Over the last 40 years, the **Center for Food Animal Health** at the UC Davis School of Veterinary Medicine has worked with its partners to improve the health of food animals, people and the environment. We are solving problems impacting California’s livestock and poultry industries, and environmental health. We support our state’s animal agriculture industry and help protect and improve public health by ensuring food safety. Our research programs and outreach efforts help to promote efficient production of safe and wholesome food products of animal origin in an environmentally and socially responsible manner.

Today’s agriculture is increasingly global. The emerging health issues facing a university of the 21st Century require us to move in new directions. As the world population grows, so does the demand for safe and quality animal proteins such as milk, eggs, meat and fish. California – the nation’s leading agricultural state with some of the largest numbers of dairy cows and goats, sheep, and beef cattle, as well as egg and poultry production – plays a central role in addressing the world’s food safety and security challenges.

This annual report highlights some examples of the exciting progress being made through the expertise of our world-renowned faculty – many who are recognized leaders in their fields. Their discoveries are helping to advance understanding and methods to keep animals and the environment healthy, improve the sustainability and profitability of food animal production, and protect the safety of our nation’s food supply. For example, we are working on addressing some of the industry’s biggest problems in food production like pinkeye and bovine respiratory disease in cattle, and food safety risks in new and growing poultry operation systems. We are protecting against emerging global disease to maintain the state’s access to interstate markets and international exports through surveillance and improvements in diagnostics. And we are finding better ways to keep our water and produce safe and clean in order to reduce the public health risk of foodborne illnesses.

As global leaders in veterinary medicine, our research is critical for meeting the most important challenges facing the food animal industry today. Moving forward, we remain focused on building the investment and growing the support required for these important discoveries that impact the health of animals, people and the environment – in California and around the globe.
About the Center for Food Animal Health

Through the expertise of our world-class faculty, we create knowledge and solutions to enhance the health and well-being of food-producing animals important to the state’s livestock, poultry and aquatic industries, promote the safety of foods of animal origin, and provide a healthy environment for food animals and consumers.

History

Established in 1972, the Center for Food Animal Health (CFAH) is an organized research program of the school and serves as the veterinary medical component of the Agricultural Experiment Station (AES) of the University of California’s Division of Agriculture and Natural Resources. Since 1988, Veterinary Medicine Extension has been an integral part of the school for the purpose of establishing closer collaborative research efforts among Cooperative Extension specialists, AES faculty and related school programs.

Behind CFAH: Outreach and Collaboration

CFAH partners with agricultural leaders and food animal stakeholders to help identify industry and societal problems for focused research efforts. A number of our stakeholders also participate in proposal review panels twice a year.

HIGHLIGHT: Bringing Together Researchers and Industry:
2015 Annual Stakeholder Meeting

Each year, industry leaders and stakeholders from across California and in all areas of food animal agriculture meet with our researchers to receive updates on CFAH-funded projects in avian/poultry, cattle nutrition, food animal diseases, beef and dairy cattle, small ruminants, and environmental health related to animal agriculture. Participants represent a wide range of livestock industry and commodity groups including the California Cattlemen’s Association, Dairy Cares, the California Wool Growers Association, Western United Dairymen, the California Department of Food and Agriculture, the USDA, California Poultry Federation, among others.

At the meeting, our researchers learn about the current and most important issues and needs in food animal health and production from industry representatives.

Stakeholder Advisory Committee

- California Aquaculture Association
- California Cattlemen’s Association
- California Dairies Inc.
- California Dairy Quality Assurance Program
- California Dairy Research Foundation
- California Department of Food and Agriculture – Animal Health Branch
- Cooperative Extension Beef Cattle Advisors
- Cooperative Extension Dairy Farm Advisors
- California Farm Bureau Federation
- California Pork Producers
- California Poultry Federation
- California Veterinary Medical Association: Agriculture Committee
- California Wool Growers Association
- Dairy Cares
- FDA Pacific Regional Office
- Foster Farms
- Land O’Lakes
- National Meat Association
- Pacific Egg & Poultry Association
- Superior Farms
- The Fishery
- UCCE Kings County
- UC Cooperative Extension Specialists
- USDA Animal and Plant Health Inspection Service (APHIS)
- Western United Dairymen

“Being a part of CFAH gives California farmers and ranchers the opportunity to contribute meaningfully to setting and funding animal health research priorities at the nation’s premier veterinary school. The insight we gain to solving nagging diseases helps us play an important role in improving food animal health for human health benefit.”

– Ria de Grassi, California Farm Bureau Federation
Research Highlights
2015 Year in Review

Our Focus
Through the input of industry stakeholders and partners, high priority areas for research are identified each year. They include:

- Endemic and production-limiting diseases
- Disease control and surveillance, including emerging and zoonotic diseases
- Animal welfare and well-being
- Public and environmental health
- Antimicrobials and antiparasitic drugs – judicious use and resistance
- Rapid and reliable diagnostic tests
- Vaccine development and vaccination delivery systems
- On-farm food safety issues
- Small-scale and sustainable production systems
- Science to help guide policy development in aquaculture

Currently Funded Research

AQUACULTURE
- Shellfish Aquaculture and Food Safety
- Eelgrass and Oysters: Evaluation of Zostera Marina as Vegetated Buffer
- Surveillance System for Infectious Necrosis Virus (IHNV) Infection

POULTRY
- Infectious Bronchitis Virus in California: Helping to Inform Backyard Poultry Producers
- Pasture Poultry Production and Food Safety: Understanding the Risk of Salmonella Enteritidis

LIVESTOCK
- Foothill Abortion Vaccine Development in Beef Cattle
- Improving Animal Welfare, Understanding Zoonotic Disease Risk and Reducing Respiratory Disease in Beef Cattle
- Pink Eye Intranasal Vaccine Development for Beef Cattle
- Controlling Salmonella spp. in Cull Dairy Cows
- Effect of Zinc Supplementation to Control Diarrhea in Holstein and Jersey Calves
- Risk Factors and Detection of Clinical Bovine Respiratory Disease in Pre-Weaned Dairy Calves
- Feed and Nutrition Management Practices on Dairies
- Colostral Management Practices on Organic Dairies
- Iodide Supplementation for Enhancing Bovine Airway Defenses

SMALL RUMINANT
- Epidemiology of Bluetongue Virus Infection in California
- Mutations in Caprine Arthritis Encephalitis Virus Related to Disease Outcome

Visit the Center for Food Animal Health’s website at: www.vetmed.ucdavis.edu/cfah
Preventing ‘Foothill Abortion’ in Cattle Through Vaccine Development

A new vaccine developed by our researchers shows promise for preventing Epizootic Bovine Abortion (EBA) – a tick-borne bacterial disease commonly known as foothill abortion which kills calves before or at birth. Endemic in California’s coastal range and the foothill regions of California, Nevada and Oregon, it is a major cause of economic loss for California beef producers, annually causing the death of an estimated 45,000 to 90,000 calves. Thanks in part to CFAH funding, the recent expansion of USDA-approved field trials for the experimental vaccine began in April 2015 and will further establish the vaccine’s effectiveness and safety in varied conditions, as well as provide relief to ranchers for protecting their calf crop.

HIGHLIGHT: Environmental Health and Sustainable Production Systems for Marine Aquaculture

In Tomales Bay, California – one of state’s premier commercial fisheries for Pacific oyster and one of three regions in the state that account for 90% of all commercial shellfish culture in California – our researchers are evaluating shellfish aquaculture microbial standards and pathogen occurrence. Through monthly sampling of water, sediment and oyster meat for pathogens capable of impacting human and oyster health, research is aimed to help guide aquaculture policy development for a safe and sustainably harvestable commodity. Microbial water quality and pre-harvest food safety are a central focus for California public health, agricultural, and water quality agencies, and shellfish harvesting is restricted in the Bay. The Bay is listed on the Clean Water Act as impaired for pathogens, leading to the adoption of a ‘total maximum daily load’ to ensure the protection of area waters. Through this project, our researchers are collaborating with the University of California Cooperative Extension – Marin to partner with area oystermen in the project, and with the California Department of Public Health, the Tomales Bay Watershed Council, and the Tomales Bay Shellfish Growers Technical Advisory Committee for community engagement and outreach.

CFAH research will help guide aquaculture policy development for a safe and sustainably harvestable commodity.
The purpose of the CFAH is to organize resources for and conduct research on animal diseases important to livestock industries, important food borne and vector borne disease problems, zoonosis associated with diseases of livestock and environmental health important to the State of California.

The California egg industry is undergoing a major transformation in production systems related to the enforcement of Proposition 2 and the Shell Egg Food Safety Rule. As a result, layer production systems that are exempt from these rules are expected to have a greater opportunity to sell their eggs commercially in California. Cage-free pasture poultry layer operations utilize moveable layer houses or “Eggmobiles” as a way to fertilize pasture and land destined for crop production for human consumption. Because these systems are increasing in popularity and are largely exempt from Salmonella Enteritidis (SE) environmental testing based on the generally smaller size of these type of farms, they may pose a food safety risk to table eggs and harvested crops grown on previously poultry pastured land. There is limited research and information for producers regarding best practices with respect to food safety. Our researchers are testing the prevalence of SE in the farm environment and other Salmonella species that pastured poultry have been exposed to on 11 commercial pastured poultry farms in California. Initial results show a similar prevalence of SE in the environment relative to larger commercial farms in California. Additional survey results have helped characterize the range of husbandry practices at these farms. Statistical analysis of these practices shows that allowing birds access to the area underneath the Eggmobile – which has slotted floors – is a significant risk factor for Salmonella exposure in the birds.

### Pastured Poultry Production and Food Safety

The California egg industry is undergoing a major transformation in production systems related to the enforcement of Proposition 2 and the Shell Egg Food Safety Rule. As a result, layer production systems that are exempt from these rules are expected to have a greater opportunity to sell their eggs commercially in California. Cage-free pasture poultry layer operations utilize moveable layer houses or “Eggmobiles” as a way to fertilize pasture and land destined for crop production for human consumption. Because these systems are increasing in popularity and are largely exempt from Salmonella Enteritidis (SE) environmental testing based on the generally smaller size of these type of farms, they may pose a food safety risk to table eggs and harvested crops grown on previously poultry pastured land. There is limited research and information for producers regarding best practices with respect to food safety. Our researchers are testing the prevalence of SE in the farm environment and other Salmonella species that pastured poultry have been exposed to on 11 commercial pastured poultry farms in California. Initial results show a similar prevalence of SE in the environment relative to larger commercial farms in California. Additional survey results have helped characterize the range of husbandry practices at these farms. Statistical analysis of these practices shows that allowing birds access to the area underneath the Eggmobile – which has slotted floors – is a significant risk factor for Salmonella exposure in the birds.

### Financial Support

We build capacity for research opportunities within the school to address the needs of the state’s food animal industry.

**2015 CFAH Research Funding**

- **Federal Funding**: $377,862
- **State Funding**: $46,229

**Total**: $424,091

*Sources: NIFA Federal Formula Funds Allocations (permanent hatch, temporary hatch, multistate and animal health)*
Today's agriculture is increasingly global. The emerging health issues facing a university of the 21st Century require us to move in new directions. As the world population grows, so does demand for safe and quality food like milk, eggs, meat and fish.

CFAH Researchers

We offer funding opportunities for faculty researchers twice a year. These resources provide seed funds to support new and innovative research. The process promotes research collaboration among school faculty with shared interests in food animal health, food safety, and environmental health related to food-animal production systems.

In recent years, more than 30 faculty members and scientists – many who are recognized leaders in their fields – across eight departments and research units at the School of Veterinary Medicine conduct research through the CFAH.

- John Adaska
- Sharif Aly
- Mark Anderson
- John Angelos
- Robert Atwill
- Chris Barker
- Patricia Blanchard
- John Champagne
- Munashe Chigerwe
- Kristen Clothey
- Beate Crossley
- James Cullor
- Rodrigo Gallardo
- Laurel Gershwin
- Meera Heller
- Terry Lehenbauer
- Xunde Li
- James MacLachlan
- Beatriz Martinez Lopez
- Pramod Pandey
- Alda Pires
- Maurice Pitesky
- Birgit Puschner
- Heidi Rossow
- Joan Rowe
- Gabriel Senties-Cue
- Noelia Silva-del-Rio
- Jeff Stott
- Simone Stoute
- Lisa Tell
- Deniece Williams

Industry and Government Partners

- The California Animal Health and Food Safety Laboratory System
- California State Veterinarian Dr. Annette Jones, California Department of Food and Agriculture

Commodity Advisory Committee

Commodity advisors evaluate the importance and potential success of proposed research projects for fulfilling high priority issues for food animal health, food safety, environmental health, and other critical issues facing animal agriculture in California and beyond. These individuals, including faculty members, cooperative extension advisors, and industry stakeholders, have served in this capacity during the past few years.

- Sharif Aly
- Mark Anderson
- John Angelos
- Rob Atwill
- Munashe Chigerwe
- Pat Conrad
- James Cullor
- Josh Davy
- Rodrigo Gallardo
- Laurel Gershwin
- Ria de Grassi
- Michele Jay-Russell
- Betsy Karle
- Terry Lehenbauer
- James MacLachlan
- Rob Moeller
- Mike Payne
- Alda Pires
- Maurice Pitesky
- Birgit Puschner
- Heidi Rossow
- Joan Rowe
- H L Shivaprasad
- Jeff Stott
- Francisco Uzal
- Deniece Williams
- Dennis Wilson

Scientific Review Committee

Scientific reviewers are charged with the task of evaluating the quality and scientific merit of research proposals. These individuals have served as scientific reviewers during the past few years.

- Sharif Aly
- Mark Anderson
- John Angelos
- Rob Atwill
- Munashe Chigerwe
- Bruno Chomel
- Al Conley
- Pat Conrad
- James Cullor
- Rodrigo Gallardo
- Laurel Gershwin
- Meera Heller
- Michele Jay-Russell
- Terry Lehenbauer
- Xunde Li
- James MacLachlan
- Beatriz Martinez Lopez
- Rob Moeller
- Brian Murphy
- Pramod Pandey
- Mike Payne
- Alda Pires
- Maurice Pitesky
- Birgit Puschner
- Heidi Rossow
- Joan Rowe
- H L Shivaprasad
- Jeff Stott
- Francisco Uzal
- Dennis Wilson

Staff

- Dr. Terry Lehenbauer, Director
- Rowena Banks, Program Manager