

School of Animal & Comparative Biomedical Sciences

Feature

ACBS Open House

The Dugan Family provides generous support for ACBS Advising Center and Business Office.

With extensive renovations to the Animal and Comparative Biomedical Sciences Building now complete, faculty, staff and students are taking full advantage of the updated spaces. While most of the renovations involved updating heating, cooling, and plumbing systems, which were important for overall use of the building and health of the occupants, there were several areas where donor support assisted in making the building a more welcoming and enjoyable space for everyone. With the help of the Dugan family, ACBS was able to add an Advising Center that includes private offices where advisors meet with students to guide them on their university and career paths and space for a student study center, as well as update and furnish the ACBS Business Offices.

To celebrate the conclusion of renovations and thank the Dugan family, ACBS hosted an Open House to show off the completed work. Guests toured the updated laboratories, advising center, and new gathering spaces. Several members of the Dugan family attended and enjoyed seeing the finished work firsthand. It's important for the Dugan family to give back to the UArizona, Dennis Dugan says. "We want to show support of the ag industry and the people who have been so great to our family throughout the years."

The story of the Dugan Dairy dynasty began more than 50 years ago in eastern Wisconsin and it continues today in Arizona as one of the state's most successful operations. Mike and Delores Dugan started out milking nine Holsteins near their hometown of Maintowoc but, in 1962, decided to venture west for health reasons and with hopes of improving their quality of life. The Dugans and their six young boys settled in Chandler, Arizona and began their new operation with 65 cows.

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ISSUE HIGHLIGHTS

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CALs Dean Shane Burgess speaks about the Dugan family legacy and thanks them for their support.



Open house guests gather in the ACBS foyer.



From the Director

I hope you all have returned from winter break refreshed and ready for an exhilarating spring semester!

As I reflect on 2019, I feel we have many reasons to be proud of our accomplishments. We moved to our renovated ACBS building, which now offers modern laboratories, a new advising center, and business office. This would not have been possible without the support of our College, Facilities Management, and the generous donation of the Dugan family.

We also moved our Equine Program to the Al-Marah Equine Center located on Bear Canyon Rd. (east side of Tucson). This endeavor took several months and I want to acknowledge the efforts of Steve Husman, Associate Director of the Experiment Station, and his crew, for their hard work in completing the first stage of the Equine Center renovations. I also want to acknowledge the generous donation of the Ruth McCormick Tankersley Charitable Trust. This donation provided the support needed to make the renovations to the classrooms, stables, and barns. Most especially, I would like to recognize the members of the Equine Committee, Wendy Davis, Betsy Greene, Kacee Richardson and Samantha Biffar, for their endless efforts in the completion of this project and in making the move of the horses and equipment go so smoothly.

Another project we started in 2019 is the revision of our Animal Science degree curriculum. I want to recognize the Curriculum Task Force Team for their hard work in this ongoing project whose ultimate goal is to develop a program that will be more student-centered. The updated program will incorporate real-life experiences along with course work to ensure our graduates are successful in their future careers. The new plan is projected to be delivered in fiscal year 2022.

Last December 2019, we also embarked on the development of a new Strategic Plan for our School. The new five-year plan will work to leverage our unique expertise, geographic location and assets to deliver research, education and extension programs. In doing so, we will contribute to the UArizona's strategic goals through modernized and exciting academic programs that will help our students gain practical knowledge and workplace skills for the future.

Lastly, I would like to acknowledge the hard work and dedication of our faculty members, academic advisors, staff and students who, on a daily basis, make our teaching, research and overall operations go as smoothly as possible. I am enthusiastic about this new decade we have just started, and look forward to continuing on our path towards making our School a great place where we can all fulfill our academic goals and thrive!

With Best Wishes,

Patricia Stock

ACBS Director and Professor
Weiler Endowed Chair for Excellence in
Agriculture and Life Sciences



SUPPORTING ACBS

Finding Tomorrow's Solutions, Together.

FUNDING

Your gifts matter.



Gifts of any size help to propel ACBS closer to its goals and have an immediate and lasting impact on our programs. Your generosity provides outstanding educational opportunities for our students and helps to attract and retain the brightest faculty.

PARTNERSHIP

Together we change the world.



With your support, ACBS research gives back to the state of Arizona community through our extension programs, as well as the nation and the world, through the discoveries we make and the products we develop.

GIVE ONLINE

www.uafoundation.org/give/cals



Gifts may be made online at the University of Arizona Foundation website. Be sure to designate the funds by selecting other and typing in SACBS. For personalized options, contact us to discuss specific ways your contribution can be made or dispersed.

THANK YOU

Thank you for your commitment to ACBS.



Whether you choose to give to a specific project or program, or simply donate to the school overall, we thank you.

Classroom Renovation Needs

Donor support needed to provide Collaborative Learning Space for ACBS students.

Collaborative Learning Spaces (CLSs) seamlessly connect instruction, technology, and space, so that teachers can promote social learning and maximize engagement. A CLS is flexible, in terms of both the physical space and how it is used. Furniture is reconfigurable, enabling easy transitions between traditional lecture, group, and independent learning. This reinforces and encourages critical thinking, creativity, and communication, which are the real tools that our students will need as members of the work force of the future.

The School of Animal and Comparative Biomedical Sciences is looking for donor support to create Collaborative Learning Spaces for our students. Many classrooms at the University of Arizona have already been created and/or renovated for this purpose and we want to provide this same improved learning experience for our students as well. We are proposing renovations to the old library/conference room and a classroom (#129) located in the ACBS building and the teaching lab in the Food Products and Safety Laboratory (FPSL) at the Campus Agricultural Center. This will allow our faculty members to incorporate innovative teaching strategies into ACBS programs to promote the active learning and engagement of our students.

Estimated budget for each classroom is ~\$40,000.



Example of UArizona classroom that was renovated to a Collaborative Learning Space (CLS). Completed shortly after fall semester began, this 51-seat, multi-tiered CLS was combined out of two smaller rooms located in the Steward Observatory. White boards and monitors circumference the room, and students can turn their chairs to comfortably have smaller group discussions with other classmates.

Spaces in Need of Renovation



Classroom 129 in ACBS Building.



Teaching lab, at the Food Product and Safety Laboratory.

(Continued from 1)

ACBS Open House

The Dugans instilled in their sons the understanding of the relationship between hard work and success. Recalls Dennis, “We were up milking, feeding and doctoring the cows every day before school and again right after school. We learned early on the significance of having a good work ethic.”

Mike and Delores wanted to ensure each of their sons’ success so one by one, they brought the boys into the family business providing each with their own farm while all along offering them guidance and support. The Dugans and their sons eventually built a combined operation of more than 25,000 cows and now a third generation is continuing the traditions. “None of this would be possible without them,” Dennis says.

The Dugan family has always cared deeply about their community and they make involvement and charity a high priority. Dennis, a UArizona alum ('72), established The Pinal 40, a group of professionals that supports children’s charities in Pinal County. Richard Dugan, also a UArizona alum ('75), served as the mayor of Chandler in the early 80s.

ACBS thanks the Dugan family for their generous support.



Clockwise from above: Dennis and Kelly Dugan in the ACBS Advising Center, Dugan family members gather for a photo, Guests enjoyed the Dugan family legacy placard, Claudia Dugan by the ACBS Study Room. Photos: ACBS



Fall Picnic at the University of Arizona Al-Marrah Equine Center

In early November, to celebrate the return of the Al-Marrah Arabian herd to the University of Arizona Al-Marrah Equine Center, ACBS held a fall picnic. Guests included faculty, staff, members of the Miller Family and Tankersley Trust, members of the equine community, and long-time program supporters who came to explore the updated property and learn about the plans for continuing the Al-Marrah legacy. The property, formally known as Al-Marrah Arabians, is located in northeast Tucson on Bear Canyon Road. With the arrival of the UArizona equine program over the summer the property was renamed but retained the Al-Marrah name to pay tribute to the ranch's great tradition of breeding and raising champion Arabian horses. The 80+ acre property features a number of different barns and pastures, both an indoor and covered arena, as well as an educational building that houses classrooms, offices and a small historical museum featuring the Al-Marrah Arabian horses.

A very special thank you goes to the Ruth McCormick Tankersley Charitable Trust for the donation of the Al-Marrah Arabian property and funding for the ongoing renovations.

Top Row: Guests explore the grounds of the UArizona Al-Marrah Equine Center.

Middle Row: (l-r) Wendy Davis, assisted by Dr. Betsy Greene, provides some information on the accomplishments of the Tankersley family and horses including a photo of Miss Missile (grey horse) winning her first class at the Scottsdale All Arabian Horse Show, as a young show mare, beginning her successful career and paving the way for her future offspring who are now winning national titles. (l-r) Dr. Patricia Stock, Dean Shane Burgess, and Hanna Miller (Mrs. Tankersley's grand-daughter) with AM Miss Missile.

Bottom Row (l-r): The horses check out the festivities. Guests gathered at picnic tables to enjoy lunch. The Al-Marrah historical museum was open for guests to view exhibits and artwork featuring the Al-Marrah Arabian horses.

Photos: ACBS



Early Career Teaching Award

We are pleased to announce that Dr. Scott Wilbur has been awarded the 2019 Bart Cordon Early Career Faculty Teaching Award. The Bart Cardon Early Career Faculty Teaching Award was created to recognize and honor unusual dedication and outstanding performance by a member of the CALS teaching faculty who is within their first 5 years of teaching at the university. Dr. Wilbur is an Assistant Professor of Practice in ACBS. He currently teaches General Microbiology (MIC205A), Biology of Microorganisms Laboratory (MIC205L), Immunology (MIC/ACBS 419), and Microbiological Techniques (MIC421b). Dr. Wilbur was recognized and presented with his award and plaque during the Fall CALS luncheon. Congratulations Dr. Wilbur!



Dr. Scott Wilbur (r), with CALS Dean Shane Burgess, receives the 2019 Bart Cordon Early Faculty Teaching Award.

Photo: ACBS

Erika Hartle-Schutte, DVM Joins ACBS Faculty

Dr. Erika Hartle-Schutte began her position as an Assistant Professor of Practice in ACBS this spring. Her instructing course load includes Animal Anatomy and Physiology, Diseases of Companion Animals, and the Environmental Physiology of Domestic Animals.

Prior to joining ACBS, Dr. Hartle worked as a veterinarian in a number of companion animal hospitals as well as with rescue/shelter organizations. She most recently was a faculty member in Pima Community College's Veterinary Technology Program. Dr. Hartle received her BA in political science from the University of Colorado, and both her MS in anatomy and her DVM from Colorado State University. Dr. Hartle is looking forward to engaging with and learning from students and colleagues at the UArizona as well as helping students discover where their academic path will lead them professionally.

Dr. Hartle-Schutte's office is located in the Shantz building room 243. She can be reached at ehartleschutte@email.arizona.edu or 520-621-9855.



Photo: Erika Hartle-Schutte

Microbiology Graduate Finds Successful Career in Produce

Jeremy Vanderzyl graduated from the University of Arizona in 2006 with a Bachelor of Science in Microbiology. He currently works for Duncan Family Farms, which is a 100% certified Organic fresh vegetable farming operation, owned by Arnott and Kathleen Duncan. The farm has growing operations in Arizona, California, Oregon and New York. Duncan Family Farms is a solutions driven company that promotes research to drive the highest standards of quality and safety in everything they do. In his position as the Director of Technical Services, Jeremy, oversees the food safety program, compost production, organic integrity, agronomy, and integrated pest management (IPM) programs. He is quick to recognize that he has amazing members on his team that make each of the programs he oversees possible.

Working for Duncan Family Farms is a perfect fit for Jeremy, who grew up fascinated by science. This attraction began with his parents, especially his father, emphasizing the sciences whenever possible. Whether it was taking him to the Copper Queen in Bisbee or to a mammoth excavation off the mesa in Somerton, AZ, it was always exciting and fun. He specifically became interested in microbiology after working on a fifth grade science project that involved growing bacteria in chicken broth, he says “From then I always found microorganisms impressive, everything from their pathogenesis to industrial capabilities.”



After graduating from the UArizona, Jeremy went to work for the Arizona Department of Health Services as a Public Health Scientist. He did bench top science performing a variety of PCR assays ranging from patient STD specimens, fluorescent microscopy of animal brain matter for rabies testing, to simple water analysis of rural potable water systems. In the lab, he was able to work with a great team and learn a variety of microbiology techniques before the state was forced to shut down the lab due to the economic downturn of 2008. Next, he worked a brief job at Gowan Milling working in their quality control lab gaining experience in physical and analytical chemistry. After that, things seemed bleak at the time as to what his career would hold, but his sister suggested he look to a new emerging field of farm food safety. She had just undertaken a food safety role with the grower she worked for and thought Jeremy’s background would be an ideal fit. With that in mind, he sent his resume to every company he came across, and in December of 2010 was invited to interview with Duncan Family Farms.

One of the biggest benefits to Jeremy, of attending the UArizona, has been the connections he made and continues to make. With his career in produce, he collaborates heavily with the UArizona including with some of the instructors that taught his upper division environmental microbiology courses. If there are questions he doesn’t have the answers to, he knows which Arizona researchers to call. These

special project collaborations have benefited Duncan Family Farms and that network of expertise has been a major asset in Jeremy’s career. “School and career have come full circle and it’s been an exciting time,” states Jeremy.

When asked what he would have liked to have known in college that he knows now Jeremy says, “The opportunities in agriculture for graduates with a microbiology degree.” He goes on to explain that many of his peers in his undergraduate program went to medical or pharmacy school, or went on to grad school and continued in the lab setting at the UArizona. He assumed those were the only avenues and the farm was the last place to look. About the possibilities, Jeremy says, “My impression of ag was that it was a family business, but once I started at Duncan I soon realized produce is a sophisticated and fast-paced business, it’s a business that has many talented people of all walks!”

Looking over his career and where he is now Jeremy shares, “Family is most important to me, I hope to be an influence on my daughters’ lives as my father was with me. My wife has been an amazing supporter of my career. My siblings all graduated from the UArizona and work in ag so we’ve been able to share thoughts with one another. Work and life are interwoven for me and it’s been a fulfilling experience.”



Jeremy Vanderzyl, BS Microbiology '06

Food Safety Certificate Program

Certificate program ranks in top 10 most popular continuing and professional education programs for 2019 at the UArizona.

The University of Arizona Food Safety Training Certificate Program equips food manufacturers, food safety professionals and food scientists/technologists to develop and implement food safety programs. It includes Basic and Advanced Hazard and Critical Control Point (HACCP) training and Preventative Controls for Human Food training. These in-person classes meet at the University of Arizona Food Product and Safety Lab. The program is designed and taught by Dr. Daniel Engeljohn, an assistant professor of practice in the School of Animal and Comparative Biomedical Sciences. Learn more about the program at <https://ce.arizona.edu/food-safety>.



Photo: ACBS

Canine Science Conference



Students in the Applied Companion Animal Behavior course attend the 2nd Annual Canine Science Conference in Phoenix, AZ.

This semester, students in Dr. Crista Coppola's Applied Companion Animal Behavior (ACBS 481/581) course had the amazing opportunity to attend the 2nd Annual Canine Science Conference in Phoenix. Registration costs were partially funded by a UA Student Faculty Interaction Grant and the students had a fantastic time. Students listened to speakers from around the world and learned incredibly interesting facts, such as, how genetically a Rottweiler is truly a small dog in a big dog's body. Students made some new connections with experts, scientists, and researchers at other Universities and non-profit Animal Welfare organizations like the ASPCA. Students also networked with graduate and undergraduate, and were inspired for future graduate school prospects. All in all, it was a truly educational and insightful experience.

Chicken Camp

Yes, we said Chicken Camp! Our ACBS 481/581 Principles of Applied Companion Animal Behavior students, taught by Dr. Crista Coppola, participated in a unique activity before heading out for winter break. They attended Chicken Camp. The camp was coordinated as part of Christy Sims graduate component in the course. Christy is seeking her Master's degree in agricultural education. For the camp, Christy brought 15 of her 4-H chickens for her fellow classmates to practice learning theory principles with, specifically classical conditioning and operant conditioning. Throughout the session, students worked in small groups to teach their chicken the meaning of a "clicker" and then used luring and shaping with positive reinforcement to teach their chicken how to traverse a variety of obstacles. The day ended with a friendly competition of "Chicken Agility". Students had a great day of fun while learning and was a great way to end our semester.



Christy Sims coordinated and taught the Chicken Camp as part of her graduate component in the Principles of Applied Companion Animal Behavior course.



A student takes her chicken through one of the obstacles on the "chicken agility" course.

Students Work With Pima Animal Care Center

Introduction to Animal Sciences Laboratory students had an exciting new opportunity available to them for the fall semester when their second companion animal rotation was held entirely at the Pima Animal Care Center (PACC). During this lab, students learned about PACC's community missions and the importance of behavioral enrichment to overall welfare for companion animals in the captive animal shelter setting. Students also created enrichment items for the shelter residents, distributed these items to individual animals and provided much needed social enrichment to some lucky dogs (and cats). Lastly, students created handmade unique adoption cards to help each of the adoptable animals in their pursuit of a future forever home. This jam-packed lab was made possible through a UA Student Faculty Interaction Grant and the help of both PACC volunteers/staff and from upper division ACBS 481/581 students. By the end of our 4 week rotation at PACC, we racked up a whopping 710 community volunteer hours!



Students provide social enrichment to PACC kittens.



Enrichment items prepared by ACBS students for animals at the Pima Animal Care Center (PACC).



Introduction to Animal Sciences Laboratory students at the PACC.

Photos: Dr. Crista Coppola

Christian Frazier Named Outstanding Senior

ACBS graduate credits his success to strong work ethic and support of family and friends.

We are excited to announce that the School of Animal and Comparative Biomedical Sciences Outstanding Senior in Veterinary Science Fall 2019 Award was presented to Christian Frazier. Christian graduated in December with his Bachelor of Science degree in veterinary science with a minor in biochemistry. After graduation, Christian will work at Pantano Animal Clinic as a veterinary assistant to work on expanding his skills in the veterinary profession. He plans to apply to veterinary school in the spring and once he receives his DVM to return to Arizona to help local ranchers.

Christian was born in Douglas, Arizona, and raised on a farm in Elfrida, Arizona. He comes from a family of livestock growers and beekeepers. His family took great pride in their beekeeping and so, since the age of five when he was first able to carry a bee box, he was out in a bee yard somewhere helping his dad work his colonies.

During his time at the UArizona, Christian worked at the feedlot for over two years, which felt like his home away from home. He used his knowledge of working with cattle and his strong work ethic to become an invaluable member of the feedlot team. In return, his work there became one of his most valued experiences at the UArizona.



Christian Frazier checking the pens at the UArizona Feedlot.

His time there not only helped him to gain feedlot experience and knowledge, but also the opportunity to watch other students grow when they visited, which was very satisfying to him. About Christian, Amber Hubbell, his supervisor at the feedlot, says, "He is a true leader and has great passion for the health and welfare of animals."

In addition to his work at the feedlot,

Christian worked with Dr. Gary Thrasher, a large animal veterinarian in southeast Arizona. He remembers, "The first thing Dr. Thrasher told me was that students who shadow him only last about three days."



Christian working at the UArizona Feedlot bottle feeding a calf.

Photo: ACBS

Christian not only lasted the three days but went on to work for him for three years traveling through Cochise County assisting with veterinary services. Working with Dr. Thrasher helped to cement his desire of becoming a livestock veterinarian to give back to the rural areas of Arizona. About Dr. Thrasher Christian says, "I idolize him, because he is so smart and humble . . . I could never thank him enough for everything he has given me."

Another area that Christian excelled was in his work with the Collegiate Livestock Growers Association (CLGA) where he had the honor to serve as President. He worked hard to improve the club and gain support from state livestock and agricultural associations.

Christian would like to thank Angelica Silva, Gilbert Zamudio, Jessica Zamudio, Mackenzie Kimbro, Kelly Glenn Kimbro, Charlie Ferini, Maya Comaduran, Susan Barney, Angie Bustamante, Marguerite Connors, Norma Brandenburg, Gabriela Amavizca, Lisa Reed, Sienna Willis, Dr. Gary Thrasher, Andy Cline, Victoria Lowe, Dr. Duarte Diaz, Christina Garcia, Ellie Haluska, Amber Hubbell, as well as his parents, and grandparents. He shares, "These were the people that were there for me in some of the biggest moments of my life. I wouldn't be where I am and the person I am today, if it wasn't for meeting them."

Congratulations Christian on this well deserved award!

Food Safety Consortium Hosts UA Food Safety Conference

The Food Safety Consortium (FSC) consists of members from across the University of Arizona as well as from the Arizona Department of Agriculture, State Health Agencies and the food safety industry. The goal of the FSC is to address food safety issues in Arizona using a multidisciplinary collaborative approach. Areas of research and interest amongst members are diverse, and span research areas from fundamental aspects of microbiology, to field-based applications that directly affect the safety of the food supply. The group also connects extension agents out in the counties to the research teams as an integral part of the information pipeline.

To promote networking and to provide educational opportunities for it's members, the FSC hosted a Food Safety Conference in October at the Lodge on the Desert in Tucson, AZ. The conference included a wide array of speakers and attracted over 70 attendees. Following the conference guests enjoyed a poster session with a student poster competition sponsored by the Victor P. Smith Endowment in Food Safety Education.

To learn more about the Food Safety Consortium go to <http://cals.arizona.edu/fsc>.



Top row (l-r): Dr. Bibiana Law and Food Safety Consortium Chair, Dr. Sadhana Ravishankar. Student Poster Competition Chair, Dr. Margarethe Cooper and first place student poster award winner, Sarah Abney. Bottom row (l-r): Second place student poster award winner, Stephanie Arellano. Third place student poster award winner, Breanna Salt. Honorable mention student poster award winner, Kaitlyn Benally. Photos: ACBS



Shaira Perez (center) receives the best presentation award at the Minority Access National Conference.

Photo: Jerry Lopez

Minority Access 20th National Conference

Shaira Perez, a molecular and cellular biology (MCB) accelerated master's student in Dr. Gerardo (Jerry) Lopez's Laboratory and a Western Alliance to Expand Student Opportunities (WAESO) student, was awarded a WAESO undergraduate research presentation travel scholarship. The scholarship provided funding for Shaira to attend and present at the Minority Access 20th National Conference in National Harbor, MD, September 26-29, 2019. During the conference, Shaira gave her presentation titled "Cyclospora: Potential Reservoirs and Occurrence in Irrigation Waters". She was recognized as giving the best presentation at the conference winning a \$1,000 first place prize.

Our Thriving Undergrads



Photo: Patricia Stock

ACBS undergraduate student Isabel Forlastro receives a presentation award for her poster presentation at the Annual Biomedical Research Conference for Minority Students.

Isabel Forlastro, a senior majoring in both veterinary science and microbiology in ACBS, and an Honors College student, participated in the 2019 Annual Biomedical Research Conference for Minority Students (ABRCMS) held last fall in Anaheim, California. The conference is one of the largest communities of underrepresented minorities in science, technology, engineering

and mathematics. Students attend this conference to present their research, enhance professional development skills, explore graduate schools, and network. Isabel gave a poster presentation on developing insect models to study Enteropathogenic *E. coli* Type 3 Secretion System, which is the Honors Thesis project she is conducting in Patricia Stock's laboratory. She was awarded a presentation award for outstanding presentation in the Microbiology poster session.

Second Annual AISES STEM Youth Conference

The University of Arizona Chapter of the American Indian Science & Engineering Society (AISES), hosted the second annual STEM Youth Conference at the UArizona main campus on November 16, 2019. The UArizona Cooperative Extension 4-H STEM Program was one of several groups who provided hands-on Science, Technology, Engineering and Math (STEM) activities to 5th - 12th graders interested in learning about the STEM Field. The team engaged two groups with about 15 youth in a one-hour session through hands-on activities demonstrating the importance of food safety. The activities were led by Shaira Perez, an accelerated master's student in molecular and cellular biology, Breanna Salt, an undergraduate in veterinary science, and Elina Landeros, an undergraduate in animal science, as part of Dr. Gerardo Lopez's UArizona Cooperative Extension 4-H STEM Program and Food Safety and Environmental Microbiology Laboratory.



Breanna Salt explains to youth how to spread plate bacteria for a food safety STEM activity.

Photo: Jerry Lopez

Parker, Arizona/Colorado River Indian Tribe (CRIT) 4-H Program Engaging in STEM

For the fourth consecutive year, Debbie Pettigrew (4-H Program Coordinator) and Emmanuel Munoz (4-H Instructional Specialist) along with 4-H parent volunteers from the Parker/CRIT 4-H program, made the five-hour plus road trip to the University of Arizona main campus to have sixteen 4-H members experience hands-on Science, Technology, Engineering Mathematics (STEM) activities. On December 9, the College of Optical Sciences provided engaging activities during the morning session and 4-H Director, Dr. Jeremy Elliot-Engel, along with the state 4-H office team, joined the youth for lunch provided by CALS Dean, Shane Burgess. The afternoon was spent learning about the importance of food safety and how a collaborative approach between national and state level government agencies, industry and academia work together to solve food born outbreaks. Youth learned how to Gram stain bacteria in Dr. Jerry Lopez's laboratory with Research Specialist Monique Torres, Mai Nguyen, a microbiology accelerated master's student, Breanna Salt, an undergraduate in veterinary science, and Shaira Perez, a molecular and cellular biology accelerated master's student.



4-H members learn about Gram staining bacteria in Dr. Jerry Lopez's Food Safety and Environmental Microbiology Laboratory.

Photo: Jerry Lopez

Southern Arizona Equine Health Symposium

The Southern Arizona Equine Health Symposium wowed participants again for the 4th year in a row where, over 200 attendees, participated in 20 different presentations and demonstrations focusing on the health and welfare of horses.

Dr. Kris Hiney provided a lecture on “Equine Fitness for the Everyday Horse Owner” and then moved on to a demonstration in the arena on horse fitness using heart rate monitors on horses as they were ridden, entitled “Who is More Fit? You be the Judge!”.

Dr. Greene presented “Equine Learning Opportunities to Engage Youth (and Adults)” with Renee Carstens (4-H, Youth Development Assistant Agent, Gila County), “Insurance and Liability for the Horse Owner/Business” with Mikel Hardy (Arizona Farm Bureau), “Horse/Rider Preparations for Desert Riding” with Dr. Ann Pearson (Reata) and Hope Martin, and Betsy worked with Ashley Wright (Area Livestock Agent) to present “Arizona Feedstuffs 101” and to bring back an audience favorite that gives attendees a hands on opportunity to learn about (or refresh) vital signs in “Horse 101: Knowing Normal in Your Horse”.

Additional lectures from area veterinarians covered pre-purchase exams, nutrition, and vices, with a special “Understanding the Hoof-Inside and Out” presentation from Page Posse and Eddie McKenzie, which included a hoof dissection. The day ended with an “Ask the Expert Panel” including most presenters and moderated by Dr. Greene. This educational event is an excellent collaboration between UA Equine Extension, Reata Equine Veterinary Group, Adobe Veterinary Center, and our industry partners. For more information go to <https://extension.arizona.edu/horse>, like us on Facebook <https://www.facebook.com/SAzEHS/>, and mark your calendar for next year’s event on January 23, 2021.



The Southern Arizona Equine Health Symposium provided a full-day of presentations with a wide selection of options for beginning to advanced equine enthusiasts, and varying venues including classroom, arena, and hands-on lectures, there was something for everyone.
Photos: SAzEHS

Barn Smarts for Biosecurity Poster

Biosecurity is an important part of keeping horses healthy. To educate Arizona equestrians, Dr. Betsy Greene and Ashley Wright (Area Livestock Agent), developed a “Tips for Keeping Your Horse Healthy” poster that covers the basics of how to prevent the spread of disease in a horse barn. To reach more Arizona horse owners, Dr. Greene worked with Juan Arias (Assistant Agent), and Apache Language Preservation, to translate the poster to Apache and distribute, along with a San Carlos Apache Rancher Resource Guide, to Apache Cattlemen’s Association members. Tribe members were very excited to be recognized and supported through this translation project. This project was funded by an Extension Strategic Initiative Grant.



Dr. Betsy Greene and Juan Arias (Asst Agent) (far right) present the Apache translated Barn Smarts for Biosecurity Poster to San Carlos Apache Cattlemen’s Association members.

Horse Lover’s Grant

A generous \$2,000 donation provided to the FFA Foundation has assisted in the purchase of much needed equipment for the UArizona equine program. Equipment includes riding helmets, halters, lead ropes, breast collars, headstalls, bits, and reins.

Biosecurity Modules for Ag Teachers

Dr. Betsy Greene, along with researchers from universities all over the US has worked with Healthy Farms Healthy Agriculture to produce learning modules for Ag teachers, the public, and youth about biosecurity. <https://futurumcareers.com/educating-youth-about-biosecurity-can-help-prevent-the-spread-of-disease-in-farm-animals>

The online article was produced by Futurum, a magazine and online platform aimed at inspiring young people to follow a career in the sciences, research and technology. For more information, teaching resources, and course and career guides, see www.futurumcareers.com



Presentations and Symposia

Abney S*, Morrison C, Clark J, De Gresham A, Ignell A, **Zhu L**, **Ravishankar S**, Ikner L, Bright K, Betancourt W, Gerba C. "Pathogen Occurrence in Treated Domestic Wastewater intended for Irrigation". Poster presented at the Food Safety Conference. Tucson, AZ. Oct 17, 2019. Received 1st place in student poster competition.

Arellano S*, **Law B**, and **Ravishankar S**. "Green Sanitizers: Improved Safety and Shelf-life of Iceberg Lettuce Washed with Plant-based Antimicrobial Microemulsions". Poster presented at the Food Safety Conference. Tucson, AZ. Oct 17, 2019. Received 2nd place in student poster competition.

Arellano S* and **Ravishankar S**. "Green Sanitizers: Improved Safety and Shelf-life of Iceberg Lettuce Washed with Plant-based Antimicrobial Microemulsions". Poster presented at the Annual GDP Student Research Showcase. Tucson, AZ, December 2019.

Benally K*, **Perez S**, **Villa Barbosa G**, **Torres M**, **Cabrera D**, Betancourt W, Bright K, Gerba C, Rivadeneira P, Kitajima M, **Lopez GU**. "Cyclospora: Potential Reservoirs and Occurrence in Irrigation Waters". Poster presented at the Food Safety Conference. Tucson, AZ. Oct 17, 2019. Received Honorable Mention in student poster competition.

Choi R, Hulverson MA, Huang W, Whitman GR, Barrett LK, **Schaefer DA**, Betzer DP, **Riggs MW***, Doggett JS, Sanchez-Sanchez R, Ortega-Mora L, Hemphill A, Arnold SL, Ojo KK, Fan E, Van Voorhis WC. "Bumped Kinase Inhibitors for the Treatment of Apicomplexan Infections". Presented at the 100th annual Conference of Research Workers in Animal Disease. Chicago, IL. Nov 4, 2019.

Cooper M. "Update on the U of A Food Safety Program". Presented at the Food Safety Conference. Tucson, AZ. Oct 17, 2019.

Greene EA. "Ranch Horse Wrecks...Are You Liable?". At Beginning Farmer/Rancher Workshop Series. Cochise College - Douglas Campus, Douglas, AZ. Nov 20, 2019.

Kaneshamoorthy S*, Mai HN, **Ravishankar S**, and **Dhar AK**. "Efficacy of Natural Compounds Against *Vibrio parahaemolyticus* causing Acute Hepatopancreatic Necrosis Disease (APHND) in Pacific White Shrimp (*Penaeus vannamei*). Poster presented at the Food Safety Conference". Tucson, AZ. Oct 17, 2019.

Law B*, **Zhu L**, Olsen C, McHugh T and Friedman M, **Jaroni D**, and **Ravishankar S**. "Apple, Carrot, and Hibiscus Edible Films Containing Plant Antimicrobials Inactivate *Salmonella* Newport in Packaged Organic Leafy Greens". Poster presented at the Food Safety Conference. Tucson, AZ. Oct 17, 2019.

Lopez, G. "Cyclospora". Presented at the Oregon Food Safety Workshop. Clackamas, OR. Nov 19, 2019.

Nguyen M* and **Ravishankar S**. "Antibiotic Resistance and Susceptibility of Bacterial Isolates from Various Irrigation Water Sources". Poster presented at the Food Safety Conference. Tucson, AZ. Oct 17, 2019.

Oliveras V, **Park R** and **Ravishankar S**. "Efficacy of Ozone Against *Salmonella* Newport in Recycled and Non-recycled Spinach Wash Water". Poster presented at the Food Safety Conference. Tucson, AZ. Oct 17, 2019.

Oliveras V* and **Ravishankar S**. "Efficacy of ozone against *Salmonella* Newport in recycled and non-recycled spinach wash water". Oral presentation given at the CONSERVE Summer Internship Webinar on August 1, 2019.

Park R, **Rao AP***, Porchas M, Brierley P and **Ravishankar S**. "Understanding the Cross-Contamination of Melons via

Environmental Matrices Simulating Field Conditions". Poster presented at the Food Safety Conference. Tucson, AZ. Oct 17, 2019.

Perez S*, **Villa Barbosa G**, **Torres M**, **Cabrera D**, Betancourt W, Bright K, Gerba C, Rivadeneira P, Kitajima M, **Lopez GU**. "Cyclospora: Potential Reservoirs and Occurrence in Irrigation Waters". Presented at the Access 20th National Conference. National Harbor, MD. Sep 26-29, 2019. Received first place for best presentation.

Ravishankar, S. "CONSERVE: Activities 1b & 3b- Analysis of Water Samples and Ozone Treatments". Oral presentation given at the CONSERVE Annual PI meeting at the University of Maryland, College Park, MD on July 14, 2019.

Rowlands D*, **Wei Q**, **Torres M**, Porchas M, Fang T, Brierley P and **Ravishankar S**. "Attachment Strength of Foodborne Pathogens on Different Melon Varieties from Various Regions in the United States". Poster presented at the Food Safety Conference. Tucson, AZ. Oct 17, 2019.

Salt B*, **Benally K**, **Cabrera D**, **Torres M**, **Lopez GU**. "Prevalence of *Cyclospora cayetanensis* in irrigation water in the Southern region of the US". Poster presented at the Food Safety Conference. Tucson, AZ. Oct 17, 2019. Received 3rd place in student poster competition.

Rao AP*, **Park R**, Porchas M, Brierley P and **Ravishankar S**. "Microbial Quality During Storage, Prevalence of Foodborne Pathogens and *Salmonella* Colonization Based on Variances in Netting Densities of Melons Grown in Different Regions of the United States". Poster presented at the Food Safety Conference. Tucson, AZ. Oct 17, 2019.

Zhu L*, **Torres M**, Betancourt WQ, Sharma M, Micallef SA, Gerba C, Sapkota AR, Sapkota A, Parveen S, Hashem F, May E, Kniel K, Pop M and **Ravishankar R**. "Incidence of Fecal Indicator and Pathogenic Bacteria in Reclaimed and Return Flow Waters in Arizona, USA". Poster presented at the Food Safety Conference. Tucson, AZ. Oct 17, 2019.

Publications

Caro A, **Fernando L**, Mai HN, Nunan L, **Lin J** and **Dhar AK**. (2019). Assessment of transmission risk in WSSV-infected shrimp *Penaeus vannamei* upon cooking. Journal of Fish Diseases, In Press.

Choi R, Hulverson MA, Huang W, Vidadala RS, Whitman GR, Barrett LK, **Schaefer DA**, Betzer DP, **Riggs MW**, Doggett JS, Hemphill A, Ortega-Mora LM, McCloskey MC, Arnold SL, Hackman RC, Banfor PN, Marsh KC, Lynch JJ, Leroy BE, Freiberg GM, Kempf DJ, Maly DJ, Fan E, Ojo KK, and Van Voorhis WC. (2019) Bumped Kinase Inhibitors as Therapy for Apicomplexan Parasitic Diseases: Lessons Learned. In press, International Journal for Parasitology.

Gangnonngiw W, Bunnontae M, Phiwsaiya K, Senapin S, and **Dhar AK**. (2020). In experimental challenge with infectious clones of *Macrobrachium rosenbergii* nodavirus (MrNV) and extra small virus (XSV), MrNV alone can cause mortality in freshwater prawn (*Macrobrachium rosenbergii*). Virology. Volume 540, 15 January 2020, Pages 30-37.

Greene EA, Smith J, McDonald J, Kerr S, Rankin J. (2019). Educating Youth About Biosecurity Can Help Prevent the Spread of Disease in Farm Animals. <https://futurumcareers.com/educating-youth-about-biosecurity-can-help-prevent-the-spread-of-disease-in-farm-animals>.

Wei Q, Zhan Y, Chen B, Xie B, Fang T, **Ravishankar S**, Jiang Y. (2019). Assessment of antioxidant and anti-diabetic properties of *Agaricus blazei* Murill extracts. Food Science & Nutrition. 00:1-8.

* presentation given by

Aquaculture Pathology Laboratory Updates

Photos: Dr. Arun K. Dhar

August 19 - 21, 2019 Muscat, Oman

Dr. Arun K. Dhar and Mr. Todd Shallcross, UArizona Defense Offset Program Manager, visited the Department of Marine Sciences & Fisheries at Sultan Qaboos University, Muscat, Oman. They gave presentations on the resources and capabilities of the Aquaculture Pathology Laboratory, specifically for international research efforts, as well as a presentation on “Emerging Diseases & Disease Management in Shrimp Aquaculture”.



Dr. Arun K. Dhar and Mr. Todd Shall Cross visit Muscat, Oman.

September 26, 2019 Baton Rouge, Louisiana

Dr. Arun K. Dhar was invited to give a talk on “Emerging Diseases in Shrimp Aquaculture” for the Department of Pathobiological Sciences, School of Veterinary Medicine, Louisiana State University, Baton Rouge, LA.



(l-r) Prof. John Hawke, Acting Director, Department of Pathobiological Sciences, LSU with Dr. Arun K. Dhar.

West Bengal Project October, 2019 West Bengal, India

The first training in the development of a disease diagnostic centre for shrimp aquaculture in West Bengal, India, was given by Dr. Luis Fernando Aranguren Caro. The week long training workshop was attended by 15 West Bengal government staff and included lectures, a shrimp farm field trip, and hands-on shrimp disease practice.



Attendees of the West Bengal Project tour a shrimp farm.



West Bengal Project participants gain hands-on practice with shrimp disease diagnostics.

Costa Rica Workshop November, 2019 San Jose, Costa Rica

Dr. Luis Fernando Aranguren Caro conducted a workshop on shrimp diseases in San Jose, Costa Rica. The event was organized by the World Aquaculture Society and the Universidad Tecnica Nacional de Costa Rica. 25 professionals participated in this workshop.



Costa Rica Workshop participants.

World Aquaculture Society Latin America Chapter “LAQUA19” Conference

November 19 - 22, 2019 San Jose, Costa Rica

During the LAQUA Conference Dr. Roberto Cruz Flores gave a talk titled “Complete genome reconstruction of White Spot Syndrome Virus from archival Davidson’s-Fixed paraffin embedded shrimp tissue”. Additionally, Dr. Luis Fernando Aranguren Caro, was invited to chair the Shrimp Diseases session and also gave a talk titled “Síndrome de la feces blancas (WFS) en el cultivo de camarón de Latinoamérica”.



Dr. Roberto Cruz Flores at the LAQUA19 Conference.



(l-r) Nelson Peña (LAQUA19 head organizer), Guillermo Hurtado (R&D Director of Universidad Tecnica Nacional de Costa Rica), Dr. Cesar Escobedo, Dr. Fernando Aranguren and Dr. Roberto Cruz Flores.



Dr. Luis Fernando Aranguren Caro chairing the Shrimp Diseases session at the LAQUA19 Conference.

Laboratory Visitors

USDA- APHIS Program Leader, Dr. Kathleen Hartman and Dr. Alicia Marston visited the Aquaculture Pathology Laboratory to view and learn more about the diagnostic workflow of the laboratory. They also visited the West Campus facility where quarantine facilities are located and work on pathogen challenge and antimicrobial therapeutic evaluation are performed.



USDA-APHIS members, (l-r) Dr. Hartman, Brenda Noble and Dr. Marston tour the Aquaculture Pathology Laboratory.



Dr. Luis Fernando Aranguren Caro demonstrates a diagnostic procedure to Costa Rica workshop participants.



ACBS Unveils New Website

The School of Animal and Comparative Biomedical Sciences has been hard at work building a new website. The new website is where you can find information on all of our Undergraduate and Graduate programs, learn more about our faculty and their research, see upcoming events, and keep up-to-date on the latest ACBS news.

Visit us at <https://acbs.arizona.edu/>

Upcoming Events

February 25 - 27

Southwest Ag Summit
Yuma, Arizona

yumafreshveg.com/southwest-ag-summit/

March 10 - 12

Range Livestock Nutrition Workshops
3/10 Benson, 3/11 Prescott, and 3/12 Holbrook
UArizona Beef Extension

extension.arizona.edu/azbqa-workshops

April 3 - 5

UA Spring Fling
The University of Arizona
Tucson, Arizona

May 15

University Commencement
7:30 pm Arizona Stadium
The University of Arizona
Tucson, Arizona

commencement.arizona.edu

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ACBS Newsletter

Volume 6 : Issue 1 Spring 2020

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The ACBS Newsletter is published three times a year for alumni and friends of the University of Arizona School of Animal and Comparative Biomedical Sciences.

Stories in this print edition have been edited for length. Visit the ACBS Newsletter online at acbs.arizona.edu/news-events/newsletters for past issues.

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