

58 Callipyge sheep and Clenbuterol-fed sheep: Models for developing laboratory skills in muscle growth and meat quality. T. D. Pringle*¹, J. N. Shook¹, C. S. Talton¹, and K. R. Smith², ¹University of Georgia, Athens, ²USDA-AMS, Washington, DC.

Sheep with the *Callipyge* gene, as well as, those fed β -agonists produce carcasses with extreme muscle growth and compromised meat quality and thus are excellent models for studying these important aspects of meat science. The Experimental Techniques in Meat Science and Muscle Biology course, at the University of Georgia, is a graduate-level course designed to introduce students to current research techniques utilized to measure quality, quantity, and functional properties of muscle as food, in a hands-on experiential learning environment. In addition, students with an interest in muscle foods improve their scientific and creative thinking skills by developing, writing, and presenting research proposals and manuscripts. The course begins with the harvest process and monitors rigor development through pH, temperature, and R-value measures. Next, specific gravity and carcass composition are determined, followed by procedures to quantify calpain and calpastatin activity, collagen solubility and content, myofibril fragmentation index, sarcomere length, fiber type and distribution, and postmortem proteolysis using gel electrophoresis. Indicators of muscle growth, including RNA, DNA, and protein content are then measured. As the semester nears completion, meat color is measured through a retail display simulation, followed by sensory and instrumental measures of meat texture. Since the retail display includes measurements of color across time, these data are used to introduce students to statistical analysis using SAS. Along with the hands-on laboratories, lectures are presented to enhance the students understanding of the principles upon which methods are based. Experts within the college and from USDA-ARS introduce students to the latest technologies and provide access to their laboratories. The use of *Callipyge* sheep and those fed β -agonists results in large, measurable differences in the traits of interest when compared to normal sheep. Students are able to immediately and easily identify these differences, which assists them in developing confidence in their laboratory skills. The ability to utilize a single model system (either *Callipyge* or Clenbuterol-fed sheep) throughout the semester gives the students a sense of continuity and helps develop a greater understanding of the relationship between the measured attributes and meat quality. Finally, the ability to measure all the attributes of interest in one model system allows students to experience the research process from beginning to completion. This includes data collection, analysis, and presentation in the form of a manuscript, ready for submission to a scientific journal. In conclusion, students improve the likelihood of success in their future research endeavors through an increased understanding of the relationships between muscle biology and meat quality; the methodologies to measure them; and through experience in the publication process.