

Livestock Health Series

Addressing Calving Difficulty

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Introduction

Calving difficulty (dystocia) is a very important economic problem in the U.S. beef cattle industry. Approximately 3 percent of all beef calves born in the U.S. will be lost due to calving difficulty. Several factors can play a role in causing calving difficulty including heavy birth weights, abnormal fetal position, limited pelvic area and the female's age. In order to recognize dystocia and know when assistance is required, it is important to be familiar with the different stages of labor.

Stages of Labor

When a cow goes into labor, the process can be divided into three general stages as summarized in Table 1.

Typically, a normal delivery should be completed within one to three hours after the water bag appears. It is important to take proper action during each successive stage of labor to ensure a live calf. A couple of weeks before the calving season, cows



Figure 1. Cow exhibiting a water bag.

and heifers that are due to calve should be moved to a smaller pasture where they can be easily observed. Always try to avoid extensive movement after labor has begun. Moving the animal will slow down the labor process because a cow or heifer will stop to examine its new surroundings. It is a good idea to always have proper facilities and equipment close at hand and in working order for use during the calving season. Movement to a maternity stall may be necessary if assistance is required.

When to Intervene

It is important to observe a cow in labor, but leave her alone if the calving is proceeding normally. If the

Table 1. Stages of Labor

Stages	Normal Duration	Normal Events
Stage 1	2-6 hours	a. Uterine contractions begin. b. Cervical dilation occurs. c. Restlessness; separate from herd. d. Water bag expelled at end of stage 1.
Stage 2	< 2 hours	a. Uterine contractions increase. b. Fetus enters birth canal. c. Calf delivery is completed.
Stage 3	2-8 hours	a. Afterbirth is expelled (cleaning).

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cow is in Stage 2 and **no progress** is observed after one hour, then assistance may be required. Upon observation of a prolonged calving period (longer than the typical durations noted in Table 1 on page 1), a cow should have a pelvic examination performed. Proper measures should be taken to disinfect yourself and the cow before attempting a pelvic exam. Always wear an OB sleeve while performing this exam.

When performing the pelvic examination, one should determine if the calf is in the normal delivery position (see Figure 2). If the calf is positioned correctly in the birth canal and the cow requires assistance to complete the delivery, OB chains can be applied to the front legs. Carefully secure the OB chains above the ankle joints onto the cannon bones of the front legs. The chains should be adjusted so that they pull from the bottom side of the legs to help prevent a leg fracture.

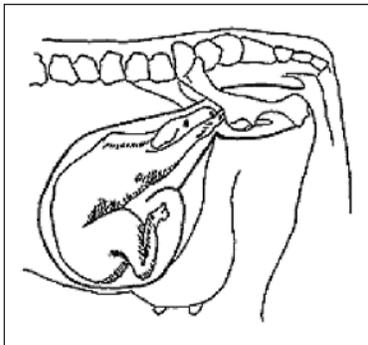


Figure 2. Normal position for delivery.

OB handles can be used to apply traction to help the cow in delivery. After the calf's head and shoulders are exposed, the calf should be pulled downward at a 45° angle parallel with the cow's back legs. In some situations, a calf jack may be needed for delivery. If using a calf jack, always bear in mind that significant pressure can be applied with this instrument. The pull from a calf jack is approximately equal to the same force as seven men. Excessive force could traumatize or injure the cow and/or calf. After the calf has been delivered up to the last rib, rotate the calf one half (1/2) turn to avoid hip lock and the rest of the calf's body should deliver on its own.

Avoid a few things while assisting a cow during calving. When dealing with an abnormally positioned delivery, the inexperienced herdsman should obtain the assistance of a veterinarian. Never use soap as a lubricant because it removes the cow's natural lubricants in the birth canal. Several good commercial lubricants are available for obstetrical use. Try to avoid pulling on the calf until the cow is also pushing, and maintain tension when she rests to keep the calf from slipping back into the uterus.

After the calf is delivered, remove all mucus and birthing tissues from the calf's airway and mouth. The calf should be tagged for identification and its birth weight recorded. Bull calves can be castrated at this time. The navel can be disinfected with iodine to reduce the possibility of infection. Keep in mind, if you experience difficulties while assisting a cow with calving, contact your local veterinarian for professional support.

Selecting for Calving Ease and Low Calf Birth Weight

Since calving difficulty is such an important economic problem, one way to address the problem is through genetic selection. Using a low birth weight bull is one step that can be taken to prevent calving difficulty. Birth weight is usually the major factor causing calving problems. Table 2 illustrates how the incidence of dystocia increases as birth weight increases and indicates why full attention should be given to this factor.

Table 2. Effect of Birth Weight on Ease of Calving in Percentage Simmental Females (Meacham, Virginia Tech)

	Ease of Calving			
	Normal Birth	Hand Pull	Mechanical Puller	Caesarean
# of Females	68	34	16	2
% of Total	56.7	28.3	13.3	1.7
Birth Wt. (lbs)	81.1	88.3	100.3	121.0

The heritability of birth weight is nearly 48 percent. Therefore, by using selection pressure on bulls for birth weight and calving ease, it would be possible to alleviate many existing calving problems within a herd. The sex of a calf can also influence birth weight. Bull calves are generally heavier at birth than heifer calves. Bull calves can outweigh heifers by 1.5 to 10 pounds at parturition. However, this occurrence is difficult and expensive to control.

What Traits Make up a Calving Ease Sire?

Expected Progeny Differences (EPDs) for birth weight, calving ease and maternal calving ease should be considered when selecting sires for use on first-calf heifers (select for a calving ease sire). For example, evaluate the information on the following two sires.

Table 3. Using EPDs to Compare Bulls for Calving Ease

	Actual Birth Wt.	Birth Wt. EPD	Calving Ease EPD	Calving Ease Maternal
Bull A	85	2	7	4
Bull B	96	5	3	7

- Bull A is expected to sire calves that come 3 pounds lighter at birth on average than Bull B (Birth Wt. EPD).
- Expect 4 percent more calves from Bull A to be born unassisted than Bull B (Calving Ease EPD).
- Daughters of Bull B have a 3 percent greater likelihood of calving unassisted as compared to daughters of Bull A (Calving Ease Maternal).

In general, Bull A should be an easier calving sire, since birth weight accounts for a major portion of the calving difficulty. However, since many breed associations report calving ease EPDs, the simultaneous use of these figures can help identify young bulls that can be used on females without causing major dystocia. Calving ease EPDs have an advantage in that this measurement of performance is not affected by management and nutritional factors that may influence actual birth weight. Calving ease maternal should be seriously considered if you are planning to keep replacements from a group of calves because this figure is really a second generation calving ease predictor.

Although the sire used plays the most important role in determining calf weight, **the genetics of the dam should not be overlooked.** Gestation length and pelvic measurements can be utilized to make replacement heifer decisions for improving calving difficulty from a maternal perspective. Gestation length has an indirect influence on calving difficulty. As the length of gestation increases, calf weight will increase by 0.3 to 0.5 lbs/day. Selecting for shorter gestation length will not only help with potential dystocia but will allow for additional days postpartum for rebreeding efficiency.

The size of the pelvic opening in relation to calf size also affects whether dystocia will occur. Selecting for large, growthy replacement females indirectly increases pelvic area. At the same time, these heifers will tend to have heavier weight calves at birth, compounding the issue. Nonetheless, pelvic measurements can still be a useful selection tool when used to compare heifers of a similar weight and age. If this selection tool is used correctly, it can provide information for culling heifers that do not meet a predetermined pelvic area requirement. The most convenient time to measure pelvic area is during the pregnancy exam. The following table uses pelvic measurement and calf birth weight ratio to estimate deliverable calf size.

Table 4. Using Pelvic Area/Calf Birth Weight Ratios to Estimate Calf Birth Weight (Deutscher, 1991)

Weight (lb)	Age at Measurement (Months)			
	8-9	12-13	18-19	22-23
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
1,000	--	2.5	2.9	3.3
1,100	--	--	--	3.4

For example: At pregnancy exam (18-19 months), a heifer weighing 800 pounds that measured 180 cm² pelvic area should have the capacity to deliver a calf that weighs 180/2.7 = 67 pounds. If the heifer measured 220 cm² pelvic area, then the estimated calf weight will be 220/2.7 = 81.5 pounds.

Age and Parity of Dam

Table 5 illustrates why it is important to know the age of your cow herd and select your herd bull accordingly. Separating the first-calf heifers to breed to a calving ease sire would be a smart practice. Breeding first-calf heifers two to three weeks prior to the cow herd can also be an important management tool. These practices concentrate the breeding season so you can give more time and attention to calving and allow heifers more time to rebreed the following year.

Table 5. Effect of Dam's Age on Calving Difficulty (Ritchie, Michigan State University)

Dam's Age	Research Station	
	MARC ^a	CSU ^b
	Percent Calving Difficulty	
2 years	54	30
3 years	16	11
4 years	7	7
5 years and over	5	3

^a Meat Animal Research Center

^b Colorado State University

Using EPDs to Select Replacement Heifers

Producers do not typically plan matings to increase calving difficulty. Proper sire selection and heifer development can go a long way in eliminating calving problems. Although, these practices are very important, do not overlook the maternal influence on calving difficulty.

The sire of the replacement heifer can have an impact on how easily a heifer will calve. Pay close attention when selecting replacement heifers on the maternal grandsire's (heifer's sire) birth weight performance and EPDs for calving ease. In this case, Calving Ease Maternal EPD is the best predictor (if reported).

Summary

While sex of calf, embryonic death and abnormal presentations are hard to control, good management, nutrition and proper sire selection can go a long way to help improve percent calf crop. It is important to identify the proper time to intervene when trying to assist with calving difficulties and to learn more about the proper use of calving ease EPDs. For more information about beef cattle management, contact your county Extension office.

Reference

Calving Difficulty in Beef Cattle. Kansas State University Cooperative Extension Service. Manhattan, KS. 1989

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