

ABSTRACT

Genetic parameters for yearling weight, carcass traits, and primal-cut yields of Hanwoo cattle

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Genetic parameters associated with yearling weight, carcass traits, and primal-cut yields of male Hanwoo cattle were investigated using univariate and bivariate animal models. The mean yearling weight (YWT), carcass weight (CWT), longissimus muscle area (LMA), backfat thickness (BFT), and marbling score (MS) were 352.47 ± 0.40 kg, 337.39 ± 0.64 kg, 78.28 ± 0.13 cm², 8.45 ± 0.05 mm, and 3.25 ± 0.03 , respectively. Total primal-cut yield (TPC) was $78.95 \pm 0.10\%$ of CWT, of which 42.3% was contributed by the forequarters (chuck, CHK; shoulder, SLD; ribs, RIB; and brisket and flank, BAF). Loins, top round (TRND), and round (RND) were associated with yields of 13.57%, $5.45 \pm 0.01\%$, and $8.87 \pm 0.02\%$, respectively. The largest cut studied was ribs ($15.67 \pm 0.03\%$). The estimated heritabilities (h^2) of YWT, CWT, LMA, BFT, and MS were 0.18 ± 0.02 , 0.29 ± 0.04 , 0.38 ± 0.05 , 0.45 ± 0.05 , and 0.62 ± 0.07 , respectively. Shoulder yield was highly heritable in Hanwoo steers (0.83 ± 0.13), followed by the yields of round (0.66 ± 0.12), striploin (0.64 ± 0.12), top round (0.62 ± 0.12), sirloin (0.60 ± 0.12), and total primal-cut yield (0.52 ± 0.11). The h^2 values of CHK, BAF, RIB, and tenderloin (TLN) ranged from 0.19 ± 0.09 to 0.41 ± 0.11 . Generally, the genetic CV was low for most traits (2.33%–6.15%), except for CHK, BFT, and MS. The genetic correlation (r_g) was strong between YWT and CWT (0.77 ± 0.06). The greatest positive and negative r_g among carcass traits were those between LMA and CWT (0.52 ± 0.08) and between LMA and BFT (-0.30 ± 0.09), respectively. The correlation between CHK and SLD (0.81 ± 0.14), and those between SLD, TLN, TRND, and RND, were mostly strong (0.77–0.87), but the r_g between RIB and other traits were strongly negative. The TPC yield showed moderate to high r_g with most primal cuts. The YWT, CWT, and LMA correlated notably with CHK, SLD, and loin yields, especially LMA. However, BFT and MS were negatively correlated with many primal cuts but RIB. Those r_g estimates were also opposite of that of LMA and CWT with primal cuts. Phenotypic correlations (r_p) were generally weaker than r_g estimates. The r_p of YWT, CWT, and LMA were either zero or moderately negative compared to those of the BFT and MS with primal cuts. Most primal cuts yielded positive r_p estimates among them, except for RIB. Our results suggest that direct selection for YWT, various carcass traits, and primal-cut yields may increase the carcass value of Hanwoo males.

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