

II. RELATIONSHIP OF PELVIC MEASUREMENT TO CALVING DIFFICULTY

Calving problems occur mainly in females having their first calf. The major contributing factor influencing calving problems is size or weight of the calf. The second is the area of the pelvic opening in the mother. These factors can be controlled by using sires with low EPDs for birth weight with high accuracies (>85%) and eliminating heifers before breeding with small pelvic area (<140 cm² at 13 months of age). There is no way to eliminate abnormal presentations of calves at birth which cause calving problems. There are four things that influence pelvic area in yearling heifers: (1) Genetics of their sire and dam, (2) breed, (3) level of nutrition, and (4) if they had received growth stimulating implants before a year. All four of these factors can decrease or increase pelvic area. Certain breeds such as Brahman, Brahman crosses, Salers, and other continental breeds have larger pelvic areas as compared to the British breeds. Also, certain breeds have shorter gestation length and give birth to smaller calves. These factors can be used in identifying females that have less calving problems for the commercial producer.

The pelvic area grows at a fairly constant rate from 9 to 24 months of age. Heifers pelvic area increases slightly faster from 10 to 15 months versus 16 to 24 months. The Continental and Brahman breeds average growth is 30 cm² per day and the English breeds are 25 cm² per day. This relates to 8 or 10 cm² increase per month for this period. This allows you to measure the pelvic area at any time. It is recommended that heifers be measured before breeding and small ones be culled, fed out in the feedlot, or kept open as grass cattle. To decrease calving problems in first-calf-heifers, remember that you must work on the two major factors that cause the problem--weight or size of calf and pelvic area. Data collected at the San Juan Basin Research Center in Hesperus, CO shows both weight of calf and pelvic area influence calving difficulty (Table 1).

TABLE 1. RESULTS ON CALVING DYSTOCIA IN FIRST-CALF-HEIFERS

Yearling Pelvic Size (cm ²) ^a	No. Calves Born	Birth Weight of Calf (lbs)	% of Calves Assisted
(Small) 100-145	60	(Large) 77-125	80%
(Large) 146-220	69	(Large) 77-125	48%
(Small) 100-145	79	(Small) 45-76	42%
(Large) 146-220	62	(Small) 45-76	19%

^a Pelvic measurements were taken at approximately 13 mo. of age.

These data were collected over a three year period on first-calf-heifers by the same person and can be summarized as follows:

1. Both pelvic area and birth weight of the calf influence calving difficulty.
2. When pelvic area was small and birth weight was large, 80% of the calves were assisted.

3. When large pelvic area and large births existed, calving difficulty was reduced from 80% to 48%. By selecting for both calf weight and pelvic area, calving problems can be decreased by about 75% (Pelvic + Calf Wt = 19 vs 80%).
4. When small pelvic area and light birth weights existed, calving difficulty was reduced from 80% to 42%.
5. When large pelvic area and light birth weights existed, calving difficulty was reduced from 80% to 19%.
6. All of the caesareans were from heifers with small pelvic areas (100-145 cm²) and large birth weights (77 to 125 lbs).
7. Some calving difficulty is unrelated to birth weight and pelvic area and is therefore unavoidable.

Dr. Gene Deutscher has developed a formula for ranchers to determine what weight calf they must have to eliminate calving problems when you know what the heifers pelvic size and weight is at different ages before calving (Table 2).

TABLE 2. PELVIC AREA/CALF BIRTH WEIGHT RATIOS FOR VARIOUS HEIFER WEIGHTS AND AGES TO ESTIMATE DELIVERABLE CALF

Heifer Weight (lbs)	Age at measurement, months			
	8-9	12-13	18-19	22-23
500	1.7	2.0		
600	1.8	2.1		
700	1.9	2.2	2.6	
800		2.3	2.7	3.1
900		2.4	2.8	3.2
1000		2.5	2.9	3.3
1100				3.4

Examples for using this table would be two heifers weighing 700 lbs at 12-13 months of age.

	Pelvic Area				Wt. of calf with No Problems
Heifer A	145	÷	2.2	=	< 66 lbs
Heifer B	180	÷	2.2	=	< 82 lbs