



Effects of Dry Heat Cookery Method and Quality Grade on the Palatability of Beef Strip Loin Steaks

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Objectives

Cooking meat using a clamshell grill has become common in university research settings due to speed, relative low cost, and acceptable repeatability. However, other cooking methods such as charbroiling and salamander grills have also become a popular method in the hotel and restaurant industry. The objective of this experiment was to evaluate the effect of different dry heat cooking methods on beef palatability across a range of USDA quality grades.

Materials and Methods

A consumer panel ($n = 288$) was conducted at Texas Tech University. Strip loin steaks from four different USDA quality grades (Prime, upper 2/3 Choice, lower 1/3 Choice, and Select) were cooked using one of four cooking methods: electric clamshell grill (CLAM), flat top gas grill (FLAT), Charbroiler gas grill (CHAR), or Salamander gas broiler (SAL). After cooking to medium degree of doneness (70–72°C), steaks were cut into cubes (1.3-cm × 1.3-cm × steak thickness), and two cubes were served immediately to 6 predetermined consumers from each steak. Each consumer evaluated 8 samples, representing half of the 16 possible quality grades × cooking method treatment combinations. Consumers scored juiciness, tenderness, flavor liking, and overall liking using electronic ballots with the zero-point anchors labeled as extremely dry, extremely tough, dislike flavor extremely, and dislike overall extremely and the 100-point anchors labeled as extremely juicy, extremely tender, like flavor extremely, and like overall extremely. Also, consumers rated each sample as either acceptable or unacceptable for each palatability trait.

Results

There were no interactions between the cooking method and quality grade for any of the palatability traits ($P > 0.05$). Steaks cooked on CHAR had greater ($P < 0.05$) flavor and overall liking scores, as well as a greater percentage of samples ($P < 0.05$) that were considered acceptable overall compared to the other cooking methods. Steaks cooked on FLAT were scored lower ($P < 0.05$) for tenderness and juiciness compared with all other cooking methods. Steaks cooked on CLAM, SAL, and CHAR were scored similarly for tenderness and juiciness ($P > 0.05$). Steaks cooked on FLAT were scored lower ($P > 0.05$) than CHAR and SAL for overall liking. Steaks cooked on CLAM had lower ($P < 0.05$) flavor liking scores than CHAR and SAL. Prime samples had greater scores ($P < 0.05$) than Low Choice and Select, which were similar ($P > 0.05$), for tenderness, juiciness, flavor liking, and overall liking, but Prime did not differ from Top Choice ($P > 0.05$) for any palatability traits.

Conclusion

These results indicate cooking method had a significant impact on consumer palatability ratings, and those results were consistent across a range of quality grades. Even though these cooking methods are all classified as dry heat cookery methods, consumers in this study were able to detect differences in tenderness, juiciness, flavor liking, and overall liking. 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 CHAR resulted in the most desirable eating experience, and cooking steaks on FLAT and CLAM were less desirable. However, the low eating satisfaction of FLAT can be linked to low tenderness and juiciness, whereas CLAM liked less due to low flavor liking.