

Assistant Professor of CE for Agricultural Toxicology

Position Title: The Assistant Professor of CE for Agricultural Toxicology is unique because it will provide support across multiple programs. Toxicology is a key component of the One Health concept, which focuses on protection of human, animal, plant, and environmental health. This CE Agricultural Toxicologist will focus on key continuing and emerging toxicological issues facing the state of California driven in part by climate change, the urban-wildfire interface, water scarcity and quality, the drive for alternative feeds to sustain food animal agriculture, and water and soil pollution arising from pesticide use (including from a burgeoning illegal marijuana industry), and fuels and minerals extraction. Collectively, these issues are a challenge to food animal agricultural sustainability, food safety, and to a sustainable environmental health. The individual hired in this position will conduct outreach and applied research to ensure agricultural sustainability in California.

Position: The successful candidate will have expertise or training in toxicology, agricultural or veterinary sciences, environmental health and/or public health. Desired experience includes a good understanding of California agriculture, demonstrated understanding of the connectivity between continuing and emerging toxicological issues impacting California agriculture, and the potential to develop integrated strategies that reduce the risk of toxic exposures to humans, animals, plants, and the environment. Key roles are to safeguard human, animal, plant, and environmental health from direct and indirect effects of toxicological threats. A particular expectation is effective communication with producers, scientists, and the public, including those participating in urban and backyard farming. Advanced degree (PhD, DVM or equivalent) is required. This position will interact closely with AES faculty, the California Animal Health and Food Safety Laboratory (CAHFS), UCCE Specialists and Farm Advisors, I&R faculty, the California Department of Food and Agriculture (CDFA), and the California Environmental Protection Agency (CalEPA) divisions focused on water quality, food safety, feed safety, and risk communication including the Office of Environmental Health Hazard Assessment (OEHHA) and the Department of Pesticide Regulation (CDPR).

Justification: The position will meet several of UCANR strategic initiatives. We face many interrelated problems and challenges in our efforts to safeguard our food supply and human, animal, plant, and environmental health while sustaining California agriculture. California is a major agricultural state, but the sustainability of food animal agriculture is being threatened by worsening droughts and water scarcity for animal production. Contaminants such as dioxins and polyaromatic hydrocarbons arising from wild and urban fires are a potential threat to water and feed quality. Research on this topic has barely begun and much ground remains to understand the long-term human and livestock health impacts. Worsening droughts are forcing stakeholders to consider alternative sources of water, including disinfected tertiary recycled water (DTCW) for livestock production. There is an urgent need to conduct studies to assess the safety of DTCW on animal health and potential chemical contamination of the food chain. Urban agriculture is growing, as is backyard farming both raising new questions such as safety of eggs because of the potential exposure to environmental contaminants. Bees and other pollinators (part of livestock) are being threatened by pesticides. The search for alternative animal feeds such as hemp and seaweeds to sustain California animal agriculture is raising novel toxicological and food safety concerns for which there are no answers yet. Hemp byproducts could potentially contaminate the food chain with cannabinoids. Seaweeds contain heavy metals and metalloids such as arsenic (a potential carcinogen); iodine and bromine (endocrine disruptors), among others. Considering that agriculture is of significant economic importance to the state of California, we need a toxicology specialist who focuses on delivering specialized toxicology knowledge from a One Health perspective. The proposed agricultural toxicologist position is critical for delivering extension services directed towards raising healthy livestock and safeguarding the food chain and environment amid the current challenges associated with climate change, water quality and scarcity, the search for safe alternative feeds, and water and soil pollution from an illegal marijuana industry. This position will join and complement a highly productive team of farm advisors, livestock and crop advisors and specialists, regulatory experts, toxicologists, agriculturalists, and veterinarians to secure a sustainable animal agriculture and ensure human and animal food safety in California.

Extension: This position will develop and deliver training, and educational and outreach materials, conduct applied research to extend science-based knowledge on how to protect humans, livestock, crops, and the environment from exposure to toxicants. This position will collaborate with toxicologists, CE professors and advisors, and AES faculty on research and demonstration projects, assist with workshops, present at field days, develop interactive learning simulators, and produce lay and peer-reviewed publications. Additional expectations include identifying key clientele groups for the UC Davis School of Veterinary Medicine and College of Agricultural and Environmental Sciences and the anticipated nature of these interactions. Key clientele include producers, ranchers, urban farmers, backyard farmers and growers, bee-keepers, allied professionals and agricultural organizations, regulatory agencies, UCCE advisors and AES faculty.

Research: The CE Agricultural Toxicologist will conduct research and intervention activities with a focus on the impact of legacy pollutants, pesticides, and emerging toxicology-related issues arising from commercial agriculture, climate change, drought, and wildfires. The impact of toxicants on livestock and wildlife health will be the focus, but continuing research is also needed to evaluate the safety of agricultural byproducts and new alternative feeds such as hemp and sea weeds, along with traditional human food safety for plant and animal-derived food stuffs. Publication outlets include California Agriculture, ANR peer-reviewed 8000 series, peer-reviewed agricultural and veterinary journals, and lay grower, rancher, and producer publications.

ANR Network: This position of Agricultural Toxicology supports ANR's new efforts for Food System, Water, and Health Resilience Networks. ANR is deeply vested in the health, economic well-being, and long-term sustainability of the California agricultural industry and environmental quality and health. This position will join an extensive network of livestock, natural resource, and watershed advisors, professors of CE (specialists), and AES and I&R faculty working on various aspects of California's agricultural industry. This specialist will fill a missing expertise link in the chain and collaborate with other specialists and external stakeholders to provide leadership on critical toxicological issues facing our environment, animal, and human health.

Network External to ANR: The person hired for this position will collaborate on research and extension projects with I&R faculty, CAHFS Lab, state agencies such as the CalEPA (especially OEHHA and CDPH), the CDFA, Western Institute for Food Safety and Security (WIFSS), CDFW (CA Department of Fish and Wildlife), and federal agencies such as National Resource Conservation Service (NRCS), United States Fish and Wildlife Service (USFWS), USDA, and FDA that have regulatory oversight regarding food and water safety and appropriate drug use. The California Department of Pesticide Regulation is very supportive.

Support: This position will be a 1.0 FTE Assistant Professor of CE split equally between Veterinary Medicine Extension within the Department of Molecular Biosciences, School of Veterinary Medicine (SVM), and the Department of Environmental Toxicology, College of Agricultural and Environmental Sciences, UC Davis. Both departments are willing to provide laboratory and office space, computing, and telephone.

Other support: The Specialist can apply for intramural and extramural grants to support his/her program. The Center for Food Animal Health (SVM) provides seed grants (\$20,000/yr.) for projects related to food animal research; Rustici Rangeland and Cattle Research Endowment (CAES-UCD) provides 2-year grants for research and extension projects on beef cattle production and rangeland management. Extramural funding may be available from federal (USDA, FDA, USGS, NIH) and state agencies (CalEPA, CDFW, CDFA, CDPH).

Headquarters and Coverage Area: This position will be located at UC Davis given the existing network of collaborators at the School of Veterinary Medicine, College of Agricultural and Environmental Sciences, and proximity to Sacramento for clientele at the CDFA, CDFW, CalEPA, SWRCB, and other agencies.

Developed and proposed by: Drafted by Drs Wilson Rumbelha, Pam Lein (Chair of the Department of Molecular Biosciences), Bob Rice (Chair Environmental Toxicology), and Ron Tjeerdema, with input and revisions provided by UC IPM, SVM faculty, Dr. Rob Atwill, and Dr. Art Craigmill. The description reflects our discussions with the Pest Management and the Dairy Production and Food Safety Program Teams.