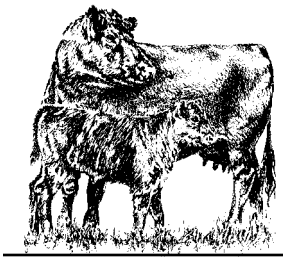
Western Beef Resource Committee

Fourth Edition



Cattle Producer's Handbook

Reproduction Section 446

Pelvic Area in Beef Cattle Production

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Calving difficulty (dystocia) is the leading cause of death in calves. Oregon surveys indicated that 53 percent of all calf deaths occur within 24 hours of birth. Montana data indicates that 57 percent of all calf losses are associated with dystocia. The recent trend in the beef cattle industry has been to produce larger animals that have larger birthweights and a higher incidence of dystocia.

Many factors influence the occurrence of dystocia. Most studies agree calf birthweight is the major cause of difficult births, but pelvic area, sex of calf, and heifer weight also contribute to the problem. The data in Table 1 show the relative importance of calf birthweight, pelvic size, and calf sex as causes of dystocia.

Dystocia results from a disproportion between the size of the calf (birthweight) and the size of the skeletal opening (pelvic size) it must come through during birth. Therefore, it may seem logical that increasing pelvic size would reduce calving problems. This result, however, does not necessarily follow.

Much has been written about the value of pelvic size as a predictor of calving difficulty. In an Oklahoma study calves born unassisted were 7 pounds lighter on average at birth than those that required assistance to be born. Heifers with small pelvic areas experienced an 85 percent difficulty rate compared to 31 percent difficulty for heifers with large pelvic areas.

Table 1. Relative importance of factors affecting dystocia in first-calf 2-year-old heifers.

Factor	Statistical sign. level	Importance rating
Calf birthweight	.01	3.05
Dam precalving pelvic area	.05	1.16
Dam precalving weight	.05	1.10
Calf sex	.05	1.00

Source: Miles City, Montana. (Bellows 1995).

South Dakota research showed heifers with below-average pelvic areas (<140 cm^2) had twice as much dystocia as those with pelvic areas larger than 140 cm^2 (49 vs. 24 percent).

Fig. 1 is based on data from a Montana study (Bellows 1995) and shows the relationship between birthweight, pelvic opening, and dystocia. Keeping calf birthweight low while increasing the pelvic opening will reduce calving problems. However, because of the high genetic correlations between traits affecting dystocia, predicting calving problems in individual heifers is a difficult task.

Valid prediction criteria should either identify heifers that (1) will not experience dystocia or (2) will experience dystocia. Montana studies indicate more success (+10 percent) in predicting heifers that will not experience dystocia than heifers that will experience dystocia. As pelvic areas became larger, the incidence of dystocia was less in all birthweight classes. This concept is important when attempting to use pelvic area to predict calving problems.

Using pelvic area **alone** has been of minor value in predicting dystocia. The reason is that accurately and consistently predicting individual calf birthweight is difficult. Large frame heifers tend to have large pelvic areas but have proportionately heavier calves at birth, which offsets any advantage in terms of less calving difficulty. Selecting on heifer body size alone seems ineffective.

In Canada, Basarab et al. (1993) conducted a study involving 4,387 heifers to examine several methods of predicting heifers that would experience calving problems. One method using pelvic size for this prediction resulted in a correct classification of only 40 percent of the heifers measured. After theoretically "culling" 64 percent of the heifers for small pelvic areas, the dystocia percentage was reduced from 9.5 to 7.9 percent. Other prediction methods involved a lower culling rate (17 percent) and reduced difficult birth rates by 10 percent.