

MUSCULARITY IN BEEF CALVES SIRED BY BULLS OF DIFFERENT MUSCLE SCORE

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Subjective evaluation of muscling in beef cattle, or muscle scoring (McKiernan 1990), has been applied to a wide range of British, large European and *Bus indicus* cross breeds. Such muscle scores have proven useful for determining the value of live cattle by virtue of their positive association with the economically important parameters of dressing percentage and meat yield (Perry *et al.* 1993).

Having established the potential for muscle scoring across breed types, a study was commenced to determine the extent to which muscle score is inherited, and contributes to economic value, in British breeds. This first report examines the effect of high and low muscle score bulls on the birth and early growth characteristics of their progeny.

In 1991, 4 high (B) muscled Angus bulls and 4 low (D) muscled Angus bulls were selected to represent diverse levels of muscularity. Within muscle groups the bulls were grouped into like pairs and mated to 50 randomly selected mixed age Hereford cows or 50 Hereford heifers for 6 weeks, after which the bull pairs were interchanged between cow and heifer groups for a further 6 weeks.

Liveweight (BW, kg), height and length were measured on calves at birth. Liveweight (W, kg), height at the withers and tail, length, girth, stifle thickness and cannon bone circumference (CC, cm) (all as per Tatum *et al.* 1986) were measured at 2 and 8 months of age. Muscle score (MS, pts) was assessed by an experienced assessor using a 15 point scale (15 high) at 2 and 8 months of age. Scanning of fat depth at the rump (P8, mm) and eye muscle area (EMA, cm²) at the 12/13th rib were also taken at 8 months of age. Data were analysed by regression analyses.

At birth there were no differences due to muscle score group in dystocia, calf birth weight, or calf height or length. However, male calves were significantly ($P < 0.05$) heavier, and cows gave birth to heavier calves ($P < 0.05$) of greater height ($P < 0.05$) and greater body length ($P < 0.05$) than heifers.

By 2 months of age the only measurement significantly greater for high muscle group was cannon circumference, although muscle score was approaching significance ($P = 0.06$). Again the calves suckling cows were significantly greater for all measurements than calves suckling heifers, male calves were heavier ($P < 0.05$) and longer ($P < 0.05$), but not higher than female calves.

At weaning calves from high muscle bulls were again just short of being significantly more muscled ($P = 0.07$) than calves from low muscled bulls. The dam effect continued with significantly greater fat depth, weight, height and length for calves raised by cows rather than heifers. Similarly, male calves had significantly greater measures for most characteristics except length and girth.

Table 1. Means and standard errors for birth weight (BW), liveweight (W), muscle score (MS), cannon bone circumference (CC), fat at the P8 site (P8) and eye muscle area (EMA) at birth, 2 and 8 months of age on progeny of high and low muscle bulls

		2 months of age				8 months of age			
		BW (kg)	W (kg)	MS (pts)	CC (cm)	W (kg)	MS (pts)	P8 (mm)	EMA (cm ²)
High	mean	37.7	86.6	7.5	23.2	194	6.3	2.5	34.8
	se	1.4	2.8	0.2	0.2	4.9	0.2	0.2	0.8
Low	mean	34.7	80.4	6.5	22.4	204	5.9	3.1	33.6
	se	1.3	2.7	0.2	0.2	4.7	0.2	0.2	0.7

The preliminary results indicate that high muscled bulls produce calves with higher muscle score than low muscled bulls, but that early growth determinants such as milk supply of the dam and sex of the calf play a larger part than sire muscle score in determining productivity prior to weaning.

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