

ANIMAL & DAIRY SCIENCES



**MISSISSIPPI
STATE
UNIVERSITY**

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DR. DERRIS BURNETT



When it comes to firing up the grill this Fourth of July, MSU Assistant Professor Derris Devost-Burnett encourages cooks to remember the ABCs – anatomy, biology and chemistry. Burnett, a meat scientist in the Department of Animal and Dairy Sciences in the College of Agriculture and Life Sciences, said the secret to grilling lies in understanding the anatomy, biology and chemistry of meat cuisine. “We tell students being a cook is just like being a scientist,” said Burnett, who teaches a meat chemistry and cuisine course. The course became so popular that students founded a Meat Chemistry and Cuisine Club, overseen by Burnett and fellow meat scientist, Assistant Professor Thu Dinh. Burnett uses brisket to illustrate the ABCs of meat cuisine. “Anatomy and biology tell us that the weight of a cow’s front end is shored by the brisket, which has a lot of connective tissue. That informs the chemistry and is why we can’t just put a piece of brisket on the grill and flip it a few times like a steak and be done with it,” Burnett explained. “We have to cook it low and slow and apply moisture to try to break down some of that tissue.” As far as what to throw on the grill for this Independence Day, Burnett said he’s a fan of flat iron steak. “It isn’t well known, but other than the tenderloin, it’s one of the most tender cuts of beef,” he said. Burnett’s path to meat science was unlikely. Growing up, he was one of four siblings raised by a single mother in downtown Denver, Colorado, and couldn’t have been farther from life on a farm. Even so, he grew up fascinated with animals, reptiles in particular. “I wanted to be like the crocodile hunter,” he remembered. His mother, Arda, allowed him to have an array of unusual pets on the condition that he bought them with his own money and took care of them himself. With his bedroom lined with aquariums, he housed an eight-foot Burmese python, iguanas, caimans and even a baby crocodile. When it came time for college, Burnett enrolled in the animal and poultry science program at Tuskegee University in Tuskegee, Alabama. “In hindsight, to be like the crocodile hunter, I should have majored in herpetology or something similar,” he said. “And I would have changed my major had it not been for my very first experience working with goats in our Intro to Animal Science class.” Burnett said the hands-on experience of Tuskegee’s program instilled a passion for animal science that motivated him to earn bachelor’s and master’s degrees in animal and poultry science at the university. From there, he went on to complete a doctorate studying metabolic efficiency in beef cattle at Auburn University. He conducted postdoctoral work at Kansas State University before joining MSU in spring 2015. Now one of Burnett’s roles is serving as faculty coordinator of the MSU meat science and muscle laboratory, an \$8.5 million, 15,000-square-foot facility nearing completion. He and Tim Armstrong, the meat lab manager, have provided input as end users as construction nears completion on the facility. “This building increases our teaching and research capabilities tremendously. We look forward to the facility helping to further enhance and build our program,” Burnett said. “Being able to have input and put our mark on what will be a flagship building for the department for years to come has been extremely rewarding.”

COW CAMP 2018



BEARDEN DAIRY RESEARCH CENTER
2128 TURKEY CREEK RD, STARKVILLE, MS 39759

COW CAMP 2018

| JULY 16, 2018 AT 1 PM TO JULY 18, 2018 AT 12 PM |



Don't miss out on the fun!

Registration and a registration fee are **required.**
Both must be received by **June 30th.**

A room block is available at \$99 per night.
Room blocks will be released June 30th.
Breakfast is provided by the hotel.

Registration is **\$100 per attendee.**
This includes dinner on 7/16 and lunch and dinner on 7/17.

LEARN HOW TO:

- Properly groom and fit
- Provide calves and cows with proper nutrition
- Prevent and detect common diseases

If students would like to bring his/her show animal for the hands-on grooming and fitting activities, please contact Dr. Amanda Stone.

COW CAMP 2018 SCHEDULE



2018 Cow Camp Schedule

Date	Time	Activity	Presenter
Monday July 16	11:00 AM – 12:30 PM	Registration; lunch on own	
	1:00 PM	“Fun with milk” (making liquid nitrogen ice cream and cheese)	Dr. Bob Horton (4H Extension Specialist, Ohio State University)
	3:00 PM	MSU dairy tour	Kenneth Graves (MSU Dairy Manager)
	6:00 PM	Dinner	
Tuesday July 17	6:30 – 8:00 AM	Breakfast	
	8:30 AM	MAFES cheese plant tour	Eric Goan (MSU Cheese Plant Manager)
	10:30 AM	Fitting demo, showmanship and grooming discussion	Wesley Blankenship (Blankenship Jerseys, Jackson, TN)
	12:00 PM	Lunch	
	1:00 PM	Hands-on cow clipping and grooming	Wesley Blankenship (Blankenship Jerseys, Jackson, TN)
	4:00 PM	Quiz Bowl and games Tentative: Charlie Crave speaking	Tentative: Charlie Crave (Owner, Crave Brothers Farmstead Cheese, Waterloo, WI)
	6:00 PM	Dinner	
Wednesday July 18	6:30 – 8:00 AM	Breakfast	
	8:30 AM	Ensuring healthy cattle	Dr. Darren McGee (veterinarian, Elanco Animal Health)
	10:30 AM	Feeding cattle	Scott Hardin (nutritionist, dairy nutrition consultant)
	12:00 PM	End of program; lunch on own	



#DIDYOUKNOW

High fertility is critical for efficient and profitable production of livestock. Obtaining viable offspring depends on quality and ability of sperm and egg to generate a developmentally competent embryo, fetus and offspring. Using innovative research techniques and cutting edge genomics approaches, the advanced research group led by Erdoğan Memili has identified biomolecular markers and mechanisms for determining the quality of sperm, egg and embryos. Through extensive collaborations with researchers in universities, research institutions, and industry around the world, the group has identified important new DNA, RNA and protein biomarkers associated with bull fertility. The world-class research is linked to education and provides valuable research experiences for undergraduate students, graduate students, and postdoctoral and international scientists. In addition to fertility, the research team also investigates genomics and epigenomics of other economically important traits within the realm of animal systems physiology. The research results are significant because they help advance fundamental science of animals and animal biotechnology. Furthermore, because of the similarities in genetics and physiology among the mammals, the research findings in farm animals are also applicable to other mammals including humans.



#DIDYOUKNOW

Ground corn flour, soybean meal and distillers dried grains with solubles (DDGS) – a by-product from ethanol production – comprise more than 70 percent of swine and poultry diets. While these ingredients are important for livestock nutrition, they are high in fiber, which is not easily digested by swine and poultry. Feed producers needed a system to remove the fiber while maintaining vital nutrients.

MAFES scientists developed a process called "Elusieve" that uses a combination of sieving and air classification to separate fiber from feeds. This technique sifts particles into four sizes and then blows them with air to remove fiber. They found that fiber separation increases starch content of ground corn flour by 3 percent and increases protein contents of DDGS and soybean meal.



ALEX HOLT CAMP RESEARCH SPOTLIGHT

Alex Holtcamp presented his last poster as an M.S. student at the 71st Reciprocal Meat Conference on June 26, 2018 in Kansas City, MO. He studied the effects of toxic ergot alkaloids in endophyte-infected tall fescue seeds on quality attributes and shelf life of beef strip steaks and ground beef. Ergot alkaloids bind to serotonin receptors, causing vasoconstriction and heat stress, and ultimately oxidative stress in cattle. Alex has recently defended his thesis successfully. He studied under the direction of Dr. Thu Dinh. His committee members included Dr. Brandi Karisch and Dr. Derris Burnett.



DR. THU DINH PRESENTS RESEARCH

Dr. Thu Dinh delivered a presentation titled "Oxidation 101: What is oxidation and how to measure it?" at the 2018 Pet Food Alliance meeting in Kansas City, MO. The Alliance is hosted at Colorado State University to bring together members of the pet food, meat, and rendering industries together to collaboratively develop implementable solutions for industry challenges and identify opportunities for innovation, growth, and mutual success. The current research focuses of the Alliance are to control oxidation in rendered fat and meals and to reduce Salmonella in ingredients and pet foods.



**BEEF EXTENSION - Dr. Brandi Karisch and
Cobie Rutherford**



**July 13: Deep South Stocker Conference
Greenboro, AL**

EQUINE EVENTS - Dr. Clay Cavinder



**For info on Events, call (662) 325-7466 or email
clay.cavinder@msstate.edu**

4-H EVENTS - Dr. Dean Jousan



**July 26: Neshoba State Fall Dairy Show
July 27: Newton State Fall Dairy Show**

DAIRY EXTENSION - Dr. Amanda Stone



**July 16-July 18: Cow Camp 2018, Bearden Dairy, Starkville
August 25: Ice Cream & a Moo-vie, Bearden Dairy, Starkville
September 20: Calf College 2018- in Brookhaven &
September 21 in Starkville
September 27-29: Breakfast on the Farm, Bearden
Dairy, Starkville**

UPCOMING EVENTS

2018 Refereed Publications

- Humphrey, R. M., Z. Yang, M. S. Hasan, **M. A. Crenshaw**, **D. D. Burnett**, J. K. Htoo and **S. F. Liao**. The compensatorily-gained pigs resulted from feeding a methionine-deficient diet had more fat and less lean body mass. *Journal of Applied Animal Nutrition*, Vol. 6; e6; page 1 of 7. <https://doi.org/10.1017/JAN.2018.5>.
- Griffin, Courtney M. , BS; Jenna A. Scott, BS; **Brandi B. Karisch, MS, PhD**; Amelia R. Woolums, DVM, MVSc, PhD, DACVIM, DACVM; **John R. Blanton, MS, PhD**; Ray M. Kaplan, DVM, PhD, DEVPC, DACVM; William B. Epperson, DVM, MS, DACVPM (Epidemiology); David R. Smith, DVM, PhD, DACVPM (Epidemiology). A randomized controlled trial to test the effect of on-arrival vaccination and deworming on stocker cattle health and growth performance. *The Bovine Practitioner*, Vol. 52, No. 1.
- Sun, Yuhang , Jin Liu, Gengping Ye, Fang Gan, Mohammed Hamid, **Shengfa Liao**, Kehe Huang. Protective effects of zymosan on heat stress-induced immunosuppression and apoptosis in dairy cows and peripheral blood mononuclear cells. *Cell Stress and Chaperones*. <https://doi.org/10.1007/s12192-018-0916-z>.
- Woolums, Amelia R., **Brandi B. Karisch**, Jonathan G. Frye, William Epperson, David R. Smith, **John Blanton Jr.**, Frank Austin, Ray Kaplan, Lari Hiott, Tiffanie Woodley, Sushim K. Gupta, Charlene R. Jackson, Michael McClelland. Multidrug-resistant *Mannheimia haemolytica* isolated from high-risk beef stocker cattle after antimicrobial metaphylaxis and treatment of bovine respiratory disease. *Veterinary Microbiology* 221 (2018) 143-152. <https://doi.org/10.1016/j.vetmic.2018.06.005>.
- Sukumaran, Anuraj T., Alexander J. Holtcamp, Yan L. Campbell, **Derris Burnett**, Mark W. Schilling, **Thu T.N. Dinh**. Technological characteristics of pre- and post-rigor deboned beef mixtures from Holstein steers and quality attributes of cooked beef sausage. *Meat Science*. 145 (2018) 71–78. <https://doi.org/10.1016/j.meatsci.2018.06.001>.
- Hart, CG, BE Voelz, KE Brockus, **CO Lemley**. Hepatic steroid inactivating enzymes, hepatic portal blood flow and corpus luteum blood perfusion in cattle. *Reproduction in Domestic Animals*. 2018;53:751–758.
- Camacho, L.E., **C.O. Lemley**, S.T. Dorsam, K.C. Swanson, K.A. Vonnahme. Effects of maternal nutrient restriction followed by realimentation during early and mid-gestation in beef cows. II. Placental development, umbilical blood flow, and uterine blood flow responses to diet alterations. *Theriogenology*. <https://doi.org/10.1016/j.theriogenology.2018.04.013>.
- Lemley, C.O.**, L.E. Camacho, D.M. Hallford, K.A. Vonnahme. Uteroplacental secretion of progesterone and estradiol 17beta in an ovine model of intrauterine growth restriction. *Animal Reproduction Science*. 193 (2018) 68-78. <https://doi.org/10.1016/j.anireprosci.2018.04.001>.
- T. Williams, **B. Rude**, **S. Liao**, C. Mochal-King, **M. Nicodemus**. Effects of fat supplementation on plasma glucose, insulin and fatty acid analysis in ponies maintained on a forage-based diet. *Journal of Animal Physiology and Animal Nutrition*. 2018;1–8. DOI: 10.1111/jpn.12905.
- Gastal, G.D.A., **J.M. Feugang**, F.L.N. Aguiar, A.P.R. Rodrigues, J.M. Scimeca, G.A. Apgar, W.J. Banz, E.L. Gastal. Cryopreservation and in vitro culture of white-tailed deer ovarian tissue. *Theriogenology*. 113 (2018) 253-260.
- Velho, Ana Luiza Cazaux, Einko Topper, Erika Menezes, **Thu Dinh**, Abdullah Kaya, Arlindo Alencar Moura, **Erdogan Memili**. Metabolomic markers of fertility in bull seminal plasma. *PLOS ONE*. <https://doi.org/10.1371/journal.pone.0195279>.

2018 Refereed Publications

- Owen, MPT , EN Ferjak, **CA Cavinder**, KJ McCarty, KC Yankey, CG Hart, **DD Burnett**, **TTN Dinh**, **CO Lemley**. Effects of body condition score (BCS) on steroid- and eicosanoid- metabolizing enzyme activity in various mare tissues during winter anoestrus. *Reproduction in Domestic Animals*. 2018;53:296–303. <https://doi.org/10.1111/rda.13104>.
- Park, Seong B., **Scott T. Willard**, Christy S. Steadman, Atul A. Chaudhari, Shreekumar R. Pillai, Shree R. Singh, **Peter L. Ryan** and **Jean M. Feugang**. Proteomic analysis of antimicrobial effects of pegylated silver coated carbon nanotubes in *Salmonella enterica* serovar Typhimurium. *Journal of Nanobiotechnology*. (2018) 16:31 <https://doi.org/10.1186/s12951-018-0355-0>.
- Cavinder, C. A.**, **PAS**, E. N. Ferjak, C. A. Phillips, **D. D. Burnett**, and **T. T. N. Dinh**. REVIEW: The importance of overall body fat content in horses. *The Professional Animal Scientist* 34:125–132. <https://doi.org/10.15232/pas.2017-01708>.
- Sukumaran, Anuraj T. , Alexander J. Holtcamp, April K. Englishbey, Yan L. Campbell, Taejo Kim, Mark W. Schilling, **Thu T.N. Dinh**. Effect of deboning time on the growth of *Salmonella*, *E. coli*, aerobic, and lactic acid bacteria during beef sausage processing and storage. *Meat Science* 139 (2018) 49–55.
- Wang, T., **M. A. Crenshaw**, N. Regmi, **B. J. Rude**, M. S. Hasan, A. T. Sukumaran, **T. Dinh**, and **S. F. Liao**. 2018. Effects of dietary lysine level on the content and fatty acid composition of the intramuscular fat in late-stage finishing pigs. *Canadian Journal of Animal Science*. 98: 241-249. DOI: [dx.doi.org/10.1139/cjas-2017-0083](https://doi.org/10.1139/cjas-2017-0083).
- Owen, M.P.T., K.J. McCarty, C.G. Hart, C.S. Steadman, **C.O. Lemley**. Endometrial blood perfusion as assessed using a novel laser Doppler technique in Angus cows. *Animal Reproduction Science*. 190 (2018) 119-126. <https://doi.org/10.1016/j.anireprosci.2018.01.015>.
- Feugang, Jean M.** , **Shengfa F. Liao**, **Scott T. Willard**, and **Peter L. Ryan**. In-depth proteomic analysis of boar spermatozoa through shotgun and gel-based methods. *BMC Genomics*. (2018) 19:62 DOI 10.1186/s12864-018-4442-2.
- Liao, Shengfa F.**, Naresh Regmi, Guoyao Wu. Homeostatic Regulation of Plasma Amino Acid Concentrations. *Frontiers in Bioscience, Landmark*. 23, 640-655, January 1, 2018.
- Feugang, Jean M.** , **Shengfa F. Liao**, **Scott T. Willard**, and **Peter L. Ryan**. In-depth proteomic analysis of boar spermatozoa through shotgun and gel-based methods. *BMC Genomics*. (2018) 19:62 DOI 10.1186/s12864-018-4442-2.
- Liao, Shengfa F.**, Naresh Regmi, Guoyao Wu. Homeostatic Regulation of Plasma Amino Acid Concentrations. *Frontiers in Bioscience, Landmark*. 23, 640-655, January 1, 2018.

2018 Book Chapters:

Jain, Sapna, Seong B. Park, Shreekmar R. Pillai, Peter L. Ryan, Scott T. Willard and Jean M. Feugang. Applications of Fluorescent Quantum Dots for Reproductive Medicine and Disease Detection. In *Unraveling the Safety Profile of Nanoscale Particles and Materials—From Biomedical to Environmental Applications*, Chapter 6, pp. 133-148, <http://dx.doi.org/10.5772/intechopen.72978>.