

**2 A comparison of high quality U.S. and Spanish beef.** C. M. Leick<sup>\*1</sup>, G. Indurain<sup>2</sup>, K. Insausti<sup>2</sup>, M. J. Beriain<sup>2</sup>, and T. R. Carr<sup>1</sup>, <sup>1</sup>University of Illinois, Urbana, <sup>2</sup>Public University of Navarra, Pamplona, Spain.

This project was carried out as part of a collaboration between the University of Illinois at Urbana-Champaign and the Public University of Navarra, Pamplona, Spain entitled "Beef Quality Attributes for Consumers and its Relation with Beef Carcass Classification Systems in Spain and the USA." Spanish beef animals are typically intact bulls, slaughtered at approximately twelve months of age. Factors involved in carcass classification in Spain include carcass conformation, fat cover, and lean color, as opposed to the USDA grading system which is based on carcass maturity and marbling. Beef producers in Spain are currently looking to expand the methods of beef carcass evaluation in order to better predict eating quality as actually perceived by the consumer. The purpose of this study was to evaluate palatability differences between high quality U.S. and Spanish beef.

Twenty strip loins obtained from young bulls of the Pirenaica breed were evaluated for marbling score and loin eye area at the Public University of Navarra, Pamplona, Spain prior to shipment to the University of Illinois Meat Science Laboratory. Twenty USDA Prime beef strip loins were obtained from a commercial U.S. packing plant, aged 14 days at 4° C, and evaluated for marbling and loin eye area at the University of Illinois Meat Science Laboratory. Strip loins were cut into one inch steaks and frozen until proximate analysis (moisture and fat), Warner-Bratzler shear force, and sensory analysis were performed. For shear force and sensory panel evaluation, steaks were cooked to an internal temperature of 70° C. Steaks were weighed before and after cooking to determine cook loss. Six cores were taken from each steak for shear force evaluation. Six trained taste panelists evaluated steaks for tenderness, juiciness, beef flavor, and off flavor.

Loin eye area was larger ( $P < 0.05$ ) in Spanish loins (104.47 cm<sup>2</sup>) compared with U.S. loins (77.89 cm<sup>2</sup>). Marbling scores reflected the different management practices of the two countries, as U.S. beef had a mean marbling score of Slightly Abundant 73, whereas Spanish beef had a mean marbling score of Traces 10. Likewise, the extractable fat and moisture percentages were different ( $P < 0.05$ ) between the two countries. Average lipid content was 14.62% for U.S. and 1.17% for Spanish loins, while average percent moisture values were 65.41% and 75.43% for U.S. and Spanish loins, respectively. Sensory panelists detected significant differences in tenderness, juiciness, and beef flavor, along with statistically significant, though numerically small, differences in off flavor. U.S. Prime beef was more tender and more juicy, with more beef flavor and less off flavor than Spanish beef ( $P < 0.05$ ). Significant off flavor was detected in both U.S. and Spanish beef; off flavor in U.S. beef was most commonly described by panelists as "buttery," whereas off flavor in Spanish beef was described as "grassy" and "metallic." Differences in sensory panel scores for tenderness were reflected in the shear force values; Spanish beef had higher average shear force values than U.S. beef ( $P < 0.05$ ), with values of 3.85 and 3.11 kg, respectively. The results show that U.S. Prime beef had significant advantages in juiciness, tenderness, beef flavor, and off flavor; however, both U.S. and Spanish beef were acceptable in palatability.