Extension Specialist in Rangeland Ruminant Nutritional Ecology

Position Description
This position will develop an applied research and extension program that integrates ruminant nutritional management on rangelands with foraging behavior and grazing management to address critical livestock production and natural resource issues on California rangeland. The candidate must have a Ph.D. in animal science, grazing ruminant nutrition, or similar disciplines. Expertise using agricultural by-products and other nutritional tools to enhance or optimize ruminant performance, animal distribution, and natural resource goals including management of rangeland fuel loads, invasive plant species, and habitat is desirable. This position will work directly with UCCE livestock and natural resource advisors, as well as the beef cattle, sheep and goat industries. A secondary clientele will be the array of conservation and land management agencies that use ruminants as the main tool to manage vegetation and achieve key natural resource goals. The integrated nature of this position provides an opportunity to foster key links among campus and county-based animal science, range management and agricultural economics programs. This integration is ultimately key for advancing sustainable and profitable production systems on California rangeland and identifying critical animal nutritional links that drive patterns of ecosystem service provision on these working landscapes.

Justification
Rangelands are the largest agroecosystem in California and thus have an overriding influence on ecosystem service provision across the state. Research and outreach by UC over the last two decades has overwhelmingly demonstrated how continued flow of these goods and services positively impacts rural and state economies, food safety and security, as well as the well-being of families and communities across the state. However, the ability of producers to maintain this critical supply of goods and services is threatened by a number of complex and interacting ecological, economical and socio-political factors. For example, over the last 5 years drought, wildfire and land use change has caused pasture rental rates to double in California and cost of traditional supplemental feed such as hay to increase over 65%. These price shocks are occurring at a time when support from federal and state agricultural conservation programs has been reduced and threat of land parcelization and land use change continues to mount. Thus, while Californians increasingly rely on rangelands to provide an array of functions that enhance quality of life, producers are facing a critical reality where supply of forage and essential feed supplements are becoming scarce and more costly while social and financial incentives to maintain rangelands as working landscapes continue to decline. Despite these mounting pressures, there is a compelling opportunity for UC to rapidly generate practical solutions to several key issues including:

1. Use of agricultural by-products in rangeland ruminant production systems to buffer effects of low rainfall years on ranch profitability and provision of ecosystem services
2. Integrating traditional and novel supplementation methods and grazing management to improve animal distribution, health and production on rangeland
3. Use of supplementation and knowledge of grazing animal behavior to manipulate vegetation, rangeland fuel loads and invasive plant abundance

Extension
These major issues will require development of new and integrated statewide extension networks that will be led by this position. For example, this position will develop extension and outreach programs that specifically link by-product development and management for key regional and statewide crop producers to nutritional management, storage and supply needs of ruminant livestock producers. Likewise, this position will develop programs that deliver information on plant and animal nutritional dynamics to conservation groups and public land managers using ruminants to manage habitat, fuel loads, and invasive species. Collectively, this integrated program will link multiple rangeland livestock production groups with the vast area of crop production groups in California as well as organizations such as Fire Safe Councils, county, state and federal land managers, NRCS, state and federal wildlife management agencies and non-profit conservation organizations.

Research
Key research questions include:
1) Development and application of strategic supplementation programs to improve livestock health, distribution and provision of ecosystem services including wildlife habitat management, fuels management, invasive plant control, and biodiversity conservation, among others.

2) Identification and integration of agricultural by-products in rangeland livestock production systems.

3) Modeling practical scenarios to identify how drought, commodity prices and changes in nutritional quality among and within by-product classes influence net benefits.

Demand for this line of discovery is broad with publication outlets including California Agriculture, ANR peer-reviewed 8000 series, Conservation Biology, Journal of Animal Science, and Rangeland Ecology and Management as well as a host of non-technical, popular press and trade outlets.

ANR Network
This position is part of the Northern California regional livestock and natural resources team with programmatic leadership in rangeland ruminant nutrition. This position also is well-poised to develop cooperative research and extension programs with campus based programs including those in Animal Management Systems, Animal Welfare and Genomics in the UCD Department of Animal Science. Likewise, Rangeland Ecology and Management programs in the Department of Plant Sciences at UCD and ESPM at UCB would also be in a position to immediately develop impactful collaborative research and outreach with this new position. Needs assessments throughout California show an overwhelming demand to bring this expertise to county programs and there are numerous opportunities to incorporate this expertise into ongoing projects on supplementation on rangeland as well as use of starting supplements to manage fuel in forest and oak woodland systems.

Network External to ANR
This position would be expected to collaborate with a broad external network including Animal Science faculty at CSU Chico, Fire Safe Councils, State and local Cattlemen’s Association, California Beef Improvement Council, Farm Bureau, commodity boards, as well as public land managers and conservation groups. This position will be a central organizing force linking research on rangeland ruminant nutrition to the ability of beef producers and conservation groups to use grazing animals to increase ecosystem service provision on California rangeland.

Support
ANR will provide startup funds as well as annual program support funds. SFREC will provide office space, lab space, human resources and business office services as well as internet phone and website service.

Other support
This line of discovery is amendable to a host of internal and external funding source including the ANR competitive grants program, Russell L. Rustici Rangeland and Cattle Endowment, Joint Fire Sciences Program, Commodity Research Boards, as well as numerous applied research programs through NIFA and Western SARE as well as regional utility and public land management agencies that use ruminants to meet management goals.

Location
The position is located at the UC Sierra Foothill Research and Extension Center (SFREC). SFREC provides over 5,000 acre of rangeland, irrigated pasture and numerous cattle feeding and working facilities, providing an exceptional experimental infrastructure to support this line of practical research and outreach. These facilities can support operational scale research in a controlled and repeatable setting. Geographically SFREC is well positioned, close to numerous diverse agricultural operations in the Sacramento Valley and close to a host of communities already interested in using grazing animals to enhance provision of ecosystem services. SFREC also has substantial capacity to support large outreach and extension programs including conference facilities and working facilities for hands on learning.

Developed and proposed by
The Sutter/Yuba County Director, in cooperation with the UC SFREC Director and multiple livestock and natural resource advisors, proposed the foundation for this position. This proposal was circulated for feedback and development by livestock and natural resource advisors through the state as well as key campus departments including UC Davis Animal Science and Plant Sciences and UC Berkeley ESPM. Position development was furthered by input from the Meat Production & Food Safety and the Forest & Rangeland Systems Program Teams, cattle, goat and sheep producer organizations, and the California Rangeland Conservation Coalition.