

2024

AUBURN UNIVERSITY
DEPARTMENT OF POULTRY SCIENCE

POULTReview



AUBURN
POULTRY SCIENCE





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A MESSAGE FROM THE DEPARTMENT HEAD

It is my privilege to serve as head of the Department of Poultry Science and to work with faculty and staff to develop future leaders of the poultry industry and meet the needs of our stakeholders. The department has had great leaders in the past, and I thank them for the initiatives that have shaped the unit today. I am excited to build upon past successes and facilitate necessary changes in our culture, capabilities, and priorities to position the department to be a global leader in the field.

Within a short time, I have realized the incredible strengths the department has in its outstanding faculty, talented staff, state-of-the-art labs, unwavering industry support, and the nationally recognized Charles C. Miller Jr. Poultry Research and Education Center. I am truly impressed with the accomplishments of our students, faculty, and staff, and in this message, I will briefly share some of the highlights of the department during the past year.

The department's graduate student numbers are steadily increasing, while undergraduate enrollment is stable. In the fall of 2024, there were 39 undergraduate students majoring in poultry science, with 24 in the production track and 15 in the pre-vet track. Fifteen students were pursuing a minor in poultry science. Of the 46 graduate students, 20 were in the doctoral program and 26 in the master's program. These numbers are expected to further increase in 2025.

Several initiatives, such as Ag Teachers Workshop and the Poultry Ambassadors Program, are currently being managed by Bethanie Gulley, our recruitment coordinator. The department also recently engaged a private firm to launch a digital campaign to identify and attract prospective undergraduate students to our program. These initiatives, combined with Mrs. Gulley's leadership and efforts, are expected to pay dividends in the next couple of years.

According to institutional guidelines, all departments are required to go through academic program reviews every seven years, and the Poultry Science Department is currently due for its review. To this end, a self-study report was developed in fall 2024 to prepare for the review committee's site visit scheduled for February 2025. After completing this exercise, the department will implement programmatic changes if deemed necessary and develop its new strategic plan with input from all stakeholders.

Several retrofitting construction projects are currently in progress at the Miller Center, and significant progress has been made during the last year with continued assistance and cooperation from Dr. Bill Dozier. A composter has been installed recently, which is envisioned to support a campus-wide initiative involving the Department of Horticulture, Campus Dining, and farm operations, in addition to the Miller Center. The Miller Center's Associate Directors Kourtney Gardner and Samuel Cowles make every effort to support all research and outreach projects while effectively accommodating the ongoing construction projects. They also provided leadership in hiring four staff members last year, including Whit Milford, Tristen Ezell, Scot Johnson, and Stephen Bryant.

During the past year, we have increased our faculty counts and expanded our research portfolio by adding three research faculty members: Dr. Sabin Poudel, Dr. Jinqun Wang, and Dr. Saida Farjana. Dr. Poudel's program focuses on inhibiting Salmonella via modulating respiratory and gut microbiome and understanding transmission routes of Campylobacter. Dr. Wang is working on preventing foodborne pathogen colonization in live birds, identifying environmental factors, and developing antibiotic alternative intervention strategies. Dr. Farjana's overall research goal is to elucidate host-pathogen interactions of polymicrobial infections in broiler chicken

“I thank all faculty and staff for their passion and dedication to student success.”

production. Searches are underway to fill three more research faculty positions and a tenure-track faculty position with expertise in poultry gastrointestinal physiology. In addition, several postdocs joined the department last year, including Dr. Shahna Fathima, Dr. Sidra Nazeer, Dr. Jihye An, and Dr. Muhammad Naeem. All of their salaries are being funded through USDA-ARS-funded projects.

The department's research productivity during the past year has been excellent. The faculty secured approximately \$9 million in external funding, authored/co-authored 42 peer-reviewed research articles, produced 3 doctorates and 12 Master of Science graduates, acquired 4 provisional patents, and filed one international patent application. As the new faculty members establish themselves in their fields with guidance from the seasoned faculty, research productivity is expected to increase exponentially in the coming years.

Soon after I joined the department, I was quite impressed by the quality of our students. Attending student seminars, presentations about their industry internships, journal club meetings, and student club activities gave me a good sense of the mentorship and training they receive. I thank all faculty and staff for their passion and dedication to student success. Every student who graduated in the fall of 2024 landed a job in the poultry industry, which has been the norm. Graduate students excel in presenting papers at national and international professional conferences. For example, Ally Jackson received a travel award and a Research Excellence Award for her presentation at the 2024 Poultry Science Association Conference in Louisville, Kentucky, and Katherine Sofia Sierra won the Meat Industry Supplier Alliance Scholarship for 2024.

The faculty works closely with the poultry industry

to understand current and emerging challenges and work toward finding solutions through use-inspired research and extension and outreach programs. The departmental research enterprise includes, but is not limited to, animal welfare, health, reproductive physiology, feed milling, nutrition, pre- and post-harvest food safety, genomics, muscle biology, poultry meat quality, processing, further processing, packaging, and sensory sciences. Our extension faculty continues to work relentlessly with the primary objective of empowering poultry and allied industries stakeholders through research-based programs. Currently, 17% of our FTE is dedicated to extension and outreach activities, and Dr. Wilmer Pacheco recently accepted the position of coordinator of the department's extension programming, a role that will be rotated among the extension specialists.

Finally, I cannot thank the poultry industry leaders enough for their continued support for the department and our students by way of providing student scholarships, paid student internships, and research funding. I look forward to our continued collaboration. I greatly value everyone's contributions to our department and feel proud to be part of this exceptional team of faculty and staff.

Sincerely,



GOVIND KANNAN
Professor and Head
Executive Director,
Charles C. Miller Jr. Poultry
Research and Education Center

RESEARCH

Improving poultry reproduction through a multi-faceted research approach

Assistant Professor Charlene Hanlon's research team is dedicated to enhancing reproductive success in both broiler breeder and laying hen flocks. Their work includes a range of studies and collaborations focused on better understanding and improving production, fertility, and hatchability, as well as outreach efforts to share their expertise.

As part of a Cobb Research Initiative grant awarded in 2023, Dr. Hanlon's research team is conducting a 64-week study on broiler breeders led by graduate research assistant Madison Berger. This study is a collaborative effort between Dr. Hanlon's lab, Cobb-Vantress and Dr. Kristen Diehl (USDA-ARS). Conducted at the Miller Center, this project is the first to hatch and place broiler chicks from a breeder flock raised at the facility. The research aims to uncover the physiological alterations associated with feeding regimens utilized during the pullet and cockerel phase that contribute to variations in fertility and hatchability rates of broiler breeder flocks. The study also examines differences in embryonic mortality and chick quality, providing valuable insights into how early-life nutritional strategies can affect downstream reproductive success.

Dr. Hanlon's lab has also teamed up with

Conducted at the Miller Center, this project is the **FIRST to hatch and place broiler chicks from a breeder flock raised at the facility.**



One of the first broiler chick flocks placed at the Miller Center, from a breeder flock also raised there.

Professor Jeremiah Davis and the National Poultry Technology Center (NPTC) team in a multi-disciplinary, collaborative effort to study reproduction using precision management tools. Sensors were installed and validated on individual cages to monitor the time of egg-laying. This innovative use of technology will improve our understanding of how management practices influence reproductive performance and guide more targeted management interventions.

Dr. Hanlon's lab is also collaborating with **Assistant Professor Bethany Baker-Cook** and Professor Grégoy Bédécarrats at the University of Guelph to investigate the impact of transitioning to cage-free systems on the reproductive success of laying hens. This study, led by graduate research assistant Olivia McGuire, aims to determine the ideal body weight for photostimulating hens to achieve optimal entry into lay. Supported by the Egg Industry Centre, Egg Farmers of Canada, and the Ontario Ministry of Agriculture, Food, and

Rural Affairs, this study addresses a timely question as the egg industry moves towards cage-free environments, seeking to balance welfare improvements with reproductive efficiency.

Through these projects and collaborations, Dr. Hanlon's lab is advancing knowledge and practices to improve reproductive outcomes in poultry, with applications across industry, academia, and community engagement.



(Top) Laying hens in a study on cage-free systems' impact on reproductive success.

(Bottom) Hen from a breeder flock at the Miller Center.

Defining the normal intestinal microbiota of chickens

The characterization of the intestinal microbiota by sequencing the partial 16s rRNA gene has been used in chicken research trials for some time. However, due to the numerous factors influencing the intestinal microbiota, interpreting these results is challenging and typically limited to comparisons between groups within a single trial.

The lab analyzed 119 DATA SETS with 3408 INDIVIDUAL SAMPLES.

To address this, **Associate Professor Ruediger Hauck's** lab compiled publicly available raw data from 16s rRNA sequencing of chicken intestinal microbiota to determine if a "normal" intestinal microbiota exists, and if it does, the characteristics of one. The lab analyzed 119 data sets with 3408 individual samples. The data sets revealed significant variations in the taxonomic composition of chicken intestinal microbiota but identified certain genera as core microbiota. Additionally, the analysis found that 40% to 60% of the metabolic function of the intestinal microbiota was stable. This finding is a step towards evaluating the impacts of various treatments and infections on the intestinal microbiota beyond individual trials.

The analysis found that 40% TO 60% of the metabolic function of the intestinal microbiota was stable.

Advancing poultry science research and teaching at the Charles C. Miller Jr. Poultry Research and Education Center

Under the direction of **Associate Director Sam Cowles**, the Miller Center has housed numerous live production activities in 2024. The live production side of the Miller Center includes a feed mill, hatchery, necropsy building, and production houses with industry-standard equipment utilized for departmental research and teaching activities.

Over the course of the year, two 64-week broiler breeder studies were conducted at the Miller Center, investigating reproductive physiology, endocrinology, metabolism, and mating behaviors. Eight hatches were carried out in 2024 from the breeder eggs laid by the flocks housed at the Miller Center. In addition to the broiler breeder studies, 22 broiler flocks were placed at the Miller Center in 2024, with studies covering a range of topics including nutrition, muscle physiology, health, feed manufacturing, food safety, gut physiology, microbiome, management, and production. The Miller Center also supported teaching activities for our Poultry Reproduction Class and Commercial Poultry Production Class.

EIGHT HATCHES were carried out in 2024 from the breeder eggs laid by the flocks housed at the Miller Center.

Under the leadership of **Associate Director Kourtney Gardner**, the Fortenberry Processing Plant, equipped with state-of-the-art technology and equipment, has been a hub for research, teaching and outreach events in 2024. Over the course of the year, 12 live bird processings have taken place for research, with 5,681 birds processed during these events. In addition

to the processing research projects, 17 other research projects in further processing, packaging and other areas have taken place in the plant.

The plant has also been instrumental in educating the next generation of poultry industry professionals. Twenty-one departmental classes have been held at the processing plant, along with nine 4-H and FFA outreach activities. To keep up with the latest advancements in technology, the plant also procured two new pieces of equipment: Combi Ovens and the Ossid E40 Thermoformer.

More detailed information about the studies and activities at the Miller Center is incorporated in this report.



A flock of broiler chicks placed at the Miller Center for research projects.

Understanding feed spillage behaviors to improve broiler feeder designs

Assistant Professor Bethany Baker-Cook's research team collaborated with Poultry Science **Associate Professor Jessica Starkey** and Biosystems Engineering **Professor Jeremiah Davis** to better understand the behaviors of broilers that lead to feed spillage. This study will examine feed spillage behaviors across different commercial feeder types and settings. The insights gained from this research will inform feeder management recommendations and could contribute to the design of improved feeders and reduce spillage.



Marcela Quino, a master's student in poultry science, and Denise Landers, a research assistant in poultry science, weighing feed for a broiler experiment.

Investigating Newcastle Disease Virus (NDV) mutations and their risk to poultry health

Newcastle disease virus (NDV) is a highly contagious and often severe disease that can infect most, if not all, bird species, making wild birds a potential reservoir that might pose a significant risk to domestic poultry. To investigate this, **Associate Professor Ruediger Hauck's** lab, in collaboration with the USDA Southeastern Poultry Research Laboratory in Athens, GA, examined how NDV isolates from ducks change when they infect chickens by passaging them in chicken embryos.

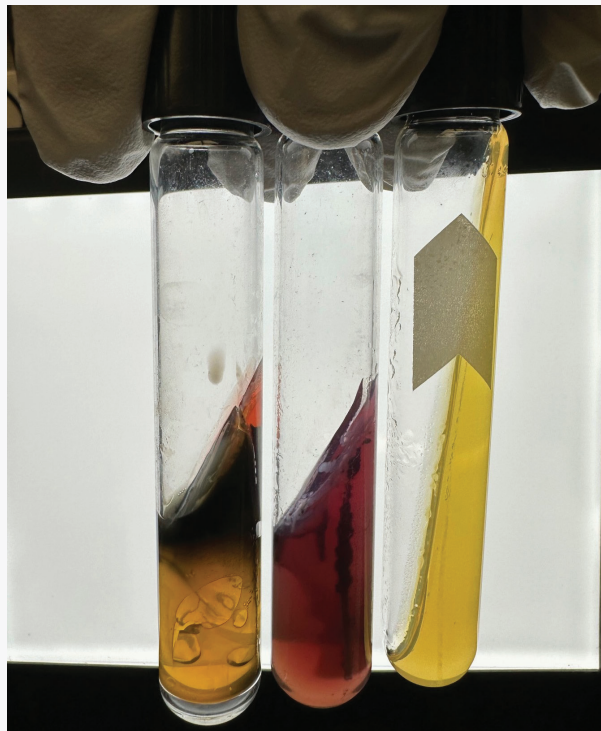
Dr. Hauck's lab found that silent mutations occurring during passaging were RANDOMLY DISTRIBUTED across the genome

By sequencing the whole genomes of the NDV isolates before and after passaging them into chicken embryos, Dr. Hauck's lab found that silent mutations occurring during passaging were randomly distributed across the genome, while missense mutations were less frequent and concentrated in a few genes. Notably, one of these genes was the hemagglutinin-neuraminidase gene, which determines the virus's tropism and virulence. Tropism refers to the ability of the virus to infect a distinct group of cells in the host. Virulence is a virus's ability to make a host sick or kill it, compared to other variants or isolates of the same virus. Identifying mutations that correlate with adaptation to chickens will help assess the risk that NDV isolates from wild birds pose to domestic poultry.

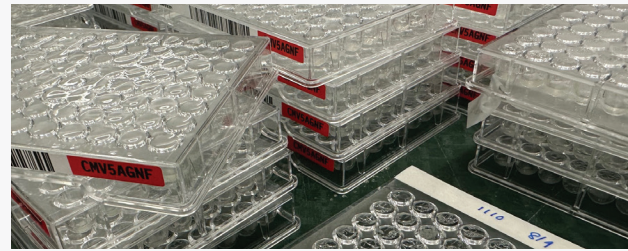
Students and post-doc enhance poultry processing and safety

One postdoctoral fellow, five graduate research assistants and one undergraduate research assistant worked under the leadership of **Associate Professor and Extension Specialist Dianna Bourassa** this year.

Postdoctoral fellow Dr. Shijinaraj Manjankattil evaluated the effectiveness of n-alkyl dimethyl benzyl ammonium chloride and peracetic acid in chilling water against different *Salmonella* serotypes inoculated on chicken flats. She found that these antimicrobials are more effective against certain serotypes than others.



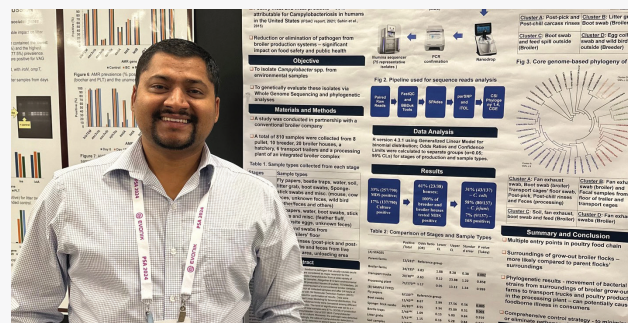
Biochemical confirmatory tests for *Salmonella*. Samples from broiler farms, hatchery, and processing plant were pre-enriched, screened with 3M- Molecular Detection System, and confirmed using triple sugar iron, lysine iron agar, and Urease slant tests.



Minimal Inhibitory Concentration (MIC) panel plates used for antimicrobial susceptibility tests of *Salmonella* isolates from chicken farms and facilities, using 14 antibiotics by the NARMS broth microdilution method.

Ph.D. student Montana Riggs is working to determine how the use of carbon dioxide-controlled atmospheric stunning during poultry processing influences changes in broiler blood chemistry and hormonal gene transcription. She has identified clear changes in blood chemistry and is conducting further investigation on how these biomarkers influence subsequent product quality and functionality.

Ph.D. student Yagya Adhikari has surveyed both conventional and antibiotic-free (ABF) poultry production systems from pullets to processed products. He has determined that certain *Salmonella* isolates can be traced across multiple production points while others only appear in one area of the complex. A better understanding of how this bacterium enters the production system is an important step in preventing foodborne illnesses.



Research poster on isolating *Campylobacter* at broiler complexes, presented by PhD student Yagya Adhikari at the 2024 Poultry Science Association Annual Meeting.



Researcher using a chroma meter to objectively measure the color of chicken breasts to assess quality.

M.S. student Abigail McConnell is evaluating the use of high-intensity light as a clean antimicrobial processing aid for the reduction of both *Salmonella* and *Campylobacter* on poultry parts. Her work has demonstrated consistent significant reductions of both pathogens without slowing production line speeds.

M.S. student Juan Figueroa has isolated a new bacteriophage with demonstrated efficacy against *Salmonella Infantis* on poultry parts during refrigerated storage. The research's goal is to apply phage to poultry parts to reduce pathogens in the food supply.

M.S. student Madalyn Jennings has determined that high holding area temperatures prior to carbon dioxide-controlled atmospheric stunning results in lighter breast fillets with lower pH values thus influencing downstream meat quality.

Undergraduate student Matthew Hughes investigated the use of sonication, or sound waves, to clean eggs for backyard producers. He found that while this method was effective at reducing bacteria, it also led to some eggs developing mixed rot.

Evaluating aquaponic systems for quality produce in food deserts

Assistant Professor Sungeun Cho and her research team recently began working on a National Science Foundation (NSF)-funded project titled "Collaborative Research: Investigation of Decoupled Algal-Biofluc Aquaponics Technology for Development in Food Deserts." This research project is being led by **Associate Professor Brendan Higgins** in the Auburn University Biosystems Engineering Department.

The project aims to overcome barriers in food deserts such as unstable systems and poor quality of fish and produce. Dr. Cho's lab uses human sensory panels and sensory instruments, such as an electronic nose and tongue, to evaluate the quality of cherry tomatoes produced from different aquaponic systems. This work will determine the quality of the fruits and help identify the best system for producing high-quality fruits.



Addressing Wooden Breast myopathy for better poultry meat quality

Associate Professor Jessica Starkey's research team is evaluating the incidence of Wooden Breast in modern commercial broilers and dual-purpose heritage broilers to establish a model to study the role of muscle satellite cells in the development of the myopathy. Dr. Starkey's research team has successfully isolated and fluorescently labeled broiler chicken skeletal muscle stem cells, called satellite cells, to study the cause of the costly myopathy known as Wooden Breast.

Following the successful isolation and culture of muscle satellite cells from unrestricted modern broiler chickens, the next phase involves transplanting these cells back into both slow-growing heritage breed broilers and nutrient-density restricted modern broilers. This experimental approach aims to understand whether the problem with muscle stem cell function in Wooden Breast-affected broilers is rooted in the cells themselves or influenced by their environment.

The Starkey Lab has also collaborated with Professor Jeremiah Davis and his team of engineers at the National Poultry Technology Center to design, fabricate, and assemble pens to house flight-capable heritage broilers used in the Wooden Breast myopathy research studies. To document and study the

development of the Wooden Breast phenotype, Starkey Lab visiting research scholars Saul Rosales, Blesseth McDonald, and Ruth Ann Morris take daily photographs of broilers from two different genetic strains (fast-growing, high-meat yielding and slow growing, dual-purpose) broilers grown at different rates.

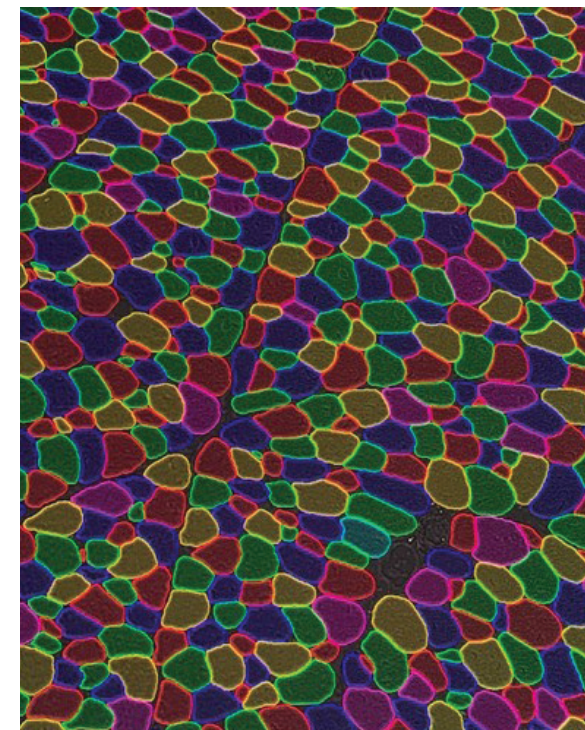
The Starkey Lab's research into Wooden Breast myopathy is critical to meat quality in the poultry industry. Wooden Breast myopathy affects meat quality and causes economic losses in the U.S. poultry industry due to reduced consumer appeal and marketability. Addressing this issue is essential for animal welfare, meeting consumer demands for quality, and promoting sustainable production practices, making it a key area of study for the long-term viability of the industry.



Starkey lab graduate students and visiting research scholars collecting growth performance data from broiler chickens grown at different rates to study the Wooden Breast meat quality defect.

Artificial Intelligence (AI) innovations boost efficiency in poultry research

Associate Professor Jessica Starkey's research team, including Master's students Wesley Rogers and Juan Barberena has adapted artificial intelligence (AI) software features to improve sample analysis efficiency. They are using these innovative software features and AI to enhance the speed and efficiency of conducting digital image analysis on immunofluorescence-stained muscle and gastrointestinal tissues for multiple projects in the lab. This advancement has reduced analysis time and increased the accuracy of their findings, contributing to more robust and reliable research outcomes.



Digital image of immunofluorescence-stained muscle tissue following segmentation by AI software.

Understanding chick behavioral development for better welfare



Broiler chicks to be placed in one of the poultry research houses at the Miller Center.

Assistant Professor Bethany Baker-Cook's lab has been quantifying the normal behavioral development of chicks during their first week of life. Their study focuses on diurnal rhythms, behavioral diversity and behavioral sequences. The findings from this study enables the detection of subtle behavioral changes, which can be used as early indicators of welfare issues and providing a more comprehensive assessment of welfare.

Elevating broiler nutrition knowledge locally and globally

Through United States Department of Agriculture – Agricultural Research Service (USDA-ARS) funded research projects and industry collaborations, **Associate Professor Samuel Rochell** and his research team conducted broiler nutrition projects to evaluate novel feed ingredients and optimize nutritional programs in modern operations.

In 2024, graduate students and post-doctoral fellows in Dr. Rochell’s lab presented six abstracts at national meetings. Annalise Anderson, a PhD student in the lab, was one of ten students selected nationally to attend the 9th Annual Evonik Doctoral Student Seminar to present her research and exchange knowledge with Evonik Animal Nutrition technical experts on current industry developments.

Dr. Rochell delivered two regional talks, four

Graduate students and post-doctoral fellows in Dr. Rochell’s lab presented **SIX ABSTRACTS** at national meetings

international talks (in Brazil, Malta (virtual), and Morocco), and a symposium presentation at the Poultry Science Association annual meeting in Louisville, Kentucky. Additionally, Dr. Rochell was recognized for completing his term as Section Editor for the Journal of Applied Poultry Research.

Innovative ingredients for nutritious and sustainable pet food

Under the supervision of **Associate Professor Jessica Starkey**, Master’s student Ileana Berganza is continuing the Starkey Lab’s pet food research.

For her master’s thesis, Berganza is investigating the physiochemical, textural, and sensory characteristics, as well as the instrumental color, of insect-based jerky-style pet treats made with different inclusions of crickets and chicken liver. Her research aims to determine if using insects and chicken livers provide a sustainable and nutritional source of protein that is also appealing to consumers, benefiting the pet food industry.



Graduate student Jorge Sandoval forming jerky-style pet treats made with different inclusions of crickets and chicken liver.

Advancing food safety with molecular microbiology

Assistant Professor Shabarinath Srikumar led the establishment of a new Molecular Microbiology Laboratory in the Department of Poultry Science. Dr. Srikumar’s lab focuses on advancing food safety research by integrating traditional microbiology techniques with cutting-edge molecular tools, including polymerase chain reaction (PCR), cloning, gene expression studies, and DNA/RNA sequencing.

In under a year, the lab has grown to include two Ph.D. students, four master’s students, a post-doctoral researcher, and nine undergraduate research assistants. Dr. Srikumar’s lab significantly enhances the department’s research capacity, fostering interdisciplinary collaborations and supporting innovative methods to address critical challenges in food safety.

In under a year, the lab has grown to include **TWO** Ph.D. students, **FOUR** master’s students, **ONE** post-doctoral researcher, & **NINE** undergraduate research assistants

In 2024, Dr. Srikumar also received the prestigious OIP Travel Fellowship, enabling him to establish research collaborations with leading universities in Thailand and Indonesia. These partnerships aim to develop innovative solutions for foodborne pathogen challenges, further expanding the global impact of the College of Agriculture’s research efforts. Graduate students from the Srikumar Lab have showcased the group’s research at several prominent conferences, including the International Association of Food Protection in Long Beach, California, the Southeastern Branch of the American Society of Microbiology in Tampa, Florida, and the 25th Annual One Health Symposium at Tuskegee University. These contributions not only strengthened the department’s reach in advancing food safety but also reflected the lab’s commitment to addressing critical global challenges in food safety and public health.



Group photo of Dr. Shabarinath Srikumar’s (top, left) lab.

Advancing food safety and quality with cutting-edge technologies

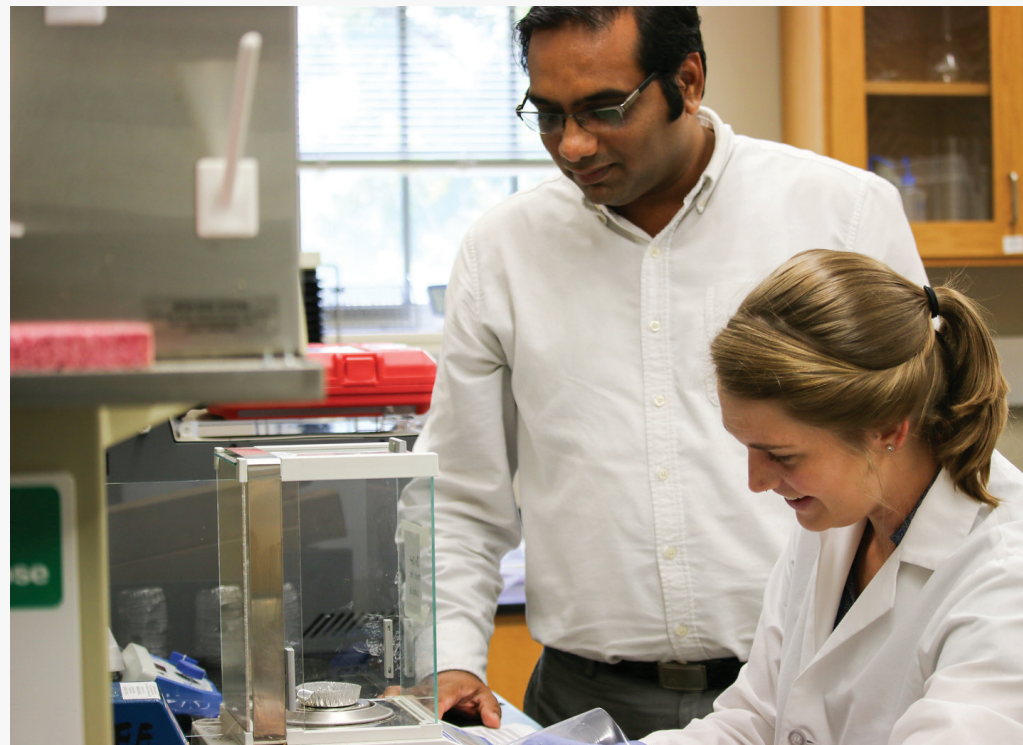
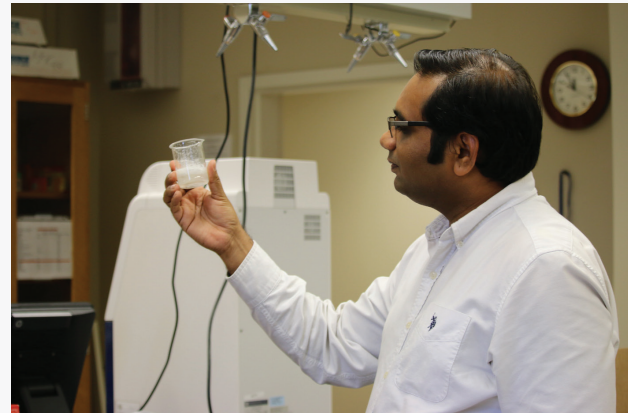
Associate Professor Amit Morey and his research team have continued to work under their motto: “Science for the Service of Mankind.”

In 2024, Dr. Morey, as a Co-Principal Investigator, received the National Science Foundation’s Convergence Accelerator Phase II grant award of \$5 million for 3 years. The award focuses on developing convergent solutions to tackle the Salmonella challenge in the poultry industry. The project aims to provide a comprehensive, data-driven decision support system from farm-to-fork through novel pathogen detection sensors and integrated data networks.

Additionally, in 2024, the lab worked on cold plasma technologies to activate antimicrobials and study their effects on eliminating *Listeria monocytogenes* on food processing surfaces. The team also demonstrated the presence of invisible fecal contamination using hyperspectral imaging systems and machine learning models.

Dr. Morey’s lab is increasingly

focused on developing and integrating innovative technologies to benefit the poultry industry by improving food safety, quality, and sustainability.



(Top) Dr. Amit Morey examining samples in one of the Poultry Science Building labs.
(Bottom) Dr. Amit Morey (left) working with a student on a research project.

Characterizing immune mechanisms in cocci-challenged broilers

Coccidiosis is a highly contagious intestinal parasite that affects broiler chickens and other poultry, causing diarrhea, weight loss, decreased production in poultry, and can even be fatal. Under the supervision of **Associate Professor Jessica Starkey** and in collaboration with Professor Hargis’s lab at the University of Arkansas, Ph.D. student Gerardo Abascal-Ponciano is investigating the molecular mechanisms underlying the immune response in cocci-challenged broilers.

Abascal-Ponciano is using a unique BrdU

(bromodeoxyuridine) proliferating cell labeling method combined with cryohistology, immunofluorescence staining, and proteomics. He has also developed a proteomic pipeline to analyze broiler tissue proteomes, which he uses in conjunction with a broiler coccidiosis model to study immune and inflammatory responses to protozoal parasite infection. This research aims to provide deeper insights into the immune mechanisms, potentially leading to more effective treatments and preventive measures for coccidiosis in poultry.



Starkey lab collecting samples for Ph.D. student Gerardo Abascal-Ponciano’s study on the molecular mechanisms underlying the immune response in cocci-challenged broilers.

OUTREACH

Feed Milling Workshop attracts industry professionals from 15 different states

Investing in workforce training is crucial for securing the long-term success of Alabama's poultry, feed, and broader animal industries, while also fostering individual career advancement.

Extension Specialist and Associate Professor Wilmer Pacheco organized a comprehensive Feed Milling Workshop aimed at equipping feed mill managers, supervisors, and allied industries personnel with the knowledge and skills needed to enhance efficiency in feed milling operations. The workshop focused on critical aspects such as optimizing feed milling production processes, ensuring quality control of ingredients and finished feed, implementing efficient preventive and corrective maintenance programs, and adopting innovative practices to meet the growing demands of the feed and poultry industries.

The workshop, held in Fall 2024 at the Charles C. Miller Jr. Poultry Research & Education Center, provided an ideal location for participants to engage in hands-on training, interactive discussions, and in-depth demonstrations.

The event attracted approximately 80 industry professionals from 15 different states, creating a diverse and dynamic group eager to enhance their expertise in feed operations, maintenance, and quality control. During the two-day training, attendees heard from and participated in hands-on activities with feed mill industry leaders and Auburn University Department of Poultry Science faculty and graduate students on a



Feed Milling Workshop attendees listening to a speaker at the Alabama Poultry & Egg Association Feed Mill, Miller Center.

wide range of topics. These experts led sessions on a broad spectrum of topics, including feed mill automation, grinding, batching, and mixing, conditioning and pelleting operations, the importance of maintenance, maintenance of elevators, check list to comply with quality and FSMA regulations, and quality control.

The workshop brought together participants from feed mills that collectively produce approximately 250,000 tons of feed per week, highlighting its broad industry reach. One participant noted that the workshop would be invaluable during the challenging winter months, offering practical solutions to enhance their daily operations. Another attendee, preparing to move into a new feed mill in April, emphasized the value of the workshop's focus on proactive measures such as check lists and preventative maintenance. They appreciated the opportunity to learn strategies that go beyond merely keeping operations running, shifting the perspective from survival mode to long-term efficiency and sustainability.

These workshops will be held annually during the fall to support the feed and animal industries at local, regional, and national levels.

HAACP Roundtable fosters collaboration in poultry and meat processing

Associate Professor and Extension Specialist Dianna Bourassa organized a HACCP (Hazard Analysis and Critical Control Point) Roundtable Program that brought 60 poultry and meat processing personnel and USDA-FSIS food safety regulators together to discuss current food safety and regulatory issues.

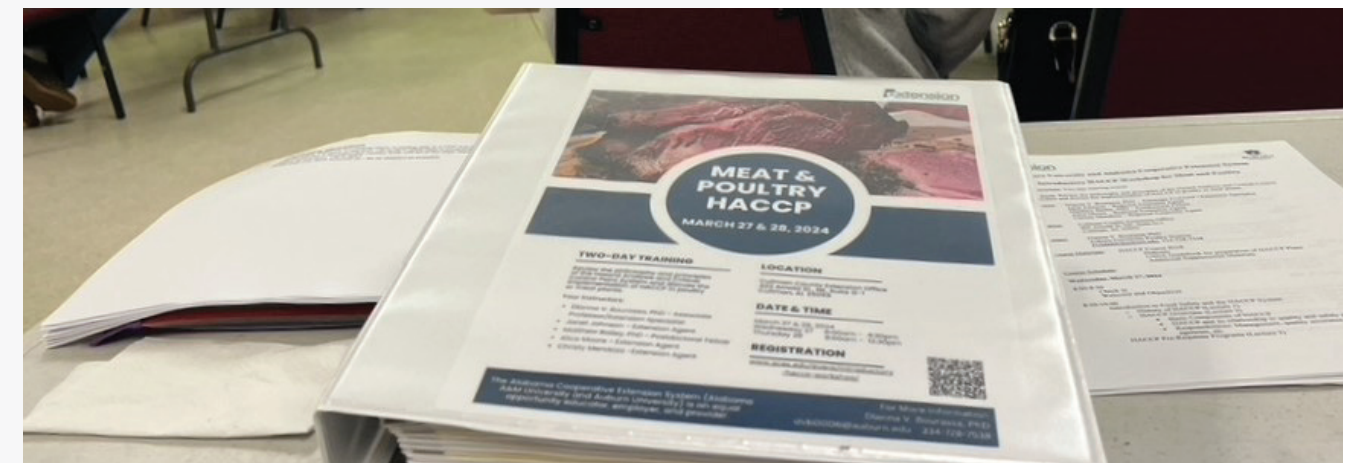
The purpose of the program is to allow these industry professionals to work together to solve problems faced by the poultry and meat industries. During the first half of the program, participants had the opportunity to talk about current food safety and regulatory concerns and assemble a list of questions for the afternoon question and answer session with USDA-FSIS representatives.

The HACCP Roundtable program encourages effective communication and positive relationships between poultry processors and government regulators that extend beyond the discussion meetings.

Strengthening food safety in Alabama with HACCP training program

The Poultry and Food Safety Extension teams are working together to provide Introductory HACCP trainings to meat and poultry industry professionals across Alabama. The Introductory HACCP course reviews the philosophy and principles of the HACCP system and discusses the implementation of HACCP in poultry and meat plants. Participants who complete this training will receive Introductory HACCP Certification through the International HACCP Alliance. In 2024, the teams hosted two training sessions in Cullman, AL at the Cullman County Extension Office with nine attendees and Auburn, AL at the Charles C. Miller Jr. Poultry Research and Education Center with 11 attendees.

The teams hosted two training sessions with 20 ATTENDEES between them.



Meat & Poultry HACCP handbook at Introductory HACCP trainings.

Poultry industry leaders share insights at Pullet & Broiler Breeder Conference

Professor and Extension Specialist William Dozier organized a Pullet & Broiler Breeder Conference at the Charles C. Miller Jr. Poultry Research and Education Center in August 2024. The event brought approximately 87 poultry industry professionals from seven southeastern states, including service technicians, pullet managers, broiler breeder managers, veterinarians, vice presidents of live production, and technical managers.

The conference aimed to provide timely information on management practices to enhance reproductive performance during the rearing and laying cycles of broiler breeders. Topics covered included: Keys to Uniformity in Rearing, Basic Posting Techniques and Chick Mortality Identification, Strategies to Obtain Four Week Target Body Weight, Feed Management Practices in Rearing and Laying, Egg Storage Practices on Hatchability, Male Spiking Programs, and Male Fertility for Optimum Feeding.

Positive feedback from participants indicated the conference was well received. The next conference is anticipated to be held in 2025.



Pullet & Broiler Breeder Conference attendees listening to a speaker in the Miller Center classroom.

Enhancing awareness of poultry science



Graduate student Juan Barberena assisting with the omelet breakfast at the Feed Milling Workshop.

In addition to their various research endeavors, **Associate Professor Jessica Starkey's** Lab also actively participated in outreach efforts on-campus and beyond. The team, which includes visiting research scholars and research interns from six different countries, assisted with the Poultry Science Department Open House, the Alabama Poultry & Egg Association capitol omelet breakfast, and the Feed Milling Workshop breakfast. Members of the Starkey Lab, along with other Poultry Science Department lab members, hosted 120 attendees of the 10th Zamorano Symposium on Auburn University's campus.

Off-campus, Dr. Starkey and graduate students have presented at numerous conferences and annual meetings, increasing awareness of the department and its research initiatives.

Webinar series aims to educate poultry industry professionals

The Alabama Cooperative Extension System Poultry Team is organizing a bi-monthly webinar series to provide timely information on topics ranging from live production to processing. The team hopes the webinar series will reach a greater audience and provide more industry professionals with pertinent information for their operations.

The team members involved in this program include **Associate Professor and Extension Specialist Dianna Bourassa**, **Professor and Extension Specialist William Dozier**, **Assistant Professor and Extension Poultry Veterinarian Maggie Thompson** from the College of Veterinary Medicine, **Associate Extension Professor Dennis Brothers** from the Department of Agricultural Economics & Rural Sociology, **Associate Professor and Extension Specialist Dr. Wilmer Pacheco**, and **Associate Extension Professor Kent Stanford** from the Department of Crop, Soil and Environmental Sciences.

The first webinar, titled "Impact of Feed Macrostructure and Microstructure on Poultry Performance," was presented by **Dr. Wilmer Pacheco** on November 1.

Exploring food safety at poultry processor meeting

The Auburn University Poultry Extension Team teamed up with Mississippi State University to host a Poultry Processor Meeting. During this meeting, 31 participants had the opportunity to discuss appeals to noncompliance records (NRs), look at condemnations in a hands-on wet lab, and hear about the challenges and opportunities regarding the newly proposed Food Safety & Inspection Service (FSIS) Salmonella rule. This one-day workshop was targeted to poultry industry professionals and hosted in Pearl, MS at the Mississippi Veterinary Research and Diagnostic Laboratory.

The one -day Poultry Processor Meeting had 31 PARTICIPANTS in attendance.



Department participates in 2024 Ag Roundup

The Poultry Science Club, the Poultry & Food Science Graduate Club, Alabama Poultry & Egg Association, and departmental faculty and staff assisted with running the department's booth at the 45th annual Ag Roundup event. Hosted by the Auburn Agricultural Alumni Club and Auburn University College of Agriculture, this event is a Homecoming weekend tradition for alumni, students, and friends of the College of Agriculture.

Alabama agricultural organizations, college departments and student organizations participate in this event by hosting booths with games, activities and food samples. This year, the Department of Poultry Science served 200 smoked chicken cupcakes, sold Poultry Science Club merchandise, and promoted the Alabama Poultry industry.



Crowd at the 45th annual Ag Roundup.

Educating the next generation on poultry reproduction



Dr. Charlene Hanlon's lab members assisting with reproduction and incubation demonstrations for departmental summer camp programs.

Assistant Professor Charlene Hanlon's lab is dedicated to educating the younger generations about poultry reproduction. The team, which includes visiting research scholars Kristian Almendares and Patricia Quino, regularly participates in outreach efforts such as summer camps and recruitment events, where they conduct chick-hatching and incubation demonstrations. These hands-on activities allow the team to showcase their hatchery management skills while educating and inspiring attendees, from young students to potential future researchers. By engaging in outreach efforts, Dr. Hanlon's lab is advancing knowledge and interest in poultry reproduction to inspire the next generation to enter the poultry industry.

ACADEMICS AND INSTRUCTION

Engaging prospective poultry science students with hands-on experiences

In 2024, multiple groups of prospective students across a broad range of ages visited and gained hands-on experience at the Charles C. Miller Jr. Poultry Research and Education Center. Hosted by the Department of Poultry Science, these visits aimed to educate middle and high school students on opportunities in the food and poultry industries.

Over the summer, the department organized three one-day camps for students aged 9-18, incorporating more science into the hands-on activities and lessons. In May and July, 20 and 15 students, respectively, aged 9-13, attended the Jr. PoultryU Camps. They learned about the science behind the poultry industry, from incubation to chicken feed nutrients, and participated in activities such as creating chicken feed, egg candling, breeding and battering techniques, using a pancake bot, and making their own Dippin' Dots. The campers also enjoyed surprise visits from Aubie the Tiger and Rocko the Chicken.

In June, 10 students aged 14-18 participated in the Sr. PoultryU Camp, where they received hands-on training in nutrition, reproduction, food technology, further processing, and housing technologies. They also heard from alumni and industry professionals about various career paths within the poultry industry.

Throughout the year, multiple high school agriculture classes toured the Miller Center and the Fortenberry Processing Plant. The department also hosted nine 4-H and FFA youth events, including poultry judging clinics and contests.

To boost enrollment, the department introduced a new event: the Admitted Students Open House. Ten students admitted for Fall 2024 visited the Miller Center, where they spoke with current students, alumni, faculty, and staff, and received an in-depth tour hosted by faculty members. This event had an 80% yield rate, marking it a success.

Overall, the department has significantly increased its recruitment efforts to boost undergraduate enrollment. With continued support from faculty, staff, and students, the department's enrollment is expected to grow over the next few years.



Sr. PoultryU Camp participants after a packaging machine demonstration.

Connecting students with industry through poultry science clubs

The Poultry Science Club offers undergraduate students an opportunity to become involved in the department. The club invites guest speakers from the industry to speak to members multiple times throughout the year, providing poultry science students with valuable networking opportunities that can lead to internships and jobs after graduation.

For graduate students, the department also has a Poultry and Food Science Graduate Club. This organization aims to unite graduate students in the poultry and food science programs, along with others interested in the animal or food industries, to create professional connections. It helps students interact with employers and industry speakers, building knowledge about professionalism and preparing them for the transition from academia to the workforce.

Students from both clubs assist with departmental events, such as Ag Roundup, the College of Agriculture's Welcome Back Picnic, and recruitment events. Club members also represent the department at off-campus events, including the Alabama Poultry & Egg Association (APEA) capitol omelet breakfast, IPPE, and the APEA Industry Workshop.



Auburn Poultry Judging Team competes in USPOULTRY Foundation Poultry Judging Contest



Auburn Poultry Judging Team members and coaches (from left to right): Madalyn Jennings, Cheyenne Weimer, Matthew Hughes, Ella Taylor, Abigail McConnell, Montana Riggs, Marissa Askew, and Lora Beeco at the 75th USPOULTRY Foundation Ted Cameron National Poultry Judging Contest.

On April 4-5, 2024, the Auburn University Collegiate Poultry Judging Team placed fourth overall at the 75th USPOULTRY Foundation Ted Cameron National Poultry Judging Contest held at Louisiana State University. The team earned third place for the Breed Selection and fifth place for the Production divisions of the competition. Additionally, two team members received individual awards—Marissa Askew placed second overall, 3rd in the Production division, and 2nd in the Breed Selection division while Ella Taylor placed 3rd in the Breed Selection division.

This year's team was led by Head Coach Montana Riggs and Assistant Coaches Madalyn Jennings, Abigail McConnell, and Matthew Hughes. Team members included Marissa Askew, Cheyenne Weimer, Lora Beeco and Ella Taylor.

< (Left) Undergraduate Poultry Science Club members at the 2024 IPPE event.

Alabama Poultry and Egg Association awards \$77,000 in scholarships

Twenty-four undergraduate students in the Poultry Science Department received a collective \$77,000 in industry scholarships in November 2024, when the Alabama Poultry and Egg Association Scholarship Recognition Program was held at the Miller Center. Johnny Adams, Ray Hilburn, Morgan Flowers and Casey Jones of Alabama Poultry and Egg recognized the student scholarship recipients.

The department has also received \$30,143 from the US Poultry Foundation to assist with recruitment efforts.



2024 scholarship recipients with Alabama Poultry & Egg Association (APEA) board members at the APEA Scholarship Recognition Program.

Graduate students gain insight into molecular pathogenicity with new department course

In Fall 2024, the Department of Poultry Science launched an innovative new course tailored specifically for graduate students. Designed and taught by **Assistant Professor Shabaranith Srikumar**, the course, Molecular Pathogenicity of Foodborne Illnesses, provided students with a comprehensive understanding of how major foodborne pathogens cause disease at the molecular level.

Through this course, students gained insights into the mechanisms of pathogenesis, equipping them with the tools to address challenges in food safety. Emphasizing real-world applications, the course helped students learn how to apply their knowledge to improve food safety practices in diverse contexts, making it beneficial for those pursuing careers in poultry science, animal sciences, and biological research fields.

This course reflects the department's commitment to preparing students with contemporary skills and expertise while addressing critical issues in food safety and public health. By incorporating cutting-edge research and practical applications, the department continues to advance educational excellence and relevance in today's ever-evolving scientific landscape.

NEW HIRES *(Staff, Post-Docs, and Assistant Research Faculty)*



Ansel Steele joins as research assistant in Bourassa Lab

Ansel Steele joined the Poultry Science Department as a research assistant in Dr. Dianna Bourassa's lab in early 2024. He earned his bachelor's degree in biology from Longwood University in Virginia. Steele previously worked in the Department of Fisheries at Auburn University and as a lab technician in Nebraska.



Whit Milford joins the Miller Center team as agriculture technician

Whit Milford is working at the Miller Center for the Poultry Science Department as an agriculture technician III. He has 13 years of experience working on his family's poultry farm and graduated from Horseshoe Bend High School.



Tristen Ezell enters department as an agriculture technician at the Miller Center

Tristen Ezell joined the Poultry Science Department as an agriculture technician III at the Miller Center. He earned a bachelor's degree in environmental science from Troy University. Before joining Auburn, Ezell worked in retail with Lowe's and Home Depot and gained experience in breeding heritage poultry, ecology, and habitat management.



Scot Johnson becomes a part of the Miller Center team as agriculture technician

Scot Johnson joined the Miller Center team in the Poultry Science Department as an agricultural technician III. He is pursuing a degree in Environmental Science from Troy University. Johnson previously studied music education before transitioning to STEM fields, leading him to his current role at Auburn.



Stephen Bryant brings experience to Miller Center as a maintenance mechanic

Stephen Bryant was hired on by the department as a maintenance mechanic at the Miller Center. He brings more than 20 years of experience in residential and commercial construction, including carpentry, plumbing, electrical work, and building maintenance. Bryant has worked at Auburn University for four years, most recently as a construction technician II with Facilities Management.



Dr. Shahna Fathima joins Hauck Lab in the department

Dr. Shahna Fathima joined Dr. Hauck's poultry disease lab in fall 2024 as a postdoctoral fellow, where her research centers on transcriptomics for pathogen surveillance in healthy commercial broiler flocks across Alabama. Originally from India, Dr. Fathima holds a bachelor's degree in veterinary science and animal husbandry (DVM equivalent). Before pursuing her Ph.D. in poultry science at the University of Georgia, she worked in India as a veterinary surgeon for animal birth control programs and as a subject matter expert in pet health insurance claims.



Dr. Matthew Bailey starts new position as research fellow in Bourassa Lab

Matthew Bailey is a Research Fellow in the Poultry Science Department, conducting research related to microbial food safety in poultry. His research interests focus on both pre- and post-harvest food safety issues, primarily involving the pathogens Salmonella and Campylobacter.

Originally from Virginia, Matthew moved to Alabama when he was 11. He earned both his bachelor's and master's degrees in Poultry Science from Auburn University and his Ph.D. in Food Science from Purdue University. He completed a postdoctoral fellowship in the Poultry Science Department at the University of Georgia before joining Auburn's Poultry Science Department as a post-doc in 2020, prior to being hired as a Research Fellow.



Dr. Sidra Nazeer brings new perspective to Srikumar Lab

Dr. Sidra Nazeer joined the department as a postdoctoral fellow in Dr. Srikumar's lab in September 2024. Her research focuses on understanding how pathogenic bacteria survive and proliferate in poultry meat and the environment. Through her work, Dr. Nazeer aims to develop data that will support the creation of novel technologies to enhance food safety. Dr. Nazeer earned her Ph.D. in Fisheries and Aquaculture, specializing in Fish Nutrition, from Auburn University in December 2023. Originally from Pakistan, she is excited to broaden her expertise in microbiology, a field she has always found fascinating.



Dr. Jihye An becomes a part of the Cho Lab in the department

Dr. Jihye An joined the department in October 2024 as a postdoctoral fellow in Dr. Cho's lab. Her work focuses on consumer sensory science, investigating how consumers perceive food and beverages using a variety of research methods. Her research aims to understand how overall liking, flavor, and texture attributes of foods are influenced under different conditions. Dr. An earned her bachelor's degree in food science and nutrition, as well as her master's and doctoral degrees in consumer and sensory Science from Pusan National University in South Korea. Before joining Auburn, she served as an adjunct assistant professor at Pusan National University.



Dr. Muhammad Naeem joins Bourassa Lab focusing on food safety

Dr. Muhammad Naeem is a postdoctoral fellow in Dr. Dianna Bourassa's lab at the Auburn University Poultry Science Department, focusing on food safety in poultry. His research aims to find strategies including dietary manipulations, water treatments, and management practices to reduce the foodborne pathogen load in birds during growth phases.

Originally from Pakistan, Dr. Naeem earned his bachelor's degree in animal science and master's degree in poultry science at the University of Agriculture, Faisalabad. He then relocated to Nottingham Trent University (NTU), UK, to pursue a Ph.D. in poultry science. Before joining Auburn University in October 2024, Dr. Naeem worked as a visiting research associate at NTU's Poultry Research Centre.



Dr. Sabin Poudel starts new position in department as an assistant research professor

Dr. Sabin Poudel transitioned to a new role in the Department of Poultry Science as an assistant research professor in 2024. His research focuses on controlling foodborne pathogens, particularly Salmonella and Campylobacter, to improve the safety of poultry products. Dr. Poudel investigates how these pathogens colonize and spread within poultry, focusing on reducing Salmonella transmission through aerosol routes and examining its impact on respiratory and gut microbiomes. Another area of his research involves studying the transmission routes of Campylobacter, including aerosol and vertical transmission from parent to offspring. Additionally, he works on reducing antibiotic-resistant bacteria in poultry litter by identifying compounds that limit horizontal gene transfer, thereby mitigating the spread of antibiotic resistance from poultry farms to the environment.



Dr. Saiada Farjana brings experience as new assistant research professor

Dr. Saiada Farjana joined the Department of Poultry Science as an assistant research professor. She aims to establish an avian immunology lab to study the interaction between hosts and pathogens in the gut of broiler chickens. Her research focuses on the broiler enteric immune system and immunosuppressive viruses. Dr. Farjana has conducted research on both human and chicken viruses. She is also interested in molecular virology, bioinformatics, and infectious diseases of poultry. Her expertise includes generating recombinant avian viral attachment proteins and conducting in-vitro and in-vivo experiments, as well as training students in poultry disease research.



Dr. Jinquan Wang joins department as an assistant research professor

Dr. Jinquan Wang joined the Department of Poultry Science as an assistant research professor, specializing in food safety and poultry nutrition. His research focuses on pre-harvest interventions, such as dietary supplements, water treatment, and management practices, to improve the safety of chicken meat. Originally from China, Dr. Wang completed two years at China Agricultural University before transferring to Texas A&M University, where he earned his bachelor's degree in poultry science. Prior to joining Auburn, he worked as a postdoctoral research associate at the Poultry Processing and Food Safety Lab at the University of Georgia.

STAFF AND STUDENT AWARDS

JOHN JONES

Auburn University, College of Agriculture Service Staff Award

KALEIGH BACKSTROM

Auburn University Undergraduate Research Student Employee of the Year.

ALEXANDRA JACKSON

- Auburn University Graduate School and College of Agriculture Outstanding Master's Student Award
- Research Excellence Award and Travel Award from the Poultry Science Association for her research on "Development of the behavioral repertoire in the early life of broiler chicks" at the 2024 Poultry Science Annual Meeting.

ANNALISE ANDERSON

Selected as one of ten students nationally to attend the 9th Annual Evonik Doctoral Student Seminar

GREESHMA BHARATHAN

Auburn University College of Agriculture Graduate Student Research Poster Showcase Winner, "Ferric Uptake Regulator (Fur) plays a significant role in the survival of Salmonella Typhimurium on meat" (Ph.D. student poster winner)

YAGYA ADHIKARI

Auburn University College of Agriculture Graduate Student Research Poster Showcase Winner, "Genomic and Phenotypic Characterization of Antimicrobial Resistance in Salmonella and Campylobacter from Commercial Broiler Complexes" (Ph.D. student poster winner)

JORGE SANDOVAL

Alabama Feed and Grain Graduate Student Scholarship

JOSEPH GULIZIA

Alabama Feed and Grain Graduate Student Scholarship

PABLO DUARTE

Alabama Feed and Grain Graduate Student Scholarship

ISSAC VARGAS

Alabama Feed and Grain Graduate Student Scholarship

MARTHA RUEDA

Poultry Science Association's Research Excellence Award in Poultry Management & Production, "Determining Feed Spillage of Broilers Using Two Commercial Feeders and Two Supplemental Feeders During the Starter Phase"

HILARY CARRERA

1st place oral graduate student presentation at the 2024 Petfood Forum, "Effect of dehydration time on textural, chemical, and instrumental color properties of jerky-style dog treats made with swine pluck

VIANCA TASHIGUANO

- Auburn University College of Agriculture Poster Showcase Winner
- Allen Edgar Scholarship

MICAH TELAH BLACK

Zemedelska Univerzita (Czech Republic) Internship Scholarship

KATHERINE SOFIA SIERRA

- 1st place 3 Minute Flash Talk Competition at the Future Technologies and Enabling Plasma Processes Annual Conference and the IFT Feeding Tomorrow Fund
- Allen Edgar Scholarship
- Meat Industry Supplier Alliance Foundation Scholarship
- Zemedelska Univerzita (Czech Republic) Internship Scholarship
- AMSA C. Boyd Ramsey Scholarship
- CORE Institute Fellowship, Leveraging Data and AI for Sustainable Regional Food Systems
- Auburn University and College of Agriculture Outstanding Master's Student Award



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