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Assisting the Beef Cow at Calving Time

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Six to ten percent of all calves born in beef cow herds in the U.S. die at or soon after birth. Approximately half of those deaths are due to calving difficulty (dystocia). This multimillion dollar annual loss is second only to losses from cows failing to conceive.

Factors Causing Calving Difficulty

About 80 percent of all calves lost at birth are anatomically normal. Most of them die because of injuries or suffocation resulting from difficult or delayed parturition (calving). Factors contributing to calving problems fall into three main categories: calf effects, cow effects, and fetal position at birth.

Calf Effects — Heavy birth weights account for most of the problems related to the calf. Birth weights are influenced by genetics of the sire and dam, sex of the calf, age of the cow, environmental temperature conditions, and, to a slight degree, nutrition of the cow. Shape of the calf also may have a small effect on calving problems.

Cow Effects — Several factors associated with the cow influence dystocia, the major ones being her age and pelvic size.

Age — Two-year-old heifers require more assistance at calving than do cows because these females usually have smaller pelvic areas.

Pelvic Area — Pelvic area (birth canal) increases as the female develops to maturity. Thus, a higher proportion of calving difficulty in 2- or 3-year-old cows is due to smaller pelvic openings. Heifers and cows with small pelvic areas are likely to require assistance at calving. However, even heifers with large pelvic areas may need help in delivering large calves. The calf's birth weight and cow's pelvic area have a combined effect on dystocia. Degree of dystocia is determined primarily by the size of the calf in relation to the size of the cow's pelvic area. Therefore, calving problems can be reduced by decreasing calf birth weight and ensuring adequate growth and

Minutes after giving birth, a 2-year-old beef cow attends to her newborn calf. Photo by Scott Bauer, USDA.

development of replacement heifers from weaning to calving.

Fetal Position at Birth — About 5 percent of the calves at birth are in abnormal positions, such as foreleg or head turned back, breech or rear end position, sidewise or rotated, etc. (*Figure 1*). This requires the assistance of a veterinarian or an experienced herdsman to position the fetus correctly prior to delivery. If fetal position cannot be corrected, the veterinarian may have to perform a caesarean section.

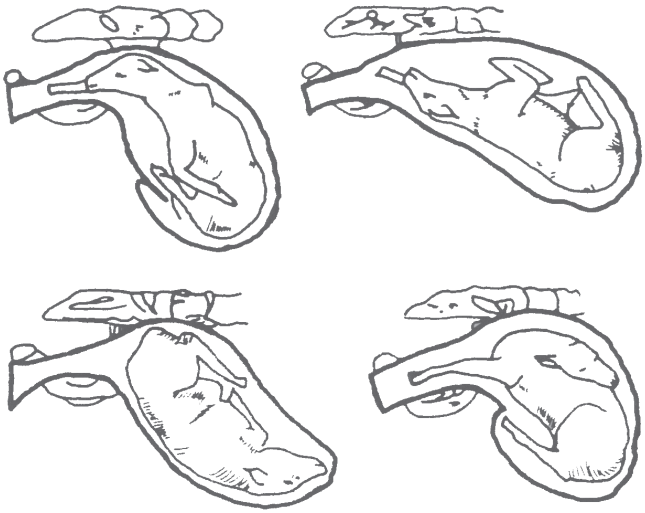

Figure 1. Abnormal positions of the calf for delivery.

Stages of Calving

Parturition, the stages of calving, is a complex, dynamic process initiated by the fetus through hormonal signals transmitted to the dam as well as mechanical and neural stimulation in the uterus. Normal calving can be divided into three general stages: I - preparatory, II - delivery of fetus, and III - expulsion of the placenta or afterbirth. The time interval of each stage varies among types and breeds of cattle and among individuals of the same breed. A general understanding of the birth process is important to proper calving assistance and is summarized in *Table I.*

Table I. Stages of Calving

Stage and time	*Events*
I - Preparatory (2 to 6 hours)	Calf rotates to upright position Uterine contractions begin Water sac expelled
II - Delivery (1 hour or less)	Cow usually lying down Fetus enters birth canal Front feet and head protrude first Calf delivery complete
III - Cleaning (2 to 8 hours)	"Button" attachments relax Uterine contractions expel membranes

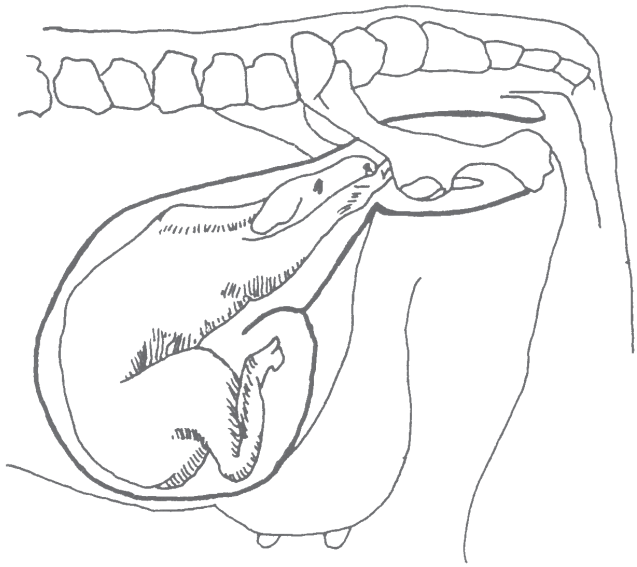

Figure 2. Normal position of the calf just prior to delivery.

Stage I - Preparatory (two to six hours) — During pregnancy, the fetal calf resides in a large fluid-filled sac and can be found in many positions. Just prior to labor, it rotates to an upright position with its forelegs and head pointed toward the birth canal (*Figure 2*).

In the preparatory stage, the cervix dilates and rhythmic contractions of the uterus begin. Initially, contractions occur at approximately 15-minute intervals. As labor progresses, they become more frequent until they occur every few minutes. These contractions begin at the back of the uterine horn and continue toward the cervix, forcing the fetus outward. Any unusual disturbance or stress during this period, such as excitement or even movement, may inhibit the contractions and delay calving.

At the end of the preparatory stage, the cervix fully dilates, allowing the uterus and vagina to become a continuous canal. A portion of the placenta (water sac) is forced into the pelvis and aids in the dilation of the cervix. This water sac usually ruptures and the membranes hang from the vulva until Stage II.

Stage II - Delivery (one hour or less) — Delivery begins when the fetus enters the birth canal, and usually occurs while the cow is lying down. Uterine contractions are now about every two minutes and are accompanied by voluntary contractions of the diaphragm and abdominal muscles.

Surrounded by membranes, the calf's forelegs and nose now protrude from the vulva. After the nose is exposed, the dam exerts maximum straining to push the shoulders and chest through the pelvic girdle. Once the shoulders have passed, the abdominal muscles of the calf relax, and its hips and hind legs extend back to permit easier passage of the hip region.

The calf is normally born free of fetal membranes (placenta) because they remain attached to the cotyledons or "buttons" of the uterus. This ensures an oxygen supply for the calf during birth. Upon passage through the vulva, generally, the umbilical cord breaks and the lungs become functional.

Delivery is normally completed in one hour or less. Special assistance is warranted if this stage goes beyond two to three hours.

Stage III - Cleaning (two to eight hours) — The caruncle-cotyledon, or button attachment between uterus and placenta, relaxes and separates after parturition. The placenta is then expelled by continued uterine contractions. Cows normally expel the placenta within two to eight hours.

Preparing for Calving Assistance

Normal delivery should be completed within two to three hours after the water sac appears in heifers, and one to two hours in cows. If prolonged, the calf may be born dead or weak.

Because timing is vital to providing proper assistance, frequent observations are a must. Assisted deliveries should not be attempted without proper preparation of facilities and equipment. A clean, well-lighted maternity stall with head catch facilitates examination. Head catch facilities should include removable or fold-out sides that allow a cow to lay down with ample room for those assisting once the "pulling" of the calf begins.

Obstetrical (OB) equipment such as chains and handles should be placed in a bucket of water with disinfectant before use to reduce bacterial contamination. Disinfectant, soap, and lubricant should be in plastic squeeze bottles to enhance use.

Check with your veterinarian for advice on when to assist a cow alone and when to call him or her. Experience will help determine if the calf can be delivered with assistance or if a caesarean is necessary. Determination is usually made on initial examination. The goal is to deliver a live calf from every cow.

Steps in Calving Assistance

1. After observing a delay in delivery, a pelvic examination should be done to determine the extent of cervical dilation. The cow's vulva and rectum should be scrubbed. You should scrub your hands and arms, and wear plastic shoulder-length OB sleeves. Lubrication should be applied to the OB sleeves.
2. Determine the position of the fetus (*Figures 1* and *2*). If it is in an abnormal position, experience and judgment must be used to determine if a correction can be made or if professional help should be summoned.
3. Examine the size of the calf relative to the birth canal. A large calf forced through a small pelvic opening may result in death of the calf and injury (including paralysis) to the cow. If this examination is made when the head and front feet are still in the birth canal, the opportunity for a successful caesarean section exists.
4. Attach the obstetrical (pulling) chains to the front legs of the calf, placing the loop of each chain around each leg. Then slide the chains up on the cannon bone 2 to 3 inches above the fetlocks (ankle joints) and dew claws. Place a second loop between the fetlocks and the top of the hoof (*Figure 3*). Make sure the chain pulls from either the top of the leg over the fetlocks or the bottom of the leg (dew claw side).

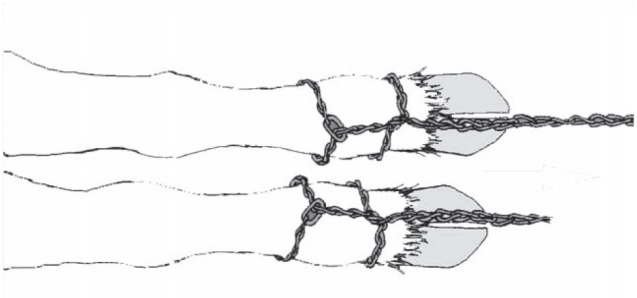

Figure 3. Proper attachment of the pulling chains.

5. Attach the obstetrical handles and pull gently, making sure the chains have not slipped. Some simple guidelines can be used to determine if the calf can pass through the pelvic canal. First, by pulling on the front legs, the entire head of the calf should enter the bony pelvic canal. Second, continue to pull on one front leg. The first joint (fetlock) of that leg should extend at least one hand's width past the vulva of the cow. Third, pull on the opposing leg. The fetlock of this leg also should extend at least one hand's width past the vulva of the cow. If all three of these guidelines cannot be accomplished, you should be concerned that the calf might be too large to successfully pass through the pelvic canal, and a caesarean section may be needed. If all the guidelines are met, then continue to deliver the head and shoulders.

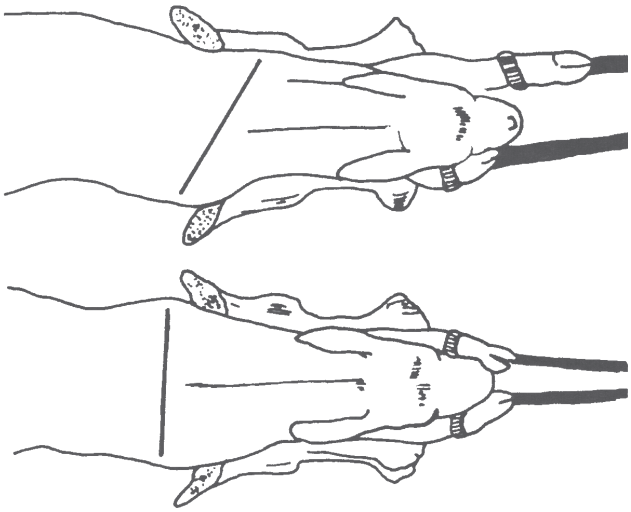

Figure 4. "Walking out the shoulders."

6. Although some calves can be delivered by pulling both legs evenly, it's usually best to alternately pull on one leg and then the other a few inches at a time (*Figure 4*).

   This is called "walking out the shoulders."

7. Once the head and shoulders are exposed, pull the calf downward at a 45 degree angle.

8. Hip lock, which occurs when the calf's hips are horizontal to the cow's pelvis, can result in loss of the calf. If hip lock occurs, push the calf back a short distance and rotate the exposed portion of the calf 90 to 120 degrees while continuing to pull downward at a 45 degree angle. If the cow is lying down, roll her on her left side before rotating the calf. Make sure the calf begins breathing normally as the umbilical cord will be pinched closed. Call your veterinarian if the hip lock cannot be readily delivered.

9. Posterior presentations (backward calf) occur in less than 5 percent of calves born. The posterior presentation is a problem because the calf's hind legs and hips do not dilate the cervix as well as the front legs and head. Due to premature rupture of the umbilical cord, early assistance and rapid delivery are needed. A backward calf in the setting position with feet and legs up under him (breech presentation) must be detected early in labor and corrected. Cows will start labor but nothing will show externally except, occasionally, the tail of the calf. These cows often appear to be in labor for a period of time and then quit as exhaustion occurs.

10. Cows with torsion of the uterus (posterior uterus and cervix twisted) will act similarly to cows with a breech presentation; however, they usually will show much more pain. On examination, the calf is difficult to palpate and the twisted opening can be determined. If detected early, the torsion can be corrected or a caesarean performed to obtain a live calf.

11. A calf puller should be used correctly and only by experienced people. A calf puller can apply traction equivalent to the pull of seven men. First examine the cow, making sure the calf is in the proper presentation and position, lubricate the vagina, and then apply gradual traction. Maintain the butt plate of the puller just below the vulva opening and the jack end of the puller at or below the level of the cow's hocks. Excessive traction may kill the calf, traumatize the cow, and both may be lost.

12. Correcting abnormal presentations and positions after extended labor usually requires professional help. Remember: be clean, know your capabilities, and learn when to call for help.

Strategies to Use if the Calf Is Not Breathing

Once delivered, clear any mucus from the calf's mouth and throat with your hand. Then, if necessary, stimulate the calf to breathe by either rubbing it briskly or tickling the inside of a nostril with a straw.

Artificial respiration can be applied to the calf as follows: place a short section of garden hose into one nostril and hold mouth and nostrils shut so air enters and leaves only through the hose. Then alternately blow into the hose and allow expiration of air. Repeat at five- to seven-second intervals until the calf begins to breathe. Another method is to alternate pressure and release on the rib cage. Commercial respirators also are available and may be a wise investment in larger herds.

Potential Post-Delivery Problems

Uterine Prolapse. This is an inversion of the uterus that can occur following calving. Prolonged labor, difficult birth, excessive traction, and subclinical milk fever are predisposing factors. Uterine prolapse should be treated as an emergency with early intervention by a veterinarian.

Retained Placenta. The placental membranes are normally expelled within two to eight hours after birth. Occasionally, they fail to separate from the uterus. If not treated, this condition may pose a health threat to the cow and cause problems in rebreeding. The reason for retained placentas is not known, but high incidence may indicate disease. They also commonly accompany difficult births, multiple births, short gestations, and bull calf births.

Research has shown that manual removal of retained placentas will decrease fertility. The recommended treatment is to wait 24 to 48 hours after birth and then treat with injectable antibiotics along with hormonal therapy as advised by a veterinarian. Observe the cow closely for signs of illness.

Summary of Calving Management Recommendations

- Observe the herd closely during calving season, especially first-calf heifers, as they likely will require the most assistance. Be there and be an astute observer.
- Have the proper equipment and facilities available and in clean working order prior to calving.
- Give assistance during delivery or call a veterinarian when needed. Do not wait more than two to three hours after labor begins to act.
- Correct any abnormal fetal positions in the early stages of delivery.
- When pulling a calf, double loop the chain or rope above and below the ankle joint. Apply gentle traction on one leg at a time to facilitate passage of the shoulders through the birth canal.
- Remove mucus from the calf's nose and mouth immediately after birth. If the calf does not start to breathe normally, stimulate the calf to breathe by rubbing it briskly, tickling the inside of a nostril with a straw, or applying artificial respiration.
- Disinfect the navel cord with iodine to prevent infection. Make sure the calf nurses within an hour after birth or give colostrum to weak calves.
- Keep birth weight and ease-of-calving records to identify the sires and dams responsible for calving problems. This information is especially important for selecting sires to breed yearling heifers. When possible, cull females with a history of calving problems and avoid selecting replacement heifers from such cows. *Table II* shows a simple calving ease scoring system.

Table II. Calving Ease Scoring System

Score	Description
1	No difficulty, no assistance
2	Minor difficulty, some assistance
3	Major difficulty, assistance with jack or puller
4	Caesarean birth
5	Abnormal presentation

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