

2018 Reciprocal Meat Conference – Consumer Topics

Meat and Muscle Biology™



Palatability of Beef from Cattle Exposed to a High-Concentrate Diet Prior to Pasture-Finishing

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Keywords: beef, palatability, pasture-finished

Meat and Muscle Biology 2(2):5

doi:10.221751/rmc2018.005

Objectives

The objective of this study was to evaluate the effects of exposure to a high-concentrate diet prior to pasture-finishing on the perceived palatability of beef strip loin steaks by untrained consumer panelists.

Materials and Methods

Forty-eight Angus-cross steers ($n = 12/\text{treatment}$) were fed a high-concentrate corn-based diet after weaning for 0 d (0D), 40 d (40D), 80 d (80D), or 120 d (120D). Following grain-feeding, cattle were finished to a target BW (487 kg; 188 to 354 d on pasture) on high-quality pastures (non-toxic tall fescue, rye/ryegrass, oats, alfalfa). Carcass data and strip loins were collected 24 h postmortem. Loins were aged under vacuum at 4°C for 21 d then frozen (−20°C). Eight strip loins from each treatment were selected based on USDA marbling scores targeting USDA Select quality grade. New Zealand process-verified grass-fed strip loins (NZ; $n = 8$) were selected by trained personnel targeting USDA Select and included as a baseline for comparison. The NZ strip loins were collected and aged under vacuum for 21 d at 4°C then frozen. Steaks (2.54 cm) were fabricated from frozen loins and assigned from anterior to posterior end to laboratory analyses or sensory evaluation. Thawed steaks were cooked on an electric clamshell grill to a medium degree of doneness (71°C). Steaks were cut into 4 equal pieces and evaluated by consumers ($n = 220$; Lubbock, TX) for tenderness, juiciness, flavor and overall liking using 100-mm anchored line scales (0 = not tender/juicy, dislike flavor/overall extremely; 100 = very tender/juicy, like flavor/overall extremely). Consumers were also asked to rate each sample as acceptable or unacceptable for each trait and assign samples to 1 of 4 perceived quality levels.

Results

Consumers detected differences in tenderness among treatments and the percent acceptability of tenderness also differed ($P < 0.01$). Samples from NZ received the greatest scores for tenderness ($P < 0.05$) and were most often rated as acceptable by consumers ($P < 0.05$). Steaks from 120D treatments received lesser ($P < 0.05$) scores for tenderness than NZ but greater scores than all other treatments ($P < 0.05$). Steaks from 120D were equally often rated as acceptable for tenderness as 80D ($P > 0.05$) but less often rated as acceptable than NZ ($P < 0.05$). Differences among treatments were reported for juiciness, flavor liking and overall liking ($P < 0.05$). Steaks from NZ and 120D were perceived as juicier than 0D and 80D ($P < 0.05$); 40D was intermediate ($P > 0.05$). Consumers rated 120D and NZ steaks as acceptable for juiciness more often than all other treatments ($P < 0.05$). Flavor acceptability did not differ among treatments ($P > 0.05$). Scores for overall liking were greater for NZ and 120D than all other treatments ($P < 0.05$), and NZ was more often rated as acceptable than all other treatments ($P < 0.05$) except 120D ($P > 0.05$). Steaks from NZ were least often rated as unsatisfactory compared to all treatments ($P < 0.05$) except 120D ($P > 0.05$), and a minority of all treatments (10.63 to 20.14%) were assigned to the unsatisfactory quality level.

Conclusion

Results indicate cattle could be finished on high-quality pastures without detrimental effects on palatability with or without grain supplementation. Traditional NZ grass-fed beef was generally rated higher by consumers, but exposure to grain for 120 d prior to pasture-finishing produced beef of similar palatability.