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Effect of Residual Feed Intake Status, Breed and Post Mortem Aging on Consumer Perception of and Preference for Beef Ribeye Steaks

Z. Jiu^{1*} on behalf of University of Alberta, W. V. Wismer¹, M. Juárez², H. Nguyen¹, C. Fitzsimmons³, C. Li³, and H. L. Bruce¹

¹AFNS, University of Alberta, Edmonton, Canada; ²Agriculture and Agri-Food Canada, Lacombe, Canada; ³Livestock Gentec, Agriculture and Agri-Food Canada, Edmonton, Canada

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Objectives

The effect of selection for efficient animals using residual feed intake (RFI) on meat sensory quality and consumer preference has had limited study. The objective of this study was to determine the effects of breed, RFI and aging on consumer sensory preference and attributes perception of beef rib-eye steaks.

Materials and Methods

Thirty-six steers were used in a 3 breed (Angus, Charolais, and Kinsella Composite) × 2 RFI level (high and low) factorial design experiment. Two aging times (4 and 18 d) were also included in the experiment. Perceived and ideal tenderness, juiciness, flavor intensity and overall acceptance of ribeye steaks were evaluated by 24 consumers prescreened to ensure that they regularly consumed high-quality steaks. Analysis of variance (ANOVA), Generalized Procrustes Analysis (GPA) and preference mapping were used to analyze consumer sensory data.

Results

Results from the ANOVA showed that consumers found no significant effect of any main factor on beef flavor intensity ($P > 0.05$). Breed significantly affected juiciness ($P = 0.0070$) and overall acceptance of steaks ($P = 0.0149$), with steaks from Angus and Charolais receiving similar juiciness and acceptance ratings. Steaks

aged 18 d were slightly juicier ($P = 0.0832$) and more acceptable ($P = 0.0075$) than steaks aged 4 d. No RFI effect was observed for any sensory attribute and acceptance of steaks ($P > 0.05$). The comparison between consumers' ideal ribeye steaks and assessed samples found that sensory attributes of steaks from some treatments were different from consumers' ideal products ($P < 0.05$). About 80% of the total variation was explained by the first 2 dimensions of the GPA consensus configuration. GPA differentiated meat clearly by aging, with samples aged for 18 d and ideal ribeye steaks characterized as juicier, more tender and as having more intense beef flavor than samples aged for 4 d. Following GPA analysis, preference mapping was performed to correlate sensory attribute perception and consumer preference. Combined with the contour plot, results of preference mapping showed that steaks from carcasses of Angus and Kinsella Composite steers with high RFI received more appreciation from consumers than steaks from carcasses of steers with low RFI. This result suggested a negative influence of selection for efficient animals using RFI on consumer preference of ribeye steaks in some breeds.

Conclusion

Therefore, RFI can be a beneficial tool in selecting efficient animals because of its limited influence on meat sensory quality, but its possible adverse influence on consumer preference should be monitored during the selection process.