

2021 UC ANR CE Position Proposal (Specialist)

Position Title: Food Crop Safety Specialist

Position: This is a 80% Cooperative Extension (CE), 20% Organized Research (OR) position based in the Department of Microbiology and Plant Pathology at UC-Riverside. The position will lead an integrated, statewide extension and research program with the goal of improving the safety of plant-based food production in California. An emphasis of the extension program on education and implementation of the Food Safety Modernization Act (FSMA) is expected. Food safety may be addressed from the perspective of contamination by microorganisms and/or microbial-produced toxins and their effect on the human gut microbiome, and may span the production chain from pre-harvest (growing and harvesting conditions) to post-harvest (handling in packing houses, transit, and marketing displays). Taking advantage of the multidisciplinary strength in Microbiology at UC Riverside, the Specialist will collaborate extensively with Microbiologists and Plant Pathologists studying plant, soil, and animal gut microbiomes. The position will be filled by an individual holding a Ph.D. degree and postdoctoral experience in microbiology, plant pathology, microbial ecology, molecular genetics or a closely related field. Experience with food-borne human pathogens or food crop production safety is required.

Justification: As demand for nutritional, fresh produce increases, it is essential to ensure that the supply is consistently safe. Mitigating food-borne pathogens and microbial toxins is critical for improving the overall health of Californians and the value of food produced in California, both for domestic markets and for export. A major driver for this position is increased demand for local and home-grown produce, which is more challenging to produce within the strict food safety regulatory requirements of large-scale agriculture. There is also interest in reducing waste in the food production chain by, for example, marketing lower quality produce previously considered unmarketable, which may increase food safety challenges.

Regulatory pressure on the safe production of food has increased dramatically in recent years. Domestically, implementation of the FSMA has brought a wave of new regulations. Internationally, the stringent limits the European Union places on contaminants such as aflatoxin present a persistent challenge for California agriculture. Concurrently, increasing awareness of foodborne illness has reduced tolerance for and increased the costs of outbreaks. Extension and research are needed to assist stakeholders in meeting regulations.

The position is at the core of the UC ANR Strategic Vision 2025 Initiative to “Ensure Safe and Secure Food Supplies”. In addition, the position aligns with several other strategic initiatives, including “Enhance Competitive, Sustainable Food Systems,” “Increase Science Literacy in Natural Resources, Agriculture, and Nutrition,” and “Enhance the Health of Californians and California’s Agricultural Economy.” Finally, the position supports the AES mission at UC Riverside and builds capacity within the UC ANR Food System Resilience Network, and secondarily within the Health Resilience Network.

Extension: The 80% CE component of this position will mainly involve developing and educating stakeholders about methods for identifying, tracing, and reducing contaminants or sources of food spoilage in the food production chain. This will include, for example, the implementation of good agricultural practices along with food safety programs in a diverse range of production systems. Any entity at any point in the food production chain is a stakeholder for the Specialist, including growers, processors and packing houses, shippers, cooperatives and commodity groups. Interactions include engaging with stakeholders on identifying priority issues, current practices, and best ways to apply research information, developing and holding workshops or other trainings to convey best practices, and dissemination of research information through written, oral or other means.

Research: The 20% OR component of this position will involve conducting research to address questions such as: How to best detect pathogens? How can water sources with bacterial or other types of contamination be disinfected or otherwise purified? How can solutions be adapted to both conventional (high- and low-input) and organic growers? What types or physical forms of microbial contamination are most damaging

to the human gut? Possible outlets for publication of research include *Food Microbiology*, *Applied and Environmental Microbiology*, *Microbiology*, *PLoS ONE*, *BMC Microbiology*, *Journal of Food Protection*, *Journal of Agricultural and Food Chemistry*, *Phytobiomes*, and *California Agriculture*.

ANR Network: The Specialist will support and interact with advisors throughout the state responsible for a crop commodity, especially in Central and Southern California counties (Fresno, Imperial, Kern, Kings, Riverside, San Diego, San Luis Obispo, Santa Barbara, Tulare, Ventura). The Specialist would be expected to interact with and complement CE Specialists at UC Davis working in food safety such as Erin DiCaprio and Linda Harris. The Specialist will interact with other Specialists and AES scientists in the areas of environmental science, plant pathology, and plant science at UC Riverside (Jim Adaskaveg, Mary Lu Arpaia, Milt McGiffen, Alex Putman, Philippe Rolshausen). In particular, the Specialist will benefit from the longstanding strength in Microbiology at UC Riverside, and develop new synergisms with the rapidly expanding core of AES and non-AES scientists in the Department of Microbiology and Plant Pathology studying the plant and animal gut microbiomes. These include plant microbiome faculty Emma Aronson, James Borneman, Emma Gachomo, and Caroline Roper and the expanding Gut Microbiome faculty cluster that includes James Borneman, Patrick Degnan, and Ansel Hsiao, as well as several additional faculty in the College of Natural and Agricultural Sciences and the School of Medicine. Finally, the Department of Microbiology and Plant Pathology is requesting a faculty position in Food Safety and the Human Microbiome that will bridge the plant and animal microbiome faculty groups. Program Teams (PT) and Workgroups (WG) that would benefit from this position include: Consumer Food Safety PT, Plant Pathology WG (Pest Management PT), Pomology PT, Vegetable Crops PT, Viticulture PT, and Agronomic Crops PT.

Network External to ANR: The Specialist will interact with the CDFA, Department of Public Health, FDA and USDA-ARS, and county agricultural commissioners on regulatory matters and methods of pathogen detection.

Support: This position will be located at the UC Riverside Department of Microbiology and Plant Pathology. The department will provide office, laboratory and greenhouse space, selected equipment and administrative support. The College of Natural and Agricultural Sciences at UC Riverside will be expected to supply a portion of the start-up funds and money for travel.

Other support: Support is expected from commodity groups, the food processing industry, statewide programs including CDFA, and federal regional projects. Collaborative projects with plant or animal microbiome researchers may also receive support from USDA, NSF and NIH.

Headquarters and Coverage Area: The position will be based at UC Riverside. This is ideally located for serving Central and Southern California, with relatively close access to Fresno, Imperial, Kern, Kings, Riverside, San Diego, San Luis Obispo, Santa Barbara, Tulare, Ventura. These are important production areas for grapes, berries, tree fruits and nuts, citrus and avocado, and a variety of vegetables such as lettuce, spinach, peppers, broccoli, melons and carrots. UC Riverside is also located close to the ports of Long Beach and Los Angeles, major points in the export/import chain and near three of the top five largest metro areas in California (i.e., Los Angeles, San Diego, Riverside-San Bernardino) with more than 17 million Californians.

Developed and proposed by: The faculty of the Department of Microbiology and Plant Pathology at UC Riverside developed the original position in 2016 and renewed its enthusiasm for the position in 2021. This year, we have consulted with the UC ANR Pest Management and Vegetable Crops workgroups regarding the position, and also obtained advice and support from others including California Leafy Greens, the Citrus Research Board, the California Citrus Quality Council, and California Walnut Commission.