Creative Inquiry
Enhancing the flavor and composition of lamb to increase consumer acceptability

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Per capita lamb consumption in the U.S. has declined throughout the last 40 yr to 0.33 kg on a boneless, retail weight basis. The majority of lambs produced in the lower South are born in January, February and March. This often makes it necessary to supplement lambs with grain or feed a concentrate-based diet in a feedlot environment to reach market weight by May or June using current genetics. Concentrate feeding and supplementation greatly increases lamb production cost and can negatively affect fat composition and the perceived healthfulness of meat. The mild temperatures and high rainfall of the southeastern United States provide an excellent environment for year-round forage production. Designing animal production systems to effectively utilize this forage production should improve the economic competitiveness of American lamb. The quality and palatability of meat products are dependent upon the nutritional parameters of the animals prior to harvest. Forage-finished beef and lamb products contain greater concentrations of conjugated linoleic acid and omega-3 fatty acids, and are lower in total fat content making them highly competitive in a niche market. The oxidation of these highly unsaturated fatty acids during cooking is also responsible for the characteristic flavor profile of lamb.

Students will lead research studies investigating the best management practices for natural, grass-fed lamb production. Students will also conduct laboratory analyses documenting the content of omega-3 fatty acids, conjugated linoleic acid, and antioxidants in these lamb products. Students will also develop methods to enhance lamb flavor and increase consumer acceptability. Students will be directly involved in marketing the lamb products to consumers as part of this research project.

Students will be recruited into this creative inquiry group through announcements and solicitations in the AVS 150 (Introduction to Animal Science), AVS 200 (Beef/Sheep Techniques), AVS 302 (Livestock Selection and Evaluation), AVS 413 (Animal Products) and advertisements in the Poole Agricultural Center. The inquiry group will consist of students from all undergraduate grade levels and a graduate student will assist with project activities. Students participating in this creative inquiry group on a formal basis will enroll in the AVS 490, Undergraduate research. Sheep utilized in this project will be provided by the Clemson University Southdown sheep flock or by regional sheep producers as “gift-in-kind” donations. All sheep experiments will be approved through the Clemson University Animal Care and Use Committee and all participating students will complete the relevant animal welfare, occupational health, and zoonotic disease training before experiments are initiated.

Students will record their activities in an e-portfolio based diary to document their learning process throughout the project. Students will also present short talks on relevant topics at extension field days and prepare a graded position paper each semester. Senior students will have increased supervisory authority and present results at regional and national meetings. Students will develop skills in critical thinking, experimental design,
scientific process, and communication. Students will learn first hand knowledge of animal production and food production from conception to consumption. Students who are involved in this creative inquiry project will know how to investigate problems and design experiments to test them, make decisions regarding animal and forage management, promote and market products that they produce, and relate with consumers on an individual basis. This creative inquiry will continue for ten semesters and enable students who continue with the project for multiple semesters to gain leadership skills by taking the lead role in the project.