NEW FACULTY

Dr. Alda Pires is a new member of the Department of Population Health and Reproduction as an Assistant Specialist in Cooperative Extension and Assistant Epidemiologist in the Agricultural Experiment Station for Urban Agriculture and Food Safety. She obtained her DVM (1999) from Universidade de Tras-os-Montes e Alto Douro in Portugal, and completed her Master of Preventive Veterinary Medicine (2007) and residency program in Food Animal Reproduction and Herd Health (2008) at UC Davis. Dr. Pires then moved to Michigan State University where she undertook graduate studies with an emphasis in veterinary epidemiology. She received her PhD (2012) from Michigan State University studying environmental factors that influence the shedding of *Salmonella* sp in growing pigs. She joins us from Michigan State University where she was employed as a Research Associate. Dr. Pires’ research focuses on disease surveillance, food safety, public health, foodborne and zoonotic diseases and epidemiology of infectious diseases, including *Salmonella* shedding and persistence in livestock species (swine and cattle).

NEW LEADERS

Dr. Janet Foley and Dr. Shirley Luckhart have been appointed as Interim Co-Directors of the Center for Vector-borne Diseases (CVEC). Their primary responsibilities are to ensure that CVEC meets its mission of promoting multidisciplinary and collaborative excellence in training and research to understand, prevent, and manage vector-borne diseases. They will support and enhance collaborations across campus in support of vector-borne disease research and education, national and international collaborations through research and program grants to strengthen both basic and translational research and provide impactful support for the development of vector-borne disease policy locally, nationally, and internationally.

Dr. Foley received her DVM and PhD from UC Davis and is a Professor in the Department of Medicine and Epidemiology, School of Veterinary Medicine.

Dr. Luckhart received her PhD from Rutgers University and is a Professor in the Department of Medical Microbiology and Immunology, School of Medicine.
CURRENT FACULTY RECRUITMENTS

- Professor of Aquatic Animal Medicine (candidate identified)
- Professor of Clinical Livestock Herd Health
- Professor of Clinical Livestock Reproduction

Two new Agriculture and Natural Resources positions have just been approved:

- **Specialist in Beef Cattle Herd Health and Reproduction.** This is a statewide position to support California’s extensive beef industry (cow-calf, stocker/feeder, seedstock, feedlot production), with a discipline focus in internal medicine, epidemiology and preventive medicine, theriogenology or infectious disease.
- **Specialist in Dairy Cattle Production Health Management.** This statewide position will focus on enhancing competitive, sustainable dairy cattle production systems in California through discovery, development and application of economic tools needed for decision support and improvement of health productivity of dairy cattle herds.

HIGHLY PATHOGENIC AVIAN INFLUENZA (HPAI)

Poultry specialists and California Animal Health and Food Safety Laboratory System (CAHFS) experts are urging backyard chicken enthusiasts and commercial poultry owners to practice strong biosecurity measures to prevent contact with wild birds, due to highly pathogenic strains of avian influenza recently detected in migratory waterfowl in British Columbia, Washington, Oregon, and Butte County, California.

The current detected strains, H5N2 and H5N8, are not a risk to human health. On January 24, 2015, H5N8 was confirmed in a commercial turkey flock in Stanislaus County through testing at CAHFS, and confirmation testing at a federal lab. Avian influenza, once introduced into an area, infection can spread through bird-to-bird contact or through contact with contaminated clothing, shoes, hands, feed, water or equipment. Because waterfowl are reservoirs for avian influenza strains that can be fatal to domestic poultry (yet often show little to no signs in waterfowl), backyard and commercial chickens raised near areas commonly used by migrating waterfowl are at risk of transmission.

CAHFS faculty continue to encourage veterinarians and owners of backyard chickens and commercial poultry operations to submit sick or recently dead birds for necropsy examination. The exam is free of charge for California backyard flock owners of fewer than 1,000 birds (chicken, turkey, waterfowl and squabs). For more information, contact CAHFS at (53) 752-8700 or visit the website at: http://www.vetmed.ucdavis.edu/cahfs. The USDA APHIS press release is available in the news section at: aphis.usda.gov.

RUMINANT HEALTH WESTERN CONSORTIUM
Faculty members representing the five college partners of the Western Region Consortium of Veterinary Medical Colleges met at the School in early January to continue planning efforts for a regional Center of Excellence (COE) for Ruminant Health. The consortium includes the schools/colleges of veterinary medicine from UC Davis, Oregon State University, Washington State University, Colorado State University and Western University of the Health Sciences. The two-day detailed strategic planning session, organized by local leaders Terry Lehenbauer and Joanie Rowe, was professionally facilitated by Daniel Stone. The COE goal is to address societal needs for sustainable animal agriculture through collaborative research, education and outreach.

The potential establishment of the COE will take fuller advantage of the different resources that exist across colleges in small ruminant health, provide students the educational opportunities they need, foster increased creativity and interactive approaches in teaching, research and outreach, and be better able to address industry and societal needs.

COYOTES AND STRAY DOGS FOCUS OF LEAFY GREENS STUDY

In 2010 an *E. coli* O145:H28 outbreak tied to bagged Romaine lettuce, sickened at least 30 people in 5 states. Three patients developed a type of kidney failure known as hemolytic uremic syndrome, or HUS. No deaths were reported. Investigations linked the outbreak to shredded Romaine lettuce from a single processing facility in the Yuma, Arizona area. Several potential sources for the *E. coli* were evaluated but the exact source was not determined.

Food safety research projects underway since the outbreak are helping answer questions faced by the leafy greens industry. The correlation between animal defection in vegetable fields and potential *E. coli* infection remains a concern.

Dr. Michele Jay-Russell, program manager at the Western Center for Food Safety, (WCFS), and liaison to the Western Institute for Food Safety and Security, (WIFSS), has published a manuscript in the journal of PLOS ONE. The study, “Prevalence and characterization of *Escherichia coli* and *Salmonella* strains isolated from stray dog and coyote feces in a major leafy greens production region at the United States-Mexico border,” helps address a concern of local vegetable growers, who feel that coyotes and unleashed stray dogs are a significant problem due to intrusions into their crop fields. Findings from the study suggest that stray dogs and coyotes in the southwest desert may not be significant sources of toxigenic *E. coli*, but are potential reservoirs of other pathogenic *E. coli* and *Salmonella*. These results show the importance of food safety practices used by growers to protect vegetable crops from bacterial contamination due to animal hazards in the fields.

HELPING TO IMPROVE EUROPEAN MEAT PRODUCTION

Catalina Cabrera, from the veterinary hospital’s Livestock Herd Health and Reproduction Service, traveled to the Republic of Georgia twice in the past few years to help improve beef and pork production conditions in the former Soviet region. Through a USAID-supported Farmer-to-Farmer Program, Cabrera conducted training in embryo transfer and artificial insemination in an effort to increase the meat quality of livestock. In this still-developing section of Eastern Europe, beef and pork producers are unable to meet the demands of customers due to low production results of the breeds indigenous to the area. Previous
attempts to improve conditions involved importation of live animals with better genetics, but those plans failed as the animals could not adhere to the Georgian feed conditions and mountainous terrains. Cabrera’s efforts sought to improve the genetics of the livestock so that future generations of animals born in the region—that would instinctively adapt to their conditions—would produce better quality and quantities of meat.

To improve pork production, Cabrera chose to artificially inseminate Georgian pigs with boar semen from several different breeds known for their production prowess. The first generation of the genetically improved piglets was born in the fall of 2013, and they were also artificially inseminated on Cabrera’s follow-up visit the next year. In just a few generations of insemination, the once low quality Georgian pigs have evolved into a high quality swine breed.

Genetic improvement was more easily accomplished in cattle. Instead of artificial insemination, the cows were implanted with embryos from American Hereford cows to immediately produce 100 percent Hereford calves—the first Herefords born in the Republic of Georgia. The new breed—that will provide better weight gain, beef quality and therefore, production—is a vast improvement over the previous cattle that failed to produce high quantities of meat due to it being an old cross-breed not specialized or separated into meat and milk production. Thanks to Cabrera’s teaching efforts, the Georgian veterinarians and farmers now have the knowledge and connections to continue improving their meat production.

**PREDICT2 - $100 MILLION USAID GRANT**

The United States Agency for International Development (USAID) has awarded $100 million for the second phase of the PREDICT project based at the School of Veterinary Medicine’s One Health Institute (OHI). PREDICT is part of the Emerging Pandemic Threats (EPT) program, an unprecedented international campaign to rapidly detect and respond to emerging viruses such as Ebola and SARS that move among people, wildlife, and livestock. The new award is one of the largest extramurally funded projects in UC Davis history.

Led by OHI Director Jonna Mazet, PREDICT and its partners have created a platform for effective collaboration across disciplines and geographic borders to promote global health problem solving. This new award opens the second phase for the EPT program and continues the efforts in disease surveillance and response. USAID is developing multiple initiatives to help prepare the world for emerging infectious diseases like pandemic influenza, SARS and Ebola.

For the past five years, the One Health Institute has led a global consortium of implementing partners in conducting pathogen surveillance, viral discovery and global health capacity strengthening in more than 20 countries. In that time, the PREDICT team:

- Equipped, supplied, and trained staff in 32 diagnostic laboratories around the world to safely and properly process and test wildlife samples for viruses of pathogenic potential.
- Trained 2,500 government personnel, physicians, veterinarians, resource managers, laboratory technicians, hunters and students in biosafety, surveillance, laboratory techniques and outbreak investigations.
• Discovered more than 800 novel viruses at high-risk pathogen transmission interfaces.
• Responded to 24 disease outbreaks, including multiple Ebola outbreaks in central Africa.

The new award will build on the success of the first phase of PREDICT ($75 million), funded in 2009. In collaboration with other U.S. government, international and host country partners, it will continue to strengthen health capacity and to intensify pathogen surveillance and risk assessment activities in geographic areas and animal-human interfaces identified as high-risk for the emergence and spread of disease.

In this second phase, PREDICT will continue to focus surveillance on viral families of epidemic and pandemic potential including coronaviruses, the viral family to which SARS and MERS belong, influenza viruses, and filoviruses, such as Ebola. This phase will also increase focus on the effects of human behavior and other drivers for disease emergence and spread, with a focus on livestock and people living in high-risk areas for disease spillover and transmission. By working with social and behavioral scientists in a transdisciplinary approach, PREDICT will integrate virus detection with investigations of human-animal interactions and the social and cultural reasons for those interactions. This One Health approach is designed to improve our understanding of the dynamics of zoonotic disease spillover, evolution, amplification, and spread in order to inform future prevention and control measures.

PREDICT is engaged in the Africa, South Asia, and Southeast Asia regions, working in Bangladesh, Cambodia, Cameroon, China, Democratic Republic of Congo, Gabon, Indonesia, Laos, Malaysia, Myanmar, Nepal, Republic of Congo, Rwanda, Tanzania, Thailand, Uganda, and Vietnam, along with a new focus in West Africa in response to the Ebola outbreak.

**PREDICT’s Impact on Ebola Response**

The extreme challenges faced in the recent Ebola outbreak amplify the lack of public knowledge on the virus and its potential hosts and transmission. Unfortunately, the countries in West Africa not previously engaged with PREDICT, were not prepared for this epidemic. In contrast, during a separate Ebola outbreak in this same time period in the Democratic Republic of Congo, where the PREDICT team and other partners were actively engaged with the government and inserted into the public health infrastructure, sick individuals were detected much more quickly. Samples were tested and control measures implemented all within just days of the first signs of illness. The rapid response and significantly reduced death toll in DRC (49 deaths) illustrate what can be achieved when a One Health workforce is trained, employed, and able to be activated in the face of extreme health challenges.

**WESTERN INSTITUTE FOR FOOD SAFETY AND SECURITY – NANJING CHINA**

At the One Health Food Safety Symposium held October 23-24, in Nanjing, China, academia and government discussed the importance of a global education system to address the challenges of food safety in the 21st century. The symposium, co-sponsored by the University of California, Davis, and Nanjing Agricultural University, (NAU), was associated with the million dollar planning and implementation project between the two universities for the establishment of a One Health Center focused on food safety at NAU. The symposium focused on food safety related subjects. Faculty presentations
from both universities were given on the first day of the symposium. A session focusing on teaching approaches from both universities followed the second day.

Dean Michael Lairmore, School of Veterinary Medicine, led the delegation from UC Davis which included Rob Atwill, Bennie Osburn, Xunde Li, Cheryl Scott, and Heather Johnson from the Western Institute for Food Safety and Security, (WIFSS), Jim Cullor, director of the Dairy Food Safety Laboratory, and Huaijun Zhou from the department of Animal Science.

The Vice-Governor of Jiangsu Province is highly supportive of the concept of a One Health Center. Future activities being planned include hosting a group of 20 NAU students for a three week visit to the UC Davis campus, providing funding for six to eight masters students annually and two to four PhD students for up to three years. As part of the project proposal, a select group of NAU faculty will be invited to spend three to six months at UC Davis for educational exchanges as they partner with faculty and staff by familiarizing themselves with blended learning, the approaches used for diagnostic and assessments of food safety related inspections and outbreaks, and application of best practices for the different agricultural systems from farm to table.

CALIFORNIA ANIMAL HEALTH AND FOOD SAFETY LABORATORY SYSTEM

Highlights from the January CAHFS Connection e-newsletter:

Bovine
- Pyelonephritis and cystitis due to Corynebacterium cystitidis was diagnosed in a pregnant beef cow with vague respiratory signs prior to death.
- Epizootic bovine abortion and selenium deficiency were diagnosed in a northern California beef herd experiencing increased late-term abortions.
- Campylobacter fetus ssp. Venerealis caused the abortion of a 6-month gestation Holstein fetus. The dairy had a high rate of open cows at pregnancy reconfirmation and abortions in multiple pens.

Equine
- Severe liver disease was detected in tissues submitted from two euthanized horses. The liver lesions and other changes were considered compatible with a toxic plant
- Nasal ethmoidal adenocarcinoma was the cause of progressive neurologic disease in a 15-year-old thoroughbred gelding.

Small Ruminants
• **Abomasal bloat and perforating abomasal ulcer** caused the death of a 2-month-old crossbred goat kid on a dairy where eight kids in a group of 100 kids fed free-choice powdered milk in a milk bar, had died with bloat.
• **Severe abomasal** parasitism resulted in anemia and low protein causing bottle jaw, anorexia, lethargy and diarrhea in multiple adult ewes on two premises.

**Porcine**
• **Haemophilus parasuis** caused pneumonia, pleuritic and pericarditis in 3-week-old pigs on a ranch experiencing a 15% incidence of chronic cough in nursery pigs.

**Poultry and Other Avian**
• **Fowl cholera** caused the deaths of chickens and wild waterfowl in multiple locations
• **Scoliosis causing spinal cord compression** was diagnosed in a 5-day-old turkey poult that was unable to stand and was lying on its back.
• **Zinc phosphide toxicosis** caused the sudden death of nine Canada geese in San Luis Obispo county. Zinc phosphide, highly toxic to all animals, is most commonly used for control of gophers, prairie dogs and moles.

**LIVESTOCK CONTINUING EDUCATION SYMPOSIUM**

The School’s Center for Continuing Professional Veterinary Education held its Livestock Symposium on Saturday, January 10, 2015 on the UC Davis Campus. The 60 participants learned the latest techniques to help veterinarians care for livestock. Dr. Tom Noffsinger, provided the keynote lecturer on Animal Behavior. Other speakers and topics included:

- Dr. John Angelos: Pink Eye Update
- Dr. Hernan Montilla: Advanced Reproductive Techniques
- Dr. Cassandra Tucker: Beef Cattle Welfare Audits
- Dr. Meera Heller: Care of the Neonate
- Dr. Frank Mitloehner: Air Quality and Health Impacts

**STUDENT FARM CLUB**

The Food Animal Reproduction and Medicine (FARM) Club exists to provide extracurricular learning and networking opportunities for students interested in production medicine. Club members are committed to providing the utmost care for animals, while working to ensure a healthy, wholesome and safe food supply to benefit the world. As future veterinarians they endorse their responsibility to bring sound scientific evidence to future clients and to educate the consuming public about the food they eat. Each year the club sponsors a number of learning opportunities including:

- Weekly clinical rounds – FARM Club hosts clinical rounds for students each Thursdays at 5 p.m. to apply what they are learning by hearing about real cases from the clinicians in the VMTH.
• Regular field trips and wet labs – FARM Club organizes many field trips and wet labs throughout the year to educate club members about the food animal industry, including current issues for producers as well as veterinarians.
• CALF team -- which allows students extra experience in C-Barn at the VMTH. Students sign up for after-hours shifts to help clinicians with emergencies and treatments.
• Annual American Association of Bovine Practitioners Conference

VETERINARY MEDICAL CENTER

Planning efforts for the proposed Veterinary Medical Center have been progressing well. This design schematic illustrates the proposed new and renovated facilities included in the overall multi-phased, decade long planning and construction plan. The concept and programing plan has been presented to Chancellor Katehi and the next phase of detailed design has been approved. Planning efforts include:

• Large Animal Facilities: Equine Sports Medicine; Equine Surgery & Medicine; Equine Intensive Care; LA Isolation Unit; Equine/Livestock Medicine
• SAC-East Additions: Emergency/ICU; Imaging; Surgery/Anesthesia; Patient Receiving/Exam; Specialty Services; Wards; Transfusion Medicine; Pharmacy; Integrative Medicine; Community Practice (remodel) – Medicine, Surgery, Shelter Animal Surgery
• Existing VMTH Repurpose: Research Labs; Offices/Support Services

The total project will be phased to allow for fundraising and capital funding efforts, as well as a construction schedule that will address new building, renovations and infrastructure build outs while maintaining on-going clinical services and teaching. The development team continues to work on the elements of the related capital campaign: major donor prospect identification; the feasibility study; prospectus development and communications.

DIVERSITY INITIATIVES

Diversity is integral to the University’s achievement of excellence. At the School, Associate Dean Sean Owens and Diversity Officer Yasmin Williams are leading efforts to promote diversity within our student population by developing pipelines to increase the number of underrepresented students and fostering a supportive and inclusive learning environment. Multiple strategies have been identified/implemented including:

• Creation of a Multi-Cultural Advisory Board
• Development of a Multi-Cultural Seminar Series

Advancing the health of animals, people and the environment
• On-line Certificate Training Program in Diversity and Inclusion
• Student Lead Diversity and Inclusion Efforts:
  o Establishment of a “VOICE” Chapter (Vet Students as One in Culture and Ethnicity)
  o A VOICE mentorship program for pre-veterinary students
• Pre-Vet Efforts to Increase Student Populations:
  o California State Summer School for Mathematics and Science (COSMOS)
  o Veterinary Medicine Exploration Academy
  o Pre-Medical and Pre-Health Professions Conference

For more information or to get involved in the diversity initiatives and activities please contact Yasmin Williams at: ymwilliams@ucdavis.edu.

NEW COMMUNICATIONS OFFICER – ANIMAL AGRICULTURE

The School welcomed Monique Garcia Gunther as our first dedicated Animal Agriculture Communications Officer. This position expands the communications team’s focus and ability to promote the extensive work, outreach activities, and educational commitment associated with our faculty and professionals in the area of livestock, poultry, small ruminants, aquaculture, food safety and security, and related one health initiatives. Ms. Garcia Gunther earned her BA in Journalism, Public Relations and English in 1993. She has previously served as the Communications Director for the Sacramento Area Commerce and Trade Organization and held PR positions with Deen and Black Public Relations, and Ogilvy Public Relations Worldwide. She has a strong background and track record in client and program communications, issues management, PR strategy, message development, media relations, brand identity, strategic partnership development and in the generation of a wide range of communication and marketing materials.

VIRUS HUNTERS FIND CATTLE DISEASE

A collaborative team of school and CAHFS scientists led by Patty Pesavento have discovered a new virus associated with brain inflammation in cattle. They had considered the usual causes when a yearling steer developed clinical signs consistent with brain and spinal cord inflammation, including rabies virus, herpes viruses, histophilus somni, listeria monocytogenes, which is the causative agent of listeriosis, and sporadic bacterial causes such as salmonella. BSE, the parasite neospora caninum and non-infectious causes such as lead poisoning and thiamine deficiency, sometimes referred to as polio, were also considered.

Since none of the known causes were found, the scientists then went hunting for novel viruses. They used a new technique called metagenomics to search for virus genes and discovered a new virus, which they called BoAstV-NeuroS1. Genetic analysis grouped it in the astrovirus family. It is distantly related to other astroviruses that cause diarrhea in infant children and a shaking disease in farmed mink.

The scientists’ next step was to look back at cases of neurological disease in cattle in which an exact cause was not found. Three of the 32 cattle that were tested had this new virus in their brain tissue.

Researchers in Switzerland independently found the same virus in cattle with neurological disease, further supporting the discovery. More research is needed to understand how the new virus is transmitted, what
proportion of cattle is exposed, what other countries have infected cattle, how the virus causes brain inflammation and if a vaccine can be developed.

The new virus discovery is important because it identifies one more option for which to test. When looking at microscopic pieces of brain tissue it’s important to determine the exact cause of inflammation. Current testing routines confirm or rule out causes such as neospora and bacteria, rabies and BSE, but viruses require additional testing.

*The Power of Metagenomics*

Virus hunting technology such as metagenomics recently became affordable and fast enough to apply to cases such as the steer in this study. The technology was originally developed and perfected through the Human Genome Project, which provided the funding to automate these techniques and make them cheaper. As a result, tissues from clinical cases can now be screened for unknown viruses.

An explosion of new viruses has been discovered in recent years. Scientists previously had to grow viruses in cultures, which left a vast amount of virus types undiscovered because they cannot be propagated in this way. Other molecular techniques became available in the last 30 years that didn’t require virus culture, but the investigators still had to have a rough idea what virus type they were looking for. These virus hunters can now “shoot in the dark” and come up with answers.

The astrovirus discovery is just the tip of the iceberg. Metagenomics will quickly open up the world to many bacteria and viruses that were previously unknown. It is an exciting time for infectious disease discovery as science continues to document, explain and understand the natural world around us. As well, veterinary pathologists now have one more virus to test for in cattle with brain inflammation.