

MN 2500 AGFO-2697

AG-FO-2697
1985

Dealing With Calf Delivery Problems

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APR 15 1986

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An Integrated Reproductive Management Publication

Introduction

Problems at calving time place the results of a previous year's planning and management in jeopardy for the dairy producer and have a profound impact on the productivity of the cow in the following season. Problems at calving also impact the long-term breeding program of the herd through the death of calves during birth or as a result of difficult birth. Each calf death represents the loss of a potential production unit in which a considerable investment of resources has already been made. Thus, it is important to understand the birth process, to know when intervention is needed and to know how to intervene effectively.

Normal Birth

Certain physical changes become obvious in the cow several weeks to a few days prior to parturition. The vulva becomes swollen and enlarged and the pelvic ligaments stretch and relax, causing a sunken appearance around the tail-head. The relaxation of the back end of the sacrosciatic ligament so that it can be moved more than an inch usually means that labor will start within a day. Vaginal mucus increases as the cervical plug dissolves near the time of birth. The mucus becomes flowing, clear, and elastic, similar to the mucus observed at estrus and in contrast to the viscous clear or opaque mucus seen earlier in the pregnancy. The udder will fill with colostrum as calving approaches.

The first, or preparatory, stage of birth is characterized by the progressive relaxation and dilation of the cervix. Initial contractions in the uterus (womb) last for about 15 to 30 seconds and occur about every 15 minutes. When this occurs, the cow becomes restless, seeks solitude, and occasionally may strain weakly. She may look back at her flanks and stamp her feet. This stage lasts for around three to six hours in cows but may be longer (even up to a full day) in heifers. It ends when the calf enters the vagina. Towards the end of this stage the waterbag, formed by the fetal membranes, will push through the vulva as a result of the contractions, stretching the cervix, vagina, and vulva as it passes through.

The breaking of the waterbag signals the second, or expulsion, stage of labor, which ends when birth occurs. The calf's legs and head (or rump) push through the cervix and into the vagina, causing the cow to strain with the uterine contractions. The cow will frequently become restless, stand and lie down, and strongly strain for 10 to 15 seconds every couple of minutes. When the calf's feet appear through the vulva, the second white membrane generally ruptures. A thick fluid is released which helps to lubricate the birth canal and assist the passage of the calf. When the second membrane ruptures, regular bouts of several abdominal presses occur about every 2.5 minutes. The cow may rest for a few minutes after the head and

shoulders are delivered. The rest of the body is then generally passed rapidly or may fall out abruptly if the cow stands. Most cows complete the final stages of labor lying on their sides, although up to five percent of cows will give birth standing.

After the birth of the calf, the uterus continues to contract and rapidly decreases in size. This period is referred to as stage three of labor and lasts until the afterbirth is passed. In a normal birth the afterbirth loosens from the mushroom-like maternal caruncles inside the uterus and is expelled through the vulva. This generally occurs within eight hours of birth. In some cases it may take several days before the afterbirth is passed.

The way the calf is situated is described in terms of *presentation* (which part comes first), *position* (which way is up) and *posture* (position of the head and limbs). Both forward and backward deliveries are regarded as normal in the cow. In the normal front presentation, the calf is upright with both front legs stretched forward and the chin resting above and somewhat beyond the knee. In a normal backward delivery the calf is also upright and the legs are stretched backwards behind the calf and are coming first out of the cow. If the body, head, or limbs of the calf are in any other position then the cow is unlikely to achieve a normal birth without assistance.

Causes of Difficult Birth

Some causes of calving problems are:

- the mother's pelvis is smaller than it should be;
- the uterus has lost its ability to contract properly;
- the posture of the calf is abnormal with the head or legs being bent or facing the wrong direction;
- the position of the calf is wrong: it may be upside down, sideways or lay across the birth canal horizontally or vertically;
- twins, which can enter the birth canal together and jam in it;
- the shape of the mother's birth canal: certain breeds with broad heads and shoulders may have more difficult births than breeds which are sleek and narrow.

However, the major factor associated with calving difficulty is calf birth weight, which in turn is affected by the sire, the dam, and the length of the pregnancy. A good understanding of the factors influencing calf birth weight will allow management modifications to avoid calving problems.

Factors Affecting Birth Weight

Research has shown that when large and small breeds of sires are bred to two-year-old heifers, the highest level of difficult births and calf deaths occur with those sires which have the biggest calves. The sizes of calves of common dairy breeds in the United States are reported in Table 1.

Difficult births may be avoided by breeding heifers and cows that have difficulty calving to bulls of smaller breeds, which produce calves of smaller birth weight.

Careful selection of individual sires, particularly those to be used for mating yearling heifers, can reduce the number of difficult births. The calving ease index given in some artificial insemination records for offspring of particular sires is useful for selecting the bulls to be used to breed replacement heifers. If the expected proportion of difficult births for a bull exceeds 11 percent the bull should not be used to breed heifers.

The calf's birth weight also tends to reflect the weight of its dam. Since older cows tend to be heavier, the size of calves increases with the mother's age up to her fourth parity. The calf's weight as a proportion of the dam's weight decreases with increasing parity, thus explaining the higher incidence of difficult births in heifers.

Nutrition of cows during pregnancy also influences the birth weight of their calves to a limited extent. Cows which are fed more heavily during gestation tend to have larger calves. If the dams become grossly overconditioned, this can lead to calving difficulty associated with the fat cow syndrome. On the other hand, if nutrition is severely limited during pregnancy, difficult births may result from metabolic diseases or poor growth in replacement heifers. In undernourished pregnant cows, losses occur in the next breeding season when the return to estrus is delayed.

The nutrition of a replacement heifer during development influences her skeletal growth and development. Heifers can put on fat and flesh without full skeletal growth or stature if rations are high in energy (particularly grain) but have inadequate protein or minerals. This stunted frame growth leads to difficult births from fetal-maternal disproportion, which is relatively common in first-calf heifers. Overfat heifers may also have calving difficulties which appear to be due to the physical obstruction of fat in the pelvic canal.

Heifers should be fed so that they achieve a target breeding weight between 14 and 15 months of age (the preferred breeding age) and achieve 85 percent of their mature weight by the time of first calving at 24 months. It is important to have heifers gain adequate weight in the last 4 months of pregnancy to maintain body condition. This means the heifers should gain at least 100 to 120 pounds in this period, since this is the amount of weight that is lost at birth.

Table 1. The birth weight of cattle of different breeds.

Breed of Sire	Average Birth Weight (lb)	Range (lb)
Jersey	54.8	45.0-57.1
Guernsey	65.9	63.9-71.0
Ayrshire	75.0	65.9-80.5
Shorthorn	81.8	73.0-84.9
Holstein-Friesian	91.0	71.2-99.0
Brown Swiss	101.4	95.0-102.5

The Management of Calving

Keep cows that are due to calve within a few days in a situation which allows frequent observation — a small pasture near the farm house or a roomy, clean calving pen in a barn. Since the normal pregnancy may vary by 10 days either side of the expected date, there is no need for worry if the cow goes a few days over her expected calving time if she appears normal in all other ways. Heifers have a much higher level of calving problems than any other age group, so they should receive close attention at calving time.

When the first stage of labor starts, observe the cow frequently but from a distance. If there is no progress after 6 to 8 hours (24 hours for heifers) the cow should be examined. The cow should also be examined if there is no progress within two hours after she begins actively straining (second stage of labor).

The examination is needed to determine the cause of the slow birth and help you decide if you can correct the situation yourself or need to call for veterinary help. The decision should be made at the time of examination and not after prolonged and unsuccessful attempts to achieve delivery. It is important to seek help early, while the cow and calf can both be saved and before the birth canal becomes dry, damaged, and swollen. If the calf is coming backwards, progress must be rapid once the hips enter the birth canal. Otherwise the calf may suffocate as the umbilical cord becomes compressed and the blood supply to the calf is cut off.

Examining the Cow

Clean your arm thoroughly by scrubbing with a disinfectant soap and lubricate it liberally before you insert it into the cow. Suitable lubricants are mild soap solutions or a soaped arm or methyl cellulose lubricant solutions containing some disinfectant. Two buckets of warm water and disinfectant should be available — one to wash the cow and the other to wash your arm and for the storage of equipment. The cow's tail should be tied out of the way with a length of bale twine around the cow's neck. Proper restraint is essential for an adequate examination and to ensure the safety of the cow and examiner.

For the actual examination, insert your clean (scrubbed) and well-lubricated hand into the vulva. Form your fingers and thumb into a cone and push them through the vulva in a vertical position. Once in the cow the hand can be flattened horizontally with the palm facing down and advanced along the roof of the vagina. If you can't feel the calf, check the cervix for adequate opening. If you do feel the calf, determine if the legs and head are present in the birth canal.

If two legs are present you need to be sure they are either both front or both back legs of the same calf before you apply any traction.

The front and back limbs can be distinguished by the direction in which the joint above the fetlock bends: if it bends in the same direction as the fetlock it is a forelimb; if in the opposite direction, it is a hind limb. The soles of the feet indicate which way up the calf is facing. On forelimbs

the soles should be facing down if the calf is in a normal position. On hindlimbs the soles should be facing up.

To check that a pair of legs belongs to a single calf, trace up one with the hand until the breast or escutcheon is reached and then trace down the other. Check that the head is situated with the chin near the knees (front presentation) or that the tail is down between the thighs (backwards presentation).

Assisting the Birth

Most births proceed normally and do not need assistance. Sometimes an overanxiety to help cows calve can create more problems than it solves. However, it may be necessary to assist with birth in the case of maternal-fetal disproportion or improper presentation. It can be useful to dilate the birth canal by inserting both hands and arms into the vagina, clasping hands, and forcing outwards to stretch the tissues.

If the calf is relatively big compared to its mother's pelvis, place chains or nylon in a double half-hitch around the legs with one loop above and one below the fetlock (Figure 1). When a calf is presenting in a forward direction, place a chain or snare around the head as a halter (Figure 2). This provides another point of traction, lifts the head into the birth canal, and stretches the calf's neck so that it doesn't bunch up and increase the effective diameter of the calf (Figure 3). It also holds the mouth shut so that the teeth do not cut the birth canal. Traction should then be applied by no more than three people to lift the calf's legs and head or legs and hips into the vagina. If the head and legs or hips do not enter the pelvis, stop all attempts to deliver the calf and seek veterinary assistance.

Sometimes it helps to rotate the calf about 45 degrees from the vertical to take advantage of the maximum cross section of the maternal pelvis. This may be especially useful when a hip lock is encountered in an oversized calf. Since the calf's greatest diameter is from hip to hip and the cow's pelvis has its greatest diameter across the diagonal, this manipulation may help the calf to pass through.

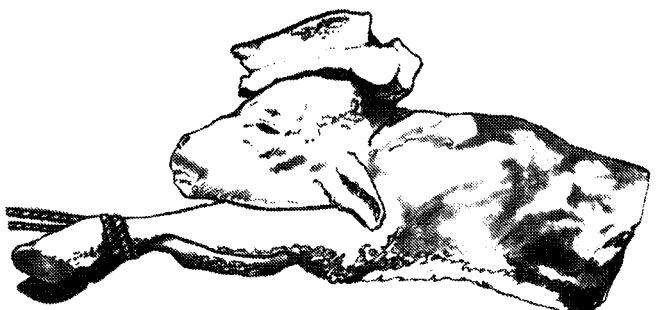


Figure 3. Without a snare on the head, the neck may become flexed and bunched up by compression when traction is applied to the legs, making delivery more difficult.

The manner in which traction is applied is critical to successful delivery. Most of the pulling force should be applied to the legs. Pull the legs so that one enters and comes through the pelvis of the cow about six inches ahead of the other. In a front presentation, the chin of the calf will rest somewhere ahead of the knee of the leading leg. By having one leg ahead of the other, the diameter of the shoulders across the pelvis is reduced (Figures 4 and 5). In pulling a calf backwards it is also useful to pull one leg ahead of the other, although the advantage gained is not as great as for the front legs.

In both forward and backward deliveries the direction of pull is initially straight back behind the cow so that the calf is pulled into the pelvis. When the calf's head and legs are delivered (or the tail base is reached, if the calf is coming backwards) shift the direction of pull downwards to make the calf curve in an arc. This allows it to pass more easily through the curved birth canal. Gradually increase the force on the rope or chain until a maximum force is achieved.



Figure 1. The correct placement of a snare or chain in this manner will reduce the risk of injury to the calf.



Figure 2. The correct placement of a snare on the head will provide another point for traction and extend the calf's neck to aid delivery.

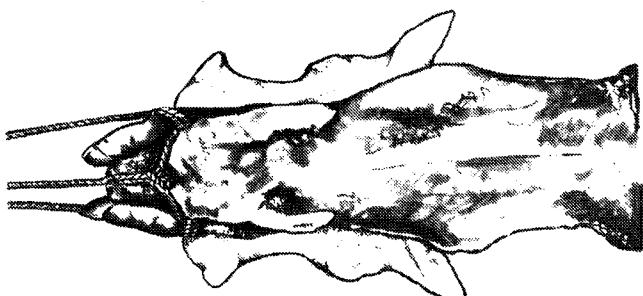


Figure 4. When traction is applied to both legs together, the diameter of the shoulders is maximal, making delivery more difficult.

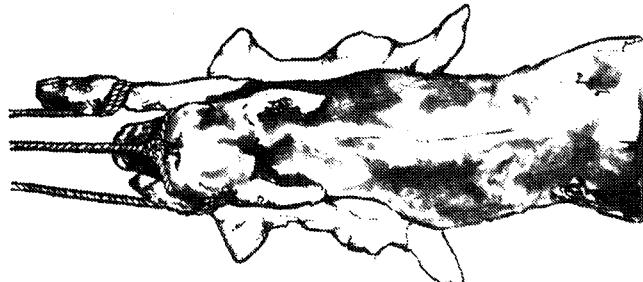


Figure 5. When one leg is pulled ahead of the other the diameter of the shoulders entering and passing the birth canal is reduced.

Synchronize the major traction efforts with the cow's straining. Release the tension on the calf in between the cow's straining efforts so that the calf can breathe once the head has been delivered. However, do not jerk on the chains and ropes, since this can injure both the calf and the cow. When large parts of the calf such as the head, shoulders, and hips are passing through the vulva, support and ease the lips of the vulva over these areas to prevent tearing of the vulva.

If the initial examination shows that the calf is not in the normal presentation, position, and posture the situation must be corrected. If a rapid and straightforward correction cannot be achieved, don't attempt to deliver the calf or use force but seek veterinary assistance.

To correct the position or posture of a calf it is frequently necessary to push the calf back into the womb of the cow (repel it) since the restricted bony pelvic cavity precludes much manipulation of a calf in the pelvis. Attempts to push the calf back need to be firm but not rough and should occur between bouts of straining by the

cow. Before pushing the calf back into the abdominal cavity place a snare or chain on a presenting head or limb. Lubrication of the genital tract is essential during these manipulations.

It is important to determine the exact posture of the calf so that the abnormally placed part of the calf can be brought into the correct position. If legs are misplaced, they can be gently guided into the birth canal. When possible, guard the sharp hooves of the calf by cupping your hand over them while correcting the abnormal posture.

Head deviations can sometimes be extremely difficult to correct. Seek veterinary assistance if the head cannot be retrieved within a half hour.

If the calf is coming backwards with its legs stretching forwards (a breech presentation), repel it while pulling one hock back into the pelvis. Then swing the hoof under the calf to bring it back out behind the calf into the normal position. Take care that the umbilical cord is not broken or caught up in these manipulations. Again, guard the hoof to prevent injury to the uterus.

When the calf is in the incorrect position — generally upside down or on its side — rotate it into normal position before it is delivered. Fetal monsters and calves with abnormalities such as fixed joints generally require veterinary intervention such as a cesarian operation or fetal dissection and removal. Twists of the genital tract can sometimes be felt as a corkscrewing series of folds along the vagina. If you feel these, seek veterinary assistance immediately to have the uterine torsion correction.

Care After Delivery

When the calf has been delivered, lift it up by its rear legs to allow mucus to drain from its respiratory tract. If it is not breathing, swing it by its rear legs through several arcs until it starts to breathe. Clear the mucus from the mouth and nose. Tickling inside the nostril with a straw to make the calf sneeze may help to clear mucus and stimulate breathing. Vigorous rubbing or dousing with cold water may also help to stimulate breathing in a depressed calf. If these techniques fail, apply artificial respiration to one nostril while closing the mouth and pinching the other nostril off. A short piece of $\frac{1}{2}$ -inch hose may be used to avoid direct contact with the calf. Blow air into the lungs of the calf every five to seven seconds until the calf starts to breathe or until its heart stops beating.

The newborn calf should receive an adequate amount of colostrum as soon as possible after calving — a minimum of two quarts within the first four hours of life. Although it is difficult to judge the exact amount of colostrum being consumed by a suckling calf, observation of the calf and cow can usually indicate whether the intake is adequate. The earlier that a calf gets colostrum after birth, the more antibodies it absorbs. Even by six hours of life the absorption of antibodies from colostrum is severely reduced. If intake appears inadequate it may be necessary to force-feed colostrum either by mouth using a teat bottle or by esophageal tube. Calves that do not get adequate colostrum have a greatly increased susceptibility to disease which frequently leads to a high incidence of scours and death losses.

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