ASSESSING OUTCOMES OF GENETIC SELECTION PANELS TO PREDICT MARBLING IN CROSSBRED BEEF CATTLE

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I. OBJECTIVES

The objective of this study was to evaluate the effectiveness of genetic panel marbling indexes (Igenity® [IT] and PredicGEN™ [PG]) to predict marbling and tenderness of crossbred beef cattle.

II. MATERIALS AND METHODS

Steers ($n = 23$) were harvested at the University of Idaho Meat Science Laboratory, and blood samples (1 mL) were submitted to Neogen® (IT) and Zoetis™ (PG) for genetic panel analysis. Marbling score (MS) and yield grade were determined by University of Idaho research team members using USDA quality and yield grading standards at 24 h postharvest and 1 h after carcasses were ribbed between the 12th and 13th ribs. Forty-eight hours postharvest, one boneless strip loin was collected from each carcass. On day 4 postharvest, six 2.54-cm-thick steaks were cut from the anterior end of each strip loin and assigned to an aging period of 14 or 21 d and evaluated using consumer sensory evaluation or Warner-Bratzler shear force (WBSF) analysis. Carcasses were grouped by their genetic panel marbling index scores into Low IT (IT indexes 3–6; $n = 16$), High IT (IT indexes 7–10; $n = 7$), Low PG (PG index < 50; $n = 9$), or High PG (PG index ≥ 50; $n = 14$). Steaks for all analyses were cooked to a target peak internal temperature of 71°C. For WBSF analysis, six 1.27-cm cores were removed from each steak parallel to the muscle fiber orientation, taking care to avoid connective tissue and fat. Cores were sheared perpendicular to the muscle fiber orientation, and peak shear force was recorded. One consumer sensory panel was conducted with 92 consumer sensory panelists. Each panelist evaluated 5 different steak samples for their perception of overall acceptability, tenderness, juiciness, and flavor. Samples were assigned to panelists using an incomplete block design. Results were analyzed using the Mixed Model procedure of SAS (SAS Institute Inc., Cary, NC). Significance was determined at $P < 0.05$, and trends were determined at $P < 0.10$.

III. RESULTS

Mean MS was observed to be greater in High IT steaks than in Low IT steaks ($P < 0.01$; 496 and 410, respectively). Additionally, mean MS was observed to be greater in High PG steaks than in Low PG steaks ($P = 0.01$; 458 and 398, respectively). A trend was observed for WBSF to be greater in High IT steaks than in Low IT steaks ($P = 0.06$), but no difference in WBSF was observed between PG marbling groups ($P = 0.83$). Consumers did not report differences between IT marbling groups in terms of acceptability ($P = 0.99$) or tenderness ($P = 0.24$). Additionally, consumers could not detect differences between PG marbling groups in terms of acceptability ($P = 0.75$) or tenderness ($P = 0.40$). Regardless of IT or PG index, consumers consistently preferred Choice steaks over Select steaks in terms of acceptability ($P = 0.02$) and tenderness ($P = 0.02$).

IV. CONCLUSION

In conclusion, based on these results, commercially available genetic tests could be a valuable tool for producers to be able to predict marbling by retaining ownership of feedlot steers with high genetic panel indexes. At times when the Choice-Select spread is high ($20), genetic panels could be cost-effective for commercial producers to use at the feedlot level to make decisions about retaining ownership or for feedlot managers to make feeding, implant, and marketing decisions.

Keywords: beef quality, genetic panels, Igenity®, marbling, PredicGEN™