**Position:** Precision Food Animal Management Specialist

**Rank:** UCCE Specialist in the Department of Animal Science, CA&ES

**Description:** Precision livestock farming (PLF) is the management of livestock by continuous automated real-time monitoring of production/reproduction, health and welfare of livestock and environmental impact. This enables evidence-based decision making. Cameras, microphones and other sensors generate continuous information about animals and their environments. Monitoring can be done remotely through sounds, sights, animal movements, and estimations of environmental parameters such as temperature, humidity, or air particulates. The biggest obstacle for PLF is transforming multiple types of information from various sensors and sources into knowledge. This knowledge could then be used to accurately predict an animal in distress or presenting disease symptoms, or an abnormal state that requires farmer intervention.

Minimum qualifications include an earned Ph.D. in animal science or a related discipline, and experience in precision livestock farming using sensor technology and/or big data management, analysis, and modeling research in the management of food animal production systems.

**Justification:** The biggest obstacle for PLF is transforming multiple types of information from various sensors and sources into knowledge. This knowledge could then be used to accurately predict an animal in distress or presenting disease symptoms, or an abnormal state that requires farmer intervention. There are two challenges facing the implementation of PLF in the livestock and dairy sectors: (1) the big data problem associated with developing predictions based on a variety of spatial and temporal measurements coming from different sources; and (2) a translational issue of interpreting the data.

PLF is markedly multi-disciplinary, requiring coordination among farmers, animal scientists, veterinarians, bioengineers, molecular biologists, and immunologists. In addition to facilitating animal-centered care, technology can be used to monitor and track the quality of the water, air and soil. These kinds of measures give farmers the opportunity to monitor and improve the health and sustainability of their farm in real time.

Anticipated retirements of both beef/range and dairy extension specialists from the Department emphasize the need for this position.

**Extension and Research**: The successful candidate will conduct applied research and extension on aspects of precision livestock management and digital agriculture including but not limited to: animal well-being and health management, optimization of animal nutrition and production environments, sustainable pasture production systems, food safety and traceability, livestock feed sourcing, animal systems modeling, environmental control of confinement housing, data acquisition and instrumentation for biological systems, automation for animal production systems, microclimatology for agriculture, and animal waste management. Ideally they will collaborate with colleagues in agricultural engineering, the School of Veterinary Medicine, agricultural producers, advisors, technology start-ups in Silicon Valley, and allied industry to come up with farmer-friendly, cost-effective PLF applications focused on a shared vision of animal-centered care.

**Support:** The Department of Animal Science will provide an office and an allocation of approximately $10,000 for transportation, supplies and research costs, etc., consistent with the level we provide to all of our Extension Specialists.

**Other support:** This Extension Specialist will be competitive to obtain external funding from industry groups, allied industries in the technology sector, and USDA-NIFA.

**Location:** As noted above, we anticipate retirements from the Department in the next 3 years of both our beef management and dairy management Extension Specialists. This will leave a critical gap in our ability to support these industries within California. Given that the dairy industry and the beef industry sectors are two of the leading agricultural commodities in the State this will represent a significant gap in our programs.

**Developed and proposed by:** Department of Animal Science