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Assisting the Beef Cow at Calving Time

This publication acquaints cattle producers with calving management principles to minimize calf loss. The objective is to deliver a live calf from every cow.

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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 multi-million dollar annual loss is second only to losses from cows failing to conceive.

Calving difficulty has received much more attention in recent years, primarily because of the mating of larger European breeds of bulls to British breeds of cows. Increased calving problems are also being encountered within purebred breeds, as genetically large bulls are often mated to cows of only average size.



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 breed of the sire, bull within a breed, sex of the calf, age of the cow, and to a slight

degree, nutrition of the cow. Shape of the calf may also have a small affect 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 in calving than do cows, because they are usually structurally smaller.

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 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 (birth weight) in relation to the size of the cow's pelvic area. Pelvic measurements can be obtained on yearling heifers and the size of the deliverable calf estimated before breeding. If preferred, measurements can be obtained at pregnancy exam. The pelvic area trait is about 50 percent heritable and can be increased through selection of both heifers and bulls. Therefore, calving problems can be reduced by decreasing calf birth weight and increasing cow pelvic size through bull and heifer selection, in addition to selection and development of large, growthy heifers.

Fetal Position at Birth. About five 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.

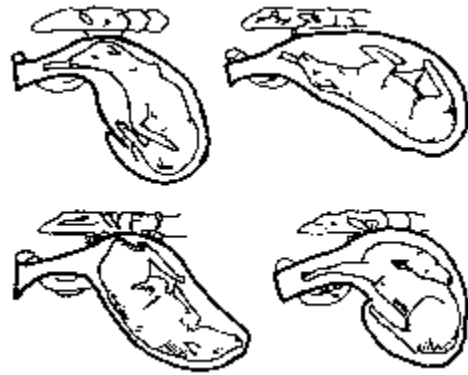


Figure 1. Abnormal positions of the calf for delivery.

Stages of Calving (Parturition)

Normal calving can be divided into three general stages -- preparatory, fetal expulsion, and 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. Although the exact stimulus that initiates parturition is unknown, it does involve hormonal changes in both the cow and fetus as well as mechanical and neural stimulation in the uterus.

A general understanding of the birth process is important to proper calving assistance and, therefore, is presented here and summarized in *Table I*.

Table I. Stages of Calving	
<i>Stage and time</i>	<i>Events</i>
Preparatory (2 to 6 hours)	<ol style="list-style-type: none"> 1. Calf rotates to upright position. 2. Uterine contractions begin. 3. Water sac expelled.
Delivery (1 hour or less)	<ol style="list-style-type: none"> 1. Cow usually tying down. 2. Fetus enters birth canal. 3. Front feet and head protrude first. 4. Calf delivery completed.
Cleaning (2 to 8 hours)	<ol style="list-style-type: none"> 1. caruncle-cotyledon (button) attachments relax. 2. Uterine contractions expel membranes.

Stage 1. Preparatory (Two to six hours). During pregnancy, the fetal calf is normally on its back. Just prior to labor, it rotates to an upright position with its forelegs and head pointed toward the birth canal (*Figure 2*). This position provides the least resistance during birth. Toward the end of gestation, the muscular lining of the dam's uterus increases in size, which aids in delivery of the calf.

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.

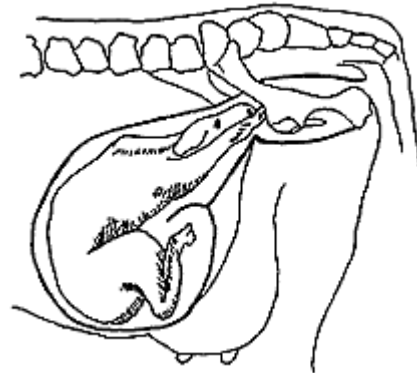


Figure 2. Normal position of the calf just prior to delivery.

At the end of the preparatory stage, the cervix expands 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 2*.

Stage 2. Delivery (One hour or less). This stage 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 insures an oxygen supply for the calf during birth. Upon passage through the vulva, the umbilical cord generally 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 3. Cleaning (two to eight hours). The caruncle-cotyledon, or button attachment between uterus and placenta, relaxes and separated 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 in a weakened condition.

Since 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. Clean pulling (OB) 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. 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, in addition to your hands and arms, and a plastic shoulder length OB sleeve worn.
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 two to three inches above the ankle joints and dew claws (*Figure 3*). Make sure the chain pulls from the bottom of the leg (dew claw side).

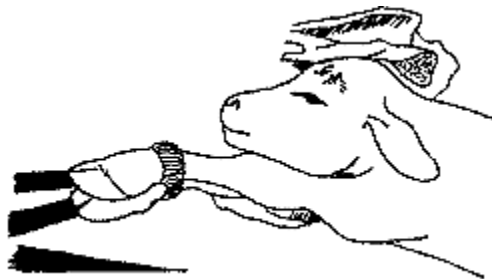


Figure 3. Proper attachment of the pulling chains.
Chain should pull direct from bottom (ventral) of the

leg.

5. Attach the obstetrical handles and pull gently, making sure the chains have not slipped. 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."
6. Once the head and shoulders are exposed, pull the calf downward at a 45° angle, or nearly parallel with the rear legs of the cow. This tends to raise the calf's hips and lessens the chance of hip lock.
7. "Hip lock" can be a problem serious enough to cause loss of the calf. If this happens, push the calf back a short distance and rotate the calf a half a turn and pull downward and forward between the cow's legs. If the cow is lying down, roll her on her back and pull the calf forward over the udder between the hind legs. 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.
8. Posterior presentations (backwards calf) occur in less than five 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 is needed. A backwards 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. If not detected, labor will cease and will not start again until the calf is emphysematous three to seven days later.
9. Cows with torsion of the uterus (posterior uterus and cervix twisted) will act similar to cows with a breech presentation; however, they will usually 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.

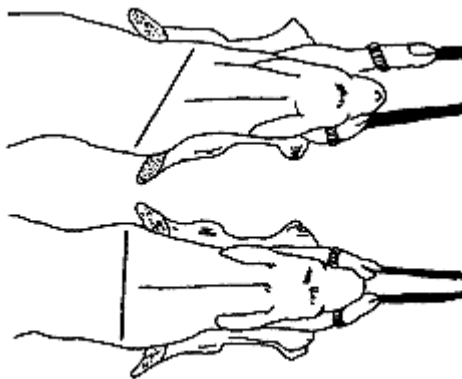


Figure 4. Applying traction at delivery by "walking out" the shoulders.

10. 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, then apply gradual traction. If no progress, a caesarean may be needed.
Excessive traction may kill the calf, traumatize the cow and both may be lost.
11. Correcting abnormal presentations and positions after extended labor usually requires professional help. Remember: be clean, learn your capabilities and learn when to call for help.

Starting the Calf

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, tickling the inside of the nostril with a straw, slapping it with the flat of the hand, or suspending it briefly by its rear legs to allow drainage of fluid from the lungs.

Artificial respiration can be applied to the calf as follows: place a short section of garden hose into one nostril, 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, excess traction and subclinical milk fever are predisposing factors. Uterine prolapse should be treated as an emergency. Contact a veterinarian for treatment and necessary drugs. Cull heifers or cows that prolapse because of the probability of it happening again.

Retained Placenta. The placental membranes are normally expelled within two to eight hours after birth. Occasionally, however, 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 a disease problem. 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 for about 48 hours after birth and then give injectable antibiotics along with uterine boluses or uterine infusions. Observe the cow closely for swelling of the vulva or signs of illness.

Summary of Calving Management Recommendations

1. Observe the herd closely during calving season, especially first-calf heifers, because they will require the most assistance. Be there and be an astute observer.
2. Have the proper equipment and facilities available and in clean, working order prior to calving.
3. Give assistance during delivery or call a veterinarian when needed. Do not wait more than a few hours after labor begins to act.
4. Correct any abnormal fetal positions in the early stages of delivery.
5. When pulling a calf, loop the chain or rope above the ankle joint. Apply gentle traction on one leg at a time to facilitate passage of the shoulders through the birth canal.
6. Remove mucus from the calf's nose and mouth immediately after birth. If the calf does not start to breathe normally, tickle the nostrils, hold it up by the hind legs and shake it, or apply artificial respiration with a short piece of hose or by alternating pressure and release on the rib cage.
7. 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.
8. Keep birth weight and ease-of-calving records to identify those sires and dams responsible for calving problems. This information is especially important for selecting sires to breed yearling heifers. When possible, cull those 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	
<i>Score</i>	<i>Description</i>
1	No difficulty. no assistance.
2	Minor difficulty, some assistance.
3	Major difficulty, assistance with jack or puller.
4	Caesarean birth.

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