



WIFSS
Western Institute for
Food Safety & Security

UC DAVIS
UNIVERSITY OF CALIFORNIA



WIFSS STRATEGIC PLAN 2020-2025:

BUILDING A FUTURE FOR THE NEXT GENERATION

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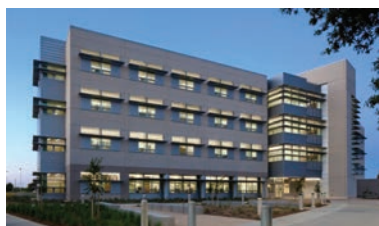
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EXECUTIVE SUMMARY

A VISION FOR THE FUTURE OF THE WESTERN INSTITUTE FOR FOOD SAFETY AND SECURITY

Humanity faces the daunting task to feed, house, and provide a healthy life for the growing global human population. At the same time, safeguarding and preserving the environment and natural resources for the benefit of future generations is paramount. Sustainable food production and environmental stewardship are needed to meet this enormous challenge and will require a One Health approach. One Health is the concept that the health of humans, animals, plants and the environment are inextricably linked. This approach can be applied



Dr. Schwabe coined the term “One Medicine,” in his book Veterinary Medicine and Human Health and he is considered the “father of modern epidemiology” and the visionary behind the One Health concept. In his book, he details the roots of One Medicine noting that traditional healers did not differentiate between practices used to heal animals or humans, the course of disease and treatment are essentially the same and fundamentally “there is only one medicine.” His work acknowledges the critical role of veterinary medicine in maintaining the health and wellbeing of food animals to ensure safe, affordable, and nutritious animal sourced foods for a growing

“

MISSION STATEMENT:

THE WIFSS MISSION IS TO SERVE THE GLOBAL COMMUNITY BY CONDUCTING RESEARCH, DEVELOPING EDUCATION, AND PROVIDING TRAINING IN AREAS OF FOOD SAFETY AND SECURITY TO ENHANCE THE HEALTH, SECURITY, AND WELFARE OF PEOPLE, ANIMALS, PLANTS, AND THE ENVIRONMENT.

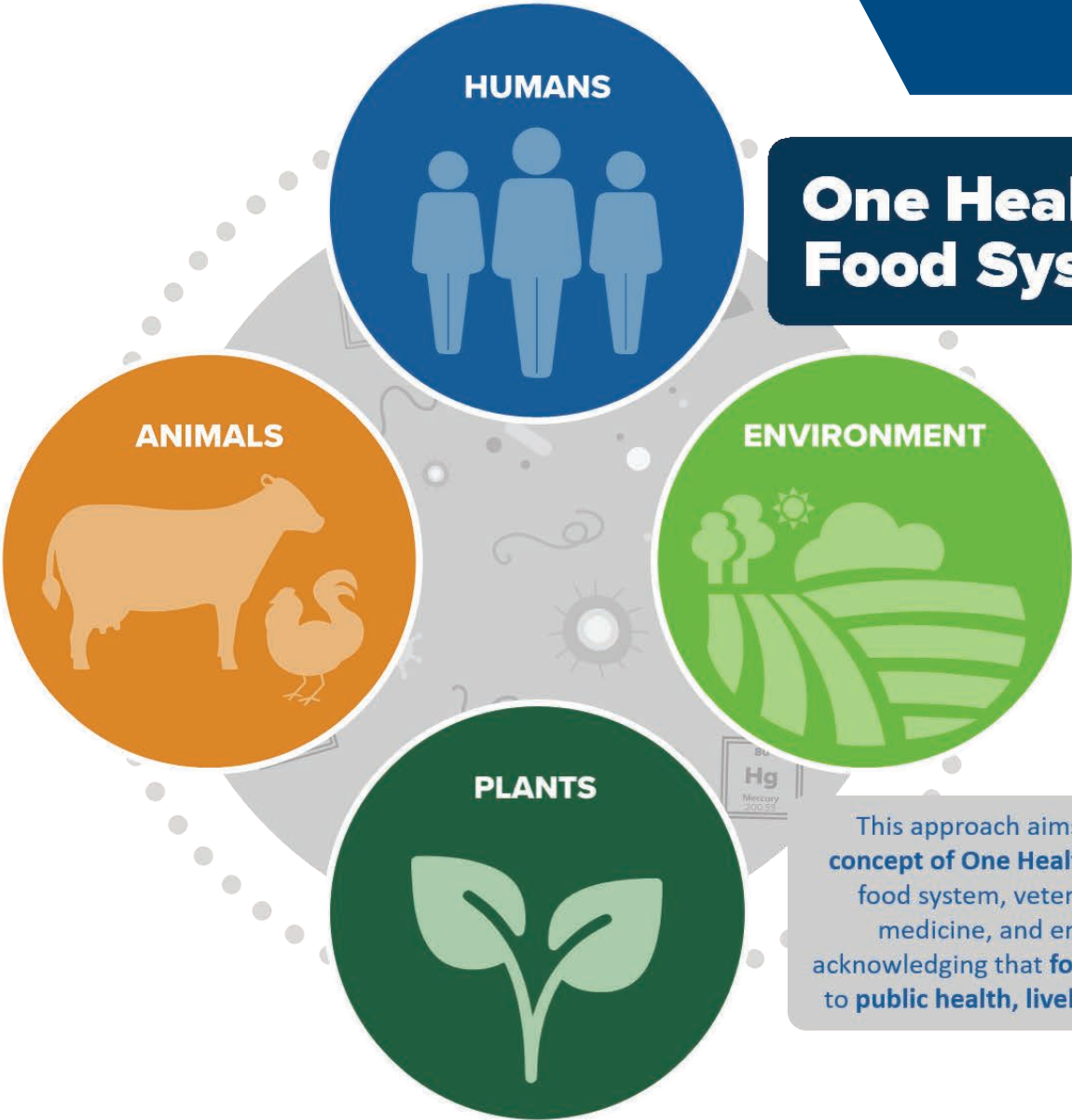
to food safety, sustainable food production, and environmental stewardship by bringing together interdisciplinary teams to create a One Health network to address these challenges. WIFSS is committed to “One Health for Food Systems” by working in areas that intersect human, animal, plant, and environmental health to address needs and challenges within the food system. Ensuring availability of nutritious, safe, and secure food in California and around the globe, advancing public health, and safeguarding natural resources for future generations is at the heart of our work at WIFSS.

The origins of One Health at UC Davis School of Veterinary Medicine reside with Dr. Calvin Schwabe, a UC Davis School of Veterinary Medicine Professor.

human population as well as the role of veterinary medicine in bridging the gap between animal and human health.

Veterinarians maintain animal health, perform meat inspections, bring new perspectives to veterinary and human public health, influence veterinary medicine curriculum, and play a critical role in policy and governance. Veterinarians are needed to address food safety and security challenges both globally and nationally. WIFSS aims to bring together disciplines in veterinary medicine, agriscience, human health, public health, and environmental health to improve health globally, ensure a safe, secure, and nutritious food supply, and improve livelihoods through advancing knowledge and education in food safety and food security.

EXECUTIVE SUMMARY



One Health for Food Systems 

This approach aims to establish a **broader concept of One Health** which incorporates the food system, veterinary medicine, human medicine, and environmental health – acknowledging that **food and agriculture** are tied to **public health, livelihoods, and social equity**.

FOOD SYSTEM CHALLENGES IN THE 21ST CENTURY

GLOBAL CHALLENGES



The global human population is expected to reach 9.7 billion people by the year 2050. ¹



13 zoonoses are responsible for a staggering 2.2 billion human illnesses and 2.3 million deaths per year, mostly in low-income and middle-income countries where the correlation between rates of protein malnutrition and incidence of endemic zoonotic diseases is 99%. ²



By the year 2050, food production will need to increase by more than 50% of 2012 production levels to meet demand. ¹



As incomes in developing countries continue to rise and living conditions improve, demand for meat, dairy and specialty crops such as fruits, nuts and vegetables has increased. ¹



U.S. CHALLENGES



The USDA estimates there will be a shortage of ~25,500 college graduates with experience in food, agriculture and renewable natural resources to fill the projected 57,900 career opportunities in this area by the year 2020. ³



Sixty three percent of established farmers are over 55 years old and less than 2% of the population is directly employed directly in agriculture in the United States. ⁴



There is a critical veterinary workforce shortage for rural communities and food-animal producers in the United States, only 5 to 8 percent of graduating veterinarians join private practices with an emphasis on food animals. ⁵

1. FAO. "The Future of Food and Agriculture – Trends and Challenges." Rome: Food and Agriculture Organization of the United Nations, 2017. <http://www.fao.org/3/a-i6583e.pdf>.

2. Kelly, Alan, Bennie Osburn, and Mo Salman. "Veterinary Medicine's Increasing Role in Global Health." *The Lancet Global Health* 2, no. 7 (July 2014): e379–80. [https://doi.org/10.1016/S2214-109X\(14\)70255-4](https://doi.org/10.1016/S2214-109X(14)70255-4).

3. Allan D. Goecker, P.U.E.S., U.S. Food and Drug Administration; J. Marcos Fernandez, Purdue University; and U.S.D.o.A. Ray Ali, NIFA; Rebecca Theller, Purdue University. *Employment Opportunities for College Graduates in Food, Agriculture, Renewable Natural Resources, and the Environment, United States, 2015–2020*. 2015; Available from: <https://www.purdue.edu/usda/employment/>

4. Ahearn and Newton, 2009; Bureau of Labor Statistics, United States Department of Labor, 2017

5. "Veterinary Medicine Loan Repayment Program: 5-Year Review 2010-2015." USDA NIFA, October 2015.

ARMS OF WIFSS

RESEARCH:

WIFSS recognizes the need for innovative research in emerging topics. WIFSS researchers have advanced knowledge in microbial food safety in animal health, crop systems, water quality, and environmental monitoring, which has resulted in millions of dollars in federal and state funded research programs. This work was the basis for FDA's establishment of the Western Center for Food Safety (WCFS), an academic Center of Excellence in partnership with WIFSS and the College of Agricultural and Environmental Sciences (CAES).

EDUCATION:

WIFSS recognizes the need to build an educated agriscience workforce capable of addressing food safety and food security challenges from farm to fork. The WIFSS mission in education aims to build competencies needed to meet current and future workforce standards for K-12, vocational, undergraduate, graduate, and professional levels through innovative pedagogical approaches.

TRAINING:

WIFSS recognizes continued education and training is vital for the current workforce to ensure food safety compliance, animal health and welfare, plant health, water quality, disaster and emergency response for the agriculture sector, and imparting innovative sustainable agricultural practices to farms and food processors.



STRATEGIC GOALS

GOAL 1

Provide research and education to equip and support stakeholders in agriculture and the food supply chain to address the needs and challenges in food safety and security for a diverse and growing global human population.

GOAL 2

Serve as stewards of scientific and regulatory information for stakeholders in agriculture to advance understanding, compliance, and promote best practices from farm to fork and throughout the global food system.

GOAL 3

Foster a creative environment of learning and intellectual freedom that supports and values development of innovative and entrepreneurial approaches to research and education.

GOAL 4

Bring together multidisciplinary stakeholders in exchange of dialog, knowledge, and principles to advance emerging and overlooked areas of scientific knowledge and foster impactful innovative partnerships for the advancement of science and education, globally.

GOAL 5

Foster educational programs emphasizing the application of One Health for Food Systems in developing countries of the world through innovative introductory and curricular programs for undergraduate and graduate students to prepare them for food system careers addressing the health of people, animals, plants, and the environment.



GOAL 1

PROVIDE RESEARCH AND EDUCATION TO EQUIP AND SUPPORT STAKEHOLDERS IN AGRICULTURE AND THE FOOD SUPPLY CHAIN TO ADDRESS THE NEEDS AND CHALLENGES IN FOOD SAFETY AND SECURITY FOR A DIVERSE AND GROWING GLOBAL HUMAN POPULATION.

CORE VALUES





- 🌍 Conduct multidisciplinary applied research on pre- and post-harvest food safety issues that will generate real-world solutions and enhance food protection.
- 🌍 Support the longstanding California Dairy Assurance Quality Program (CDAQP) in close collaboration with the dairy industry and research community.
- 🌍 Build relationships with domestic and international partners to successfully leverage resources and maximize the ability to achieve research and translate to education and outreach objectives.
- 🌍 Support advancements in reducing global and US burdens of endemic foodborne disease through a One Health approach that acknowledges the roles of soil, plants, animals, and humans, in complex ecosystem interactions.
- 🌍 Promote public awareness of translational research taking place at UC Davis School of Veterinary Medicine and College of Agricultural and Environmental Sciences and UC Agriculture and Natural Resources.
- 🌍 Advance and disseminate scientific knowledge to better serve and equip California's diverse population of farmers and farm workers to ensure safe and nutritious food for all Californians.



GOAL 2

SERVE AS STEWARDS OF SCIENTIFIC AND REGULATORY INFORMATION FOR STAKEHOLDERS IN AGRICULTURE TO ADVANCE UNDERSTANDING, COMPLIANCE, AND PROMOTE BEST PRACTICES FROM FARM TO FORK AND THROUGHOUT THE FOOD SYSTEM.

CORE VALUES

-  Provide agricultural producers with relevant education and training that can be deployed on-farm to improve communication and build teamwork between management and workers, and improve processes to safeguard animal health, human health, and environmental health for the economic benefit of agricultural producers.
-  Bridge the gap among agriculture, science, medical sciences, government, industry and public advocacy to promote dialog, cooperation, and mutual understanding of complex topics in the food system.
-  Provide translation of rigorous scientific topics in STEM and agriculture so that individuals with a non-science background can understand complex concepts.
-  Provide technical assistance to the farming community in adopting and complying with components local, state, and federal regulatory programs through outreach materials, food safety workshops, and educational programs for food producers, harvesters, processors and key stakeholders across the continuum of food systems.



GOAL 3

FOSTER A CREATIVE ENVIRONMENT OF LEARNING AND INTELLECTUAL FREEDOM THAT SUPPORTS AND VALUES DEVELOPMENT OF INNOVATIVE AND ENTREPRENEURIAL APPROACHES TO RESEARCH AND EDUCATION.

CORE VALUES

- 🌱 Apply innovative approaches to pedagogy to achieve learning outcomes that foster critical thinking, problem solving, and cooperation for students, trainees, and faculty.
- 🌱 Use problem-based learning strategies to achieve desired learning outcomes.
- 🌱 Provide and support a culture that extends the benefits of our research and education activities beyond the boundaries of the university.
- 🌱 Foster a creative environment of intellectual freedom that supports the development of an innovative and entrepreneurial culture to advance emerging and overlooked areas of scientific knowledge.



GOAL 4

BRING TOGETHER MULTIDISCIPLINARY STAKEHOLDERS IN EXCHANGE OF DIALOG, KNOWLEDGE, AND PRINCIPLES TO ADVANCE EMERGING AND OVERLOOKED AREAS OF SCIENTIFIC KNOWLEDGE AND FOSTER IMPACTFUL INNOVATIVE PARTNERSHIPS FOR THE ADVANCEMENT OF SCIENCE AND EDUCATION.

CORE VALUES

- 🌐 Advance the One Health for Food Systems approach with stakeholders to impart the concept and need for a safe, secure, nutritious, and sustainable food supply globally.
- 🌐 Build relationships with domestic and international partners to successfully leverage resources and maximize the ability to achieve research, education, and outreach objectives.
- 🌐 Bridge the gap among agriculture, medical sciences, social science, government, industry, and public advocacy stakeholders to promote dialog, cooperation, and mutual understanding of complex topics in the food system.
- 🌐 Foster exchange of knowledge and principles to foster impactful and innovative partnerships for the advancement of science and education.
- 🌐 Develop global educational programs for introducing the concept of One Health for Food Systems impacting the rapidly changing health needs of the global society.



GOAL 5

FOSTER EDUCATIONAL PROGRAMS EMPHASIZING THE APPLICATION OF ONE HEALTH FOR FOOD SYSTEMS IN DEVELOPING COUNTRIES OF THE WORLD THROUGH INNOVATIVE INTRODUCTORY AND CURRICULAR PROGRAMS FOR UNDERGRADUATE AND GRADUATE STUDENTS TO PREPARE THEM FOR FOOD SYSTEM CAREERS ADDRESSING THE HEALTH OF PEOPLE, ANIMALS, PLANTS AND THE ENVIRONMENT.

CORE VALUES

- 🌍 Provide education and training for K-12, vocational, undergraduate, graduate, and professional levels that builds competencies to meet workforce standards and best practices to ensure a proficient and adequate workforce of the future.
- 🌍 Support agricultural production and rural sustainability with accessing training on emerging topics such as disaster management, catastrophic animal disease, and approaches to sustainable agricultural practices.
- 🌍 Provide student based multidisciplinary learning programs using awareness examples designed for addressing local food system problems of food safety, food security, and sustainable food production.
- 🌍 Foster examples of problems that utilize interdisciplinary teams which can be implemented in train-the-trainer programs for addressing local food system challenges.
- 🌍 Prepare students to design and create call to action reports for informing others of existing and emerging challenges which need solving.



THE CALIFORNIA DAIRY QUALITY ASSURANCE PROGRAM

WIFSS & THE CALIFORNIA DAIRY QUALITY ASSURANCE PROGRAM

ORIGINS & MISSION

The California Dairy Quality Assurance Program (CDQAP) is an industry, regulatory and academic collaborative mission to promote the health of the consumer, the health of the environment, and the health and welfare of dairy livestock. The program was created through a partnership agreement in 1998 signed by fifteen agencies and industry organizations which included UC-ANR, USDA and three state cabinet-level secretaries. The original partnership grew to encompass every major dairy trade organization and dairy processor in the state. CDQAP recently celebrated its 20th anniversary.



AWARDS & RECOGNITIONS

The program and its leaders continue to receive numerous awards most notably including Governor Schwarzenegger's Environmental Partnership Award in 2007, the California Milk Advisory Board's Golden Seal Award in 2018 and most recently the Rominger Agricultural Sustainability Leadership Award and the North Coast Regional Water Quality Stewardship Award both in 2020.

FUNDING, PROGRAM INITIATIVES & WIFSS

Over more than two decades base-funding for the program has been supplied by the California Dairy Research Foundation (CDRF), typically about \$200,000 per year. The program aggressively pursues additional grants and collaborations. An economic analysis reported in 2014 estimated a 5-to-1 return for every industry dollar invested in the program.

WIFSS serves as the School of Veterinary Medicine's home for the CDQAP, the most comprehensive source of continuing education for the state's dairy producers. Some of WIFSS/CDQAP's recent and current projects are described below.

ENVIRONMENTAL HEALTH

Training & Outreach – Every year CDQAP provides classroom training to assist producers in meeting air and water quality laws and regulations. Over two decades this has resulted cumulatively in 12,665 in-person contacts and 39,410 hours of training. The program provides a comprehensive website containing all relevant course binder content, employee training tools, animal care topic papers and the monthly newsletter. The program offers a comprehensive on-line study course for dairy water quality that is a prerequisite for the program's environmental certification. The program conferences every two months with industry leadership on environmental issues.

Environmental Certification – CDQAP provides a third-party environmental evaluation certifying compliance with all federal, state and local laws and regulations. Certified producers receive a 50% reduction in state water fees, collectively saving our 700 producers more than \$2 million annually.



ANIMAL HEALTH & WELFARE

Animal Handling – In 2019, CDQAP partnered with the California Beef

Council, the National Cattleman's and Beef Association and Dairy Management Inc. to deliver a two-day dairy stockmanship workshop from the three most recognized "cow whisperers" in the country.

Secure Food Supply – WIFSS has been building on previous online and demonstration projects addressing prevention and response to foreign animal disease. This year WIFSS was awarded a \$560,000 grant from USDA-APHIS to pilot a program to assist dairy and poultry producers for creating enhanced, emergency biosecurity plans for three Western states.

FOOD SAFETY

Produce Safety – In 2019, CDQAP and WCFS-WIFSS acquired a \$45,000 grant from CDFA to bring together the dairy, feedlot and producer industries in two "Good Ag Neighbors" workshops that examined the scientific and regulatory aspects of contamination of fresh produce grown adjacent to CAFOs.

Antibiotic Resistance – CDQAP and WIFSS have consistently focused on new state mitigation requirements for livestock. This has included a suite of videos designed specifically for dairy producers. WIFSS/CDQAP is participating in CDFA's Antimicrobial Use & Stewardship (AUS) advisory group.

MORTALITY MANAGEMENT

Training & Outreach – Previously CDQAP and WIFSS managed the statewide Emergency Animal Disposal Workgroup which completed a white paper detailing dead-stock disposal challenges in California and completed \$300,000 worth of composting research. CDQAP is a local coordinator for a USDA composting demonstration to be held in March 2021.

Emergency Disposal Events – With disturbing regularity CDQAP managed the development of plans for emergency disposal of excessive carcasses resulting from either heat events (2006) or mechanical failures at rendering facilities (2017 and 2020). CDQAP has led the industry in gaining a promise from CDFA to create a livestock mortality management workgroup.

FARM SECURITY

Terrorism – In 2019, CDQAP partnered with producer and processor leadership, the FBI, Homeland Security, FDA and state ag and public health agencies for a two-day, table-top exercise modeling a deliberate contamination of the milk supply.

Ag Crime & Activists – CDQAP partnered with local sheriffs' offices and the FBI to deliver workshops throughout the state and seven additional dinner presentations focusing on prevention of rural crime and theft and dealing with activist and drone trespass. The program conferences every month with industry leadership on farm security issues.

Natural Disasters & Other Emergencies – An important attribute of CDQAP is the program's ability to provide critical timely outreach during times of crisis. In addition to the mortality

disposal crisis listed above in 2019-2020 the program nimbly responded with information for producer dealing with the COVID epidemic, and it's associated emergency on-farm dumping of milk, seasonal flooding, wind events and power loss and a number of catastrophic hay fires.

Farmer Mental Health – In the wake of both the 2008 and current recession CDQAP partnered with Colorado State University to deliver a webinar and resource webpage on *Addressing Stress, Depression and Suicide in Dairy Families*.



CURRENT PROGRAMS

WIFSS Outreach seeks funding and partnerships to provide education and training that build competencies to improve workforce standards and best practices to ensure a proficient and adequate workforce of the future. WIFSS has the unique ability to quickly pivot to address emerging challenges and gaps in educational content. Our educational programs cover a wide range of topics in food safety, food security, animal health, zoonoses, agroterrorism and emergency response for rural communities. Many of the WIFSS educational programs are focused on these needs and are vital in maintaining a safe, secure, and sustainable food system. Many of our partnerships and grant awards work towards this goal.

WIFSS OUTREACH

STATE PROGRAMS

OUTREACH AND TRAINING FOR URBAN FARMERS IN NORTHERN CALIFORNIA

California Department of Food and Agriculture Specialty Crop Block Grant

\$384,699, FY 2021-2024

PI – Sara Garcia

Co-PI – Bennie Osburn

The Western Institute of Food Safety and Security and University of California Cooperative Extension, Urban Agriculture and Food Systems Program will work with urban farmers in the Sacramento Valley region and the San Francisco Bay area to conduct education and training with urban farmers. Many

urban farmers are new farmers from historically underrepresented groups and live in low-income areas that experience food insecurity. This project aims to assist resource-limited, Black, Indigenous, and People of Color (BIPOC) urban farmers in attaining education and resources for economic prosperity in growing specialty crops by reducing barriers in the following areas, the Food Safety Modernization Act-Produce Safety Rule (FSMA-PSR) risk assessment, soil management, accessing markets, and COVID-19 resources for agriculture. This will be accomplished by building a BIPOC community network to facilitate the communication and exchange of knowledge among BIPOC urban farmers to empower communities in wealth creating and food security.

FSMA PRODUCE SAFETY RULE ALIGNMENT FOR CA SPECIALTY CROP GROWERS

California Department of Food and Agriculture Specialty Crop Block Grant

\$385,842, FY 2017-2020

PI – Bennie I Osburn

PM – Heather Johnson

Purpose: To create online educational modules and build a resource library to assist small to medium specialty crop growers in understanding regulatory requirements and implementation of the Food Safety Modernization Act Produce Safety Rule (FSMA-PSR) on-farm. This educational program provides opportunities to complete the FSMA-PSR required Produce Safety Alliance Growers Training certification course, as well as knowledge and practices farmers can implement on-farm for employee training and recordkeeping, which meets the regulatory compliance requirements of FSMA-PSR.

FOOD DEFENSE AND FSMA: HOW TO MODEL RISKS, VULNERABILITIES AND IMPLEMENT MITIGATION PLANS

California Department of Food and Agriculture Specialty Crop Block Grant

\$374,989, FY 2017-2020

PI – Bennie I Osburn

PM – David Goldenberg

Purpose: Under the Food Safety Modernization Act (FSMA) Mitigation Strategies to Protect Food Against Intentional Adulteration (Food Defense Rule), Food and Drug Administration (FDA) registered food facilities are required to develop a food defense plan to protect against intentional adulteration. This project will assist California specialty crop facilities meet this new requirement through an online program on creating a food defense plan with model plans representing various specialty crop industries. Representative specialty crop companies of various size and complexity will be recruited to develop model plans. The food defense plans will contain a vulnerability assessment, mitigation strategies and management, and training and recordkeeping. The result will be a formal food defense plan for each volunteer company and template plans for use by all impacted California specialty crop facilities. The project will include a social media outreach plan and a limited number of workshops to socialize the project.

SECURE FOOD SUPPLY CONTRACT

California Department of Food and Agriculture

\$162,000, FY 2018-2020

PI – Bennie I Osburn

PM – Heather Johnson

Purpose: WIFSS went into contract with CDFA in 2017 to assist in the development of the California Secure Food Supply (SFS) program and to provide video training resources to train pre-service veterinarians at UC Davis. The CA SFS program was developed to align with the USDA SFS program, however, there are unique aspects to the program build in California for the agricultural industries in our state. The main objective of the CA SFS is to ensure continuity of business during an animal disease incident, while also protecting the industry from catastrophic destruction due to wide-spread distribution of the disease. WIFSS Outreach was tasked with designing and building template documents for dairy and poultry farmers to use in developing enhanced biosecurity plans that are required by the CA SFS program. The use of this tool will help farmers more quickly develop the required biosecurity plans while also reducing the time required by CDFA employees to assist in reviewing and correcting plans that are submitted to the program. In addition to the template documents, WIFSS has also been tasked with providing instructional video and graphic resources to further assist CDFA with communication and training on the CA SFS program. The audience for this project are CA poultry and dairy farmers, as well as CDFA staff and allied industry groups that seek to assist farmers in the development of the required CA SFS plans.

The development of teaching materials to train pre-service veterinarians at UCD-SVM included the production of a ~20 minute video on official ID tags that are found on food animals. The content and script was written and thoroughly reviewed by CDFA staff. Precise images of all official ID tags and markings were provided to WIFSS along with the highly vetted script so that an extremely correct teaching aid could be produced and used annually at UCD-SVM for the training of large animal vet students. This tool will be used in a laboratory setting and will ensure that every student will receive the same training every session, and that students will have a foundational reference that can be used as they work in the field. The audience for this video is pre-service veterinary students at UCD-SVM.

NATIONAL PROGRAMS

ENGAGING ASIAN AMERICAN AND PACIFIC ISLANDER (AAPI) GROWER EDUCATIONAL NEEDS FOR SAFE FRUIT & VEGETABLE PRODUCTION IN HI & CA

USDA Food Safety Outreach Program Cooperative Agreement - Sub awardee

\$545,600, FY 2021-2024

PI – Sara Garcia

Co-PI – Bennie Osburn

Purpose: The project entitled “Engaging Asian American and Pacific Islander (AAPI) Grower Educational Needs for Safe Fruit & Vegetable Production in HI & CA” aims to provide Food Safety Modernization Act – Produce Safety Rule (FSMA-PSR) resources to socially-disadvantaged AAPI fruit and vegetable growers in Hawaii and California. Nationally, AAPI growers constitute 28,000 growers, earning \$7.5 billion in annual produce sales, but they can have difficulty in accessing critical food safety information like FSMA-PSR due to limited English proficiency. The project team proposes to 1) Translate the WIFSS supplementary FSMA-PSR e-course and associated resources into Ilocano and Mandarin for AAPI growers in Hawaii and California, 2) Identify and address gaps in course curricula and content by obtaining feedback from stakeholders, 3) Migrate the FSMA-PSR online course and resources to a dedicated website that can support demand and user traffic, and 4) Conduct FSMA-

PSR outreach to AAPI growers and stakeholders, which includes PSA Grower Trainings and workshops showcasing the newly translated e-course website and materials. The team will collaborate with partners such as the Produce Safety Alliance and the Western Region Center to Enhance Food Safety to gather feedback and disseminate project outcomes to agricultural stakeholders.

PREPARATION AND RESPONSE TO CATASTROPHIC ANIMAL DISEASE: REMOVING CRITICAL OBSTACLES TO READINESS IN THE WESTERN STATES

USDA National Animal Disease Preparedness and Response Program (NADPRP) Cooperative Agreement \$563,000, FY 2020-2022

PI – Bennie I Osburn

PM – Michael Payne

Co-PI – Sara Garcia

Purpose: State animal health officials responding to END, HPAI and vND outbreaks in the western states report that disease control efforts are significantly hampered by both industry's lack of preparation and inability to support regulatory goals. Specifically, animal rearing and processing operations cannot assist first responders by quickly implementing enhanced biosecurity plans and cooperating in monitoring and reporting programs. WIFSS has been given funding to create a University-Federal-State-Industry partnership, facilitating preparation and response to catastrophic outbreaks of foreign animal diseases. We will create novel on-line tools and in-person training, tailored to increasing industry (poultry and dairy) awareness and activities that will facilitate response in California, Oregon and Arizona. Co-training of state, federal, academic and industry stakeholders will build alliances and allow industry representatives to act as a "force multiplier", dramatically improving industry preparedness and amplifying regulatory response. The main objectives of this new project include providing a complete and comprehensive needs assessment by surveying the industry; creating novel educational tools and an online biosecurity learning center that will house resources for farmers who are developing their own enhanced biosecurity plans; and coordinate and deliver in-person, on-farm biosecurity demonstration events that will be paired with train-the-trainer workshops for allied industry groups who will be assisting farmers in the development of enhanced biosecurity plans. The audience for this project includes regulatory officials from CA, OR, and AZ along with industry stakeholder groups who seek to support farmers in meeting the requirements of the secure food supply programs in each state. This project proposal was widely supported by state veterinarians from all three states, and the regulatory agencies that oversee the secure food supply programs in each state.

PROVIDING APICULTURE EDUCATION TO VETERINARIANS TO SUPPORT BEE HEALTH AND FOOD SAFETY

USDA Specialty Crop Multi-State Program

\$474,328.00, FY 2018-2021

PI – Bennie I Osburn

PM – Elina Niño

The Western Center for Food Safety and Security (WIFSS) has partnered with Elina Niño and Bernardo Niño at UC Davis E.L. Niño Bee Laboratory, Jonathan Dear at UCD School of Veterinary Medicine, and Ramesh Sagili at Oregon State University Honey Bee Laboratory to create a new course designed to educate veterinarians in treating diseases of honey bees through an award from the USDA Specialty

Crop Multi-State Program. Veterinarians play an important role in maintaining animal health of many species to ensure that people have plentiful, safe, and nutritious food. As a food producing animal, honey bees are included. Honey bees are vulnerable to highly contagious bacterial diseases, such as American foulbrood, and veterinarians are necessary to oversee the proper use of antibiotics in apiaries to treat bacterial disease. The program developed at UC Davis, will train veterinarians, apiculture educators, and bee keepers to better understand the prudent use of antibiotics, the Veterinary Feed Directive (VFD), bee biology, and bee keeping. Training will be provided through a comprehensive online bee biology course and a hands-on bee keeping program and covers honey bee biology, beekeeping techniques and tools, and information regarding the new laws that govern antibiotic use in apiculture. The oversight veterinarians provide in prescribing antibiotics helps prevent the development of antibiotic resistant bacteria, enhances food safety and ultimately safeguards the health of human, animal, and environment. By bringing veterinarians together with apiculturists through education, we can maintain strong, healthy colonies for specialty crop pollination and safe honey production for consumers. This program highlights the unique role WIFSS plays in bringing together experts from SVM and CAES to address important emerging issues at the interface of animal health, veterinary medicine, food safety, and public health.

RURAL DOMESTIC PREPAREDNESS CONSORTIUM (RDPC) CONTRACT

\$522,000, FY 2016-2019

PI – Bennie I Osburn

PM – Heather Johnson

Purpose: WIFSS has been under contract with RDPC for 12 years to deliver training on disaster preparedness for animals, agriculture, and food sectors. The courses we have written and currently deliver are focused on raising awareness in rural communities about the risks and vulnerabilities that are present and how planning and preparing can lessen the impact of all hazards disasters when they occur. One topic that is covered is agroterrorism - intentional adulteration of food with the intent of causing harm. Trainings have been completed in nearly every state in the U.S., and several U.S. territories. The audience for the training efforts in this program include emergency managers, first responders, animal control, USDA, Dept. Public Health, farmers, ranchers, and faith-based organizations that may be involved in a disaster response.

DELAVAL TRAINING VIDEO SERIES CONTRACT

\$190,000, FY 2015 – 2020

PI – Bennie I Osburn

PM – Heather Johnson

Purpose: WIFSS and Delaval have been working collaboratively since 2015 to develop a series of mutually beneficial educational videos. To date, WIFSS has produced over 25 short (2 - 4 minute) informational videos that serve to enhance the information that DeLaval can offer to customers, as well as adding to WIFSS's educational endeavors for One Health in Food Safety Program. Both WIFSS and Delaval provided a list of topics to be considered by the group for production. Topics that were selected were decided to be mutually beneficial. The WIFSS Instructional Design Team worked with designated individuals from Delaval to develop scripts and storyboards of the topics. WIFSS provided a videographer and graphic designer for the production and editing of the filming. All videos were filmed on actual working dairy farms in California, or at the UCD SVM teaching dairy. The audience

for these videos is primarily dairy producers and DeLaval customers, however, the videos have proven valuable in classroom teaching at the Western Veterinary Schools and have been used in the One Health Conferences.

INTERNATIONAL PROGRAMS

ONE HEALTH CONFERENCES FOR CHINESE UNIVERSITIES AND COLLEGES

\$1,069,000 FY 2016-2020

PI – Bennie I Osburn

PM – Chris Brunner

Title - NAU-UC Davis One Health for Food Safety Program

SUMMARY – Nanjing Agricultural University and WIFSS/ UC Davis School of Veterinary Medicine have an ongoing program to establish a One Health Program for Animal Health and Food Safety. The original program between NAU and UC Davis has expanded to include Massey University and Wageningen University Research now called the Global One Health Program.

The program consists of two separate activities:

- 1) To hold two annual symposiums for developing collaborative research programs for graduate student training opportunities
- 2) To introduce undergraduate and graduate students to the concept of One Health as it applies to food systems. The conferences are directed toward introducing the students to One Health as it applies to food systems. A high percentage of these students go on for post graduate studies or veterinary schools around the world. To date, over 400 students have gone through our program. Our program is now going online since there are travel restrictions on the students. We are informed that our conferences are the most popular one for NAU students.

Timeline – no limit

Target Audience –NAU faculty and undergraduate and graduate students

December 2 – 7, 2019: Academic Committee Meeting of the Joint International Research Laboratory of Animal Health and Food Safety of the Ministry of Education, China; a.k.a. “International Academic Symposium,” held at Nanjing Agricultural University, (NAU). The Joint International Research Laboratory of Animal Health and Food Safety at Nanjing Agricultural University in China was approved by the Ministry of Education in 2017. The laboratory focuses on important scientific and technological problems related to the economic and social development of China. There is in-depth research cooperation between domestic and international scientists on animal pathogens epidemiology, pathogenic and immune mechanisms, digestive tract nutrition and animal product quality, meat quality safety and nutrition. The two sides have made important progress in academic exchange, scientific research cooperation, and joint training.

May 28-30, 2019: One Health for Food Safety and Animal Health Symposium: Pathogenesis, Prevention and Control Technologies of Important Transboundary Diseases, held at UC Davis. WIFSS hosted the international symposium connecting UC Davis, Nanjing Agricultural University, Massey University, and Wageningen University and Research Center. During the 3-day symposium, administrators and faculty from the four institutions collaborated on planning for the establishment of a diagnostic laboratory to be located at NAU. The laboratory will begin to address common food

system problems. The symposium brought together faculty from multiple disciplines to address emerging diseases such as African Swine Fever. The emphasis of discussions focused on using a One Health approach for diagnosing the disease through collaborative efforts involving scientists such as pathologists, epidemiologists, virologists, and immunologists. This team has the capability to track where sick and dying animals are located; determine how best to prevent the spread of the virus; produce vaccines; determine how the virus causes the types of lesions and the pattern of lesions for diagnostic purposes; and evaluate the spread of the virus in the environment. These exercises are key approaches for diagnostic laboratories. In addition, there was discussion on vector borne diseases and antibiotic resistance, both societal disease issues of which the School of Veterinary Medicine plays an important leadership role.

January 27 – February 16, 2019: NAU-UC Davis Education Conference on One Health for Food Safety and Security, sponsored by Nanjing Agricultural University and hosted by WIFSS. The 3-week conference held at UC Davis provided in-depth educational experience for 34 undergraduate students and two teachers from NAU to learn about the importance of applying a One Health approach to solving problems concerning food safety and security, and animal health. The comprehensive program included lectures, field trips, and team-building exercises which increased the students' awareness of taking a multidisciplinary approach to solving complex problems concerning the health of people, animals and the environment. This One Health approach to solving problems is critical in promoting progress towards safer, better quality food systems and healthy animals in China.

August 12 – 30, 2019: One Health for Food Systems Conference: Integrating Veterinary, Food, Animal and Agricultural Engineering Sciences, 3-week conference sponsored by NAU and hosted by WIFSS, held at UC Davis, was attended by 30 undergraduate students and 2 teachers from NAU. Five student teams chose as their presentations for the last day of the conference: 1) Ocean Pollution; 2) Greenhouse Gases of Cattle; 3) War Against E. coli, 4), Application of Artificial Intelligence (AI) in Prevention and Treatment of Mastitis; and 5) The Bullfrog Story which highlighted the importance of food safety regulations at Hot Pot restaurants.

Title – Collaboration with Jiangsu Agri-animal Husbandry Vocational College (JAHVC)

SUMMARY – Five years ago, WIFSS/SVM was asked by JAHVC to provide an introduction of the One Health concept to their faculty as well as representative faculty from other vocational colleges in China addressing animal health and animal science. This introductory course is similar in format as the conferences for students from NAU. To date 102 faculty from other vocational colleges throughout China have joined their counterparts from JAHVC. These faculty are returning to their respective colleges and integrating information into their colleges program.

October 14-16, 2019: “Schedule of the Second Council Meeting of the Higher Vocational Education International Alliance for Agri-husbandry,” held at UC Davis, included representatives from seven colleges including China, the United States, Australia, and South Africa. The governing council meeting of the Higher Vocational Education International Alliance for Agri-Husbandry (HVEIAA) was sponsored by Jiangsu Agri-animal Husbandry Vocational College, (JAHVC), and hosted by UC Davis WIFSS, and was under the direction of Wenlin Ji, Chairman of the Alliance and former President of JAHVC. Bennie Osburn, co-Chairman of the Alliance, hosted the 2-day event. Ji and Osburn were joined by 12 members of the governing council. Dean Michael Lairmore, UC Davis School of Veterinary Medicine, was the keynote speaker on Tuesday where he gave a presentation on **“Promotion of a Global Partnership for Animal, Human & Environmental Health.”** The Alliance can play a role is

educating vocational faculty to be global leaders in promoting a safe and sustainable food supply from the farm to the table. The urgency of a new approach of addressing the complex issues on a global basis are associated with issues such as alleviating poverty, recognition and control of new and re-emerging zoonotic diseases, providing safe foods on a global basis that will provide a sustainable food supply, and maintain a safe and healthy environment for animals and people throughout the world. Educating undergraduate students about the interconnection between the health of people, animals, plants, and the environment is the cornerstone to solving the complex problems that threaten the health of our planet. The Alliance then voted to accept One Health as a cornerstone of their future educational programs.

August 5 – 13: Integrating One Health for Agriculture and Veterinary Sciences hosted by WIFSS and sponsored by Jiangsu Agri-animal Husbandry Vocational College, and held at UC Davis, featured a panel discussion on transboundary diseases discussed epidemiology's role in mitigating the spread of African Swine Fever in China and the potential economic and health impacts of African Swine Fever on small rural farmers. In addition, the faculty were introduced to the concept of problem-based learning which they plan to include in their educational programs.

RWANDA – DAIRY PRODUCTION AND FOOD SAFETY PROGRAMS

\$82,000 and In-kind Collaboration, FY 2016-2020

PI – Sara Garcia

Summary – The WIFSS dairy production and food safety programs at WIFSS originated through work done at the Dairy Food Safety Laboratory (DFSL) at the UCD SVM. DFSL partnered with the UCD Global Healthshare Initiative to secure a subaward from USAID Rwanda Dairy Competitiveness Program II. The subaward aimed to implement a One Health integrated education, training and research program by bringing together stakeholders from academic, government and industry to participate in a comprehensive animal health and dairy production management course and learn about the One Health approach to dairy production. This program ran from 2012-2016 and successfully trained 25 professionals in animal health, milk microbiology, and research design and conducted in-field research over the course of 16 weeks. The study enrolled 100 smallholder dairy farmers with cows less than 30 days in milk in an animal health and management program. Outcomes of this research showed a gain of knowledge among participants in animal health, mastitis management and research and study design. Smallholders that participated showed a gain in knowledge and compliance to the animal health and management program and cattle showed a decrease in total bacterial count over the 16-week program.

This work resulted in Dr. Sara Garcia receiving a Fulbright Scholar award to Rwanda for the 2017-2018 academic year, a UCD Blum Center Poverty Alleviation through Sustainable Solutions grant, and a gift award from Humanity Beyond Barriers non-profit organization. Dr. Garcia conducted postdoctoral research and was appointed as a faculty member at University of Rwanda-CAVM where she taught project management and microbiology. Dr. Garcia's Fulbright research is epidemiological work to determine prevalence of Brucella and Bovine Tuberculosis in dairy cattle in Rwanda. Dr. Garcia and Rwandan colleagues received a research award from the Dutch Government to assess economic constraints on smallholder dairy farmers in Rwanda. Dr. Garcia continues her collaborations and mentors faculty at UR-CAVM in career development. Several faculty have attended Masters and Ph.D. programs in molecular biology and animal healthy as a result of these partnerships.

BUILDING NATIONAL CAPACITY TO PROTECT AGAINST HYBRID THREATS AND WARFARE IN AGRICULTURE AND FOOD CHAIN

Swedish Board of Agriculture Collaboration

\$165,000, FY 2019-2021

PI – Bennie I Osburn

PM – David Goldenberg

Purpose: 1. Support the project/project director in developing texts/presentations with the aim to educate/inform decision makers and other stakeholders in Swedish authorities on threats to food and feed production. The support is foreseen to be the form of access to educational materials at WIFSS as well as providing insights and suggestions to texts that will be written by project director (Haralampos Keremidis). Keremidis will, once a year while the project is ongoing, have a scheduled longer visit at WIFSS to work with this as well with the below mentioned assignments. Delivery, October 1, 2021. 2. Collaboration in Outreach-programs in the subject. 3. Collaboration in providing an overview of research and other academic related developments in the field of agroterrorism, agro-crime, and other related antagonist threats in the U.S. for the project. 4. Helping to enhance knowledge of an InfraGard-type system to actors involved in the project. The audience for this project includes the Swedish Board of Agriculture, Swedish National Defense University, Swedish National Food Agency, Swedish Veterinary Institute, Public Health, Law Enforcement, Emergency Service agencies as well as Swedish academic institutions.

PENDING SUBMISSIONS

HARVESTING, HANDLING, AND FOOD SAFETY TRAINING FOR COMMUNITY FOOD PROVIDERS

California Department of Food and Agriculture Specialty Crop Block Grant

\$469,880, FY 2022-2025

PI – Sara Garcia

Co-PI – Bennie Osburn

This project will add new educational modules to the current WIFSS FSMA-PSR e-course which will cover post-harvest handling and food safety. This project will provide just-in-time (JIT) training for Community Food Providers (CFPs) such as small and urban produce farmers, food gleaners, and emergency food distributors that work in low-income communities and respond to disasters. CFP workers and volunteers are in need of JIT for post-harvest handling and food safety. Topics include 1) FSMA-PSR: Packing, and Holding of Produce, 2) Regulatory Requirements for the Distribution of Donated Foods Related to Produce, 3) Conduct outreach to CFPs. This will be accomplished by building a community network to facilitate outreach and training by providing culturally appropriate education and training to CFPs, thereby ensuring the viability and increasing access of Ca specialty crops, and enhancing the safe handling and distribution of specialty crops in food insecure disadvantaged communities of Ca.



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