magnesium levels in mineral supplements for cows grazing cool-season forages and winter annuals this fall.
- Schedule breeding soundness exams for bulls used for fall service.
  - Monitor BCS, particularly on young bulls.
  - If bulls are BCS  $\leq 5.0$  after summer breeding, consider supplementing to regain BCS going into fall.

### Calf Management

- If you are creep feeding spring-born calves, continue to closely monitor intake and calf condition/fleshiness going into the fall until weaning.
- Schedule any pre-weaning vaccination or processing activities if not already done.
- Consider the economic value by implanting nursing fall-born calves and weaned spring-born calves.
- If not already done, schedule your breeding protocols for fall replacement heifers in advance of the breeding season.
  - If synchronizing with MGA, make sure intake is consistent at 0.5 mg of melengestrol acetate per hd per day for 14 days, and remove for 19 days prior to administering prostaglandin.

### General Management

- Employ multiple strategies, chemistries for late-season fly/insect control.
- Take inventory of and begin sampling harvested forages for fall feed needs.
  - Use the forage inventory calculator (<https://www.agmanager.info/hay-inventory-calculator>).
  - Balance forage inventories with fall/winter grazing acres.
- If planning to harvest corn or sorghum silage:
  - Prepare your pile/bunker site and equipment.
  - If using a custom harvester, communicate with them well in advance.
  - Closely monitor whole plant moisture levels.
  - Have silage tarps in place and ready to cover once harvest is complete.
- Use the Management Minder tool on *KSUBeef.org* to plan key management activities for your cow herd for the rest of the year.
- With high feeder calf prices, consider price risk management tools.
- Visit with your local FSA and extension office if you plan to utilize CRP acres for emergency forage use or for information on other assistance programs.



# What's New for Beef Cattle Producers

## ↪ **Effects of Biuret and Lasalocid (Bovatec) Inclusion into a Commercial Mineral Supplement on Growth Performance of Yearling Calves Grazing in the Kansas Flint Hills**

The objective of this experiment was to measure the effects of non-protein nitrogen (NPN; i.e., biuret) or NPN + ruminal modifier (i.e., biuret + lasalocid) inclusion in a commercial mineral mix on growth performance of yearling beef calves grazing in the Kansas Flint Hills. Over a two-year period, 742 crossbred steers [initial body weight (BW): 655 ± 52.2 lb] of Texas and Nebraska origin previously backgrounded at the Kansas State Beef Stocker Unit were used in this experiment. The three mineral treatments consisted of a basal supplement (Control), a basal supplement plus biuret (Biuret), and a basal supplement plus biuret and lasalocid (Bovatec; Zoetis, Parsippany, NJ) with a 4 oz/head daily mineral consumption target. Each treatment was randomly assigned to one of 18 pastures with a total of six pastures per treatment. To determine days-to-empty, mineral feeders were checked daily. Mineral feeders were also weighed weekly to determine mineral consumption. At the onset and conclusion of the experiment, pasture weights were taken to determine average initial and average final BW.

**Results:** Total BW gain, average daily gain (ADG), and mineral consumption did not differ ( $P \leq 0.15$ ). However, final BW did differ between mineral treatments ( $P \leq 0.03$ ). Likewise, there was an interaction between treatment and week for days-to-empty ( $P \leq 0.05$ ).

**The Bottom Line:** These data were interpreted to suggest that the addition of biuret or biuret + Bovatec to a commercial mineral supplement may improve the growth performance of yearling beef cattle grazing in the Kansas Flint Hills. More information is available on this experiment and others in the KSU Cattlemen's Day report at [KSUbeef.org](http://KSUbeef.org). For more information, contact KC Olson (785-532-1254 or [kcolson@ksu.edu](mailto:kcolson@ksu.edu)) or Dale Blasi (785-532-5427 or [dblasi@ksu.edu](mailto:dblasi@ksu.edu).)

## ↪ **Evaluation of Bovine Myosin Heavy Chain Isoforms and Muscle Fiber Cross-Sectional Area on the Eating Quality of 11 Different Beef Muscles**

The objective of this study was to investigate the contribution of muscle fiber type and size on the eating quality of 11 different beef muscles. Eleven different beef muscles were utilized from two separate studies. In study 1, shoulder clod, flank, knuckle, mock tender, top sirloin butt, brisket, eye of round, and ribeye were collected from 10 U.S. Department of Agriculture choice carcasses ( $n = 80$ ), and each muscle was fabricated into steaks at 2 days postmortem. In study 2, strip loin, tri-tip, and heel were collected from 10 USDA low choice carcasses ( $n = 30$ ). Myofibrillar proteins were extracted and analyzed by immunoblot to determine muscle fiber type. Cross sectional area (CSA) and muscle fiber diameter were determined under the microscope. An average of 400 fibers per sample were analyzed to determine CSA and muscle fiber diameter. Pearson correlation analysis was conducted to determine the relationship between muscle fiber type, CSA, and diameter with the results for the eating quality of beef as determined by a trained panel that were reported in previous studies.

**Results:** In study 1, there was a positive correlation between fiber type 1 and initial juiciness ( $r = 0.37$ ;  $P < 0.05$ ), sustained juiciness ( $r = 0.39$ ;  $P < 0.05$ ) and lipid flavor ( $r = 0.41$ ;  $P < 0.05$ ). Conversely, there was a negative correlation between fiber type 2A and initial juiciness ( $r = -0.40$ ;  $P < 0.05$ ) sustained juiciness ( $r = -0.42$ ;  $P < 0.05$ ), and lipid flavor ( $r = -0.45$ ;  $P < 0.01$ ). Both studies saw a negative correlation between muscle fiber CSA and diameter with connective tissue content ( $P < 0.05$ ), but positive correlations to overall tenderness ( $P < 0.05$ ).

**The Bottom Line:** This study shows that muscles predominated by type 1 fibers will likely deliver a higher eating quality experience for consumers, while muscles with more glycolytic fibers 2A and 2X will deliver a less favorable eating experience for consumers. On the other hand, these data also demonstrated that larger muscle fiber CSA and diameter are not necessarily a negative eating quality marker as muscles with those characteristics had less connective tissue and had greater tenderness scores. More information is available on this experiment and others in the KSU Cattlemen's Day report at [KSUbeef.org](http://KSUbeef.org). For more information, contact Michael D. Chao (785-532-1230 or [mdchao@ksu.edu](mailto:mdchao@ksu.edu)) or Liz Boyle (785-532-1247 or [lboyle@ksu.edu](mailto:lboyle@ksu.edu).)

# What's New for Swine Producers

- ☞ **Use of Specialty Soy Products to Replace Poultry Meal and Spray-Dried Blood Plasma in Diets Provided to Nursery Pigs Housed in Commercial Conditions-** A total of 2,260 pigs (PIC TR4 × [Fast LW × PIC L02]; initially 14.8 lb) were used to evaluate a specialty soy protein source as an alternative to poultry meal and spray-dried blood plasma on nursery pig performance in a commercial environment. At weaning, pigs were allotted to 1 of 5 dietary treatments based on initial weight in two research nurseries. In the first facility there were 20 pigs per pen and 10 pens per treatment. In the second facility, there were 21 pigs per pen and 12 replications per treatment for a total of 22 replications per treatment. Dietary treatments included a control diet containing 9.5% poultry meal (AV-E Digest, XFE Products, Des Moines, IA) and 4.13 (phase 1) or 2.75% (phase 2) spray-dried blood plasma (Appetein, APC Inc., Ankeny, IA). The four additional diets were set up in a 2 × 2 factorial with a novel soy protein concentrate (AX3 Digest; Protekta; Plainfield, IN) or fermented soybean meal (MEPro; Prairie Aquatech; Brookings, SD) replacing poultry meal or poultry meal and spray-dried blood plasma in the control diet. Pigs were fed experimental diets during phase 1 (d 0 to 7) and phase 2 (d 7 to 21). Following phase 2, pigs were fed a common diet for an additional 21 d (d 21 to 42). During the experimental period (d 0 to 21), pigs fed the novel soy protein concentrate had improved ( $P < 0.001$ ) F/G with no differences in ADG or ADFI compared to pigs fed fermented soybean meal. During the experimental period (d 0 to 21) and overall (d 0 to 42), pigs fed soy protein as a replacement to poultry meal had increased ( $P \leq 0.016$ ) ADG and ADFI compared to pigs fed the control diet. During the experimental period (d 0 to 21), pigs fed soy protein as a replacement to spray-dried blood plasma had improved ( $P = 0.044$ ) F/G compared to pigs fed soy protein without replacing spray-dried blood plasma, with no differences in ADG or ADFI. In summary, utilizing a specialty soy protein source as a replacement for poultry meal improved growth performance. Replacing poultry meal and spray-dried blood plasma with soy protein improved feed efficiency when treatment diets were fed, but not overall. In addition, the novel soy protein concentrate improved feed efficiency compared to fermented soybean meal during the experimental period with no effect on ADG or ADFI. More information is available on this experiment and others in the KSU Swine Day report at [KSUSwine.org](http://KSUSwine.org). (This study conducted by Ethan B. Stas, Jamil E. G. Faccin, Zach B. Post, Chad W. Hastad, Mike D. Tokach, Jason C. Woodworth, Joel M. DeRouchey, Robert D. Goodband and Jordan T. Gebhardt.)
- ☞ **Development of a Self-Emulsifying Adjuvant for Use in Swine Vaccines-** Emulsion-based adjuvants are commonly used in animal vaccine formulations for several reasons including affordability, stability, and efficacy in inducing disease-protecting immune responses. Here we report a novel, cost-effective, stable, self-emulsifying adjuvant (SEA1) that is prepared by a simple low shear process or low-energy mixing without the use of expensive and complex proprietary equipment. Characterization of the SEA1 adjuvant showed good stability at different temperatures (4°C, 20°C, and 37°C) after one month of storage. Minimal changes in droplet size distribution, polydispersity index, Zeta potential and pH in 1-month-old SEA1 preparations were observed when compared with a fresh SEA1 preparation. SEA1 emulsion-based experimental vaccine preparations effectively stimulated humoral immunoglobulin (IgG) responses in mice and swine and were comparable to commercially available adjuvants Montanide ISA 201 and 206. More information is available on this experiment and others in the KSU Swine Day report at [KSUSwine.org](http://KSUSwine.org). (This study conducted by Rachel Madera, Yulia Burakova, Lihua Wang and Jishu Shi.)
- ☞ **Evaluating the Effects of Benzoic Acid on Finishing Pig Growth Performance-** A total of 2,106 pigs (PIC 337 × 1050; initially 73.5 ± 4.21 lb) were used in a 101-d growth study to evaluate the effects of dietary benzoic acid level on grow-finish pig growth performance and carcass characteristics. Pens of pigs (27 pigs per pen) were randomly assigned to 1 of 3 dietary treatments with 13 pens per treatment. Dietary treatments were corn-soybean meal-DDGS-based with an inclusion of none, 0.25, or 0.50% benzoic acid (VevoVital, DSM Nutritional Products, Parsippany, NJ). Diets were fed in 4 phases from 74 to 110, 110 to 165, 165 to 220, and 220 to 290 lb body weight. In the grower period (d 0 to 44), there was no evidence of differences ( $P > 0.10$ ) for pigs fed increasing benzoic acid for any growth response criteria. For the finisher period (d 44 to 101) and overall (d 0 to 101), increasing benzoic acid tended to increase ADFI (linear,  $P < 0.10$ ) and worsen F/G (linear,  $P < 0.01$ ). There was no evidence of differences in ADG ( $P > 0.10$ ) for the overall experimental period. For carcass characteristics, no evidence of differences ( $P > 0.10$ ) were observed. In conclusion, these data suggest that feeding benzoic acid in the grow-finish period had no impact on ADG, but tended to increase ADFI and worsen F/G. More information is available on this experiment and others in the KSU Swine Day report at [KSUSwine.org](http://KSUSwine.org). (This study conducted by Katelyn N. Gaffield, Mike D. Tokach, Robert D. Goodband, Jason C. Woodworth, Joel M. DeRouchey, and Jordan T. Gebhardt.)

# What's New for Dairy Producers

## ↵ Effect of diet supplementation with omega-3 fatty acids on reproduction and milk production in cattle-

The aim of this study was to assess the effects of omega-3 fatty acid supplementation on reproduction and milk production in dairy cattle. Holstein cows (primiparous [n=22], multiparous [n=28]) housed at the Kansas State University dairy were randomly assigned to two diets: omega-6:omega-3 ratio of 6:1 (**Control**, n=26), or 2:1 (**OMG3**, n=24), and allocated randomly into 6 pens (3 controls and 3 OMG3). Diets were isocaloric and isonitrogenous. GreatOPlus®, which is an extruded feed containing flaxseed and *Nannochloropsis oculata* algae, was used in the OMG3 group. Cows were milked 3x/d and fed 1x/d. Experimental diets were fed from 15 days in milk (**DIM**) until ~140 DIM. Data were analyzed using the Glimmix procedure (SAS 9.4). Body condition score was not different ( $P=0.15$ ) between Controls and OMG3 diets at -21, 0, 21, 50, 75, or 110 DIM. Multiparous OMG3 cows ( $60.8 \pm 2.2$  kg) tended ( $P=0.1$ ) to produce more milk (15 to 140 DIM) than multiparous Controls ( $55.6 \pm 2.2$  kg). Primiparous ( $41.5 \pm 1.7$  kg) produced less ( $P<0.01$ ) milk than multiparous, with no difference between diets. Based on milk and blood samples from 15, 50, 75, and 110 DIM, milk protein ( $2.84 \pm 0.34\%$ ) and fat ( $3.27 \pm 1.08\%$ ) were not different between diets ( $P>0.45$ ), but plasma ratio omega-6:omega-3 was reduced ( $P<0.001$ ) in the OMG3 at 50, 75, and 110 DIM compared to Controls. Thus, hypothesis 1 was supported, that OMG3 would not influence milk protein or fat content but would have greater omega-3 concentration. Oocyte quality was assessed by a single oocyte harvest at 50 DIM, and the number of follicles (>3mm) or recovered oocytes did not differ between diets ( $P>0.3$ ), but a diet-by-parity interaction was detected ( $P=0.0007$ ) for the number of grade I and II oocytes/total recovered oocytes: primiparous-Controls =  $58.5 \pm 8.6\%$ ; multiparous-Controls =  $59.7 \pm 7.9\%$ ; primiparous-OMG3 =  $31.2 \pm 7.8\%$ ; multiparous-OMG3 =  $70.5 \pm 7.5\%$ . Cows received first and second TAI at 75 and 110 DIM, respectively, and weekly ovarian ultrasound was performed from day 11 post-TAI until day 30 to evaluate CL volume and blood flow. On day 30 post-TAI, pregnancy was diagnosed by an embryo with heartbeat. From days 30 to 60 post-TAI, pregnant cows had CL, embryo, and amniotic vesicle evaluations. Only pregnant primiparous-Controls (n=6), primiparous-OMG3 (n=7), and multiparous-Controls (n=9) were compared post-TAI due to lack of representation in the multiparous-OMG3. CL volume did not differ ( $P>0.3$ ) among groups, but CL blood flow was lower in primiparous-Controls on days 25 and 39 post-TAI. Finally, embryo and vesicle size did not differ among groups ( $P>0.7$ ). Thus, hypothesis 2 was partially supported, that omega-3 enhances oocyte quality and in vivo embryo development.

**The Bottom Line:** Omega-3 supplementation increases omega-3 in blood and enhanced oocyte and CL quality, but it is unclear if this can translate into direct benefits on embryos from day 30 to 60 of gestation. (*This study was conducted by Santiago Paez Hurtado, Andréia Ferreira Machado, Galo Vera Tinocco, Leticia P. Sanglard, James Drouillard, and Victor E. Gomez-Leon [vgomezleon@ksu.edu]*).

# ASI FACULTY SPOTLIGHT...



**Deanna Retzlaff** ([retzlaff@ksu.edu](mailto:retzlaff@ksu.edu) or 785-532-2202)

## Teaching Professor

Deanna Retzlaff earned her B.S. degree in Animal Sciences from the University of Tennessee (Martin, TN). She then continued her education at Kansas State University, earning a Ph.D. in Food Science, with a focus on food safety. Deanna left the university to manage a commercial analytical laboratory before returning to K-State in 2002.

Deanna's position provides support for the online programs in both Animal Science and Food Science, including program coordination, student services, and academic advising. She also teaches FDSCI 307 Applied Meat and Poultry Microbiology.

Deanna is a member of the National Academic Advising Association, the University Continuing Education Association, the American Society for Microbiology, the International Association for Food Protection, and the Institute of Food Technologists.



**Joel DeRouchey** ([jiderouch@ksu.edu](mailto:jiderouch@ksu.edu) or 785-532-2280)

## Professor & State Extension Leader, Monogastric Swine Nutrition

Dr. Joel DeRouchey grew up on a diversified purebred swine, cattle and sheep operation in Pukwana, S.D. He graduated with his bachelor's in Animal Science from South Dakota State University in 1997 and his M.S. (1999) and Ph.D. (2001) in Swine Nutrition from Kansas State University. He was hired in 2001 as the Northeast Livestock Extension Specialist for Kansas State University. In 2004, Joel moved to the Department of Animal Sciences and Industry as a Livestock Nutrition and Environmental Management Specialist and with a 40% Extension, 40% Research, and 20% Teaching appointment. Currently, he is a full professor and State Animal Science Extension Program Leader and has a 50% Extension and 50% Research appointment.

A brief listing of Joel's Extension and Research interests involve mentor and train swine nutrition graduate students, conducting applied swine nutrition and management research, Providing environmental information to livestock producers for regulatory and manure management compliance and coordinate youth swine activities to increase swine industry knowledge and awareness of career opportunities in swine production.

Recently, Joel was the recipient of the 2023 AFIA Award in Nonruminant Nutrition Research. In 2018 Joel was named the National ASAS Outstanding Extension Specialist and received the North Central Region Excellence in 4-H Volunteerism Award. Joel is the faculty coordinator for ASI 890 and ASI 990 Graduate Student Monogastric Seminar, and is a guest lecturer in ASI 535 Swine Science. He formerly taught ASI 320 Principles of Feeding. Joel works with a productive applied swine nutrition team that maintains approximately 12 MS and PhD students. He has co-authored 287 refereed journal papers, 540 abstracts and 791 extension publications and field day reports and a co-advisor or active committee member for 101 MS and PhD graduate programs. They enjoy K-State football tailgating, 4-H activities, youth livestock exhibitions and currently live on a small farm near Wamego, KS.

*We need your input! If you have any suggestions or comments on **News from KSU Animal Sciences**, please let us know by email to [katiesmith@ksu.edu](mailto:katiesmith@ksu.edu)*