INFLUENCE OF BISON FINISHING SYSTEMS ON CARCASS CHARACTERISTICS AND MEAT QUALITY

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I. OBJECTIVES

This study evaluated the influence of finishing system (grain or grass finishing) on carcass characteristics and meat quality of bison heifers, and consumer preference for bison steaks.

II. MATERIALS AND METHODS

Bison heifers were randomly assigned to treatments: grain-finished ($n = 108$, backgrounded on pasture and finished in a drylot for 130 d with *ad libitum* access to hay and a corn and dry distillers grain diet) or grass-finished ($n = 93$, remained on pasture until slaughter). Heifers were slaughtered at 28 mo of age. Carcass measurements were recorded, and striploins were collected from a subsample of carcasses ($n = 30$ carcasses closest to the treatment average hot carcass weight). Ultimate pH was recorded, striploins were fabricated, and the *longissimus lumborum* was isolated and cut into 2.54-cm steaks. One steak was designated for analysis of fatty acid profile, cholesterol content, and proximate analysis. Two steaks were aged for 14 d for consumer sensory evaluation; 4 steaks were aged for 4, 7, 14, or 21 d for analysis of Warner-Bratzler shear force and cook loss. All data were analyzed using the MIXED procedure of SAS (SAS Institute Inc., Cary, NC). Carcass and meat quality data were analyzed for the main effect of finishing treatment, with slaughter date as a random effect. Cook loss and Warner-Bratzler shear force were analyzed as repeated measures using the ante-dependence covariance structure for effects of finishing treatment, aging, and their interaction, with peak temperature as a covariate. Consumer preference was analyzed for the main effects of finishing treatment and serving order; serving time and panelist were included as random effects. Separation of least-squares means was performed using least significant difference with a Tukey adjustment, assuming $\alpha = 0.05$.

III. RESULTS

Grain-finished bison heifers had greater ($P < 0.01$) live and hot carcass weights, dressing percentage, ribeye area, backfat, and marbling scores compared to grass-finished heifers. Instrumental color values (L^*, a^*, b^*) of the ribeye and a^* value of backfat opposite the ribeye were increased ($P < 0.01$) for grain-finished heifers. However, L^* and b^* values of backfat opposite the ribeye were decreased ($P < 0.01$) in carcasses from the grain-finished system. Steaks from grain-finished heifers had increased ($P < 0.05$) crude protein and fat content and decreased ($P < 0.01$) moisture, while percentage of ash did not differ ($P > 0.05$) between treatments. The grain-finishing system produced steaks with increased ($P < 0.01$) cholesterol, palmitic, stearic, oleic, linoleic, arachidonic, and total fatty acids (mg/g of wet tissue). However, when expressed as a percentage of total lipid, grass-finished samples had increased ($P < 0.05$) proportion of polyunsaturated fatty acids and saturated fatty acids. The grain-finished system produced more tender ($P < 0.05$) steaks than grass-finished. Tenderness of all steaks improved ($P < 0.01$) with postmortem aging. Cook loss was affected ($P < 0.05$) by

the interaction of treatment with aging period. Overall cook loss was reduced ($P < 0.01$) for grain-finished and increased ($P < 0.05$) in steaks aged 4 d compared with 7 d or 21 d. Finishing system did not influence ($P > 0.05$) ultimate pH or consumer sensory ratings.

IV. CONCLUSION

Collectively, these data indicate that finishing systems influence bison carcass characteristics and meat quality, yet these differences do not translate to changes in consumer preferences. Additionally, finishing system influenced nutrient content and fatty acid composition, which may have health implications.

Keywords: bison, carcass characteristics, consumer sensory, finishing system, meat quality