

### Sha Tao's research at UGA-Tifton helps dairy cattle better deal with effects of heat stress

Article by Clint Thompson

When Sha Tao joined the University of Georgia's Department of Animal and Dairy Science in 2014 to study heat stress nutrition, management and physiology in dairy cattle, Georgia's dairy producers welcomed the new expert in heat stress physiology.

Five years after joining the UGA College of Agricultural and Environmental Sciences, Tao is seeing the impact of the research he's conducting on the UGA Tifton campus.

Research that's emerged from Tao's lab not only helps elucidate the potential impact of heat stress on the development and function of the bovine mammary gland but also facilitates the understanding of differences in metabolic and physiological responses and



Sha Tao

growth performance of dairy calves raised during hot, humid summers and the temperate winter environment in south Georgia.

Heat stress is inevitable in the Southeast, and Tifton's location in south Georgia provides prime real estate to conduct heat stress research. June, July and August are routinely hot months in Georgia and, already this year, temperatures reached 100 degrees Fahrenheit in May.

What makes Tao's job so essential for dairy producers are the negative effects heat stress can have on dairy cows' ability to get pregnant and produce milk, as well as increasing susceptibility to disease.

"Heat stress is a major issue in the dairy industry. Because it is caused by high temperatures and high humidity, it will lead to several physiological adjustments of the cows. You'll have increased body temperature, increased respiration rate," Tao said.

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### Department Info

#### Department of Animal & Dairy Science

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“If we can understand how heat stress influences a cow and calf metabolically and physiologically, we can develop some additional management strategies or nutritional pharmaceutical interventions to reduce the impact. We can't 100% mitigate the impact of heat stress but we can develop information that will better aid dairy cattlemen.”

Milk production is of utmost concern, according to Tao. Reduced milk production caused by heat stress in the U.S. leads to a \$2 billion annual loss, he said.

Dairy producers already use management strategies to help dairy cattle stay cool during the summer. Fans, misters and soakers are used to cool off cattle at dairy operations across the Southeast, including the research farm Tao uses for his research at UGA-Tifton.

“In our dairies here in the Southeast, for example Florida and Georgia, we face the most severe heat stress issues, and that's because we have longer summers and more humidity. That causes problems,” Tao said.

When cows are exposed to a temperature-humidity index above 68, their milk production level begins to decrease, Tao said.

Seventy-five percent of Tao's time is spent conducting research and 25% is spent focused on Extension, sharing his findings with cattlemen.

“We still feel there's plenty of information to gather about heat stress,” Tao said. “Without this knowledge, we have difficulty developing further information to distribute to producers about heat stress.”

Georgia's dairy industry has been successful despite the

state's warm climate.

According to the UGA Center for Agribusiness and Economic Development, dairy generated \$323.8 million in farm gate value in 2017, accounting for 22.6% of the livestock/aquaculture sector in Georgia.

[See this story on our website.](#)



*Sha Tao, an animal and dairy scientist on the UGA Tifton campus, shows how to feed a calf during the UGA New Faculty Tour in 2017. The tour stops at the UGA-Tifton dairy every year, and Tao is one of the scientists who talks about research being done on campus.*



## From the Department Head



*Francis Fluharty, Animal and Dairy  
Science Department Head*

As we get ready for another school year, there are a lot of events that deserve mention. From a faculty standpoint, we have hired [Dr. Valerie Ryman](#) as a tenure-track assistant professor. Valerie is a mastitis expert who will add significantly to our teaching and extension outreach programs. In addition, we have added Pedro Fontes in a beef cattle teaching and extension position. Currently, Pedro is at Texas A&M, and he will begin at UGA on January 2, 2020. Pedro is the recipient of the 2019 American Society of Animal Science Wettemann Graduate Scholar in Physiology Award, presented to the outstanding graduate student in physiology, endocrinology and/or reproduction. His training and experience in beef cattle reproductive physiology will be a huge addition to our programs. We are in the midst of interviews for an assistant professor in molecular muscle biology. This position will add depth to our meat science and Regenerative Bioscience Center programs. Finally, we have been given permission to conduct a search to fill the beef extension and teaching position, in Tifton, vacated by Jacob Segers which he resigned to pursue his love of teaching. Change is the only constant in life, and we will continue to strive to adapt to the needs of our students, producers, stakeholders, and the people who hire our graduates. Thanks for your continued support!

A handwritten signature in blue ink that reads "Francis Fluharty". The signature is written in a cursive style.

## Upcoming Events

### [UGA-Tifton New Student Orientation](#)

**August 12, 10 a.m.-2 p.m.**

### [CAES Orientation 2.0](#)

**August 15, 5:30-7 p.m.**

### [Ag Dawg Kickoff](#)

**August 28, 6-8 p.m.**

### [2019 Summer Lamb and Goat Classic](#)

**September 7-8, 7 a.m. – 5 p.m.**

### [Engaging with your College, Department, and Major](#)

**October 24, 5-6 p.m.**

### [D.W. Brooks Lecture and Awards](#)

**November 12, 3:30 p.m.**



## Kari Turner

Article by Merritt Melancon

Kari Turner has earned her reputation as one of the best teachers in the University of Georgia College of Agricultural and Environmental Sciences by inspiring more questions than she answers.

Her students say that she has the uncommon ability to inspire them to learn more after her class is over. Her goal is to make her students want to learn about the world around them and to give them the tools they need to become critical thinkers.

“Dedication to knowledge is admirable, but a truly special teacher fosters an unquenchable thirst to analyze the world around you,” said one of Turner’s former undergraduate students.

Turner realized her passion for teaching while pursuing her master’s degree at Virginia Tech. She pursued her doctorate at Michigan State University, with the express purpose of teaching at the college level after graduation.

Since joining the UGA faculty in 2005, Turner has not only excelled in the classroom but also has taught numerous workshops and short courses in her role of UGA Cooperative Extension’s equine specialist. That balance of classroom and real-world experience has helped Turner prepare her students for the transition from college to graduate school or the career world.

“Students do not view her class as simply a formality to graduate; she is the gateway through which students are able to learn skills that will guide them through life,” said one former student.



*Francis Fluharty, department head and Kari Turner, associate professor in the UGA College of Agricultural and Environmental Sciences (CAES) Department of Animal & Dairy Science*

Turner teaches about 255 students in four to five courses each semester focusing on a wide variety of different topics, ranging from elective classroom-based courses to interactive seminars, to required upper-level laboratory courses. These include Companion Animal Care, Horse Production and Management, Equine Science Seminar, Equine Exercise Physiology, Special Problems – Equine Reproduction and Foaling, and two First-Year Odyssey Seminars.

Despite her heavy course load students often cite Turner’s enthusiasm in the classroom as one reason for her effectiveness as an instructor. Her enthusiastic teaching style and connection students have earned her numerous departmental, college and university-level and national teaching awards.



## Georgia native ushers the UGA livestock judging program into a new era

Article by Merritt Melancon

University of Georgia Livestock Judging coach and youth extension specialist, Sarah Loughridge, brings a whole new meaning to education out of the classroom. Charged with coaching a group of UGA students interested in livestock judging, Loughridge loads them up in a van and brings them all over the country to develop their evaluation skills.

“What I enjoy is exposing students to the industry outside of Georgia,” said Loughridge. “It is much larger than this state and university.”

Loughridge has been preparing for this job practically her entire life. She grew up on a cattle operation in Chatsworth, GA and started judging livestock in the 10th grade though FFA. She then judged at Butler Community College and Kansas State University, where she earned her bachelor’s degree in animal science. Later on, she received her master’s in agricultural education and leadership from UGA. Throughout her judging career, she has gained a great respect for evaluation and what it teaches students, she said.

“In 12 minutes, you have to make a decision and come up with reasoning to defend yourself,” said Loughridge. “The ability to do that will take you very far in life.”

Under Loughridge’s leadership, the livestock judging program at UGA has grown to new heights, providing students the opportunity to judge at national livestock judging contests scattered across



*Sarah Loughridge, public service assistant in the UGA College of Agricultural and Environmental Sciences (CAES) Department of Animal & Dairy Science*

the U.S., and Loughridge believes the future is bright for this program.

Loughridge encourages any student interested in judging become involved in the program here at UGA. The advantages to being a part of the team are limitless, she said.

“No, you may not grow up to be a judge, and that is perfectly fine,” said Loughridge. “The people you meet and the skills you gain along the way make being on a competitive team worth it.”

Her success in this livestock industry has been a collaborative effort, said Loughridge.

“I am thankful for the opportunities I have been afforded in this industry, but more so, I am beyond appreciative of the people to have and continue to be mentors and supporters,” said Loughridge. “I would not be able to do what I love on a daily basis without their guidance and encouragement.”

For more information about the UGA Livestock Judging Team, please contact Sarah Loughridge at [sloughridge@uga.edu](mailto:sloughridge@uga.edu)

# Student Spotlight

## Ruth M. Orellana Rivas

Ruth grew up in a dairy farm in Honduras and obtained bachelor's degree in agricultural sciences from the Universidad Nacional de Agricultura, Catacamas, Honduras. She earned a master's degree in animal sciences focusing on dairy calf nutrition from Louisiana State University. Since joining Dr. Tao's lab at the University of Georgia, Ruth has focused on two aspects of dairy calf nutrition.

First, she is interested in the impact of environmental heat stress and nutritional factors on liver and mammary gland development during transition and lactation periods of dairy cows. The second area of her interest is to utilize nutritional and management approaches to improve calf growth and health during summer.

Ruth's research is of importance not only for the scientific community but also for dairy producers. Heat stress is a critical issue facing the dairy industry and negatively impacts the health and productivity of both cows and calves. In one study, Ruth explored the possibility to improve cow metabolic health (i.e., reducing ketosis and fatty liver) of heat-stressed transition dairy cows around calving by feeding a glucose precursor.

She has also studied different dietary zinc sources, inorganic and mineral amino acid complex, on mammary gland development of heat-stressed lactating dairy cows. She utilized different approaches and studies the alteration of mammary gene expression, cell proliferation and apoptosis by different dietary zinc sources of heat-stressed mammary gland.

The results from her studies not only provide an improved understanding of the mechanisms how dietary supplements and heat stress influence tissue development of dairy cows but also provide practical feeding strategies to improve metabolic and mammary growth and health of transition and lactating dairy cows.

In the second area of Ruth's doctoral research, she focuses on feeding rates and frequency of accelerated milk replacer on calf growth, health and metabolism during summer. In a dairy farm, it is a common strategy to feed large amount of milk replacer to preweaning calves in order to increase energy intake for better growth.

However, Ruth characterized that feeding large amounts of milk replacer twice daily lead to a higher incidence of metabolic diseases, such as abomasum bloating and scour, which she believe is because of the reduced milk replacer abomasal emptying rate by heat stress during summer. From this trial, she designed a follow-up study to explore the impact of feeding frequency of milk replacer on calf health, abomasal emptying rate and metabolic adaptation during summer.



*Ruth M. Orellana Rivas*

She discovered that increasing feeding frequency from twice to three times a day had no improvement in animal performance during summer, but improved average daily gain of calves during winter. The interesting findings provide valuable information to guide the calf feeding management during summer and improve the health and growth of preweaning calves.

Academically, Ruth loves to learn and is not afraid of anything beyond her comfort zone, which is an important trait for a successful animal scientist.

She is a productive student. Within only two years in Dr. Tao's lab, she has co-authored three peer-reviewed articles including a symposium review paper, and has prepared five first-author articles ready for submission.

It is expected that she will generate at least three to four more first-author papers from her current and future projects. Additionally, she has published 10 meeting abstracts and two conference proceedings. Ruth is also actively involved in the Extension program at UGA. She participated and gave talks at Extension events such as the Sunbelt Agriculture Expo, First Grade Field Day and at heat stress workshops etc. She is also productive in publishing extension articles. In her two years at UGA, she has published five extension newsletters in UGA Extension's DairyFax, and one article at Progressive Dairyman.



# Student Spotlight

## Madison Fagan

Madison Fagan came to the UGA Department of Animal and Dairy Science (ADS) in the fall of 2016. Madison is from Greensboro, North Carolina and earned her bachelor's degree in animal science at North Carolina State University. While at NC State, she was a student worker at their Equine Unit as well as a summer intern for the Duke Lemur Center. Madison completed her master's degree at UGA with a focus in equine nutrition in August 2018 under the direction of Kylee Duberstein and is currently finishing her first year as a Ph.D. student.

Madison's master's project was supported by a Waltham-Buckeye Equine Nutrition Grant and focused on vitamin E supplementation in exercising horses. Her findings have been presented at multiple national and international symposia including the Equine Science Society Symposium, the American Society of Animal Science annual meetings and International Conference on Equine Exercise Physiology. She has also presented her work at several university symposia and won the Broadus Browne award — a prestigious competition in the UGA College of Agricultural and Environmental Sciences for effective research communication. Madison has made a total of 11 conference presentations where she was a presenter and eight conference presentations where she was a collaborator. She recently had her master's work accepted for publication and is also a co-author on an extension bulletin recently accepted for publication.

As part of her Ph.D. work, Madison is currently assisting with a large National Institute of Health grant studying



*Madison Fagan*

regenerative therapies for stroke using a pig model. She continues to research horses and has spent the past year assisting with the development of a new gait capture and analysis program used to study equine biomechanics. She has also helped coordinate several undergraduate and graduate research projects utilizing this new system, and her assistance and expertise allowed three other students to present research at national meetings this summer.

Madison is a true team player, and she has been actively involved in the department during her time here. She has served as the president for the UGA ADS Graduate Student Association since 2017 and has served as both a teaching assistant and graduate mentor for the department. She is always willing to lend a hand and has helped coordinate several departmental programs and outreach events. Madison's enthusiasm and work ethic make her a stand-out student in the ADS department where she generously contributes her time and talents to so many programs.

