Effects of USDA Carcass Maturity on Sensory Attributes of Beef Produced by Grain-finished Steers and Heifers Classified as Less Than 30 Months Old Using Dentition

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Abstract
This study compared sensory properties of LM (strip loin) steaks from A maturity and B maturity or older carcasses that were produced by grain-finished steers and heifers classified as less than 30 months old at the time of slaughter using dentition. Carcasses were selected to represent 2 maturity groups and 3 marbling categories within each maturity group, resulting in 6 maturity x marbling subclasses, each subclass consisting of 75 carcasses. Maturity groups consisted of carcasses classified by USDA graders as either A⁰⁰ to A⁹⁹ overall (A) maturity or B⁰⁰ to C⁹⁹ overall (B-C) maturity; marbling categories consisted of carcasses with instrument marbling scores of Slight/Select (SL), Small/Low Choice (SM), or Modest⁰⁰ or greater/Upper 2/3 Choice (MT+). Carcasses were selected in pairs so that each carcass chosen to represent the B-C maturity group was paired with an A maturity carcass of the same sex and marbling score (±30 marbling units). Strip loin steaks were obtained from both sides of each carcass. After a 14-day aging period, 1 LM steak was measured for Warner-Bratzler shear force (WBSF) and slice shear force (SSF), whereas the other LM steak was used for sensory analysis by a trained descriptive attribute panel. No differences (P > 0.05) in WBSF, SSF, or sensory panel ratings for tenderness, juiciness, or flavor were detected between LM steaks from carcasses classified as A maturity and steaks from B-C maturity carcasses. However, marbling categories effectively stratified carcasses (MT+ > SM > SL) according to differences (P < 0.0001) in LM tenderness, juiciness, meaty/brothy flavor, and buttery/beef fat flavor. Increased marbling also was associated with lesser (P < 0.01) intensities of bloody/serumy and livery/organy flavors and reduced (P < 0.01) values for WBSF and SSF. Of the traits tested, only bloody/serumy flavor was affected (P < 0.05) by the maturity x marbling interaction. Interaction means showed that LM steaks from B-C maturity carcasses with SL marbling had a less intense bloody/serumy flavor than did steaks from A maturity carcasses with SL marbling. Results of this study suggest that, when applied to carcasses from grain-finished cattle whose dental ages are less than 30 months old at the time of slaughter, USDA quality grades would be no less effective in identifying eating quality differences if the A and B-C maturity groups were combined and quality grades were assigned using only marbling.

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