



DEPARTMENT OF
ANIMAL &
AVIAN SCIENCES





Twenty-four poster presentations lined the Animal Sciences Building concourse during the Annual Symposium's Poster Session including presentations from labs and researchers from all over the ANSC department.

After cancellation and postponing due to the COVID-19 pandemic, ANSC's 34th Annual Symposium was a day filled with research presentations and reconnecting

(2nd place) who is studying regulatory crosstalk between adipose metabolism and copper homeostasis in mice in the Sunny lab. The postdoc award went to Dr. Ali of the Salem lab who is examining the genetic sequencing of rainbow trout with economically important traits. The Shaffner Poultry Research Awards went to Chirantana Mathkari (1st place) and Kuan-Ling Liu of the Porter lab (2nd place).

Closing out the day was a barbecue dinner during which students, faculty, staff, and presenters enjoyed a relaxing time to gather and reconnect after a year and a half of remote activities.



2021 Symposium Honors:

- Outstanding Ph.D. Student: **Chaitra Surugihalli**
- Outstanding MS Student: **Ashlyn Snyder**
- Graduate Student Poster Presentations: **1st- Sandeepan Ghosh, 2nd- Parama Bhattacharjee**
- Post-Doc Poster Presentations: **1st- Ali Ali**
- Graduate Student Oral Presentations: **1st- Chirantana Mathkari, 2nd- Zoie McMillian**
- Post-Doc Oral Presentations: **1st- Halli Weiner**
- Shaffner Poultry Research Award: **1st- Chirantana Mathkari, 2nd- Kuan-Ling Liu**
- Staff Member of the Year 2021: **Clare Capotosto**



The 34th Annual Symposium

After being postponed from the spring and entirely cancelled last year because of the COVID-19 pandemic, the 34th Annual Symposium of the Department of Animal and Avian Sciences took place on Thursday, August 26, 2021. The morning began with coffee, bagels, and an insightful presentation by keynote speaker Dr. Nicholas Gabler. A Professor of Swine Nutrition and Physiology and the Associate Chair of Research in the Department of Animal Science at Iowa State University, Dr. Gabler addressed "The impact of stress and disease on intestinal function and integrity in growing pigs."

What followed was a day full of activity that showcased the department's ongoing research, as presented by graduate students and postdocs, including 15 oral presentations and 24 posters. Graduate students and postdocs gained valuable speaking experience for their future participation in national and international conferences as well as feedback from faculty and guest judges, Drs. Randy Baldwin, Kristen Brady and Inkyung Park of the USDA. Presentations included topics such as iron utilization and neuron inputs in

mice, immune system responses in bovine cells, lights, fans, and environmental enrichments in avian food production, and genetic study of insulin regulation in swine stem cells. At the conclusion of the symposium, awards were given to the top-rated presentations as well as other departmental recognitions. See the full list of honors below.

While all of the oral presenters did excellent jobs, the honors went to two graduate students, Chirantana Mathkari (1st place) who is studying the effects of enrichments on the well-being of commercial breeding colony quail in the Dennis lab, and to Zoie McMillain (2nd place) who studies the benefits of circulation fans in commercial broiler houses with Dr. Weimer. The postdoc oral presentation award was won by Dr. Halli Weiner of the Keefer lab for her talk on evaluating an enzyme as a type of metabolic assessment of bovine embryo health.

The highest marked posters in the competition were created by Sandeepan Ghosh (1st place) who is studying how a microscopic roundworm senses and processes heme in the Hamza lab, and Parama Bhattacharjee



2021 Mary Shorb Lecture in Nutrition

Nutrition lecture jointly presented by ANSC and NFSC with Jeffrey I. Gordon, M.D., the 'father of the microbiome'

On Thursday, November 4, the 2021 Mary Shorb Lecture in Nutrition was jointly presented by the departments of Animal and Avian Sciences and Nutrition and Food Science with keynote presentation given by Jeffrey I. Gordon, M.D., who is known as the 'father of the microbiome.' His talk was entitled, "Development of gut Microbiota-directed foods for treating childhood malnutrition" in which he discussed an ongoing research project utilizing specific nutrients to encourage healthier gut microbe populations to combat malnutrition.

Dr. Gordon has spent his entire academic career at Washington University,

first as a member of the Departments of Medicine and Biological Chemistry, then as Head of the Department of Molecular Biology and Pharmacology and since 2003 as founding Director of the University's interdepartmental, interdisciplinary Center for Genome Sciences and Systems Biology. His lab studies the biological effects of human gut microbial communities and focuses on addressing the global health challenges of obesity and childhood under nutrition through new understanding of the interactions between diets and promoting healthy development of the gut microbial community.

For Dr. Gordon's lecture, he presented on a long-running research project on childhood malnutrition and gut microbiomes in Mirpur, Bangladesh. His lab began by examining how gut microbe development is affected by malnutrition—specifically the interactions and timing of development between specific microbe populations. They conducted a series of animal and child studies they found and confirmed the underdevelopment in key microbe populations due to malnutrition, which slowed growth and development. Then, they turned to development of food packages specifically designed to increase the microbe fitness in malnourished children through a nutrition program. Through regular feeding and testing, the researchers measured each group's gut microbe populations with very positive results from one of their experimental nutrition mixes.

This year's Mary Shorb Lecture in Nutrition was held via zoom and with the help of three ANSC faculty who served on the organizing committee, Drs. Younggeon Jin, Byung Kim and Mohamed Salem, which was chaired by Dr. Diana Obanda, NFSC.



Mary Shorb

The Lecture series is named for Mary Shaw Shorb who received her B.S. in Biology from the College of Idaho (1928) and her Sc.D. in Immunology from Johns Hopkins University

(1933). In 1942, she took her first research position at the Bureau of Home Economics and Human Nutrition of the USDA at Beltsville. Two years later, she transferred to the Bureau of Dairy Industry (USDA) where she was tasked with culturing *Lactobacillus lactis* Dorner (LDD), which was being used to make various fermented Dairy products. The media used to grow LDD required liver extract, which led Dr. Shorb to hypothesize that LDD could be used as a rapid biological assay to identify the anti-pernicious anemia factor identified in liver, for which Minot and Murphy shared the 1934 Nobel Prize in medicine.

After being bumped from her position at USDA in 1946 by the returning veteran who had held the position prior to the war, Dr. Shorb was given laboratory space and an unpaid appointment in the Poultry Husbandry Department of the University of Maryland. With an initial grant from Merck & Company, she developed an LDD bioassay to quantify the concentration of anti-pernicious factor in liver extracts. This assay allowed her collaborators at Merck & Company to rapidly purify and crystalize the substance they named vitamin B-12, which was rapidly proven to be therapeutically effective for pernicious anemia. She and her collaborator, Dr. Karl Folkers (Merck) were corecipients of the Mead-Johnson Award of the American Institute of Nutrition in 1949 for this work. In 1970, two years before Dr. Shorb's retirement from the University of Maryland, Merck & Company donated \$10,000 to establish a Shorb Lectureship in Nutrition to honor and perpetuate her legacy.

UMD Maryland Day Returns



When: **April 30, 2022**

Where: **UMD College Park Campus**

The University of Maryland invites you to unlock a world of learning, discovery and exploration at Maryland Day. Take part of hundreds of family-friendly events and interactive exhibits during a daylong celebration and inspiring journey across campus.

marylandday.umd.edu for more information



Dr. Carol L. Keefer Honored with 2022 International Embryo Technology Society Pioneer Award

International Embryo Technology Society Press Release

The 2022 Pioneer Award of the International Embryo Technology Society (IETS) has been awarded to Dr. Carol L. Keefer, Department of Animal and Avian Science, University of Maryland. Since the 1980s, Dr. Keefer has been a true pioneer in the areas of sperm injection, embryo and somatic cell nuclear transfer, transgenesis, and stem cell research.

The IETS Pioneer Award is given to provide recognition for those people who were the earliest contributors to the development of embryo transfer technology and the embryo transfer industry. The contribution of the individual should be directly in the field of embryo transfer. Other reproductive physiology organizations will give recognition to endocrinologists, sperm physiologists, and other who contributed indirectly to embryo transfer.

Dr. Carol Keefer's career has spanned clinical, industry, and academic settings, giving her a uniquely broad perspective. Her interest in reproductive biology began at the University of South Carolina and continued as she studied developmental biology at the University of Delaware, where she earned her PhD. Her post-doctoral work at Johns Hopkins and the University of Pennsylvania was instrumental in the successful cloning of rats. She was then an Assistant Professor at the University of Georgia and helped establish Reproductive Biology Associates, one of the first human in vitro fertilization clinics in the United States. During this time, her research was funded by the NIH, and she discovered and published that viable embryos and pregnancies could be obtained following direct microinjection of dead sperm into rabbit oocytes, which provided the option to rescue sperm and genetics from males from whom viable sperm could not be collected.

Keefer then applied her experience from academia when she transitioned to industry, working for American Breeder's Service and making several discoveries in embryo cloning technology that received widespread adoption. Six years later, she moved to Nexia Biotechnologies in Quebec, Canada, where she produced transgenic goats via nuclear transfer with transfected donor cells, which secreted recombinant spider silk protein and recombinant human butylcholinesterase in their milk. Her expertise was recognized, and she served as industry liaison for grants of nearly \$1 million.

Returning to academia, she began studying pluripotent cells, including embryonic stem cells in ruminants and mice, feline spermatogonial stem cells, and human teratocarcinoma cells at the University of Maryland, where she is currently a professor and mentor and continues to study stem cells and reproductive technology. Her research program there has received funding from the USDA, NSF, private foundations, and competitive internal grants, and her laboratory was the first to describe induction of trophoblast lineage differentiation by cytokines in mouse embryonic stem cells. She collaborates with researchers from the University of Maryland as well as investigators at the Smithsonian Conservation Biology Institute.

In addition, Dr. Keefer is involved with many scientific societies and committees. From 2006 to 2007 she served as one of only three external reviewers for the FDA's Risk Assessment of Animal Cloning. She has been active in the IETS and served as the first female IETS president in 2003. Carol Keefer has significantly contributed to the advancement of reproductive technology, and the IETS is proud to honor her with the 2022 Pioneer Award.

Four ANSC Pre-Vet Students Receive Judith E. Brocksmith Scholarship Awards



Judith E. Brocksmith Pre-Veterinary Scholarship Winners (from left to right): Kruti Patel, Jolie Quiros, Avital Saletsky, and Laura Grant

Four Animal and Avian Sciences students were awarded the Judith E. Brocksmith Pre-Veterinary Scholarship this semester. Laura Grant, Kruti Patel, Jolie Quiros, and Avital Saletsky received this prestigious scholarship that is designated for pre-vet students and based on merit. Ms. Brocksmith is the donor for the namesake scholarship and a University of Maryland Alumna, Class of 1964.

Each of these ANSC students spoke of the motivations that lead them in the direction of veterinary medicine, and all share a love and care for animals. At the age of 12, Avital made a documentary on the gestation and birthing process of a pet guinea pig. Jolie and Kruti have worked with veterinarians and these experiences lead them to want to become one themselves.

Kruti has interned at the Prince George's County SPCA. "Seeing the veterinarians volunteer their weekends to provide services for low-income families in the area has shown me true compassion for animals and what it really means to be a vet. Experiences like this have only drawn me more towards this career."

When asked why she chose to attend UMD, Laura said, "I loved the atmosphere of the campus. I knew the strong animal science department would prepare me for veterinary school and the on-campus farm would give me excellent hands-on experiences." In fact, three of the recipients highlighted the hands-on experience of the Campus Farm and all four spoke of the strength and opportunities of the Animal and Avian Sciences Department.

Kruti and Laura have found their favorite classes to be Anatomy and labs, while Jolie and Avital have best enjoyed the sheep and lamb classes on the Campus Farm. Avital discovered "the hands-on experience with sheep during a global pandemic was the perfect relief from the stress of online classes."

Each student has different thoughts on where they hope to focus their careers, but all are looking forward to veterinary school. Jolie hopes "to focus my veterinary career on emergency medicine and surgery or on veterinary epidemiology. I'm hoping to explore both of these options in veterinary school."

Home(grown) for the Holidays

Dining Services Cooks Up a Terp-raised Feast



Originally published in Maryland Today on Dec. 9, 2021

By Chris Carroll & Annie Krakower

The holidays lately are more than just a time for fun, family and friends—they're also an opportunity to contemplate fragile supply chains and the gifts that got held up along the way.

But no long-distance delivery snafus threw a wrench into the array of delicacies—from juicy prime rib to roast leg of lamb to seasonal side dishes—that University of Maryland Dining Services prepared for its annual holiday dinner on Dec. 9, 2021. That's because in some cases, the supply chain doesn't even stretch to Baltimore Avenue.

"Most of what we'll be serving comes from facilities managed by the College of Agriculture and Natural Resources, including lamb that was raised right here at the Campus Farm, and Wye Angus beef from the Eastern Shore," said Bart Hipple, assistant director of

communication for Dining Services. Produce that went into some of the side dishes, meanwhile, was raised at Dining Services' Terp Farm, located at an AGNR research station in southern Prince George's County.

And while the meal included a genuinely astonishing array of meat dishes apportioned between the three campus dining halls, special vegan options were available as well, featuring plant-based protein.

Dining Services presents special meals each semester, said Senior Executive John Gray; what sets this holiday dinner apart is sheer variety. Pandemic staffing issues forced the cancellation of the harvest celebration dinner earlier in the fall semester, which led to an even bigger holiday spread.

"It's been a really great collaboration to get all these products," Gray said. "It's been growing for

four or five years, and the cooperation is resulting in us being able to offer some great, locally sourced food we wouldn't otherwise be able to offer."

Wye Research and Education Center Beef



When students tuck into a steak or burger or—one of Gray's favorites—Guinness-braised short ribs, they'll be tasting the result of a carefully designed cattle management and breeding program with roots stretching back nearly 85 years.

The Wye herd of Angus cattle was established by wealthy industrialist Arthur Houghton Jr. in 1937 on a plantation once owned by Declaration of Independence signer William Paca; in 1959, the herd was "closed," meaning no outside genetics have been introduced since then, allowing a high degree of control of herd characteristics. In the late 1970s, Houghton donated the herd and land to the University of Maryland, and today the cattle live at what's known as the Wye Research and Education Center on the Eastern Shore, part of AGNR's statewide Maryland Agricultural Experiment Station.

Because of the herd's consistent, well-understood gene pool, researchers have a perfect test bed for experiments like a current one on the effects of feeding grain to a segment of the normally grass-fed cattle, said Eddie Draper, the Wye Angus program manager.

From the beginning of UMD's stewardship of the herd, conservation and sustainability research have been among the cornerstones of the program, and when Dining Services began to increase its own sustainability efforts several years ago—in part by responding to student requests for more local food production—a deal was struck in 2017 to begin supplying Wye Angus beef to UMD dining halls.

"Dining Services is committed to sourcing local food as a part of our sustainable food commitment," said Allison Tjaden, assistant director of new initiatives for Dining Services. "It doesn't get more local than when it's raised by UMD's College of Agriculture and Natural Resources. Our work with the

Campus Farm and Maryland Agricultural Experiment Stations is such an incredible collaboration and so much fun."

Thanks in part to the arrangement, 31.7% of Dining Services food was sustainably sourced in 2020, well above the goal of 20% by 2020, Tjaden said.

Beyond the advantages of in-state production, the quality of the meat justifies the arrangement as well, Gray said.

"It's exceptional beef, with outstanding marbling, and that's what gives you the flavor and the tenderness," he said. "It almost has a very slightly sweeter taste than regular beef."

Campus Farm Lamb



But when it comes to eating local, Terps can't do better than food straight from the Campus Farm.

That's what Sarah Balcom, principal lecturer in the Department of Animal and Avian Sciences, and Crystal Caldwell, Campus Farm manager, had in mind when they partnered with Dining Services in 2014 to serve UMD-raised lamb.

"We could highlight that we are raising animals for food on our campus, and we're doing it in a lot of ways that are sustainable and humane," Balcom said. "(The lambs) get even higher levels of care and treatment and oversight than you would see on a typical farm."

That intensive supervision comes courtesy of students in the spring "Sheep Management" class. It includes the popular "Lamb Watch" experience, in which they look after pregnant ewes during late-night visits involving feeding, cleaning and checking for signs of labor. Once lambs are born in February or early March, students weigh them, keep them warm and make sure they're suckling, then close out the semester with physical exams and other labs.

Any lambs not kept or sold to other farms for breeding end up as meat that goes to Dining Services, Caldwell said. This year, the farm provided a dozen for the holiday dinner.

"Most of us don't know where our food comes from. It appears as cellophane-wrapped pieces in a butcher case or a grocery store shelf," Balcom said. "Simply

involving people in the process (helps), because all of us eat every single day."

Chesapeake Wild Blue Catfish



In a sense, what makes the invasive blue catfish so bad—it consumes native Chesapeake Bay aquatic species, from blue crab to striped bass and yellow perch, and reduces their populations—is the same thing that makes it so good. Unlike much wild-caught catfish, there's no funky smell or taste to contend with.

"It's not a bottom feeder, so it is a very clean, very delicious white-meat fish," Gray said.

The state of Maryland in 2019 began promoting the fish as a food that when aggressively fished, actively benefits the bay by its removal, and purchases from commercial fishers feed into a fund to improve the Chesapeake's health. University of Maryland Extension specialists and educators, meanwhile, have been working to educate the fishing industry and the public about the species, and Dining Services began serving blue catfish at the same time—more than 7,000 pounds during Fall 2019.

Terp Farm Produce/Side Dishes



Focusing solely on main dishes is a mistake when sweet and savory sides like various recipes starring butternut squash and sweet potatoes will be offered during the holiday meal.

They were grown on Terp Farm, which occupies five acres of AGNR's Central Maryland Research and Education Center Upper Marlboro Facility, and has been supplying the dining halls with fresh produce, from salad greens to more carb-heavy options since Dining Services launched the farm in 2014.

"We have a story to tell about all these products, which is that we're working closely with the culinary team in Dining Services and with students on everything we do," said Guy Kilpatrick, Terp Farm manager. "As students are eating and enjoying the produce, we want them to remember it was their peers who actually grew it."



ANSC's own Chris Erdman delivered the Stole of Gratitude address for the AGNR December 2021 commencement and received the ANSC Outstanding Academic Achievement Award.



Chris Erdman
Animal & Avian Sciences

Congratulations to all of our ANSC Graduates

Graduation

The College of Agricultural and Natural Resources Commencement Ceremony took place on December 22, 2021. Due to a rise in COVID cases on campus, UMD canceled the university's ceremony and the AGNR event was recorded; all winter graduates are invited to participate in the Spring ceremony (scheduled for 05/20/22).

Graduate Students:

- Amanda Fischer (M.S.)
- Anna Magnaterra (M.S.)
- Chaitra Surugihalli (Ph.D.)

Undergraduates:

- Andrea Block
- Daniela Gil Jaramillo
- Sarah Anne Ibach
- Kendal Joyce
- Megan YuanTeague
- Sarah Claire Hobdy
- Maya Imani Jackson
- Alyssa Catherine Kent

- Sarah Nicole Schneider
- Magnolia Marie Blahut
- Chris Scott Erdman
- Layla Amanda Garyk
- Chloe Elise Kehlbeck
- Grace Donna Carlson
- Rachele Elena Franceschi
- Sidney Michelle Richards