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Impact of Dry Heat Cookery Method on Consumer Ratings of Beef Strip Loin Steaks Following Sous Vide Preparation

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Objectives

The objective of this study was to determine the impact of 4 dry cookery methods following sous vide preparation on consumer ratings of beef strip loin steaks from 2 quality grades.

Materials and Methods

Strip loins (n = 40, 20/grade) were selected from 2 USDA quality grades: upper 2/3rds of Choice (Modest^{00}–Moderate^{100} marbling) and Select. Subprimals were aged at 2 to 4°C for 21 d. Strip loins were then fabricated into 2.5 cm steaks, packaged, and frozen at –20°C. Steaks were thawed, then cooked sous vide in a circulating hot water bath under vacuum at 63.5°C for approximately 1.5 h to a medium-rare degree of doneness (63°C). Immediately prior to serving to panels, steaks were finished to a medium degree of doneness (71°C) on 1 of 4 randomly assigned cooking methods: charbroiler grill (CHAR), clamshell grill (CLAM), convection oven (OVEN), or salamander broiler (SALA). Cooking surfaces were heated to 200°C and monitored during cooking using surface thermocouples. Steaks were then cut into 2.54 × 1 × 1 cm cubes and 2 cubes were served to each panelist. Untrained consumer panelists (n = 100) evaluated 8 samples, 1 from each treatment, for flavor, tenderness, juiciness, and overall liking on unstructured 10 cm line scales using a digital survey on an electronic tablet. Each panelist was also asked to rate each trait as acceptable or unacceptable.

Results

There were no cooking method × quality grade interactions ($P \geq 0.55$) for all traits evaluated. However, SALA steaks were rated higher ($P < 0.05$) by consumers than CLAM steaks for all palatability traits. Oven steaks were rated higher ($P < 0.05$) than CLAM steaks for flavor and overall liking but were similar to CLAM steaks ($P > 0.05$) for tenderness and juiciness. Charbroiler steaks were similar ($P > 0.05$) to CLAM steaks for flavor, juiciness, and overall liking, but were rated higher ($P < 0.05$) for tenderness. When asked if samples were acceptable for each palatability trait, consumers rated a greater percentage ($P < 0.05$) of SALA steaks as acceptable for flavor, tenderness, juiciness, and overall acceptability than CLAM steaks. Salamander steaks had the greatest percentage ($P < 0.05$) of steaks rated as acceptable for juiciness in comparison to all other treatments, which were similar ($P > 0.05$). For flavor acceptability, a similar percentage of OVEN and CHAR steaks were rated as acceptable ($P > 0.05$), however, a greater percentage of OVEN steaks were rated as acceptable in comparison to CLAM steaks ($P < 0.05$). Clamshell steaks had the lowest percentage of steaks rated as acceptable ($P < 0.05$) for tenderness in comparison to all other treatments, which were higher and similar ($P > 0.05$). Overall, SALA steaks had a higher percentage of steaks rated as acceptable overall ($P < 0.05$) compared to CLAM steaks, however, CHAR and OVEN steaks were intermediate and similar to both treatments ($P > 0.05$). Quality grade did not influence ($P \geq 0.07$) palatability traits or acceptability, as consumers rated both Top Choice and Select steaks similar for flavor, tenderness, juiciness, and overall liking.

Conclusion

These results indicate cooking method has a significant impact on consumer palatability ratings. This may be due to increased cooking times or differing types of heat transfer possessed by the various cooking methods. These data suggest cooking steaks by radiant flame or convection results in a more desirable eating experience.

