

OBSERVATIONS ON THE EFFECT OF SELECTING BEEF SIRES
FOR HIGH AND LOW BIRTHWEIGHT

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Dystocia in beef heifers is a problem of considerable economic importance. Numerous studies have shown that it is primarily a function of calf size and the pelvic area of the dam (reviewed by Price and Wiltbank 1978). Since nutritional management cannot be relied on to substantially reduce dystocia rates (Kroker and Cummins, 1979), other techniques need to be evaluated.

Birth weight has a moderate to high heritability (Preston and Willis, 1970). Consequently, selection of low birth weight sires specifically for use on heifers may be a useful procedure.

For this experiment, 8 Angus bulls were purchased from two Victorian herds. Using birth weight data adjusted for dam age, the two heaviest and lightest bulls available in each herd were selected on their individual birth weights. The four heavy birth weight bulls and the four light birth weight bulls were then mated (as multiple sire groups) with herds of 143 yearling Hereford heifers for 8 weeks beginning April 22.

After mating the two groups of heifers were run together as a single mob throughout pregnancy and calving. For the first 19 days of calving, the heifers were inspected twice daily and newborn calves were weighed, tagged and identified with their dams. Results are shown in the table below.

TABLE 1: Some Effects of Mating Bulls of High or Low Birth Weights to Hereford Heifers

	High Birth Weight	Low Birth Weight	t Test
No. of bulls	4	4	
Bull birth weight ¹	35.6 ± 1.4	26.9 ± 1.2	xx
No. of calves recorded at birth	73	90	
Calf birth weight ²	32.4 ± 0.4	30.2 ± 0.4	xxx
No. assisted	2	1	NS
No. stillbirths ³	3	0	NS
No. of calves recorded at weaning ⁴	57	67	
Weaning weight ²	148 ± 3.3	146 ± 2.6	NS

¹Adjusted for dam age

²Adjusted for sex

³Four other stillbirths occurred, but could not be attributed to individual dams.

⁴Discrepancies between birth and weaning due to loss of tags and calf deaths.

xx P <0.01

xxx P <0.001

The selection procedure resulted in a significant difference in birth weight in the progeny of the two groups of bulls. This difference gave a realised heritability of $h^2 = 0.5$.

The dystocia and stillbirth rate was considerably lower than normally experienced in this herd. Based on the identified calvings, it did not differ between the two groups of bulls. Data from Smith *et al*, (1976) indicates that the difference in birth weight achieved might be expected to lead to a 7 percent reduction in dystocia rate. Extrapolation of the data from Price and Wiltbank (1978) indicates a possible reduction of 11 percent if birth weight and pelvic areas were in the critical regions.

Although these results offer some encouragement for the concept of sire selection based on individual bull birth weight as an aid to reducing dystocia rates in beef heifers, a more complex management and selection system may be required to have a substantial impact on this problem.

REFERENCES

- KROKER, G.A. and CUMMINS, L.J. (1979). *Aust. Vet. J.* 55: 467.
- PRESTON, T.R. and WILLIS, M.B. (1970). *"Intensive Beef Production"*, Pergamon Press, Oxford.
- PRICE, T. and WILTBANK, J.N. (1978). *Theriogenology* 9: 195 and 221.
- SMITH, G.M., LASTER, D.B. and GREGORY, K.E. (1976). *J. Anim. Sci.* 43: 27.