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Comparison of Sensory Characteristics, Fatty Acid Profiles, Proximate Analysis, and Shelf-Life Stability of Akaushi Beef, Commodity Prime Beef, and Top Choice Branded Beef

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Objectives

The objective for this study was to compare Akaushi beef with commodity prime beef and top choice branded beef (TCB) looking at trained sensory panel attributes, tenderness, nutritional composition and shelf-life.

Materials and Methods

Striploins (n = 106) were collected from 2 commercial beef plants. Beef type served as treatment [Akaushi top choice (Akaushi; n = 36), top choice branded (TCB; n = 36), and USDA low prime (prime; n = 34)]. Striploins were selected with marbling scores of Mt to Md for the top choice products and SLAB marbling for the prime product. Striploins were fabricated into 2.54-cm steaks and assigned to various laboratory analysis after 21, 28, and 35 d of wet ageing at 4°C. Steaks from the posterior end of the striploin were displayed for 4 d in an atmosphere consistent with a commercial retail case lighting and temperature and were then utilized for TBARS analysis. A trained sensory panel was used to evaluate common sensory attributes. Steak types were evaluated for tenderness using Warner-Bratzler Shear Force (WBSF), proximate analysis using a Foss Foodscan (Eden Prairie, MN), and fatty acid composition using gas chromatography. Differences between beef types and ageing treatments were analyzed using the mixed models procedure of SAS (SAS Inst. Inc., Cary, NC).

Results

Akaushi (21.8%) and prime (21.7%) had lower protein percentage compared to TCB (22.6%; $P < 0.0001$). TCB had the highest moisture percentage, followed by Akaushi, and prime (67.9, 67.1, and 64.3%, respectively; $P < 0.0001$). TCB (47.4) had the highest percent of composite saturated fatty acids, followed by prime (46.6) and Akaushi (42.8; $P < 0.0001$). When assessing composite monounsaturated fatty acid percentages, Akaushi (53.8) was the highest, followed by prime (49.7), and TCB (48.3; $P < 0.0001$). TCB (4.4) had the highest percent of composite polyunsaturated fatty acids followed by prime (3.7) and Akaushi (3.4; $P < 0.0001$). Akaushi had the highest lipid oxidation followed by TCB, and prime ($P < 0.0001$) averaging 0.5, 0.4, and 0.3 mg mal/kg of meat, respectively. Additionally, there was a difference among ageing treatments, ($P < 0.0001$), with 21d (0.4) and 28d (0.4) being similar, while 35d (0.5) was more oxidized. Akaushi and prime were similar for juiciness scoring 6.0 and 6.0, respectively on a scale of 1 to 8, and both were juicier than TCB (5.6; $P < 0.05$). Akaushi (6.2) was tenderer than TCB (5.8; $P \leq 0.05$). Evaluating overall acceptability on a scale of 1 to 8, Akaushi and prime were similar (6.2 and 6.1, respectively), and both more favorable than TCB (5.8; $P < 0.05$). Average WBSF values were similar ($P = 0.20$) for TCB (2.8 kg), Akaushi (2.7 kg), and prime (2.5 kg).

Conclusion

Results show that while there were differences, all 3 beef types would be considered very acceptable to consumers when analyzing organoleptic properties. The fatty acid profile element was diverse, as TCB had the highest percentage of polyunsaturated fatty acids, and Akaushi had the highest percentage of monounsaturated fatty acids. Akaushi beef compares well to Prime and TCB when evaluating sensory and fatty acid profile attributes; this could benefit Akaushi producers if other factors do not impede economical beef production.

