



Protecting Livestock & Poultry Health, Public Health and the Food Supply

The California Animal Health and Food Safety Laboratory System (CAHFS) is a unique service program within the School of Veterinary Medicine that provides a critical early warning system that helps protect the health of California's livestock and poultry, and safeguards public health with rapid and reliable diagnoses for animal diseases. CAHFS operates in partnership with the California Department of Food and Agriculture (CDFA), veterinarians, and livestock and poultry producers.

CAHFS' core mission is to provide the surveillance and diagnostic support necessary to rapidly detect and respond to catastrophic and emerging animal diseases, including Foot and Mouth Disease, Exotic Newcastle Disease and Highly Pathogenic Avian Influenza. CAHFS faculty and staff have an outstanding record of discovering new and emerging diseases, and developing new and improved diagnostic methods.

Critical surveillance and response capability

- The new Alex A. Ardans Tulare Branch Laboratory is expected to open following the dedication ceremony October 28, 2016. The lab will provide veterinary diagnostic testing to support ongoing food animal production, flock and herd health monitoring, food safety programs, and surveillance for foreign and emerging diseases. The lab is located adjacent to the school's Veterinary Medicine Teaching and Research Center (VMTRC) in Tulare County. Together, the CAHFS Tulare Branch lab and VMTRC provide major services to animal agriculture in the valley.
- In 2015, CAHFS conducted 508,886 tests to protect against foreign and emerging animal diseases.
- CAHFS played a major role in limiting the spread of avian influenza in 2015 as the U.S. experienced its worst outbreak in history. CAHFS tested 37,934 samples for avian influenza, including 2,887 for avian influenza outbreak response; 7,777 for wild waterfowl surveillance, and 25,929 from domestic birds. Highly pathogenic avian influenza (HPAI) was quickly identified twice in affected commercial poultry flocks in California. Each time birds from the affected flock were rapidly tested and diagnosed with HPAI, CDFA and USDA were alerted, and the disease was quickly contained.
- Dr. Beate Crossley, a leader at CAHFS in virology and biotechnology, worked with the USDA to develop a test that can detect Foot and Mouth Disease (FMD) in bulk-tank milk from a single infected cow out of a herd of 1,000 cows or more. Additionally, the testing system has increased the capacity to test four times as many samples simultaneously (400), providing rapid and efficient regional surveillance.
- As a member of the National Animal Health Laboratory Network (NAHLN) – a nationally coordinated network and partnership of federal, state, and university-associated animal health labs—CAHFS can now run official tests in California rather than sending samples to out-of-state federal labs. Local testing accelerates results and response time enabling swift and effective action to control a disease outbreak and minimize its impact.
- In 2015, CAHFS faculty participated in organizing a workshop at the school with the Farm Foundation on antibiotic resistance. By bringing together the state's livestock and poultry producers, feed suppliers and veterinarians, the group could effectively discuss the changing landscape of antibiotic drug use in food animals.

These changes are a result of a national effort to reduce antibiotic resistance, a top health concern.

- In 2014, scientists detected Avian Influenza virus subtype H5N8 in a quail flock. Quail can serve as a “mixing vessel” where human and avian strains of influenza viruses can recombine to create new strains that may be more pathogenic to animals and people. Early detection by CAHFS prevented spread of the disease.
- CAHFS is the only laboratory in California that provides support for the USDA/CDFA bovine tuberculosis program. The last confirmed herd infected with bovine TB was in 2013.
- In 2012, scientists detected the first case of “atypical Bovine spongiform encephalopathy or BSE” in California. CAHFS was one of only seven approved testing labs in the U.S. Following this detection, the lab hosted trade delegations from Taiwan and South Korea to demonstrate the highly effective BSE surveillance program in the U.S., which directly contributed to keeping the multi-million dollar trade markets open to beef exports.
- In 2009, diagnosticians detected a very virulent form of infectious bursal disease virus (vIBDV) in a commercial layer flock. This strain had not been previously documented in the U.S. The CAHFS diagnostic team developed and validated a rapid assay for detection of vIBDV. As of June 2014, more than 100 cases originating from commercial and backyard flocks have been diagnosed with the disease.
- In 2002, CAHFS faculty diagnosed Exotic Newcastle Disease (END) in backyard chickens, which led to a \$168 million joint USDA/CDFA eradication effort. CAHFS performed more than 110,000 tests for the disease in 10 months. Anticipating the need for a rapid, high volume test to show freedom from the disease, CAHFS, working with several commercial companies, developed an innovative, high throughput PCR test which markedly shortened the time to reopen international markets and reduced the overall cost of the outbreak.
- As a core laboratory in the National Animal Health Laboratory Network (NAHLN), CAHFS has the expertise and capability to test for a number of foreign animal and high-consequence domestic diseases. CAHFS provided validation of a method that allows screening of bulk milk for FMD. This provides rapid determination of herd status, which allows more effective quarantine measures, deployment of response personnel and valuable information to assist in keeping export markets open.

Innovative and powerful collaboration

- One of the largest animal health laboratory systems in the nation, the CAHFS team routinely collaborates with veterinary faculty to support research, teaching and public service initiatives. The system’s faculty and staff expertise, statewide scope and in-depth disease investigation benefits both private and public stakeholders.

Ensuring food and feed safety

- California produces more than 21 percent of the nation’s milk supply. CAHFS provides diagnostic laboratory support to the CDFA Milk and Dairy Food Safety Program, assuring a safe and wholesome milk supply for consumers of California products world-wide.
- CAHFS offers a reduced-cost backyard poultry necropsy service that has detected toxic levels of lead in backyard chickens whose eggs were a source of food for the owners. In rapidly-growing urban communities, this service can be critically important to families that may not be aware of disease risks associated with keeping backyard chickens. The service also assists the state in detecting index cases of rapidly moving viral diseases such as END and AI in order to prevent human disease and economically



devastating outbreaks from significantly impacting the state's economy.

- In 2013, the Equine Analytical Chemistry Laboratory, during routine post-race testing of urine from horses at several tracks in California, detected the banned substance zilpaterol. Occurrences of the substance at multiple, geographically separate sites led to a multi-agency investigation which focused on feed as the source of the drug. CAHFS quickly developed an assay to detect the compound at low levels in feed and molasses. The investigation discovered that the feed, which had been given to the horses who tested positive for zilpaterol, contained molasses supplied from a company that also made cattle molasses premix containing zilpaterol, which led to accidental contamination of the horse feed.
- As a member of the FDA's Veterinary Laboratory Investigation and Response Network, which primarily responds to contamination events in animal feed, CAHFS is assisting FDA with the ongoing investigation of suspected contaminated "jerky treats" from China that has led to sickness and death in pets.
- In 2007, CAHFS collaborated with the FDA and played a critical role in identifying melamine and cyanuric acid in pet food as the cause of kidney failure in cats and dogs. Toxicologists then developed tests to screen for melamine in animal feed for pets and food producing animals.

Monitoring environmental health and our natural resources

- The Deepwater Horizon oil spill in the Gulf of Mexico - recognized as the worst oil spill in U.S. history - occurred in 2010. As a Food Emergency Response Network member, toxicologists responded to this emergency food contamination event by providing testing of Gulf seafood for oil residues.
- CAHFS faculty worked with biologists at Integral Ecology in conducting a three-year mortality investigation of Pacific fishers (mammals related to pine martens and wolverines). In 96 percent of the animals, evidence of anticoagulant rodenticide poisoning or exposure was detected. Illegal marijuana cultivation sites were identified as the likely primary source of exposure for this endangered species. Contamination of these public forest and park lands in California is an emerging issue and CAHFS' testing of wild animal species serves as a critical monitor of environmental health.

Supporting horseracing safety and integrity

- In partnership with the California Horse Racing Board (CHRB), CAHFS operates the Kenneth L. Maddy Equine Analytical Chemistry Laboratory (EACL), the primary equine drug testing lab for California's permanent and seasonal racetracks. The lab also tests show and performance horses for antibiotic drug residues and other substances. Lab personnel test more than 36,000 samples annually and are able to detect and measure more than 800 drug substances.
- Also by contract with the CHRB, the EACL performs a post-mortem examination on every horse that dies or is euthanized on racetracks or facilities under the jurisdiction of the CHRB. Since 1990 more than 6,500 horses have been necropsied through this nationally and internationally recognized model for the racing industry.
- In collaboration with the school's J.D. Wheat Veterinary Orthopedic Research Laboratory, the post-mortem information has been used in research to study the risk factors for catastrophic injuries in racehorses and subsequent jockey injuries due to falls. The significant finding is that catastrophic injuries are preventable with early detection of stress fractures, management of training and race surfaces to prevent stress fractures. Since 2006, the number of horses experiencing catastrophic injuries has significantly declined.