

Carcass composition is linked to residual feed intake level in crossbreed growing bulls

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Feed efficiency is often determined by the residual feed intake (RFI) that is the difference between measured and predicted feed intake [the latter is obtained by a linear regression relating feed intake on metabolic body weight (BW^{0.75}) and average daily gain (ADG)] within a group of cattle receiving the same diet. This study aimed to assess the effect of RFI level on carcass composition of crossbreed bulls. Bulls (n = 84, 155 ± 9 kg BW, 124 ± 13 days old; mean ± SD) cross from dairy mother and dairy (n = 22), mixed (n = 24) or beef (n = 38) breed father were allocated into three growing diets. Diets composed of maize (whole crop or ear-enriched) silages, grass silage and concentrates (76:24 forage/concentrate) were iso-proteinic and had low, mid or high levels of net energy for meat production (7.0, 7.4 and 7.5 MJ/kg DM, respectively). Bulls were slaughtered at a BW of 534 kg (n = 41, 340 days old) or 603 kg (n = 43, 390 days old). Carcass weight, proportions of adipose tissue, muscle and bone of the 11th rib were determined in order to predict carcass composition using the linear models developed by Geay and Béranger (1969; DOI:10.1051/animres:19690106). Within each treatment, RFI was computed over a 152 days period (164 to 315 days old) before bulls were classified as high, mid or low feed efficient (relative to the RFI mean, HiE > 0.5 SD below, MiE ± 0.5 from and LoE > 0.5 SD above, respectively). Carcass traits were analyzed by ANOVA using the MIXED procedure of SAS with diet, breed type, BW at slaughter, RFI class and their interactions as fixed effects, and bull as random effect. On average, ADG was 1.46 kg/d and was unaffected (P > 0.10) by diet, breed type or RFI class. Among breeds, beef crossbreed bulls had higher (P < 0.01) carcass weight and yield, whereas dairy crossbred tended to have lower (P < 0.10) muscle and had higher (P < 0.05) bone proportions in carcass. For LoE bulls, amount and proportion of adipose tissue were higher (13.3%; P < 0.05) and that of muscle tended to be lower (68.8%; P < 0.10), than for MiE and HiE bulls (11.8% adipose, 70.4% muscle). Such results highlight that animal selection based only on RFI could affect carcass composition and thus carcass sale incomes.