Sensory acceptability and chemical characteristics of healthy rib-eye steaks from forage-finished steers

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Consumer interest in health benefits of forage-finished beef has led to increased product demand. To date, little information exists regarding sensory acceptability and chemical characteristics of rib-eye steaks from forage-finished steers. This study was undertaken to evaluate the acceptability, chemical characteristics and microbiological safety of rib-eye steaks from forage-finished steers and one commercial steer cooked by grilling and/or 2-sided grilling using Hispanic consumers. In addition, this study examined if commercially frozen rib-eye steaks are safe.

MATERIALS AND METHODS

Steers, feeding systems, and rib-eye steaks: Steers were blocked into one-mongrel (2 steer/group) and each group was randomly assigned to one of three forage feeding systems (Table 1). Two steer groups (18 steers) were selected and harvested. Six rib-eye from each steer (left and right) of each carcass (18 carcasses) were used for two studies. Right rib-eye steaks were selected for the first harvested beef consumer survey (first study) and left rib-eye steaks were used for 5 months -20 °C for the second study. Treatments to evaluate were rib-eye steaks from forage-finished steers (S1, S2, S3) and one commercially available grain-fed rib-eye steer (C, USDA Choice grade, West-Dale, Baton Rouge, LA, Table 1).

Proximate, fatty acid and microbiological analyses of different rib-eye steaks: Analyses were done following AOAC standard procedures.

Results

Table 1: Mean values for the proximate and fatty acid analyses of the rib-eye steaks

Table 2: Mean consumer acceptances scores for overall appearance and overall liking for different rib-eye steaks treatments

Table 3: Mean consumer acceptances scores for sensory attributes of rib-eye steaks cooked by the grilling method (frozen stored during 5 months)

Table 4: Mean consumer acceptances scores for sensory attributes of rib-eye steaks

Table 5: Mean consumer acceptances scores for sensory attributes of rib-eye steaks cooked by the grilling method (frozen stored during 5 months)

Discussion

Consumer acceptability of different cooked rib-eye steaks (freshly harvested beef): For all sensory attributes, no significant differences were found between cooking methods except for searing in S3 where the grilling method had a higher mean score compared to 2-sided grilling. For overall appearance and overall beef flavor, no significant differences were found (P > 0.05) among steaks treatments regarding the mean consumer acceptances for juiciness, tenderness and overall liking. C (2-sided grilling and grilling) and S3(grilling) consistently presented higher mean scores compared to other treatments. Differences among forage-finished steaks treatments could be due to differences in sensory panel or quality of the grasses (Janes et al. 1995). The purchase intent of all cooked steaks treatments was greater than 65%. Overall liking of S2 and S3 was negatively affected by the fact of knowing and S1 was negatively affected by the lack of juiciness and tenderness. Conversely, for C, less than 21% of the panelists considered the meat not juicy enough and less than 10% considered the steaks to be not tender enough. The attributes tenderness, juiciness and overall liking were significantly associated (P ≤ 0.05) with the purchase intent of the consumer (Can 1) of the linear discriminant functions.

Consumer acceptability of different cooked rib-eye steaks (frozen stored for 3 months): For overall liking, S3 presented a significant higher mean score compared to S2 but was not significantly different to S1. The purchase intent of cooked S3 was significantly higher than S1 but not significantly different from S2. The purchase intent of uncooked S3 was significantly higher than S1 and S2. The purchase intent of frozen S2 has increased after knowing the health benefits of steaks obtained from grass-fed cattle. Overall liking of all steaks was negatively affected by the fact of knowing and S3 was negatively affected after knowing the health benefits of steaks. Frozen consumer acceptances scores between S2 and S3, S2 and S1 and S3 and S1 were not statistically different. These results indicate that the acceptability of forage-finished steaks are potentially healthier and grain-fed commercial steaks and have market potential toward Hispanic population.

Conclusions

Two cooking methods did not cause significant differences in liking scores. Purchase intent was affected by the fact of knowing the health benefits of forage-finished steaks. The acceptability of forage-finished beef was not affected by the frozen storage. The consumer panel was under the belief that there was no difference in the sensory acceptability between the forage-finished steaks and the grain-fed steaks after the 2 cooking methods.
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