News From KSU Animal Sciences

OCTOBER 2025

ASI Family & Friends Reunion Hosted October 18

Plan to join us for this year's K-State ASI Family & Friends Reunion which will be hosted this Saturday, October 18 at the Stanley Stout Center. The event will start at 4 p.m. with dinner served at 5:30 p.m. There will also be Bilbrey Family Event Center Tours available from 3:00 to 5:00 p.m. Activities available during the event include great food, live music, Junior Wildcat Barnyard, Willie the Wildcat and more. The K-State Applied Swine Nutrition Team will be presented as the 2025 Don L. Good Impact Award Winner. Registration is available on site and costs $50 for adults, $10 for students and children under the age of 5 are free. For more information visit asi.ksu.edu/familyandfriends. For questions contact Katie Smith (katiesmith@ksu.edu or 785-532-1267).

KSU Swine Day to be Hosted November 20

Registration is now open for KSU Swine Day, to be hosted at the K-State Alumni Center in Manhattan, Kansas, on Thursday, November 20. The trade show, with more than 30 exhibitors, will begin at 8 a.m., followed by a great program with updates on K-State Applied Swine Nutrition Research, and featuring a presentation from Dr. Arkin Wu, Director of Nutrition and Technical Service at Riverstone Farms in China on "Understanding China's ever-changing pork production landscape."
The schedule is as follows:

8:00 a.m.	Technology Trade Show *The trade show will conclude at 4 p.m.*
9:15 a.m.	Welcome
9:30 a.m	Latest Update on K-State Applied Swine Nutrition Research, K-State Swine Faculty *Research highlights of Nutrition, Management, Feed Processing and Feed Safety*
11:30 a.m.	Lunch with Technology Trade Show
1:30 p.m.	Latest Update on K-State Applied Swine Nutrition Research, cont...
2:30 p.m.	Understanding China's everchanging pork production landscape *Dr. Arkin Wu, Director of Nutrition and Technical Services, Riverstone Farms, China*
3:15 p.m.	Question-and-Answer Session
3:30 p.m.	Reception with K-State Call Hall Ice Cream

Pre-registration is $25 per participant and due by November 7. On-site registration is $50 per participant. There is no charge for K-State students if they are pre-registered. The complete schedule and online registration information can be found at KSUswine.org. For more information, contact Katie Smith (katiesmith@ksu.edu or 785-532-1267).

Grilling Academy "Holiday Edition" - Nov 15

Register now for this year's Holiday Edition of the K-State Grilling Academy to be hosted on November 15 at Weber Hall in Manhattan, KS. This single day grilling academy is a chance to learn more about the science and meat cookery, techniques, methods, and seasonings while having a chance to showcase your skills in a cooking contest. This event will focus on proteins that are Holiday Favorites. More details including registration are available at https://bit.ly/ksu-grilling. For questions, contact Erin Beyer at erbeyer@ksu.edu or 832-276-3350.

IRM Redbooks for Sale

The 2026 IRM Redbooks are now for sale and will be sold on a first-come, first-serve basis. The price is $7.65 per book for orders of 10 or more and $8.00 per book for orders of less than 10, which includes postage. To order your supply of Redbooks, contact Katie Smith (katiesmith@ksu.edu or 785-532-1267).

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Upcoming Events

October 18, 2025
ASI Family & Friends Reunion

November 15, 2025
Grilling Academy - Holiday Edition

November 20, 2025
Swine Day

February 3, 2026
Swine Profitability Conference

February 19-21, 2026
K-State College Rodeo

March 5, 2026
Stockmen's Dinner

March 6, 2026
Cattlemen's Day

March 6, 2026
Legacy Bull Sale

What's New

Management Minute

"Becoming More Efficient in Your Day"

Justin Waggoner
KSU Extension Beef Cattle Specialist
Garden City, KS

Fall is a busy time of year for many households with evenings and weekends being filled with a variety of activities ranging from sports to livestock shows. One of the more common issues for many of us in the workplace is trying to simply find time to get more done. Time management experts suggest that the best way to make more time for any new activity is to become more efficient within our day. Efficiency is essentially organizing and prioritizing the daily "to do list" but it also includes looking for places in our day where we simply waste time. The most common "time waster" for many people involves a computer or a phone in today's world. Procrastination is also another common "time waster" that reduces our ability to get things done. Many strategies have been developed to combat procrastination. One simple strategy that I recently came across is the 2-minute rule and it essentially targets all those little things that we encounter during the day that eventually add up. This informal rule essentially says that when we encounter anything in our day that will take less than 2-minutes that we should do it, be it a quick email response or cleaning up our computer files. It is difficult to find more time in our busy work schedules, but one thing is clear seconds turn into minutes, minutes into hours, hours into days and so forth, which proves that little things do add up over time.

Feedlot Facts

"Feeding newly-weaned calves"

Justin Waggoner
KSU Extension Beef Cattle Specialist
Garden City, KS

One of the primary challenges associated with weaning calves is simply getting newly-weaned calves to consistently consume feed. The transition from a milk and grazed forage to grazed forage and supplement, hay and supplement, or a ration containing novel feeds delivered in a bunk isn't always easy. However, a little preparation and following a simple feeding management strategy can help calves make this necessary transition. Feeding both cows and calves a small amount of the supplement or weaning ration prior to weaning, in the weaning pen or pasture can be used help acclimate calves to both the feeds and the environment. Additionally, feed intake of weaned calves is often low (1.0 to 1.5 % of bodyweight, dry basis) immediately following weaning. Calves also have relatively high nutrient requirements. Thus, the weaning diet must be nutrient dense to meet the nutrient requirements of the calves at the expected intakes previously mentioned. Unfortunately, the dry feeds calves are often most familiar with (typically grass hays) are not necessarily nutrient dense. At the K-State Agriculture Research Center, Hays, KS a feeding management protocol for weaning calves has been developed that works well for transitioning weaned calves to a total mixed ration. The protocol is summarized in the table below. Essentially, high-quality grass hay and the weaning ration are offered each at 0.5% of the calves' current bodyweight, dry basis, on the day of weaning. The weaning ration is placed in the bottom of the bunk and the hay is placed on top. The amount the weaning ration is steadily increased, while the amount of hay offered remains constant. In addition, on day 4 the hay is placed on the bottom of the bunk. Over a period of 7-10 days the dry intake of the calves is steadily increased and should reach approximately 2.2-2.5% of the calves' bodyweight by 10-14 days following weaning.

Table 1. K-State ARC-Hays Weaning Feed Management Protocol*

Day	Weaning Diet	Hay	Feedstuff Order
1	0.5% Bodyweight	0.5% Bodyweight	Diet bottom/hay on top
2	0.7% Bodyweight	0.5% Bodyweight	Diet bottom/hay on top
3	0.9% Bodyweight	0.5% Bodyweight	Diet bottom/hay on top
4	1.1% Bodyweight	0.5% Bodyweight	Hay bottom/diet on top
5	1.3% Bodyweight	0.5% Bodyweight	Hay bottom/diet on top
6	1.5%Bodyweight	0.5% Bodyweight	Hay bottom/diet on top
7	1.8% Bodyweight		
8	---Increase diet by 0.25 to 0.50 lb per calf/day---		

*Remove any uneaten feedstuffs before feeding current days ration

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

KSU Cow-Calf Checklist - October 2025

Management Considerations for December 2025

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

Cow Herd Management

- If not already done, take inventory of and test harvested forages for the following:
  - Moisture/dry matter
  - Crude protein
  - Energy (NE_m, NE_g, and/or TDN)
  - Fiber components (ADF, NDF)
  - Macro-minerals (calcium, phosphorus, magnesium, potassium, salt)
  - Nitrates and/or prussic acid when appropriate
  - Starch for silage crops
- Calculate forage needs based on herd inventory, cattle weight, and days, and develop a plan to ensure that adequate harvested forage is available if grazing is limited (https://www.agmanager.info/hay-inventory-calculator).
- Body condition score cows to develop informed supplementation strategies (both spring and fall-calving herds).
  - Targeted BCS at calving: 5 for mature cows, 6 for young females (2,3, & 4 year olds)
  - Record scores with the BCS Record Book (https://bookstore.ksre.ksu.edu/Item.aspx?catId=562&pubId=19320) from KSRE!
- Consider utilizing crop residues for late-fall and winter grazing needs.Assess down grain in the field and be aware of nitrates and prussic acid (around the time of frost for sorghums).
- For spring-calving cowherds:
  - Schedule pregnancy checking if not already done.
    - How were pregnancy rates relative to last year?
    - Do we need to re-think our fall/winter nutrition program?
- For fall-calving cowherds:
  - 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 synchronization protocols.
- Review your marketing strategy for cull cows.
  - Cows with a BCS ≥ 6.0 will likely sell well with current market prices.
  - Look for opportunities to increase value by adding weight prior to market.
- Ensure bulls undergo breeding soundness exams prior to fall/winter service.
- Manage young and mature bulls during the offseason to ensure bulls are BCS ≥ 5.0 prior to the next season of use.

Calf Management

- If not already done, make arrangements to wean spring-born calves.
  - Finalize plans to either market calves or retain and add weight post-weaning.
  - If marketing calves, communicate your strategy to prospective buyers in advance.
- 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.
- If retaining calves post-weaning:
  - Review your nutrition plan.
  - Ensure you have sufficient forages available to match cowherd needs.
  - Closely observe feed and water intake the first few weeks.
  - Make sure all cattle have sufficient access to feed and water.
- Review/update your health protocols as needed for either weaned or new-born calves.
- Consider either supplementing fall-calving pairs or creep feeding fall-born calves to maintain calf performance on low-quality winter forages.
- For replacement heifers, manage your program to properly develop them prior to your given breeding time.

Forage/Pasture Management

- Make plans for controlling invasive species for the next growing season.
- Winterize water sources if applicable.
- Work on fencing/facility projects as time/weather allows.

General Management

- Develop and/or review your risk management plans for the coming year.
- Evaluate your short and long-term herd inventory goals with current conditions.
- Update lease arrangements as necessary.
- Schedule an annual meeting with your lender, insurance agent, and extension professional.
- Consider opportunities to lock prices in, if possible, for co-products and commodity feeds.
- Understand what nutrients you are targeting to purchase and price feeds on a cost per unit of nutrient basis.

What's New for Cattle Producers

Post-Weaning Feed Intake and Performance of Bulls Developed in an Automated Feed Intake Management System- Our objectives were to compare expected and observed dry matter intake (DMI) and average daily gain (ADG) of beef bull calves fed in an automated feed intake system using modeled nutrient requirement equations. Feed intake and performance data from purebred Angus, Hereford, and Simmental bull calves across three calf crops (birth years 2021 [n = 40], 2022 [n = 37], and 2023 [n = 41]) were utilized for this analysis. Projected DMI and ADG were calculated for each group of bulls by year on an individual basis using the Growing Bull module of the Excel-based Beef Ration and Nutrition Decision Software (BRaNDS) formulation program. These predicted figures were compared to the Insentec intake data and analyzed via SAS.

The Bottom Line: While significant individual variation in intake exists, the BRaNDS program more accurately predicts DMI than ADG for growing bulls. The model consistently underestimated actual ADG, highlighting the need for refinement in predicting growth outcomes, even though its predictions for intake aligned reasonably well with observed values. More information is available on this study and others like it at KSUBeef.org. *(This study conducted by Brandon J. Fraser, J. W. L. Banks, Karol E. Fike, and Jason M. Warner).*

Determining the Spoilage Threshold for Ground Beef Using Multiple Objective Measures- The objective of this study was to determine the point at which ground beef reaches spoilage as determined by consumers. Retail ground beef packages were procured from a ground beef facility and randomly assigned to a storage duration (0 – 14 days) for simulated retail display. Packages were stored in mother bags at 36 to 40°F in the absence of light until placed in the retail case under fluorescent lights on the designated display date. Samples were displayed in three coffin-style cases at 36 – 40°F for eight different display periods (0, 2, 4, 6, 8, 10, 12, and 14 days). Consumer sensory panelists evaluated eight samples for visual appearance, odor, and touch. For each measure, consumers were asked if they would purchase the sample and if they considered the sample spoiled. Trained sensory panelists evaluated the same samples on the same day of display and were asked to evaluate redness, percent discoloration, odor, and touch characteristics.

Results: Consumers were less ($P < 0.05$) likely to purchase and more ($P < 0.05$) likely to rate samples spoiled once samples reached 8 days of display for visual appearance, touch, and odor. Consumer evaluation of the visual appearance score of the samples showed the strongest relationship to spoilage, having a high R^2 of 0.89 ($P < 0.05$). Threshold values of 50%, 75%, 90%, and 95% were identified for consumer purchase intent likelihood using multiple objective measures. With an R^2 of 0.86 ($P < 0.05$), trained panel redness scores of 60.15, 73.9, 87.6, and 96.95 corresponded to 50%, 75%, 90%, and 95% likelihood of a consumer purchasing the product. The likelihood of consumers classifying a sample as spoiled ($R^2 = 0.76$) 5%, 10%, 25%, and 50% of the time corresponded with a trained sensory panel redness score of 74.8, 64.1, 48.4, and 32.7, respectively. Overall, consumers' opinion toward the product's appearance plays the biggest role in their purchase intent and assessment of spoilage as opposed to touch and odor.

The Bottom Line: Though many changes were identified throughout the retail display period, the change in color from a bright, cherry-red to brown was shown to be the most important factor considered by consumers when they identified whether or not samples were spoiled; therefore, maintaining beef in a bright, cherry-red state is crucial to maximizing value. More information is available on this study and others like it at KSUBeef.org. *(This study conducted by Lauren M. Frink, Stephanie L. Witberler, Mason J. Prester, Erin S. Beyer, Jessie L. Vipham, Morgan D. Zumbaugh, Michael D. Chao, and Travis G. O'Quinn).*

Quality and Sensory Attributes of Tumbled or Marinated Beef Jerky- The objective of this research was to evaluate the quality and sensory characteristics of vacuum-packaged shelf-stable beef jerky produced using tumbling or marination. This study used 12 USDA Select beef inside top rounds (semimembranosus) that were stored in a non-barrier shrink bag held at 36°F for 10 to 14 days before processing. On each processing day, whole rounds were trimmed, pH was measured, and the weights were obtained before and after trimming. Trimmed rounds were cut in half, and each half was allocated to a tumbled or marinated treatment. Before the processing treatments were applied, each beef round half was sliced using a slicer (Treif Puma Slicer, Shelton, CT) into 3 mm slices and then weighed. Pieces from each half were collected for determination of structural analysis, sarcomere length (SL), and myofiber diameter (MD) using transmission electron microscopy (TEM) and light microscopy (LM) and for proximate analysis. After tumbling or marinating, percent pickup was measured following a 5-minute rest period, and a sample from each half of tumbled or marinated rounds was held to measure sodium chloride content (SCC), structural analysis, SL, and MD. After thermal processing, samples from each treatment were vacuum-packaged and sampled initially on day 0 and after 3 and 6 months at 68°F. Cook yield was determined after thermal processing. On day 0, the pH, moisture, and protein content, water activity (a_w), instrumental color, shear force (SF), sensory evaluation, SCC, structural analysis, SL, and MD were measured. After 3 and 6 months of storage, the instrumental color, sensory evaluation, a_w, SF, SCC, moisture, structural analysis, SL, and MD were measured.

The Bottom Line: Tumbling produced a jerky product that was more tender, less brittle, and more flavorful during 6 months of storage compared to marination as a processing method. More information is available on this study and others like it at KSUBeef.org. *(This study conducted by Ashton L. McGinn, D. L. Boyle, Travis G. O'Quinn, and Elizabeth A. Boyle).*

What's New for Swine Producers

Is Nitrogen the Limiting Factor to Maintain Feed Efficiency when Feeding Low Protein, Amino Acid Fortified Diets?- A total of 981 mixed-sex pigs ([Fast LW × PIC L02] × PIC 800; initially 22.8 ± 0.42 lb) were used in a 21-d study to determine if nitrogen, derived from non-protein nitrogen or amino nitrogen, is the limiting factor to maintain feed efficiency when feeding low protein, amino acid fortified diets. Pens of pigs were randomly allotted to one of five dietary treatments in a randomized complete block design with BW as a blocking factor. There were 19 to 20 pigs per pen and 10 pens per treatment. The experimental diets were corn-soybean meal-based and were fed when pigs reached an approximate BW of 23 lb, considered d 0 of the study. The five treatments consisted of: 1) low level of feed-grade AAs with a SID Lys:CP ratio of 6.0:1; 2) moderate level of feed-grade AAs with a SID Lys:CP ratio of 6.5:1; 3) high level of feed-grade AAs with a SID Lys:CP ratio of 7.0:1; 4) diet 3 with di-ammonium phosphate (DAP) added to achieve a SID Lys:calculated CP ratio of 6.5:1; 5) diet 3 with glycine added to achieve a SID Lys:calculated CP ratio of 6.5:1. All diets contained 0.4% titanium dioxide for determination of apparent total tract digestibility (ATTD) of dry matter (DM) and crude protein (CP). Treatment diets were fed for 21 days. Feces were collected on d 21 from three pigs per pen to determine fecal DM. Overall (d 0 to 21), ADG was not influenced by treatment. Feed efficiency worsened (linear, $P = 0.002$; quadratic, $P = 0.054$) as the SID Lys:CP ratio was increased above 6.5% with additional feed-grade AAs. Adding DAP or glycine to the high feed-grade AA diet improved ($P \leq 0.003$) feed efficiency compared to pigs fed the high feed-grade AA diet because of a reduction ($P = 0.007$) or numerical reduction ($P = 0.109$), respectively, in ADFI. There was a decrease (linear, $P < 0.001$) in blood urea nitrogen (BUN) as feed-grade AAs increased. Adding additional nitrogen to the high feed-grade AA diet increased (DAP; $P = 0.038$) or tended to increase (glycine, $P = 0.091$) BUN. There was a tendency (quadratic, $P = 0.051$) in fecal DM with pigs fed the moderate feed-grade AA diet having the lowest fecal DM. Pigs fed the diet containing DAP had increased ($P = 0.005$) fecal DM compared with pigs fed the high feed-grade AA diet. There was a tendency for an increase ($P = 0.060$) in the ATTD of DM for pigs fed the DAP diet compared with the pigs fed the high feed-grade AA diet. The ATTD of CP decreased (linear, $P = 0.048$) as the SID Lys:CP ratio increased. Pigs fed the diets containing either DAP or glycine had increased ($P \leq 0.026$) CP digestibility compared with pigs fed the high feed-grade AA diet. These data suggest that diets for 25 to 50 lb pigs should be formulated to a SID Lys:CP ratio of 6.5 or lower and that adding a non-protein nitrogen source or non-essential AA to diets formulated above this ratio can improve feed efficiency and CP digestibility. More information is available on this study and others like it at KSUSwine.org. *(This study conducted by Jessica L. Smallfield, Mike D. Tokach, Jason C. Woodworth, Robert D. Goodband, Joel M. DeRouchey, Katelyn N. Gaffield, Jordan T. Gebhardt, Keith D. Haydon, Alan J. Warner, and Chad W. Hastad).*

Effect of Increasing 6% Oil Corn Dried Distillers Grains with Solubles on Finishing Pig Growth Performance and Carcass Characteristics- A total of 2,108 finishing pigs (PIC 337 × 1050; initially 54.7 ± 2.05 lb) were used in an 88-d study to investigate growth performance and carcass characteristics of pigs fed diets with increasing levels of 6% oil corn DDGS. Pigs were housed in mixed-sex pens, with 27 pigs per pen and 20 pens per treatment. Experimental diets were corn-soybean meal based with increasing levels of DDGS (0, 10, 20 and 30%) across four phases. The experiment was a randomized complete block design with barn and initial weight as blocking factors. Pens of pigs were weighed every two weeks to determine ADG, ADFI, and F/G. Three weeks prior to the end of the trial, three of the heaviest pigs in each pen were marketed. The remaining pigs were then marketed at the end of the study and carcass characteristics were also collected. Increasing DDGS decreased (linear, $P < 0.005$) ADG and worsened (linear, $P < 0.001$) F/G in both grower (54 to 168 lb) and finisher (168 to 295 lb) phases while average daily feed intake decreased (linear, $P < 0.001$) in the grower stage and tended (linear, $P < 0.075$) to increase in the finisher stage. Overall, final BW and ADG decreased (linear, $P < 0.001$) with increasing DDGS. However, average daily feed intake was not affected resulting in poorer (linear, $P < 0.001$) F/G. Caloric efficiency tended to increase (linear, $P = 0.062$) with increasing DDGS suggesting that our initial estimate of NE of DDGS (1,005 kcal/lb) was overestimated. There was a tendency (linear, $P > 0.075$) for decreased mortalities as DDGS increased, but no statistical difference in total mortality and removals was observed. Market weight, carcass yield, HCW and loin depth decreased (linear, $P < 0.05$) with increasing DDGS in the final marketing event, but backfat depth tended to decrease (quadratic, $P = 0.076$) and percentage lean tended to increase (quadratic, $P = 0.058$) as DDGS increased up to 20%; however, then reversed when DDGS inclusion further increased to 30%. Additionally, a subset of pigs (three barrows per pen from one of two research groups) was sampled at the first marketing event for determination of carcass characteristics and iodine value (IV). Market weight, carcass yield, and HCW decreased (linear, $P \leq 0.020$; Table 5) with increasing DDGS. There were no differences in backfat depth, loin depth, or percentage lean between treatments during the first marketing event. Carcass IV increased (linear, $P < 0.001$) with increasing DDGS, ranging from 62.6 mg/g for pigs fed the diet without DDGS to 71.3 mg/g for pigs fed 30% DDGS. In conclusion, increasing 6% oil corn DDGS decreased ADG, market weight, carcass yield and HCW and increased IV. Thus, the reduction in diet cost with added 6% oil DDGS needs to offset the decreased growth performance to be economically justified and needs to be evaluated on a case-by-case basis. More information is available on this study and others like it at KSUSwine.org. *(This study conducted by Rachelle Lazaga, Katelyn N. Gaffield, Mikayla S. Spinler, Robert D. Goodband, Jordan T. Gebhardt, Mike D. Tokach, Joel M. DeRouchey, and Jason C. Woodworth)*

ASI Faculty Highlight

Celsey Crabtree (celseyb@ksu.edu or 913-267-4805)
Instructor and Horse Judging Team Coach

A native of Cuba, Kansas, Celsey Crabtree was raised on a commercial cow-calf operation, showed horses, and was active in 4-H, FFA and sports. Celsey continued at Kansas State University in 2011 to pursue an Animal Sciences and Industry degree and threw javelin for two years for the track team. During her time as an undergraduate, she also worked at the KSU Horse Unit,
Crabtree was a part of the KSU 2014 AQHA Congress Champion Horse Judging Team, and Reserve World Champion Team, where she won the Performance division and was 3rd High Overall Individual. Celsey also was the 4th High Overall Individual at the Tulsa Horse Judging Contest.
After graduating with a bachelor's degree from Kansas State University, Celsey obtained her master's in equine reproduction from Colorado State University. At CSU, Celsey taught several equine classes and coached the CSU Horse Judging Team to an AQHA Reserve Congress Championship.

Celsey joined K-State ASI faculty in 2017, teaching several lab classes in the ASI department. She finished her Ph.D. in Curriculum and Instruction in 2021, specializing in online agriculture education courses. Crabtree teaches on-campus and online Companion Animal and Equine lab, Beginning Horse Evaluation, and coaches the horse judging team.
Celsey lives east of Manahttan with her husband and sons, Paden and Porter. Celsey is very involved in the horse industry, showing horses across the midwest, and is a State Director for the American Paint Horse Association and part of the American Quarter Horse Association's Young Adult Leadership Program.

Mike Tokach (mtokach@ksu.edu or 785-532-2032)
University Distinguished Professor
Extension Specialist
Research Coordinator

Dr. Mike Tokach is a University Distinguished Professor of Animal Sciences and Industry at Kansas State University. A native of North Dakota, Mike joined K-State in 1991. As a swine nutrition researcher and extension specialist, Mike is author on more than 500 articles in scientific journals, 12 book chapters and more than 1,200 extension and non-refereed articles. Tokach has received more than $29 million in research grants and gifts. He also has been awarded seven patents for his research and has given more than 385 invited lectures at national and international conferences. Tokach has also advised and mentored over 130 advanced-degree students and visiting professors since joining the university. Mike's wife Lisa also specializes in Swine as a veterinarian. Together, they have three children, Sage, Rogan, and Fiona.

We need your input! If you have any suggestions or comments on
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please let us know by email to katiesmith@ksu.edu