



Animal & Comparative Biomedical Sciences

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University and Regional Excellence in Advising Awards for Jasmine Acosta, ACBS Academic Advisor

ACBS is proud to announce that Jasmine Acosta has received the University of Arizona Excellence in Undergraduate Advising Award - Primary Academic Advisor Award. In addition, she has been awarded a Region 10 Excellence in Advising - Primary Role Advisor: Certificate of Merit from NACADA : The Global Community for Academic Advising.

Jasmine serves as an Academic Advisor I for ACBS Veterinary Science majors with the last names L-Z and Sophomores+. She also is the club advisor for the 2024-2025 Volunteers for Intercultural and Definitive Adventures (VIDA) student club. She holds a BS in animal science and an MS in agricultural education from the University of Arizona.

Jasmine works tirelessly as an advocate for her advisees. She strives to address their concerns and champion their needs within the academic system of not only her department, but the college and University as well. Whether it is navigating complex policies or connecting them with essential resources, she is committed to ensuring they receive the support necessary to succeed. Additionally, as a first-generation graduate herself, she relates to the struggle and feeling of not

belonging that her advisees sometimes feel. She endeavors to empower her students to become advocates for themselves, equipping them with the skills needed to navigate their educational journeys effectively.

About her position Jasmine says, "I'm thankful and grateful to have the opportunity to work with students everyday. Our students are so full of life and potential, I can't wait to see how they all change the world. I'm beyond thankful to be advising in the same department I graduated from and the same college I received both degrees in."



Jasmine would like to thank her family for their unwavering support and for displaying that anything is possible as long as you never give up. She would also like her students to remember to be kind to themselves and others as they move through their studies and careers. "You are a human first before you are a student/employee. It takes just as much energy to be negative as it is to be positive. Make an effort to be positive and if you are struggling, reach out because you are not alone."

Congratulations, Jasmine, on all your hard work and these well-deserved awards!



From the Director



The weeks have flown by for me, and I suspect that the same is true for many of you. Though this will be a 'difficult and unprecedented' year financially for our University, College, and School, I'm struck by how imperative it is that we don't let these challenges stop us from delivering on our mission or on the many great accomplishments of our ACBS Team. Our charge to provide first rate Instruction to our students, to perform groundbreaking Research, and to provide outreach and need-based Extension programming for Arizonans is unchanged. Though it may be difficult this year to accomplish everything that we want, I'm reminded daily that the ACBS Team is willing and able to rise to this challenge.

I continually feel fortunate to have colleagues that are so passionate about what we do. Regardless of what is going on around us, we must retain that focus and not forget the many great things that are happening here in ACBS. A few recent examples that keep me going include:

1. Watching our faculty's faces light up as they talk about their classrooms and the energy and excitement that the students display as they learn new material.
2. Reading an email from a recent graduate thanking a faculty member for challenging them in the classroom, teaching them the process of learning, and preparing them for their current position.
3. Seeing ACBS faculty highlighted in news articles and interviews on topics that range from food safety to human-animal interactions to human health to animal production.
4. Reading the notices of new grants awarded to our students and faculty to support their research.
5. Hearing from our Extension faculty about their current programs and impact on our communities.
6. Watching the steady progress on our renovation and expansion of our Food Product and Safety Lab, which is currently planned to reopen in March 2025.
7. Watching our staff support and work to motivate each other even when their own workloads are too high.
8. Seeing our faculty honored by various scientific societies.
9. Seeing our enrollment of ~275 new undergraduate majors in one of our three degrees.
10. Attending our welcome/welcome back events for our undergraduate students and seeing their excitement to be here and to hear about our student clubs and opportunities.
11. Watching our graduate students present their research at our seminar series.
12. Meeting and talking to our Stakeholders about their lives and needs.

I could go on, but I think that you get the point; even when things are challenging, we are surrounded by amazing people, activities, and events that we can't lose sight of.

I'm honored to work with and for you all!

- Scotty

D. Scott Merrell

Director and Professor
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How Your Morning Oats Could Help You Manage Your Weight

New research from the Department of Animal and Comparative Biomedical Sciences in the College of Agriculture, Life and Environmental Sciences suggests that consuming foods rich in beta-glucan, a type of fiber found in oats and barley, can reduce body weight and obesity.

Ozempic – known generically as semaglutide – has taken the weight-loss market by storm, promising to help people shed pounds quickly. Though many use the drug to reduce body weight, it is mostly prescribed for treating type 2 diabetes in adults and carries a high price without insurance coverage. But what if you could achieve weight loss and improved glucose control without medication?



New research led by Frank Duca, associate professor in the University of Arizona Department of Animal and Comparative Biomedical Sciences in the College of Agriculture, Life and Environmental Sciences, suggests that consuming foods rich in beta-glucan, a type of fiber found in oats and barley, can reduce body weight and obesity. The study, published in

The *Journal of Nutrition*, analyzed the impact of different fibers on gut microbiota – the community of tiny microbes living in the digestive system that are responsible for breaking down the food we eat.

“We know that fiber is important and beneficial; the problem is that there are so many different types of fiber,” Duca said. “We wanted to know what kind of fiber would be most beneficial for weight loss and improvements in glucose homeostasis so that we can inform the community, the consumer and then also inform the agricultural industry.”

Not all fiber is created equal

The researchers looked at the effect of five different plant-based fibers in rodent diets: pectin, beta-glucan, wheat dextrin, starch and cellulose. Only beta-glucan resulted in reduction of body weight and fat, as well as improvements in glucose homeostasis. Beta-glucan is a unique fiber that is found in many foods, including oats, barley, mushrooms and yeasts, and future studies will examine how different sources of beta-glucan could differ in their effectiveness.

Changes in metabolites – the molecules produced when gut bacteria interact with fiber – seemed to be responsible for the

weight-loss effects, particularly a specific metabolite called butyrate. Butyrate is a key fuel source for colon cells, promoting a healthy gut barrier to reduce systemic inflammation. Butyrate also induces the release of gut peptides, or messengers that regulate the functions of the gut, such as the glucagon-like peptide-1, or GLP-1.

Drugs like semaglutide are synthetic versions of GLP-1, which stimulate insulin and can also help people feel full. One key difference of naturally occurring GLP-1 is its rapid degradation near the intestine, whereas semaglutide is made to last longer and target the brain.

“Part of the benefits of consuming dietary fiber is through the release of GLP-1 and other gut peptides that regulate appetite and body weight,” Duca said. “However, we don’t think that’s all of the effect. We think that there are other beneficial things that butyrate could be doing that are not gut peptide related, such as improving gut barrier health and targeting peripheral organs like the liver.”

Duca is researching other types of fiber that can be beneficial for weight reduction. In a previous study, the Duca Lab discovered that barley flour was the most effective in promoting weight loss compared to several other commercially available flours. Other studies involving oligofructose have also demonstrated beneficial effects. In the future, Duca hopes to collaborate with other researchers to develop enhanced fibers that can optimize the release of butyrate.

- Elena Lopez, CALES News

Originally published July 18, 2024

<https://news.arizona.edu/news/how-your-morning-oats-could-help-you-manage-your-weight>

Elizabeth Howard Awarded USDA and NIFA Predoctoral Fellowship



ACBS Graduate Student, Elizabeth Howard, has been awarded a USDA Predoctoral Fellowship for her research entitled “Impact Of Beta-Glucan And Oligofructose On Metabolic Homeostasis Through Alterations Of The Gut Microbiota.” Elizabeth will be working on her research in Dr. Frank Duca’s lab. Through her research she hopes to develop a better understanding of the impact of plant-based fiber on altering the gut microbiota in order to improve metabolic homeostasis and provide a potential treatment option for obesity and other metabolic-related conditions in humans. The Fellowship will provide a stipend, cover tuition, and other fees associated with her Research Assistantship for her to complete her PhD work.

National Institute of Food and Agriculture (NIFA) \$180,000

United States Department of Agriculture (USDA) \$180,000

The Feathered Frontier: Interning as Chicken Docents

Internships are not just for the birds, they can play a pivotal role in career development by providing hands-on experience and industry insight. They also facilitate valuable networking opportunities and help students build a professional portfolio, making them more competitive in the job market and when applying to graduate and veterinary schools. In fact, 84% of ACBS students recently surveyed expressed strong interest in internship opportunities. However, securing internships in animal and veterinary sciences can be challenging. That's why local organizations like Tucson Village Farm, which welcomes undergraduate ACBS students as interns, make a significant difference.

This fall, five undergraduates in Animal Sciences and Veterinary Science interned as Chicken Docents with Tucson Village Farm. This vibrant facility offers numerous field trips for K-12 students, serving over 5,000 visitors each year. With an on-site chicken coop and plans to expand by adding more animals like sheep and goats, the farm provides a dynamic environment for learning.

As Chicken Docents, the interns underwent training before managing the chicken station and delivering engaging presentations to students. Their talks cover a range of topics including chicken anatomy, nutrition, health, and animal welfare. Through these experiences, the interns develop essential skills in animal handling, communication, and time management. They not only inspire and educate young visitors but also engage with them by addressing questions and fostering a love for farming and animals.

While the role comes with its challenges, such as ensuring the safety of both the animals and the visitors, there is a great sense of fulfillment in witnessing the positive impact of their efforts. Seeing excited attendees develop a newfound appreciation for agriculture and animal care is incredibly rewarding.

Interning at Tucson Village Farm offers a rich, immersive experience that is going beyond theoretical and classroom knowledge. It offers practical skills, professional insights, and a deep appreciation for the complexities of chicken and animal management. For those interested in agriculture, animal science, or food production, interning with chickens can be a rewarding and educational endeavor.

The experience has proven beneficial not only for the interns but also for the Tucson community and the farm itself. It is truly exciting to those who explored this feathered frontier and the future possibilities it has unlocked for the interns, community, youth, and Tucson Village Farm. Tucson Village Farm is committed to continuing these internship opportunities for ACBS students in the future, further fostering growth and learning, which is a win-win for all involved.



ACBS students, (l-r) Trevor Deffenbaugh, Nick Gallo, and Neferti Gonzalez working as Chicken Docents with Tucson Village Farm.



Chicken Docent, Nick Gallo (back left), doing Bee Wiggles for the students to show how bees move when they pollinate.



Interactions with the Tucson Village Farm chickens help visitors develop a newfound appreciation for agriculture and animal care.

New Course for Animal Science Majors: Animal Ethology and Welfare Science

We are excited to announce the launch of “ACBS 222: Animal Ethology and Welfare Science”, co-taught by Drs. Dieter Steklis, Netzin Steklis and Emma Grigg. As a part of the core curriculum for animal sciences majors, this course offers a robust framework for understanding and addressing animal welfare issues in both academic and professional settings.

Course material will explore the growing field of animal welfare science, connecting the disciplines of ethology, sentience, ethics, and animal welfare. Recent developments, such as the UK's Animal Welfare Sentience Act (2022) and the New York Declaration of Animal Consciousness (2024), highlight the importance of recognizing animals' sentience and the ethical responsibility to improve their welfare.

Students will learn that animal sentience and welfare is not just a matter of philosophical or ethical concern but that it is also of practical value, as a growing body of scientific evidence

demonstrates the connection between improved animal welfare and increased quality and/or quantity of a desired animal product (e.g., milk or meat). In response to these advancements, our course aims to equip students with a thorough understanding of the biological and ethical foundations of animal welfare, and methods of assessing animal welfare in a variety of contexts, from research laboratories to animal farms, pets at home, exotics, animals in zoos, and wildlife. The course will prepare students for careers that prioritize and enhance the well-being of animals across a variety of these contexts.

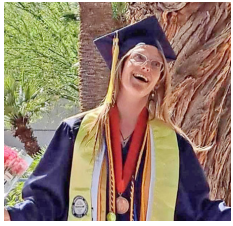


ACBS 222: Animal Ethology and Welfare Science, co-instructors (l-r) Drs. Emma Grigg, Netzin Steklis and Dieter Steklis.

Spring Semester 2024 ACBS Outstanding Seniors

Ariana Bootier

Outstanding Senior | Animal Science



Ariana Bootier, graduated with a BS in animal science with an emphasis in science and pre-professional. She was born and raised in East Bridgewater, MA, where her interest in animal science began from day one at Norfolk County Agricultural High School. Horses, cats, and dogs have always been her outlet to feel connected in this world.

Following graduation Ariana is applying to vet school where she will pursue her DVM and is looking forward to wherever this next adventure takes her and her husband. About her future career goals she says, “I enjoy helping people care for their pets and teaching pet owners how they can understand them better. Animals have been there supporting my health every step of the way. I feel that working to improve animal care and welfare is the least I can do to give back.”

During her time at the U of A, Ariana experienced a set back in achieving her goals when she lost her first acceptance to vet school due to her grades falling below Honors status. She has since chosen to use this as a “failing forward” experience to learn from her mistakes, dust herself off, and start moving towards her goals again. About this experience she says, “It is okay to fail. Nothing great in this life comes without being comfortable with failure. All the grooviest experiences in my life have bloomed from some of the most difficult life obstacles. We can take the time we need to see and accept ourselves authentically and appreciate the setbacks, overcoming scary decisions, and the headspace of not knowing. We are great enough, no matter where the road takes us.”

Dustin Loso

Outstanding Senior | Microbiology



Dustin Loso was born and raised in Seattle, WA, and received his Bachelor’s of Science degree in microbiology. About his major, Dustin says, “Since I was a kid, I have always wanted to pursue a career in science, and during my time in high school, I became interested in infectious diseases and molecular biology.”

While at the University of Arizona, Dustin worked as an undergraduate researcher in Dr. Kerry Cooper’s lab where he gained invaluable experience exploring the world of microbiology research. He will build on this experience as he pursues a doctoral degree in the Molecular Genetics program at the University of Toronto.

Dustin would like to thank Dr. Scott Wilbur for being an incredible mentor to all of the Microbiology students. About Dr. Wilbur he says, “His courses provided me with an incredibly robust understanding of Microbiology, and always helped to make me feel more passionate about the field. He always challenged me and helped me to take the opportunities that would be valuable to me.”

Nguyen Dang

Outstanding Senior | Food Safety



Nguyen Dang graduated with a Bachelor of Science in food safety with a minor in microbiology. In addition to being named ACBS Outstanding Senior, he was awarded the Merrill P. Freeman Medal by the University of Arizona for his extraordinary accomplishments both in and out of the classroom. This fall, Nguyen began a Master’s program at the U of A in Applied Biosciences focusing on Industrial Microbial Biotechnology.

<https://news.arizona.edu/news/seven-graduating-students-receive-awards-commencement>

Ela Fuentevilla

Outstanding Senior | Veterinary Science



Born and raised in Tucson, AZ, Ela Fuentevilla graduated from the U of A with a BS in veterinary science. Following her graduation from the University of Arizona, Ela Fuentevilla, is working full time as a veterinary assistant and part time as a research assistant. She plans to pursue her DVM degree and has recently applied to vet school.

About her time at the U of A Ela says, “I loved getting involved in research and student organizations, as well as, being able to enjoy Tucson (especially the food), and meeting some amazing people!”

She would like to thank Dr. Duarte Diaz for his support over the past two years as well as her family and friends for being there for her throughout her undergraduate degree.

Why Were Zebras Not Domesticated? A Review of Domesticability Traits and Tests of Their Role in Ungulate Domestications with Macroevolutionary Models

<https://pubmed.ncbi.nlm.nih.gov/39199888/>

Netzin G Steklis, Mateo Peñaherrera-Aguirre, Horst Dieter Steklis, Isabel Herrera



The study contrasts zebras with domesticated horses, highlighting how zebras’ “capture myopathy” made them unsuitable for domestication. Horses, by comparison, were more adaptable to human interaction and stress due to their different evolutionary and environmental pressures. Horses evolved in regions with fewer predator pressures, which likely reduced their stress responses to human handling, making them more docile and trainable, unlike zebras. This key difference in stress response played a critical role in the domestication of horses.

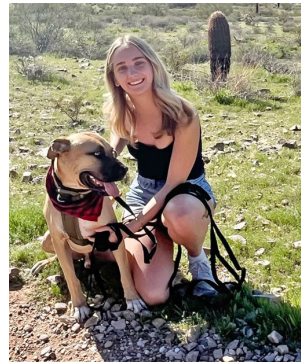
ACBS Students Travel to Thailand for Pre-Vet Med Program

This summer ACBS Veterinary Science majors, Aivlys Garcia, senior, of Yuma, AZ, and Ally Yemm, junior, of Saint Louis, MO spent two weeks in Thailand gaining experience through a once-in-a-lifetime veterinary shadowing opportunity and immersion in Thai culture through Loop Abroad's Thailand College Pre-Veterinary Medicine program. Students were selected based on their outstanding academic transcripts, compelling admissions essays, and strong professional references. During the program students worked with both small and large animals in two distinct settings

For one week, the students volunteered at the renowned Elephant Nature Park in northern Thailand, a sanctuary for over 100 rescued elephants. Under the guidance of an experienced elephant veterinarian, they assisted in the daily care of these magnificent creatures, many of whom bear physical and emotional scars from past mistreatment. Duties included studying elephant behavior, observing medical conditions, and contributing to the overall well-being of the sanctuary's diverse animal population, including hundreds of dogs and cats, water buffalo, pigs, and horses.

The second week took the students to the Dog Rescue Clinic in Chiang Mai, where they worked alongside teaching veterinarians to provide essential care to local dogs. Responsibilities included assisting professionals in performing check-ups, learning about essential care, supporting veterinarians in delivering assessments, and assisting with sterilization surgeries. This practical experience offered valuable insights into small animal veterinary practice and shelter medicine.

Of her trip, Ally says, "Embarking on this pre-vet trip to Thailand was an eye-opening journey where I immersed myself in the invaluable experience of working at the Loop Abroad dog clinic and the Elephant Nature Park. Beyond the challenges of cultural differences, witnessing firsthand the dedication to animal care and welfare has profoundly shaped my path toward veterinary medicine. It's moments like these that reaffirm my commitment to pursuing this noble profession."



Ally Yemm (l), pictured with her dog, and Aivlys Garcia (r), learning to draw blood, studied and worked for two weeks in Thailand through Loop Abroad's pre-veterinary study abroad program.

Throughout the program, students gained approximately 80 veterinary hours, enhancing their qualifications for future veterinary school applications. The experience not only developed practical skills in animal care but also deepened understanding of global veterinary practices and animal welfare issues.

This immersive program offered Aivlys and Ally a unique opportunity to contribute to animal conservation efforts while experiencing Thai culture, setting a strong foundation for their future careers in veterinary medicine.

About Loop Abroad

Loop Abroad is the largest pre-veterinary study abroad program in the United States, offering students unparalleled opportunities to gain hands-on experience in 9 countries across 5 continents. Since 2009, Loop Abroad has been dedicated to helping aspiring veterinarians pursue their dreams through immersive programs ranging from two-week summer adventures to full semester abroad experiences. College credit is available through their partnership with the University of Findlay.

Interested participants can learn more and apply at www.LoopAbroad.com.

From Curiosity to Co-Authorship: A Student's Journey into Equid Domestication

Isabel (Izzy) Herrera's research journey began when she, then an undergraduate, approached Drs. Netzin and Dieter Steklis after a lecture, driven by a burning curiosity about a class puzzle, why were zebras never domesticated, while horses and donkeys were? That simple question sparked a journey. Isabel's dedication led to years of collaboration, as she persistently explored the evolutionary puzzle, uncovering answers, raising new questions, and ultimately co-authoring a lengthy publication.

When reflecting on this project, Isabel says, "Honestly this research helped me gain a new understanding of equids in general and how the relationship between humans and animals really impacted how certain species we know today came to be. The research gave me a new respect for equids and also helped me gain a new

love of research. I never thought this paper would be published, it just seemed like the story would keep going and we would unlock more questions than answers. However, I'm glad we stuck through it till the end and finally have an amazing educational paper that the rest of the world can see."

Today, Isabel is working towards her DVM at the University of Arizona's Veterinary School, specializing in large animal medicine, building on the passion that started with one question.

This project also highlights the broader mission of Drs. Netzin and Dieter Steklis, who co-direct the Human-Animal Interaction Research Initiative (HAIRI), offering undergraduates like Isabel Herrera hands-on research opportunities. Through HAIRI, students bridge classroom learning and curiosity into real-world scientific exploration and even co-authorship.



(l-r) Dr. Netzin Steklis and Isabel Herrera just prior to Isabel's graduation with her BS from ACBS Veterinary Science program. Isabel painted the zebras for Netzin as a way to remember their research journey together.

Thoroughbred Makeover Event - Lexington, KY

University of Arizona Race Track Industry and Equine students experienced a different but growing part of the Thoroughbred horse industry when they traveled to Kentucky for the 2024 Thoroughbred Makeover event. The event is held annually at the Kentucky Horse Park in Lexington, KY, by the Retired Racehorse Project (501c3), and provided a venue for professional and amateur trainers to showcase over 350 former racehorses in training for their next career over the last 10 months. Horse and rider combinations compete in one to two of ten separate discipline competitions including dressage, show jumping, barrel racing, competitive trail, polo, and more.

Students also attended morning training and afternoon races at Keeneland Race Track, attended the International Jockey Concussion, Safety and Wellness Conference with presentations by Hall of Fame Jockeys on mental health, toured Spendthrift Farm, home of Kentucky Derby winner Authentic and 5-time champion sire Into Mischief, and evaluated a selection of horses for a potential U of A candidate for the 2025 Thoroughbred Makeover Contest. RTIP Endowed Chair, Robert Hartman and Dr. Betsy Greene chaperoned.



Elizabeth Rogers Joins Race Track Industry Program Faculty

The University of Arizona's Race Track Industry Program (RTIP) is proud to announce the addition of Elizabeth Rogers to its faculty. Rogers, an RTIP alum, brings extensive industry experience that will greatly benefit RTIP students.



"Elizabeth, a graduate of RTIP, brings a wealth of knowledge to the students," said Robert Hartman, RTIP Endowed Chair. "Her experience in race track operations and the racing office will serve our students well. We could not be more pleased to welcome her back to the Race Track Industry Program."

Rogers has over a decade of racing industry experience, making significant strides in racing office roles at Hollywood Casino at Charles Town Races and Hollywood Gaming Mahoning Valley Race Course. Her most recent role was as Director of Racing at Mahoning Valley. Additionally, she has been an active member of the Racing Operations Committee (ROCO), collaborating with her counterparts at other race tracks on challenges faced by the industry.

"It is an honor to join the RTIP team in the important responsibility of teaching and supporting our industry's future leaders," said Rogers.

Originally published by RTIP, June 6, 2024

<https://rtip.arizona.edu/news/elizabeth-rogers-joins-race-track-industry-program-faculty>

University of Arizona's Race Track Industry Program Celebrates 50th Anniversary

The University of Arizona's Race Track Industry Program (RTIP) is celebrating its 50th anniversary this year, marking a half-century of leadership in equine industry education. Founded in 1974, the RTIP is the world's premier programs for training professionals in the horse racing industry, including roles in management, regulation, training, and equine welfare.

"It's incredible to look back on what our program has accomplished and the lasting impact it has on the racing industry," said Robert Hartman, RTIP Chair. "Our graduates continue to shape the future of the sport while setting new standards for excellence."

The RTIP is renowned for its unique curriculum that blends classroom learning with hands-on experience at racetracks across the country. Over the past 50 years, RTIP has developed a network of alumni who have gone on to prominent positions in the sport, including triple crown-winning trainers, racetrack executives, regulators, and racetrack announcers.

"RTIP graduates are at the forefront of keeping horse racing relevant and sustainable in the modern era," said Dr. Scott Merrell, Director of the School of Animal and Comparative Biomedical Sciences. "This program has always been about preparing students to be day-one ready for a horse racing career. The alumni network and success of the Symposium is a testament to the industry's support of the program."

To celebrate its 50th anniversary, the RTIP has organized a series of special events, including an alumni reunion during the Global Symposium on Racing. This annual conference, hosted by the RTIP, draws prominent leaders from the worldwide racing industry.

The 50th anniversary is not just a reflection of past achievements but a stepping stone toward new challenges and advancements in the next era of horse racing. Two of the program's most recognizable alumni, Hall of Fame trainers Bob Baffert and Todd Pletcher, will be returning to Tucson to speak at this year's Global Symposium on Racing, on Tuesday, December 10, 2024.

As the industry evolves, the RTIP continues to adapt its curriculum to meet emerging trends such as equine safety technology, digital wagering platforms, and regulatory reforms ensuring its students are prepared for the ever-changing landscape of the racing world.

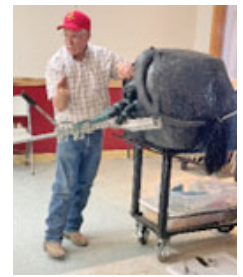


Making a Difference for Navajo Nation Livestock/Horse Ranchers

In July 2024, livestock ranchers across the Navajo Nation received top notch training, education, hands-on opportunities, and resources from experts across the state at 3 Tribal Livestock Management and Stewardship workshops organized by the U of A Cooperative Extension Tribal Livestock/Horse Extension Team.

The workshops were held in Red Mesa (July 24), Window Rock (July 25) and Tonalea, AZ (July 26) and covered several key livestock management topics including:

- Proper techniques in castration (calves and lambs)
- Proper vaccine storage, transport, administration, and choices (cattle, sheep, and horses)
- Tail docking, ear tagging, and hoof trimming
- Horse health care and lameness evaluation techniques
- The Arizona Livestock Incident Response Team (ALIRT) Program
- Upcoming Federal regulations for electronically readable identification and commerce at livestock auctions
- Dealing with cattle dystocia issues in the field



Photos clockwise from top left:

- Dr. Madelyn Melchior explains how to use emasculators for castration.
- Dr. John Wenzel demonstrates pulling a calf when it isn't coming out right (dystocia) using a cow training model.
- Alex Carlisle demonstrates ear tagging while Dr. Madelyn Melchior restrains the lamb.
- Dr. Ryan Wolker, Arizona state veterinarian, presenting about equine lameness, the ALIRT program, new food animal regulations, and more.

2024 Arizona State 4-H Horse Show

The 2024 State 4-H Horse Show was held at the Navajo County Fairgrounds in Holbrook, AZ, for the third year in a row, but Mother Nature made sure that the third time was not a charm. Heavy rains and cold temperatures resulted in delays, but the English day was able to finish their classes. However, the Western day was not so lucky, since continued rain negatively impacted the footing, resulting in cancellation of several Saturday classes (e.g. reining, ranch horse, etc.) and the entire Gymkhana show (e.g. barrel racing, poles, etc.). The roping events were delayed, but did go on.

Photo right: L to R: Ester Turner (4-H Agent, Pinal Co.), Dr. Todd Kesner (State 4-H Assoc. Director), Michelle, Elizabeth, and Robert Spurlock, Dr. Betsy Greene, and Caroline Werkhoven (4-H Asst. in Extension, Maricopa County). Two Navajo County Families were presented State Recognition 4-H Awards for their above and beyond efforts hosting and contributing in all aspects of the State 4-H Horse Show for the last several years in Navajo County (Holbrook, AZ). The Spurlocks (missing: Rebecca, Michael, and Sharon) and the DeSpain Family was also awarded, and Kerry Officer was also presented a State Recognition Award for her years of dedicated service to the State 4-H Horse Show.



Photo bottom: Several participants in the Cattle events show off their bounty after a successful showing in spite of the poor weather.



Equine Extension Podcasts

- Tack Box Talk - Equine Internships for College Students. Nov 15, 2024. With Betsy Greene, Kris Hiney, and Kathy Anderson. <https://www.buzzsprout.com/242373/episodes/15991812-internships-the-story-of-test-driving-a-career>
- Tack Box Talk - Monensin in Horse Feeds: The story of practical advice for the average horse owner. Sep 10, 2024. With Betsy Greene, Kris Hiney, and Nettie Liburt. <https://www.buzzsprout.com/242373/episodes/15728455-monensin-in-horse-feeds-the-story-of-practical-advice-for-the-average-horse-owner>

ALIRT FBI Training

Dr. Greene participated in an Animal Plant Health Joint Criminal Epidemiological Investigations Course put on by the FBI, USDA, APHIS, and Oklahoma State University as the U of A representative of ALIRT. This training had law enforcement, livestock inspectors, state and local veterinarians, border patrol, etc. training together to improve the safety of farm and ranch operations in Arizona.

NACAA Western Regional Meeting and Awards

Dr. Greene finished her term as Western Regional Vice Chair for the Animal Sciences Chair and was voted in as the Western Regional Vice Director for the National Association of County Agricultural Agents (NACAA).



2024 Regional Winner

NACAA Communications Award. "SCRUB: Science Creates Real Understanding of Biosecurity Curriculum". Learning Module/Notebook.

2024 State Winner

NACAA Search for Excellence in Livestock Production Award. "Arizona Cooperative Extension's Role in Orchestrating the Arizona Livestock Incident Response Team (ALIRT) Program with State Regulators, Industry, and Tribal Partners".

STEM Extension Program: *Inspiring the Next Generation of STEM Professionals*

Arizona 4-H Summit



High School 4-H members from across the state came to Tucson, AZ to attend the 4-H Summit held June 2 - 6, 2024 on the University of Arizona main campus. The twenty-four attendees engaged in hands-on activities across campus. For the summit, Dr. Gerardo Lopez, Associate Professor and Extension Specialist STEM, offered two separate 1.5 hour hands-on STEM activities through his lab which

included conducting molecular laboratory techniques used in his Food Safety Environmental Microbiology Lab and simple circuitry.

For the molecular laboratory techniques activity, Khai Truong and Miely Suarez, second year and first year PhD Microbiology Graduate Students, respectively, facilitated gel electrophoresis and quantitative polymerase chain reaction (qPCR) with the students. Teams able to carry out the molecular techniques correctly, resulting in a clear band size in the gel, received a ribbon and pin.

Ivan Becerril, a former Santa Cruz County STEM Ambassador and National Tech Changemakers Spokesperson and now a STEM undergraduate student coordinator majoring in Business, led the simple circuit activity where youth worked in pairs learning how to use a multimeter while testing the resistance of resistors, single and double pole switches, and the volts from various size batteries.

Both of these STEM activities expose students to science, technology, engineering and math concepts and help spark an interest in high school students to pursue STEM related careers. The 4-H Summit is made possible by the generous donations from community partners to the Arizona 4-H Youth Foundation.

Intern and Undergraduate Research Opportunities

The Lopez lab is committed to providing high school and undergraduate students with laboratory research experience to help them be competitive for graduate school and to enter the workforce. Students work closely with Khai Truong and Miely Suarez, microbiology graduate students to conduct research on *Cyclospora cayetanensis*, a foodborne human parasite associated with fresh produce outbreaks causing Cyclosporiasis. Students learn and gain research experience using molecular methods such as DNA extractions, qPCR, PCR, and next generation sequencing. Students in addition, read research articles, prepare posters, and PowerPoint presentations for lab seminars, conferences, and for their specific programs.

Students are supported through various programs including:

- Vertically Integrated Projects (VIP)
- Arizona, Science, Engineering, Math Scholars Program (ASEMS)
- Steps-2-STEM
- UROC Summer Research Institute (SRI)
- Western Alliance to Expand Student Opportunities (WAESO)

AgDiscovery Camp



AgDiscovery Camp provides hands-on activities, tours, and demonstrations focusing on agricultural related careers to high school students from Arizona and across the US. In June 2024, camp participants spent the second week of the two-week camp at the University of Arizona main campus in Tucson, AZ after starting the camp at Arizona Western College in Yuma, AZ.

For their hosted camp activity, student researchers in the Lopez Food Safety Environmental Microbiology Laboratory, facilitated gel electrophoresis and quantitative polymerase chain reaction (qPCR) molecular techniques with the camp attendees.

Camp activities are provided in partnership with numerous community partners, USDA, faculty, and staff members to help pique the interest of students in pursuing careers in agricultural.



Student Interns and Undergraduate Researchers in the Lopez Lab

- Dynorha Alvarez, Microbiology - Fall VIP, WAESO
- Kirsten Begay, Vet Sci - Fall VIP, WAESO
- Aracely Castillon, Vet Sci - Fall VIP, WAESO
- Jennifer Conley, Ecology and Evolutionary Biology - UROC SRI; Fall, VIP
- Alex Gerber, Microbiology - Fall VIP
- Jack Lu, Microbiology - Fall VIP
- Fabiola Mendoza, Applied Biotech - Fall VIP, WAESO
- Amadia Molina, Microbiology - Fall VIP, WAESO
- Roman Orozco, Vet Sci - Fall VIP, WAESO
- Savannah Pinto, Senior Walden Grove High School, Sahuarita, AZ - Summer Steps-2-STEM
- Dylan Quick, Microbiology - Fall VIP

Salvador Lab Updates

CIRTL Postdoc Pathways Program



Congratulations to Sarita Bugalia for being accepted to the 2024-2025 University of Arizona CIRTL Postdoc Pathways Program cohort! The Center for the Integration of Research, Teaching, and Learning (CIRTL) is an internationally-recognized network of research institutions that helps prepare STEM graduate students and postdocs for future teaching positions in higher ed and introduces them to the field of teaching and learning.

Sarita is a postdoc in Dr. Liliana Salvador's lab. She works in the field of mathematical epidemiology, where she develops innovative mathematical models to study infectious diseases. Specifically, her work involves employing advanced simulation techniques, including rigorous analytical methods and data analytics, to elucidate and enhance the understanding of the transmission dynamics of both emerging and re-emerging infectious diseases that are of significant public health concern.

The CIRTL Postdoc Pathways Program is a one-year, fast-track program that combines training in evidence-based teaching and an intensive, short-term co-teaching project with a faculty mentor to practice these skills in a collaborative, helpful environment. All postdoctoral scholars at UArizona are eligible to apply. The program runs from September - May each year, and begins recruitment for the new cohort in August.

For more information on the CIRTL Postdoc Pathways Program go to <https://academicaffairs.arizona.edu/cirtl/postdoc-pathway>.

Welcome New Lab Members

- Lucy Kelly - Independent Study, BS Veterinary Sciences
- Isabella Arenas - Directed Research, BS Bioinformatics
- Natalia Grazda-Valdez - ASEMS-STAR program, BS Veterinary Sciences
- Bryan Roxas - Assistant Research Scientist
- Alyssa Gregory - Accelerated Master Microbiology
- Luis Alegria - PhD Microbiology

Aquaculture Path Lab Updates



Shrimp Pathology Short Course - 2024

The 33rd session of the "Shrimp Pathology Short Course" was conducted on June 24-29, 2024 in Tucson, Arizona. A total of 10 participants from five countries including Brazil, France, Singapore, Taiwan and the United States participated in the training.

Ravishankar Lab Activities

Awards and Recognition

Dr. Ravishankar was inducted as a Senior Member of the National Academy of Inventors at their Annual Conference held in Raleigh, North Carolina, on June 17, 2024 (photo right).



Graduate student, Chelsea Fast, received the Margaret Bilson Award through the Applied Biosciences-GIDP in August 2024.

Graduate student, Richard Park, received the PANDA Endowment fellowship in Bioinformatics & Molecular Genetics in August 2024.

Industry Outreach

July 15 - Dr Law met with Dr. Subash Shrestha from Cargill to discuss potential research collaborations.

Sep 18 - Drs. Ravishankar and with graduate students Chelsea Fast and Yash Sharma, met with Cargill to present research updates and to discuss future collaborative projects.

Sep 25 - Drs. Law and Ravishankar met with the Chairman of ZelosDx, Conrad Plimpton, to discuss natural antimicrobial research done in the lab and potential for research collaborations.

AQVac Develops Novel and Effective Aquaculture Oral Vaccine



Dr. Arun Dhar, co-founder of AQVac an aquaculture health start-up.

AQVac, an aquaculture health start-up, is commercializing an orally-delivered viral vector platform (patent pending) to address finfish and crustacean diseases. With the help of Tech Launch Arizona, viral vector platform (VVP) inventors, Arun K. Dhar, director of the Aquaculture Pathology Lab, and Thomas Allnutt, chief science officer at biotechnology company NuLode, are working to build a team and identify strategic partners to validate, bring-to-market, and scale their VVP product.

Aquaculture is the fastest growing food production sector in the world yet suffers 10% annual losses due to diseases (that's ~\$25 billion lost). Tools for control of these diseases are insufficient or too expensive. Efficacious and inexpensive solutions to address aquaculture disease are an industry priority. AQVac's viral vector platform can be a solution - flexible and customizable to address finfish and crustacean diseases. It can be delivered orally to lower cost and make it more universally applicable to the industry.

Learn more at:

<https://techlaunch-static.arizona.edu/startuphub/startup/aqvac-llc/>

Grants

Title: A Systems-Based Interrogation of Porcine *Clostridioides Difficile* Diarrhea

Funding Agency: United States Department of Agriculture

PI: Fiona McCarthy

Funding Amount: \$650,000

Local, Regional and National News

Do you buy rotisserie chickens? Read this before your next trip to the grocery store

<https://www.kold.com/2024/07/03/do-you-buy-rotisserie-chickens-read-this-before-your-next-trip-grocery-store/>



Rebecca Taylor - KOLD News 13
July 2, 2024

Dr. Sadhana Ravishankar speaks with KOLD News 13 about the safety and quality of rotisserie chicken in bags.

A glimpse into the 2024 National Students Leaders Connecting Conference hosted with University of Nebraska-Lincoln

<https://fb.watch/uqV8GN5IRY/>



Lucila Garcia, an ACBS graduate student, gives an inside look at attending the 2024 National Student Leaders Connecting Conference (SLC) Aug 6-9 in Lincoln, Nebraska.

The conference provides an opportunity for up-and-coming student leaders to connect with other students and industry professionals, be exposed to industry opportunities through facility tours and career panels, and learn about current topics in the meat industry.

For more information on future SLC conferences:
<https://meatscience.org/events-education/slc>.

Officials warn residents about unlicensed vendors, foodborne illnesses

<https://www.kold.com/video/2024/08/30/officials-warn-residents-about-unlicensed-vendors-foodborne-illnesses/>



Sean Mahoney - KOLD News 13
Aug 29, 2024

Dr. Sadhana Ravishankar speaks with KOLD News 13 regarding the safety of food truck vendors.

Publications

Brischke A, **Greene E**, and Hennig J. 2024. Unintended consequences of the wild fee-roaming horses and burros act. University of Arizona Cooperative Extension. Pub az2099. Nov 2024. <https://extension.arizona.edu/publication/unintended-consequences-wild-fee-roaming-horses-and-burros-act>.

Greene EA. 2024. "Living the Land Grant Mission: Making a Difference for Navajo Nation Livestock/Horse Ranchers" Arizona Cattlelog. Volume 79:1. September, 2024. <https://online.fliphtml5.com/gomwr/jxhg/#p=10>.

Greene E, Wright A, and Thompson A. 2024. Identifying and Mitigating Ionophore Poisoning. University of Arizona Cooperative Extension. Pub az2090. Sep 2024.

<https://extension.arizona.edu/publication/identifying-and-mitigating-ionophore-poisoning>.

Steklis NG, Peñaherrera-Aguirre M, Steklis HD, Herrera I. 2024. Why Were Zebras Not Domesticated? A Review of Domesticability Traits and Tests of Their Role in Ungulate Domestications with Macroevolutionary Models. *Animals (Basel)*, 14(16), 2355. <https://doi.org/10.3390/ani14162355>.

Cho S, Schafer DA, Mai HN, Riggs MW, Dhar AK. 2024. Immunofluorescence detection of *Enterocytozoon hepatopenaei* in *Penaeus vannamei*. *Journal of Microbiological Methods*, 226: 107039.

Dhar AK and **Pantoja C**. 2024. Reestablishing the need to include histopathology for health assessment of farmed shrimp in the era of molecular diagnostics. *Reviews in Fisheries Science & Aquaculture*. <https://doi.org/10.1080/23308249.2024.2401583>.

Sumon MAA, Meregildo-Rodriguez ED, Lee P-T, **Dinh-Hung N**, Larson ET, Permpoonpattana P, Van Doan H, Jung W-K., and Linh NV. 2024. Droplet digital PCR for fish pathogen detection and quantification: A systematic review and meta-analysis. *Journal of Fish Diseases*. e14019. <https://doi.org/10.1111/jfd.14019>.

Dinh-Hung N, Mwamburi SM, Dong HT, Rodkhum C, Meemetta W, Linh NV, **Mai HN, Dhar AK**, Hirono I, Senapin S, and Chatchaiphan C. 2024. Unveiling insights into the whole genome sequencing of *Mycobacterium* spp. isolated from Siamese fighting fish (*Betta splendens*). *Animals* 2024. 14(19), 2833. <https://doi.org/10.3390/ani14192833>.

Presentations and Invited Lectures

Akhmetova A. Mycobacterial Load Assay for rapid molecular identification of *Mycobacterium bovis* in bovine tissues. Arizona Postdoctoral Research Conference - Building a more sustainable future within academia. Sep 20, 2024. Tucson, AZ.

Bugalia S. A mathematical model at the wildlife-livestock-human interface to predict the implications of measures to control bovine tuberculosis. Arizona Postdoctoral Research Conference - Building a more sustainable future within academia. Sep 20, 2024. Tucson, AZ.

Dhar AK. Combining histopathology & molecular diagnosis in shrimp disease surveillance. Invited lecture. Precision Control of Aquatic Animal Diseases Conference. Department of Biotechnology and Bioindustry Sciences, National Cheng Kung University. July 07, 2024. Tainan, Taiwan. Virtual.

Dhar AK and **Mai HN**. Development of PCR-based diagnostic assays in support of disease-free attestations of formulated aquafeed. USDA Virtual Meeting on Special Research Grants for Aquaculture Research Program, Project Director Meeting. Sep 4, 2024.

Greene EA, Farrell G and Alden E. Equine activity Diseases, Vaccinations and Safe Storage. Song of the Horse Camp. June 6-8, 2024. Tuba City, AZ.

Greene EA, Farrell G and Alden E. Disease Transfer Between Horses Biosecurity Activity. Song of the Horse Camp. June 6-8, 2024. Tuba City, AZ.

(Pubs continued on 12)

Greene EA, Farrell G, and Alden E. Equine Nutrition, Digestion, and Colic Activity. Workshop activity at Song of the Horse Camp. June 6-8, 2024. Tuba City, AZ.

Greene, EA, Farrell G, and Alden E. How to Check Your Horse's Vital Signs. Workshop activity at Song of the Horse Camp. June 6-8, 2024. Tuba City, AZ.

Greene EA, Arias J, Thomas L, Carlisle A, and Alden E. SCRUB: Vaccine Education and Cooler Making Activity. Workshop at the 2024 Southwest Indian Agriculture Association Livestock Field Days – Youth Program. June 19-20, 2024. Prescott, AZ.

Greene EA, Arias J, Carlisle A, Thomas L and Alden E. SCRUB: Cleaning and Disinfecting Horse Stalls and Barns Activity. Workshop at the 2024 Southwest Indian Agriculture Association Livestock Field Days – Youth Program. June 19-20, 2024. Prescott, AZ.

Greene EA, Reed DLH, Carstens R, Avery D, and Hiney K. SCRUB: Tools to Teach Disease Prevention to Audiences Ranging from 4th Graders to 4-H Youth to Horse Owners to Tribal Ranchers. 2024 Chad Reid Western Region Meetings. Sep 2024. Sandpoint, ID.

Law B. Innovative Approaches to Ensure Food Safety: Future Directions in Combating AMR with GRAS Microorganisms. Symposium - Beyond Pathogens: "GRAS" Microbes as Silent Carriers of Antimicrobial Resistance (AMR) Genes, Posing a Challenge to Food Safety. International Association for Food Protection (IAFP) Annual Meeting. July 15, 2024. Long Beach, California.

Ravishankar S. Agriculture Related Careers and What to Consider for a Successful Application for Graduate School. Special Seminar. College of Agriculture, Annamalai University. July 18, 2024. Tamilnadu, India.

Ravishankar S. Recent Advances in Food Microbiology and Plant Biotechnology. Special Seminar. Centre for Drug Discovery and Development, Sathyabama Institute of Science and Technology. July 19, 2024. Tamilnadu, India.

Salvador L. Unravelling surveillance strategies and genomic patterns of zoonotic bacterial pathogens. University of Arizona Ecosystem Genomics GIDP. Sep 20, 2024. Tucson, AZ.

Salvador L. Computational zoonoses: Multi-disciplinary insights from animal tuberculosis data. University of Pennsylvania Center for Infectious Disease Dynamics at the Huck Institutes of the Life Sciences. Departmental Seminar. Oct 17, 2024. University Park, PA.

Poster Presentations

Bains K, Zhu L, and Ravishankar S. Comparative Evaluation of the Efficacy of Organic Sanitizers against *Listeria monocytogenes*, *Salmonella enterica*, *Escherichia coli* O157:H7 and Leafy Green Native Microbiota on Different Food Contact Surfaces. International Association for Food Protection (IAFP) Annual Meeting. July 16, 2024. Long Beach, California.

Bugalia S. A mathematical model at the wildlife-livestock-human interface to predict the implications of measures to control bovine tuberculosis. University of Arizona BIO5 Research Showcase. Oct 8, 2024. Tucson, AZ.

Greene EA, Reed DLH, Arias J. Sharing Horse Care Knowledge in Culturally Applicable Methods to Engage Native American Tribal Communities to Proactively Contribute to Their Horses' Best Lives. University of Arizona Cooperative Extension Conference. July 31, 2024. Tucson, Arizona.

Reed DLH, Carstens R, Avery D, Hiney K, **Greene EA**. A Good Life for Horses: Teaching Horse Owner About Disease Transfer and Prevention. University of Arizona Cooperative Extension Conference. July 31, 2024. Tucson, Arizona.

Sargent E, Yazdi A, and Ravishankar S. Microbial Population Distinctions between Open Field Grown Versus Controlled Environmental Agriculture Grown Leafy Greens. International Association for Food Protection (IAFP) Annual Meeting. July 16, 2024. Long Beach, California.

Wright AD and **Greene EA**. 2024. The Other Side of Arizona Livestock Incident Response Team (ALIRT): Cooperative Extension's Role in Solving Livestock Mysteries. 2024 Chad Reid Western Region Meetings. Sep 2024. Sandpoint, ID.

ACBS Newsletter

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We respectfully acknowledge the University of Arizona is on the land and territories of Indigenous peoples. Today, Arizona is home to 22 federally recognized tribes, with Tucson being home to the O'odham and the Yaqui. Committed to diversity and inclusion, the University strives to build sustainable relationships with sovereign Native Nations and Indigenous communities through education offerings, partnerships, and community service.

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