

ABSTRACT

**Characterization of biological types of cattle (Cycle VII): Carcass, yield, and longissimus palatability traits<sup>1,2</sup>**

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The objective of this experiment was to provide a current evaluation of the seven most prominent beef breeds in the United States and to determine the relative changes that have occurred in these breeds since they were evaluated with samples of sires born 25 to 30 yr earlier. Carcass (n = 649), yield (n = 569), and longissimus thoracis palatability (n = 569) traits from F(1) steers obtained from mating Hereford, Angus, and MARC III cows to Hereford (H), Angus (A), Red Angus (RA), Charolais (C), Limousin (L), Simmental (S), or Gelbvieh (G) sires were compared. Data were adjusted to constant age (445 d), carcass weight (363 kg), fat thickness (1.1 cm), fat trim percent (25%), and marbling (Small(35)) endpoints. For Warner-Bratzler shear force and trained sensory panel traits, data were obtained on LM from steaks stored at 2 degrees C for 14 d postmortem. The following comparisons were from the age-constant endpoint. Carcasses from L-, G-, and H-sired steers (361, 363, and 364 kg, respectively) were lighter ( $P < 0.05$ ) than carcasses from steers from all other sire breeds. Adjusted fat thickness for carcasses from A-, RA-, and H-sired steers (1.5, 1.4, and 1.3 cm, respectively) was higher ( $P < 0.05$ ) than for carcasses from steers from all other sire breeds (0.9 cm). Longissimus muscle areas were largest ( $P < 0.05$ ) for carcasses from L-, C-, S-, and G-sired steers (89.9, 88.7, 87.6, and 86.5 cm<sup>2</sup>), respectively) and smallest for carcasses from H- and RA-sired steers (79.5 and 78.4 cm<sup>2</sup>). A greater ( $P < 0.05$ ) percentage of carcasses from RA- and A-sired steers graded USDA Choice (90 and 88%, respectively) than from carcasses from other sire breeds (57 to 66%). Carcass yield of boneless, totally trimmed retail product was least ( $P < 0.05$ ) for RA- and A-sired steers (59.1 and 59.2%, respectively) and greatest ( $P < 0.05$ ) for G, L-, C-, and S-sired steers (63.0 to 63.8%). Longissimus muscle from carcasses of A-sired steers (4.0 kg) had lower ( $P < 0.05$ ) Warner-Bratzler shear force values than LM from carcasses of G- and C-sired steers (4.5 to 4.3 kg, respectively). Trained sensory panel tenderness and beef flavor intensity ratings for LM did not differ ( $P < 0.05$ ) among the sire breeds. Continental European breeds (C, L, S, and G) were still leaner, more heavily muscled, and had higher-yielding carcasses than did British breeds (H, A, and RA), with less marbling than A or RA, although British breeds have caught up in growth rate.

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