



## Evaluation of Quality Characteristics for Beef Cuts Following Different Production and Branding Approaches

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### Objectives

Consumer demand has driven the expanding variety of fresh beef available for retail purchase, with considerably variable price points. The objective of this study was to assess the impact of production style and branding on the quality and sensory characteristics of ribeye steaks.

### Materials and Methods

The varieties evaluated in this study were USDA Choice Black Angus, grass-fed, organic, USDA Prime, and Piedmontese. For each trial and variety, 5 steaks were cut to a target thickness of 3.18 cm from ribeye rolls procured from a local grocery store with sell-by dates within 3 d of each other. Steaks were individually overwrapped on foam trays with PVC film and stored at  $1.1^{\circ}\text{C} \pm 2.0$  under  $175 \pm 15$  foot candle lighting for 7 d. Purge, color, cooked texture, and cook yield were measured on d 0, 1, 4, and 7 while sensory evaluation was conducted only on d 0. A Minolta colorimeter was used to measure  $L^*a^*b^*$  values at 3 locations on the longissimus dorsi (LD) of each raw, overwrapped steak. Raw steaks were weighed and placed onto griddles preheated to  $177^{\circ}\text{C}$ , cooked to an internal temperature of  $35^{\circ}\text{C}$ , flipped over, and cooked to a final internal temperature of  $70^{\circ}\text{C}$ . For sensory analysis, eight semi-trained panelists evaluated 1.75 cm cubes of LD for aroma, juiciness, flavor, texture, and overall appearance using a nine-point hedonic scale to score, where 1 = dislike extremely and 9 = like extremely. After cooking, steaks used for texture analysis were allowed to cool for 2 h at room temperature before five cores (diameter = 1.5 cm) were taken from each steak parallel to the muscle fibers while avoiding visible exterior fat. Using a TA.XT Texture

Analyzer, Warner-Bratzler shear force was measured perpendicular to the muscle fiber of each core using a rounded V-shaped blade with a  $60^{\circ}$  angle and a cross head speed of 200mm/min, where firmness equaled the maximum peak of the curve (kg) and toughness equaled the area under the curve (kg-s). This experiment was repeated three times.

### Results

USDA Prime and Piedmontese scored significantly higher ( $p \leq 0.05$ ) than all other varieties for overall acceptance with scores of  $7.42 \pm 1.22$  and  $7.04 \pm 1.34$ , respectively. Although not always significant ( $p > 0.05$ ), both USDA Prime and Piedmontese also received numerically higher ratings for all other sensory traits evaluated compared to other varieties. For d 1 objective texture measurements, USDA Prime displayed lower ( $p < 0.05$ ) values for both firmness and toughness, while organic revealed the numerically highest value. At d 1 and 4 Piedmontese had significantly more purge ( $p < 0.05$ ) than USDA Prime, USDA Choice Black Angus and organic, but by d 7 differences between all treatments were diminished. For any single variety, cook yields over time (ranging from 70.2 to 80.0%) were not always found consistently different than other varieties. USDA Prime had the highest  $a^*$  value at d 0 ( $p \leq 0.05$ ) and was also significantly higher than organic on d 1, 4, and 7 ( $p < 0.05$ ).

### Conclusion

Considering quality and sensory traits evaluated in this study, USDA Prime consistently stood out as being the most distinguishable branding type, while there were limited differences between Piedmontese, organic, grass-fed and USDA Choice.