



Protecting Food Safety in All Stages of Production

Established in 2002, the Western Institute for Food Safety and Security (WIFSS) is a pioneering center of excellence based in the School of Veterinary Medicine. Its unique mission encompasses the broad impacts of food production practices, infectious disease organisms, animal waste and water quality on human health. The center brings together leading scientists from academia and government to study specialized aspects of food safety research.

Farm to fork – The institute is the first to address all stages in the food production system from farm to fork, including such points as dairies, produce fields, processing plants, restaurants and other sites. The institute is one of the first research organizations to address foods of plant and animal origin in a holistic way to address the wholesomeness and safety of both types of food products.

A leading defender against agroterrorism – Faculty developed one of the first Department of Homeland Security emergency response programs dedicated to food supply emergencies caused by acts of agroterrorism or accidental contamination. Trainers have instructed more than 6,000 frontline responders in 80 communities and 25 states to strengthen their ability to prevent, detect, respond to and recover from agroterrorism events or other foodborne disease outbreaks.

Influential publications – WIFSS faculty have produced publications that have advanced scientific knowledge about the spread of infectious diseases through water sources, including irrigation water, reservoirs, agricultural runoff, dairy sites and wildlife. Examples include:

- *Animal Waste, Water Quality and Human Health*. A collaboration with the World Health Organization and numerous international scientists. The 2012 book is free and available online.
- "Introduction to Waterborne Pathogens in Agricultural Watersheds, Technical Note No. 9." The 2012 publication reviews the biology and medical ecology of waterborne pathogens in agricultural watersheds. The technical note also discusses the many management practices that landowners, regulators, and agencies can use to reduce their risks.

A new research framework – Faculty scientists supported by FDA funding have begun providing data on new research protocols that will support proposed produce rule variances under the U.S. Food Safety Modernization Act regarding grower practices.

Quantitative Predictive Risk Assessment Model – Faculty have completed field trials that form the basis for enhancing the Quantitative Predictive Risk Assessment Model, helping government agencies focus limited resources on the greatest risks and greatest opportunities to reduce risk, all to achieve the goal of improved produce safety.

Assuring clean irrigation water – Medical ecologists funded by the center perform ongoing microbial monitoring of irrigation water using high tech filtration techniques to detect pathogens and help growers assess food safety risks in their fields.

Managing wildlife risks to food safety – The Western Institute for Food Safety and Security is one of the few

organizations to test for pathogens in wildlife in and around produce fields. Veterinary scientists isolated *Campylobacter* from a population of free-ranging, feral swine investigated in California, during the 2006 spinach-related *E. coli* O157:H7 outbreak. Results underscored the importance of protecting raw vegetable crops from contamination by wild animals. Findings also led to a caution for hunters to be prudent when handling and processing wild swine meat. More recently, veterinary scientists have learned that amphibians and reptiles in wetlands located near fresh produce fields may harbor *Salmonella*, but they do not apparently pose a risk for *E. coli*.

National integrated food safety training – Faculty have developed the first national food safety curriculum and are providing one of the first training courses to integrate food-industry investigators at all levels and all points of the food production continuum. Program leaders have designed courses on specialty produce crops and dairies while simultaneously assisting the FDA to develop new accreditation standards for inspections, investigations and laboratory testing. The effort is part of the FDA competitive grants program geared to building an integrated national food safety system as mandated by the U.S. Food Safety Modernization Act of 2011.

Western Center for Food Safety – In a cooperative agreement between WIFSS and the U.S. Food and Drug Administration, WIFSS launched the Western Center for Food Safety and Applied Nutrition in 2008 to address research critical to high-priority public health issues concerning fresh fruits, vegetables and tree nuts. Faculty synthesize real-world research data and communicate it rapidly to stakeholders – the FDA, industry and consumers – to develop new policies, guide evidence-based food safety practices, and raise consumer awareness about food safety issues.

Engaged: Leafy greens, desert agriculture, raw milk facts – School faculty are actively engaged in the development of scientifically-based food safety metrics for leafy greens and tomatoes; identification of pre-harvest risk factors associated with desert agriculture; survival estimates regarding foodborne pathogens in recently watered produce crops; evaluation of the impacts of conservation practices on food safety; and more. Institute veterinarians also reach out to consumers and legislators to inform them about the risks associated with raw milk products.

Minimizing food safety threats in the home garden – In a 2011 study, equine veterinarians and food safety specialists determined that the use of raw manure from a sick horse to fertilize an edible home garden led to the spread of *Salmonella* all over the farm. The study underscores the need for more education about potential food safety hazards associated with using raw animal manure to fertilize edible home gardens.