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Meat and Muscle Biology™

Consumer Evaluation of 9 Different Beef Cuts From 3 USDA Quality Grades

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Objectives

To determine consumer perceptions of 9 cuts including strip steaks and 8 Beef Innovation cuts of varying quality grades.

Materials and Methods

Beef strip loins (IMPS # 180), inside rounds (IMPS # 169) bottom rounds (IMPS # 171), shoulder clods (IMPS #114), and chuck rolls (IMPS # 116A) were selected from 3 USDA quality grades (Prime, Low Choice, Select; n = 10/quality grade). Sub-primals were vacuum packaged and aged 21d at 2 to 4°C. Sub-primals were fabricated into 2.54 cm steaks to represent 8 Beef Innovation cuts (San Antonio, Western Griller, Delmonico, Flat Iron, Tucson, Denver, Ranch, and Shoulder Petite Tender steaks) as well as strip loin steaks. Steaks were cooked to 71°C on an electric clamshell grill (Cuisiart Griddler Deluxe, model GR-150, East Windsor, NJ) with temperatures monitored using thermocouples connected to a Doric Mini-trend Data logger 205 B-1-c OFT (Doric Scientific, San Diego, CA). Consumers (n = 210) were fed 9 samples representing differences in muscle and quality grade in a random order. Consumers evaluated steaks for juiciness, tenderness, flavor, and overall liking on continuous line scales. Additionally, consumers rated each trait either acceptable or unacceptable. Consumers also rated each sample as unsatisfactory, every day, better than every day or premium quality. Data were analyzed as a 9 × 3 factorial with a model that included the fixed effects of cut, grade, and their interaction and the random effect of panel and steak peak temperature as a covariate.

Results

There were no muscle × quality grade interactions for all traits evaluated (P > 0.05). The Delmonico, Flat Iron, and Denver steaks were rated the highest (P < 0.05) for juiciness while strip loin steaks were rated similar (P > 0.05) to Ranch steaks. The Delmonico and Flat Iron were rated more tender (P < 0.05) than Denver steaks, which were more tender (P < 0.05) than all other cuts. The strip loin was rated similar (P > 0.05) in tenderness to the Shoulder Petite Tender and Ranch steak. The Western Griller was the toughest (P < 0.05) when compared to all other muscles, except the Tucson steak. The Delmonico and Flat Iron steaks were rated the highest for flavor (P < 0.05). The San Antonio, Western Griller and Tucson had the lowest (P < 0.05) overall liking ratings while the Delmonico had higher (P < 0.05) overall liking scores than all other cuts except for the Flat Iron. The Western Griller had the lowest percentage (P < 0.05) of steaks rated acceptable for tenderness. The Delmonico had the highest percentage (P < 0.05) of steaks rated acceptable for overall liking. The Delmonico had the highest percentage (P < 0.05) of steaks rated as premium quality whereas the San Antonio, Western Griller and Tucson had the highest percentage (P < 0.05) of steaks rated as unsatisfactory. For all muscles, Prime was rated the highest (P < 0.05) for all traits evaluated and had the highest percentage (P < 0.05) of steaks rated acceptable for juiciness, tenderness, flavor and overall liking.

Conclusion

The Delmonico, Flat Iron, and Denver steaks had a better eating quality than strip steaks. This represents an opportunity for retailers and foodservice to market these more affordable cuts and still deliver a high level of eating satisfaction to customers. Moreover, the positive impact of increased quality grade was consistent across all cuts.