

**From Theory to Smoke: Experiential Learning in Undergraduate Meat Science
Education for Smoked Success**

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Introduction/need for innovation or idea

Today there is an increasing disconnect in knowledge between consumers and the meat products they purchase, particularly regarding how and where the products are sourced and processed. The literature clearly states that consumers are faced with a barrage of options and conflicting messages with respect to meat consumption (Clonan, 2015). Most of these conflicting messages are based on the following: perception of quality, nutritional adequacy and healthiness, health risks, ethical concerns, belief systems, and concerns about the origin of the products (Dinah de Araújo et al., 2022). Consumers tend to draw conclusions based on misinformation and limited foundational knowledge. Therefore, there is a need for educational efforts to improve consumer understanding of meat production, processing, and preparation. As a solution, an innovative experiential learning opportunity within an undergraduate meat science course was developed offering solutions to bridge this gap and promote informed consumer decision making when purchasing and preparing meat products.

How it Works

AG 4330 - Food Technology: Processing Meats students spend much of the semester learning about different retail and wholesale cuts of beef, pork, lamb, poultry and focus on carcass anatomy, production, processing, and preparation. Following these lecture competencies, several experiential learning opportunities were offered through laboratory activities, allowing students to connect foundational knowledge with hands-on application. One of these laboratory lessons included a rib smoking competition. The students participated in a class competition working with a partner to prepare a rack of ribs for judges. The panel of judges was made up of faculty, graduate students, and an experienced pitmaster. The students spent the first day learning the difference between spareribs and the St. Louis style ribs and deciding which they would like to use for their protein cut. Students selected a rib profile (wet, dry, or glazed), a binder, and a spritz. Additionally, students learned some of the different rub profiles: Texas Style, Sweet & Heat, and Carolina Style. Critical thinking skills were utilized to decide on ingredients to use in their rub to help meet the rub profile expectations. By the end of day one, all pairs applied their rubs, set the ribs to marinate, and completed all decisions regarding their preparation. On the following day, students worked around their course schedule to help with smoking and spritzing. By the time class started, students applied final touches to their ribs and learned how to properly cut, prepare, and present their ribs to the judges. The students were scored on their overall presentation of the ribs, how well they understood the preparation and cooking process, and presentation. They were also scored on the visual appearance of their ribs, if the taste matched the flavor profile, doneness/bite test, and overall taste. The top 3 pairs with the highest score received extra credit; 10, 7, and 5 points respectively.

Results to date/implications

To date, a total of 80 students have participated in the competition. As shown in Table 1 below, several social media posts and feedback from course survey evaluations included positive comments regarding the rib smoking competition.

Table 1*Student Comments on the Rib Smoking Lab*

Comments from Social Media	"...unforgettable and incredibly fun experience!" "The end result? Tender, sweet, smokey perfection."
Comments from Course Survey Evaluations	"I only wish we could have done more labs. The lab for smoking ribs was amazing and really cool!! I've never done that before, and I plan to use the smoker my dad never opened hopefully this summer!!" "This class was very fun and one of my favorites so far at Texas State and rib contest!" "The ..., ribs, and ... were all very engaging and educational." "Making the ribs was a blast, and I'm so grateful for Mr. Sam for helping us.

Implementing a rib smoking lab in the AG 4330 course reinforced a deeper, comprehensive understanding of the meat production process as a whole. Students experienced each stage of production individually and were able to make the connection to fully grasp the final product seen at grocery stores. Through the lecture, students learn how genetics, nutrition, handling, fabrication, and processing can impact meat quality. However, with the lab, the students learned this through hands-on experiences by observing anatomical structure in specific cuts, understanding how fabrication impacts the value of a product, and experienced how processing techniques, such as smoking, enhances flavor and tenderness. This lab prepared students to make better informed decisions in the real world. It provided students with the information and experiences necessary to effectively communicate meat production to the public. Overall, this idea contributed to bridging the gap between consumers and the meat industry by placing emphasis on the system as a whole process, from pasture to plate. Ideally, this information is passed on to those who do not have educational opportunities like this to help clarify consumers' common misconceptions.

Future plans/advice to others

Moving forward, instructors will continue teaching this lab and eventually expand the content by incorporating different cuts of meat from various primals such as the loin, belly, shoulder, and ham. The plan is to recruit students in different agriculture majors to enroll in the course to broaden education beyond animal science majors. In the future, curriculum changes will be made to divide AG 4330 into two courses, Meat Muscle Biology and Processed Meats to place even more of an emphasis on hands-on experiences allowing students to develop a deeper understanding of the science behind processed meats.

Costs/resources needed:

Based on 32 racks of ribs, averaging 5.5 pounds each at \$2.19 per pound, the total estimated cost is about \$385. However, the racks of ribs were donated to the class from a grocery store near campus. Apart from the ribs, the only out-of-pocket costs for the department were ingredients like various barbeque sauces and seasonings, as well as some supplies including foil pans, spray bottles, and smoke chips. These costs were roughly \$230. Additionally, the meats lab is well equipped with appliances and utensils for preparing, storing, and smoking the ribs.

References

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