

23 Effects of animal age, boning method (hot-boned vs. cold-boned), and pH-enhancement on consumer ratings of beef. C. D. Nath*, T. M. Nath, and D. M. Wulf, *South Dakota State University, Brookings.*

Research was conducted on beef muscles to determine the effect of animal age, boning method (hot-boned vs. cold-boned), and pH-enhancement on consumer acceptability of beef steaks. The experimental design was a $2 \times 2 \times 2$ factorial design with two animal ages: young and cow, two boning methods: cold-bone and hot-boned, and two treatments: control and pH-enhanced. Two muscles, longissimus thoracis (LT) and gluteus medius (GM), were evaluated in two separate trials to quantify desirability using a 107 and 146-member central-location consumer panel, respectively. Subprimals were cut in half and each half served as either control or pH-enhanced. Subprimal halves designated for pH-enhancement were injected with a patented solution containing water, ammonium hydroxide, carbon oxide, and salt (Freezing Machines, Inc.). All muscles were stored vacuum packaged, then cut into 2.5-cm-thick steaks, and cooked to 71°C on gas grills for consumer sensory panels and on clam-shell style grills for Warner-Bratzler shear force (WBS). Consumers rated each sample on a ten-point scale (1 = dislike extremely to 10 = like extremely) for 'overall like', 'like of tenderness/texture', 'like of juiciness', and 'like of flavor'. Consumers also determined if there was a 'presence of off-flavors' (yes = off-flavors present or no = no off flavors present). Young had lower WBS (2.34 vs. 2.73 kg), higher 'overall like' ratings (6.95 vs. 6.62), higher 'like of tenderness/texture' ratings (7.21 vs. 6.64), and higher 'like of flavor' ratings (6.79 vs. 6.45) for LT and higher 'like of flavor' ratings (6.80 vs. 6.48) for GM than cow ($P < 0.05$). Hot-boned had lower 'like of juiciness' ratings (6.61 vs. 7.21) and lower 'like of flavor' ratings (6.51 vs. 6.77) for GM than cold-boned. pH-enhanced had higher 'overall like' ratings (7.53 vs. 6.04), higher 'like of tenderness/texture' ratings (7.70 vs. 6.14), and higher 'like of flavor' ratings (7.31 vs. 5.92) for LT and lower WBS (3.16 vs. 3.72), higher 'overall like' ratings (7.96 vs. 5.82), higher 'like of tenderness/texture' ratings (8.24 vs. 5.86), higher 'like of juiciness' ratings (8.01 vs. 5.81), higher 'like of flavor' ratings (7.67 vs. 5.61), and lower responses of 'yes' to the statement 'presence of off-flavors' (19 vs. 27%) for GM than control ($P < 0.05$). There was a significant ($P < 0.05$) age by boning method interaction for 'overall like' and 'like of tenderness/texture' ratings in GM. Hot-boned had lower 'overall like' ratings (6.62 vs. 7.35) and 'like of tenderness/texture' ratings (6.64 vs. 7.57) than cold-boned for young ($P < 0.05$), whereas boning method had no effect for cow ($P < 0.05$). There was a significant ($P < 0.05$) boning method by treatment interaction for LT WBS and 'like of juiciness'. Enhancement decreased WBS more for hot-boned (2.02 vs. 3.59 kg) than for and cold-boned (1.97 vs. 2.56 kg, $P < 0.05$). Enhancement increased 'like of juiciness' ratings more for hot-boned (7.47 vs. 5.67) than for cold-boned (7.51 vs. 6.37). In conclusion, consumers liked young beef more than cow beef, and cold-boned beef more than hot-boned beef, but pH-enhancement improved the palatability of all beef resulting in cow beef and hot-boned beef that was similar in consumer like to young beef and cold-boned.