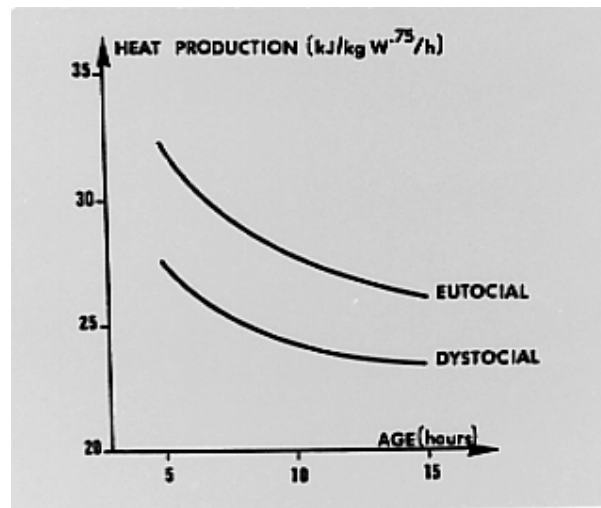


CALVING AND HANDLING CALVING DIFFICULTIES

R. G. Mortimer, MS, DVM
Associate Professor
Department of Clinical Sciences
Colorado State University
Fort Collins, Colorado 80523

Introduction

The most common reason for calf losses in the beef cattle industry is still calving difficulty. Looking only at the effects of calving difficulty on the calf, we find the following four relationships well established in the literature. First, the more difficult the calving difficulty the greater risk for infectious disease. Typically, this is reflected by higher incidences and death loss associated with either diarrhea or respiratory disease. Second, the more difficult the calving difficulty, the harder it is for the calf to maintain its body temperature following calving. This is illustrated in Graph 1:



Graph 1: Relationship between calving difficulty and body heat production of the calf

The third relationship with degree of calving difficulty is the decrease in absorption of protective antibodies with more difficult deliveries. The fourth relationship with calving difficulty that has been firmly established is the increased infertility losses in the dam. To these losses must be added the increased maternal deaths, treatment costs and diminished productivity of the dam. In a survey of the effects of dystocia on fertility in 1889 cows, Laster et al. (1973) found that cows which experienced calving difficulties had a delay in resuming estrus and showed 15.9% reduction in conception rate compared with cows which had calved normally.

Commonly, producers and veterinarians alike, feel that successful dystocia management is achieved with a calf that is alive at birth. I would offer that the successful management of calving difficulty is achieved when we optimize calf survivability and dam reproductive performance. Thus, the goal of providing assistance is to minimize stress on the calf and dam. This article

describes some useful guidelines and obstetrical techniques that can help you reduce the losses due to dystocia.

The basics of normal calving

The recognition of dystocia comes first from a basic understanding of normal calving. From this understanding, you can establish guidelines for frequency of observation of cattle during calving and when to provide assistance during the delivery process. The rancher and/or his personnel must use good judgement in deciding when to intervene and when to call for professional help if calf losses are to be reduced.

Calving is a complex process. Many mechanisms affect the process, but none completely control it. As the fetus matures and the uterus enlarges, the capacity of the placenta to respond to additional demands of the fetus may be surpassed. The placenta may begin to function less efficiently due to limiting morphologic changes, which occur during the latter part of pregnancy. These or other undefined stimuli cause a fetal stress reaction. In cattle, this results in an increased production of glucocorticoids such as cortisol and steroid precursors to estrogens from the fetal hypothalamo-pituitary adrenal systems. These steroids in turn enable the feto-placental unit to produce estrogens and prostaglandins. Endometrium layer in the uterus may also produce prostaglandins. Concurrently, production of progesterone is decreased, probably at least in part due to the luteolytic effect of the prostaglandins on the corpus luteum of the ovary. The estrogens and prostaglandins in turn stimulate maternal release of oxytocin, sensitize the uterus to the effects of oxytocin, and cause the cervix to dilate. The uterus is thus released from inhibition by progesterone and made sensitive to the stimulatory effects of prostaglandins and oxytocin, and to stimulation mediated through the autonomic nervous system. Uterine muscles, which have increased contractility in late pregnancy due to stretching, begin to contract regularly as the cervix dilates. When the cervix is dilated, fetal parts are forced into the birth canal. These produce point pressure in the vagina, further stimulating release of oxytocin and initiating the abdominal press. The process appears to have a cascade effect and is irreversible. The fetus must be delivered or death of either the fetus and/or the dam or both are likely to occur.

Signs of labor

From the practical viewpoint, the time sequences involved in calving are more important than the biological process. Prediction of time of calving would be of value under certain conditions, but it is difficult to predict time precisely on the basis of clinical signs. Criteria that have been used in attempts to identify the onset of labor in cattle include changes in body temperature, respiration and heart rates, "springing" or relaxation and enlargement of the vulva, udder changes including enlargement, tenseness and filling of the teats, changes in quantity and viscosity of vaginal secretions, relaxation of the sacro-sciatic ligaments, and dilation of the cervix.

Two criteria, relaxation of the sacro-sciatic ligaments and cervical dilation, are more reliable, but difficult to apply on a practical basis for beef operators. Relaxation of the sacro-sciatic ligaments can be palpated best by inserting one hand into the rectum and placing the other on the caudal border of the ligament from the outside. Displacement of the ligament can be estimated when pressure is placed against it from the inside. Several days before term, the ligament can be displaced up to 2.5 cm (1 inch). This relaxation should not be confused with the progressive

relaxation that occurs just before calving, allowing displacement of the ligaments 5 cm (2 inches) or more. Successive palpation will help define this stage, which indicates that calving will usually occur within 24 hours.

Dilation of the cervix begins shortly before calving. It is usually closed prior to calving; although up to four fingers can be inserted part way in some cows. Normal dilation preceding calving can be identified by a progressive, conical dilation of the cervical canal with the apex of the cone toward the internal Os. When uterine contractions begin, mechanical forces are applied to the internal Os and enlargement of the cervical canal proceeds throughout its length. Once cervical dilation is initiated, calving usually occurs within 24 hours, sometimes in as little as 6 hours in mature cows. Cervical dilation is very rapid in most cows after it has opened enough to allow passage of the hand. Normal calving is a continuous process, but is often divided into three stages for the purposes of description. These stages are arbitrary but fairly well defined. They usually follow one another in the sequence given, but sometimes, when dystocia is present, fetal membranes are expelled or at least freed from their maternal attachments before a dead fetus is delivered. Dystocia occurs when any stage is slow developing or fails to progress normally.

Stage 1

Visible signs of labor may be scant or absent in mature cows, but more evident in the first-calf heifers. The pastured cow will usually seek an isolated place and vaginal discharges increase in liquefaction and expulsion of the cervical plug. The cow (particularly first-calf heifers) will show signs of uneasiness and pain.

Occasionally she will kick at her belly and wring her tail. Restlessness and a tendency to lie down and get up frequently are also often observed. Stage 1 begins with contraction of the longitudinal and circular muscle fibers of the uterus and ends when the cervix is fully dilated and fetal parts enter the birth canal. Uterine contractions first occur about every 15 minutes, but by the end of stage 1, they occur about every 3 minutes. As the first stage progresses, the contractions become strong enough to cause the cow to arch her back and strain slightly. In cattle, the normal duration of stage 1 is 2-6 hours, sometimes longer in heifers.

What is happening inside the cow's uterus at this stage? Each time the uterus contracts, the cow feels a slight, sharp pain which produces her uneasiness. With each uterine contraction you have to realize that some separation of the normal strong attachment of the placenta to the cow's uterus is being weakened. Thus, the supply of oxygen may be decreasing with each uterine contraction. With each uterine contraction the cervix is also progressively dilating. Normally, the first water sac (chorioallantoic sac) is forced into the dilating cervix and breaks during stage 1 and the rancher may observe that the water has broken. Certain abnormal deliveries are characterized by a failure of the heifer or cow to progress into stage 2 and the calf may be dead before the decision for intervention is made. Thus, if you really suspect a heifer or cow has been in stage 1 too long and not progressed into Stage 2, intervention is recommended.

Stage 2

Second stage labor begins when the cervix is fully dilated and the second water sac (amniotic sac), plus fetal parts enter the birth canal further stimulating stronger uterine contractions. The unbroken water sac is often forced through the vulva after the cow has been in labor a short time.

For the producer, the observation of the water sac is probably the most practical indication the animal is in stage 2 labor. When point pressure is applied to the birth canal by fetal parts, the abdominal press accompanies its uterine contractions. The pains of uterine contraction at this point usually force most cows to lie down. The abdominal press is exerted more frequently as labor progresses until it occurs up to 1-3 times per minute.

At this point it is appropriate to introduce the terms of **presentation, position, and posture** of the fetus during a delivery.

- **Presentation** refers to whether the calf is coming frontward, backward, or transverse.
- **Position** refers to whether the calf is right side up or upside-down with only right side up being considered normal.
- **Posture** refers to the relationship of the calf's legs and head to its own body.

The most frequent calf delivery is a frontward presentation, right side up position, and a normal posture of both front legs and head extended into the birth canal.

Sometimes a backward presentation may occur and may be deliverable if we have right side up position and the posturing being with both hind limbs in the birth canal. Nevertheless, a backward presentation should be considered a high-risk delivery a grounds for intervention. All other presentations are considered abnormal.

During delivery, a series of frequent abdominal presses followed by a short period of rest is characteristic. The greatest frequency and force is achieved when the fetal head is being forced through the birth canal and vulva. Following delivery of the head, a short period of rest may occur. Strong expulsive efforts are required again to force the shoulders and chest of the calf through the birth canal. Sometimes the cow will stop straining for a short time following delivery of the chest, allowing the rear legs to rest in the birth canal.

At this point, usually the umbilical cord may be compressed shutting off the oxygen supply to the calf from the dam. It is not unusual to observe the calf establishing its own breathing at this point. Occasionally at this point, the sac is still over the head of the calf, and the calf could suffocate if the sac is not broken. Delivery of the hips and legs is usually uneventful; occurring soon after the chest passes through the vulva. Second stage labor lasts from .5 to 4 hours in the cow, but intervention guidelines suggest assistance at not over 2 hours, and earlier if it is not progressing normally.

Stage 3

The placenta or fetal membrane is usually expelled within 8-12 hours after delivery of the calf.

Recognizing deliveries that may need assistance

At the time of calving all preventive procedures have been exhausted and the producer is left with human judgement as the biggest single factor in successful deliveries. **Four managerial decisions that dramatically effect the outcome are:**

- **Frequency of observation**
- **When to intervene**
- **Can the calf be delivered by forced extraction, and**
- **When to call for professional assistance**

After a thorough understanding of the stages of labor involved in a normal delivery, it is possible to establish a recommended frequency of observation of cows and heifers during the calving season or period. It is recommended that frequency of observation be a **minimum of three hours apart**. This recommendation may need to be modified to fit within the economic restraints of the individual ranch operation, but should be weighed heavily in favor of calf survivability. Large cow/calf operations usually can provide almost full-time observation of their heifers, but may fall short of adequate in mature cows. Smaller operations may find it more difficult to have the level of observation that would be optimal. Nevertheless, efforts need to be made to come as close as possible to these guidelines if losses are to be decreased.

The decision to intervene should be made based on sound judgement. An understanding of the rationale behind these guidelines is essential for all personnel who may be involved in the calving crew. Recommended guidelines based on stage of labor are:

Stage 1

If you suspect the cow has been in stage 1 of labor for over 8 hours, intervention is indicated. Some abnormal deliveries do not allow the cow to progress into a normal stage 2 of labor. In other cases, the cow may be in a state of uterine inertia and will not go into stage 2 of labor.

Stage 2

Intervention is indicated if any of the following conditions of stage 2 exists:

- **If the water sac is visible for 2 hours and the cow is not trying.**
- **If the cow has been trying for over 30 minutes and making no progress.**
- **If the cow has quit trying for over a 15-20 minute period of time after a period of progress. Breaks normally should not exceed 5 to 10 minutes unless fatigue or uterine inertia is involved.**
- **If the cow or calf is showing signs of excessive fatigue and stress--like swollen tongue of the calf or severe bleeding from the rectum of the cow.**
- **If from an observational standpoint you determine that you have an abnormal delivery from the presentation, position, and posture standpoint.**

Stage 3

If the cow has not passed fetal membranes within 12 hours of calving, intervention may be necessary. If they are retained, treatment may be indicated. In no instances, however, is manual removal of the fetal membranes advocated, as this is detrimental to subsequent reproductive performance.

These specific guidelines for intervention in protracted labor will be adequate in most instances. However, the stockman should realize that interruption of normal progress of labor at any stage or time is sufficient justification for intervention. Early intervention appears to be of the greatest benefit for calf survivability and reproductive performance of the heifer or cow. Early intervention is defined as 30 minutes after presentation of the water sac with feet outside the vulva. Late intervention was 1 hour. This is particularly significant when a recent survey of national cattle producers revealed that they would not intervene in Stage 2 of labor until 3 hours had elapsed (Beef'97; NAHMS)

Table 1: Effect of intervention time on calf survivability and cow reproductive performance

Item	Intervention time	
	Early	Late
Calf vigor (1-3)	1.1	1.1
Calving Difficulty Score (1-5)	2.1	1.3
Postpartum Interval (days)	52	54
1 st Service CR (%)	75	60
% Heat begin breeding season	91.4	81.7
% Pregnant	90	76

Bellows, R.J. 1984

Physical facilities and equipment for handling dystocia

The design of the physical facilities should allow easy entry of animals and minimize the stress of handling and restraint during assistance. Preference on most operations, unless on very small herd size, is to have a separate delivery and post-delivery areas. This is advocated from both the physical handling of the delivery and the potential for build-up of disease producing organisms. For the calf, dam, and attendant providing assistance, protection from the elements is the most desirable. Being dry and warm will go a long way in encouraging the use of proper techniques in dystocia management. The delivery area should have a straight-sided head catch with side gates that are hinged on each side of the head catch to swing freely to either side with sufficient room to the sides and rear to allow assistance with the needed personnel or fetal extractor. This allows the cow to go down and still breathe comfortably.

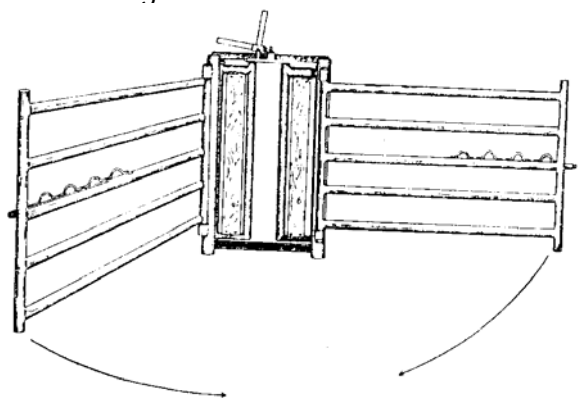


Figure 1: Suggested delivery restraint facility

Handling dystocia in squeeze chutes is to be avoided. A cement floor is recommended for cleaning purposes with access to both hot and cold water preferred. This may seem like a luxury, but may make the difference in optimizing calf survival from the standpoint of accurate decision making during the delivery. Obstetrical chains are preferred to rope when traction is required because they are more easily sanitized. Also, handles are available which attach anywhere along the chains and make traction easier to apply. Nylon web obstetrical straps are available. These may be less traumatic to the fetus, but must be sanitized very carefully between deliveries. Fetal extractors are an essential component of the calving shed, but are a dangerous item of equipment if misused.

How to examine the cow

Keeping in mind:

- Obstetrics is a branch of surgery and therefore cleanliness, asepsis, and gentleness are of prime importance.
- Whereas the treatment must be humane and should be carried out with adequate available help to realize the best outcome.
- Obstetric cases should always be regarded with urgency but the actual intervention requires patience, bearing in mind the normal duration of the different stages of labor.

First, take time to scrub the hands and arms thoroughly with soap, warm water and antiseptic. Now wash the vulva and anal area plus an area lateral to both. Use of plastic palpation sleeves is recommended in most instances in the examination process--especially in geographical areas with herds who have a Brucellosis problem.

Insert your hand slowly into the vagina, and don't rupture the water-sac unless the cervix is fully dilated. Use lubrication as necessary and determine the presentation, position, and posture of the calf. If the calf's presentation, position or posture is not normal, you may want to seek help particularly if you encounter a delivery you have not seen before. Then, the presentation, position, and posture of the fetus should be assessed and a determination made as to whether it can be handled within the capabilities of the assistant. Luckily, the handling of most dystocia problems is within the capabilities of the stockman. If assistance is to be provided, it is essential that the assistant have a thorough understanding of the amount of traction, direction of pull, and limitations of assistance in the delivery process. If not, more qualified help should be sought immediately. The methods presented in the following paragraphs are for the Utrecht method of handling dystocia.

Before attempting assistance it is best to determine if the calf is alive or dead and the relative strength of the calf before attempting correction and manipulations. **The reflexes used for determining viability are:**

- **Withdrawal reflex-** Pinching between the digits of the hoof, and the calf withdraws its limb in response.
- **Suckle reflex-** Placing hand in mouth you can feel mouth close or tongue move.
- **Poke in eye-** Calf usually responds by withdrawing head.
- **Check for heartbeat-** For a frontward calf, run hand down along side of the chest and feel for the heart beat, or in a backwards calf feel for pulsation in the umbilical cord.

- **Rectal reflex-** In backward calf, sticking finger in rectum should elicit contraction on the finger in a good strong calf.

These reflexes themselves are helpful in determining if the calf is strong enough to withstand correction and/or delivery by forced extraction. They are generally unnecessary to apply if you have observed good observation times and intervene according to the given rules. The second point to be made relative to providing assistance in correction is to understand that the uterus has contracted down around the calf from all directions. This has decreased the amount of room within the uterus for corrective purposes. It is generally advantageous to apply lubrication liberally within the uterus of the cow before correction is started. In some instances, the use of 4 to 5 gallons of warm water with lubricant in it will also help distend the uterus to give you the extra room needed for correction.

Lastly, the following guidelines are recommended to call for professional help to maximize the opportunity for a live calf. Professional assistance needs to be defined as someone who knows more about handling the problem than you do. The different level of experience among individuals will dictate what problems you are requiring assistance in. Regardless of the experience level, if these rules are followed the survivability opportunities of the calf and dam are increased. **The suggested guidelines are:**

- **Don't know what problem they are dealing with!**
- **Know the problem and the solution, but know they are unable to handle the problem!**
- **Know the problem and the solution; have tried and simply made no progress in a 30-minute period! Further delays will simply put the calf in jeopardy.**

Causes of dystocia

The **most common** cause of dystocia is a relatively oversized frontward-presented calf for the size of the birth canal. This calf is also in the normal position (right side up) and posture (both front legs and head presented in birth canal). This accounts for 90% or more of the assisted births at the producer level. Another 5% of dystocia are due to abnormal presentation, position, and posturing of the calf. The remaining 5% of dystocia is due to the cow herself and not the calf. This is in most instances uterine inertia due to fatigue, disease, or metabolic problems. Failure to follow recommended guidelines would result in more dystocia due to uterine inertia than would be expected.



Figure 2: Sequence of delivery by forced extraction of calf in frontward presentation with normal position and posturing

Oversize calf

The clinical diagnosis "oversize calf" includes "relative oversize" in which the calf is of normal dimension but the maternal pelvis is too small, "absolute oversize" in which the maternal pelvis is normal but the calf is abnormally large. In cases of oversize it may not be always be obvious to the obstetrician whether the calf is too large or the pelvis too small, but the technique of delivery is the same irrespective of the source of the trouble.

Delivery of the frontward calf by forced extraction

The question for the producer is whether the calf is deliverable by forced extraction or not. After examination and a determination that the calf is in the correct position and posture, chains or straps should be placed on both forelimbs. They may be placed either above the fetlock joint or bellow or above the hoof of the calf or a combination of the two. In most instances, it is recommended to place the chains above the fetlock and take a half hitch below the fetlock joint as well. In placing above the fetlock, please insure you are where the bone is decreasing in size on the leg so you are above the growth plate of the bone. Traction should only be applied when the cow is assisting with an abdominal press. You are now at a point to determine if delivery by forced extraction is possible. (Figures 2 & 3) This test for delivery is valid only if certain criteria are followed relative to position of cow, type and amount of traction, and direction of pull. Traction should only be applied when the cow is assisting with an abdominal press. In the frontward presentation with normal position and posture of the fetus, this guideline is whether both shoulders of the calf can pass through the pelvis of the cow using recommended traction techniques. To actually determine this, the cow should be down, on her **right side**, and traction should be applied to one leg at a time (unilateral traction) to walk the shoulders through the pelvis of the cow. Positioning of the cow on her right side allows the frontward calf to enter the pelvis of the cow relatively straight. In a difficult delivery, this is important. Type and amount of traction should be no more than the force of one person per leg and the direction of pull should be straight out. Research in England has demonstrated that direction of pull straight out reduces the amount of force need by about 30%. This is

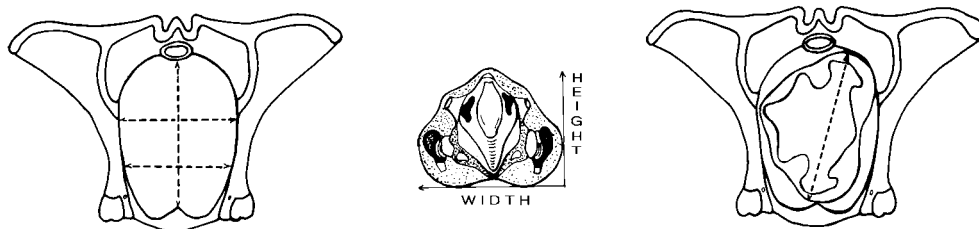


Figure 3: Illustration of relationship between pelvic opening shape of the cow and cross-section of the hips of a calf during delivery process

very advantageous in reducing stress to the calf. It is preferable to start with the down leg (left) of the calf. This usually comes through easily, so **the actual test for delivery is if you can get the second shoulder past the cow's pelvis**. You should be able to feel the shoulder move

past the pelvis as you are applying traction. However, a suggested rule to determine if the shoulder of the calf is past the pelvis of the cow is if the calf fetlock joint is one hand's breadth or about 10 cm outside the vulva of the cow. Once the first shoulder is through the pelvis of the cow, it should be held in place and traction applied to the other leg. The amount of traction should be limited to the force of one man per leg. Two strong men can exert a force of from 400-600 pounds while erroneous use of a fetal extractor could exceed 2000 pounds of pressure. Thus, good clinical judgement in the application of traction is important and necessary. Our goal is to deliver a live calf with the maximal opportunity for survival. Exceeding this rule may result in the delivery of the calf, but will markedly increase the chances for the loss of the calf during delivery or subsequently to disease, cold, or starvation.

Once the shoulders of the calf are through the pelvis of the cow, delivery by forced extraction is possible. If not, call for professional assistance, as a C-section is

recommended if you want a live calf. Bilateral traction can be exerted at this point to further pull the calf before the pelvis of the calf enters the pelvis of the cow. As in the normal delivery, this is when the umbilical cord is compressed and the cow usually takes a break for a short period of time. This is a point when the calf should be allowed to breathe on its own or oxygen can be administered. It is also a point with the oversized fetus where rotation of the calf should occur. This rotation is necessary to bring the widest part of the calf pelvis through the widest diameter of the cow's pelvis. Once breathing has been established, completion of delivery is possible in most instances. Occasionally, calves are lost because of failure to allow the calf to breathe. Constant pulling on the calf at this point will not allow the calf to expand its chest and take in any oxygen and it is possible to lose the calf if breathing is not allowed.

Delivery of the backward calf by forced extraction

The test for delivery of a calf in the backwards presentation but normal position and posture differ in that the fetus should be first rotated 45-90 degrees by crossing the legs before attempting delivery to take



Figure 4: Sequence of delivery of calf in backward with normal position and posturing

advantage of the widest diameter of the cow's pelvis. In addition, the direction of pull on the calf is in a direction that is slightly up from a line straight out from the back of the cow. (See Figures 3 & 4)

Bilateral traction can be applied in the amount of two men and should be applied bilaterally (both legs at the same time). The test for delivery is if both hips of the calf can pass through the pelvis of the cow. This is determined in most instances by the extension of the hocks of the calf beyond

the vulva. If this is easily accomplished, possible delivery can be made. However, now we have very little time left to accomplish rotation of the fetus to a right side up position for the chest of the calf to come through the pelvis of the cow and deliver the calf. We have probably no more than 2-3 minutes to complete the delivery. If the test fails in either case, call for professional assistance as surgical delivery is probably indicated.

There is a common misunderstanding, that calves need to be pulled out very rapidly, otherwise they will die. One must remember that the calf's life will not be compromised until its umbilical cord becomes trapped against the maternal pelvis. In practical terms, therefore, traction should be slow and controlled until such time as the calf's tail head and anus begin to emerge from the cow's vulva. Once this point is reached, delay should be avoided.

Common abnormal presentations, positions and postures

Abnormal presentations, positions, and postures are best corrected while the cow is in the standing position. Once corrected, the tests for delivery can be applied as previously described. Try to carry out all these operations when the cow is not straining vigorously.

Elbow lock posture

If one or both of the forelimbs are not extended as they come into the pelvic inlet,

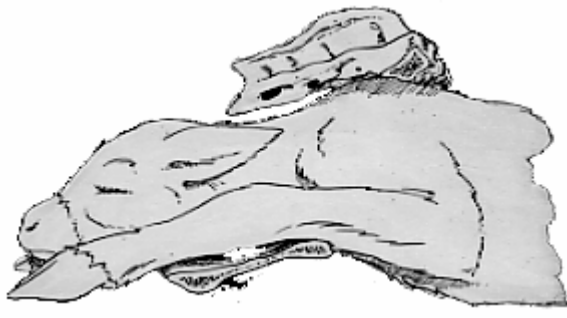


Figure 5: Calf in elbow lock posturing

the partly flexed elbows may lock on the brim of the pelvis and cause elbow lock. This is an easily corrected problem requiring repulsion of the body of the calf while simultaneous traction is exerted on the affected limb.(Figure 5)

Deviation of the head

If the head cannot be felt, do not assume that the calf is coming backward. The two front legs may be presented and the head deviated to the side or down between the front. Before pulling on the limbs, distinguish between forelimbs and hind limbs as described earlier. If the head is bent back into the right flank of the cow it will be easier to correct if the left hand is used and vice versa. By grasping the muzzle or by placing the thumb and middle finger in the eye sockets, the head can be raised and directed into the pelvis (Figures 6, 7, & 8).

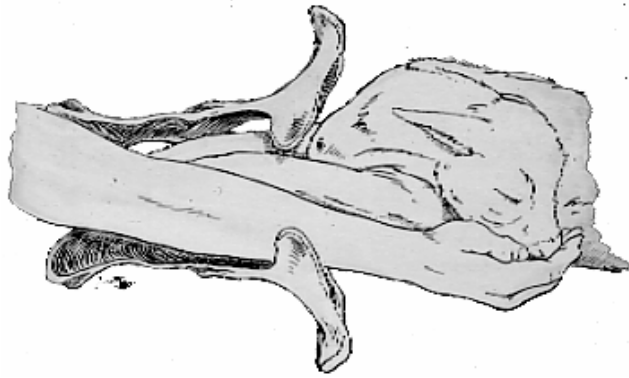


Figure 6: Correction of deviated head by grasping the muzzle or nose of calf

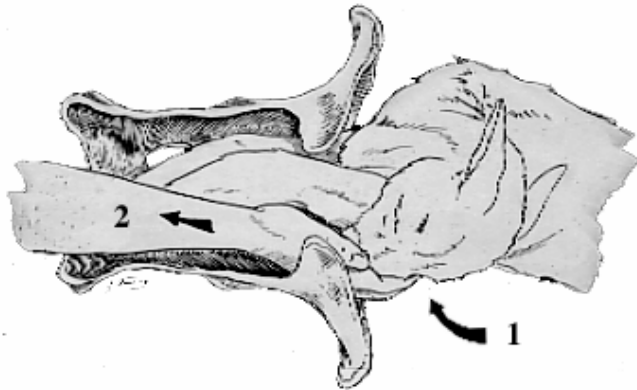


Figure 7: Correction of deviated head by swinging head into correct posture before extraction is attempted

A loop of soft rope or chain placed in the mouth and looped up around the poll of the head behind the ears will sometimes be helpful. The honda of the rope may be placed next to the mouth and the rope placed above the tongue of the calf. In some instances, looping the rope around the lower jaw may be used instead. However, it is easy to use excess traction and fracture the lower

jaw, so this should be avoided unless absolutely necessary. In all these cases, the head can be brought up and straightened more easily if the body of the calf is at the same time repelled further back into the uterus. This can be done by placing the hand between the front legs and pushing back the chest while the head is being pulled into the pelvis at the same time. In some instances, it is necessary to create even more room to correct the head. This may require one of the front legs to be pushed back into the uterus to create a retained front leg that is flexed at the shoulder. In the case where the head is between the front legs this needs to be done first. This would allow you to manipulate the head into first a lateral deviation and then correct as previously described.

It should be pointed out clinically that many of the calves with the head deviated between the front legs are dead or weak before you even start. In addition, many of the calves with a deviated head will still fail the test for delivery for using forced extraction once they are corrected.

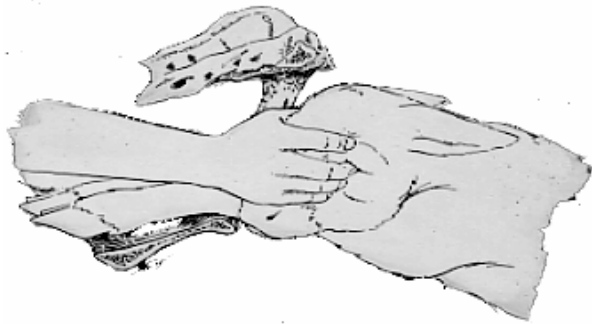


Figure 8: Alternative use of gripping the orbits of the eye in correcting a head deviation

Therefore, good judgement needs to be used before putting excess stress on the calf during assistance.

Retention of one or both forelimbs

The calf may have the head out, but one or both forelegs retained. Secure the head by placing a chain behind the poll and through the mouth, then lubricate the head and push it back into the uterus. Then search for the limbs one at a time. If fully retained, the limb should be grasped just below the knee (carpus) and the limb be pulled until bent at the knee. Once this is accomplished you can generally slip a hand down the limb and grasp the hoof. It is necessary to cup the hoof such that you are providing protection for the uterus of the cow as you continue in the correction process. (Figures 9 & 10)

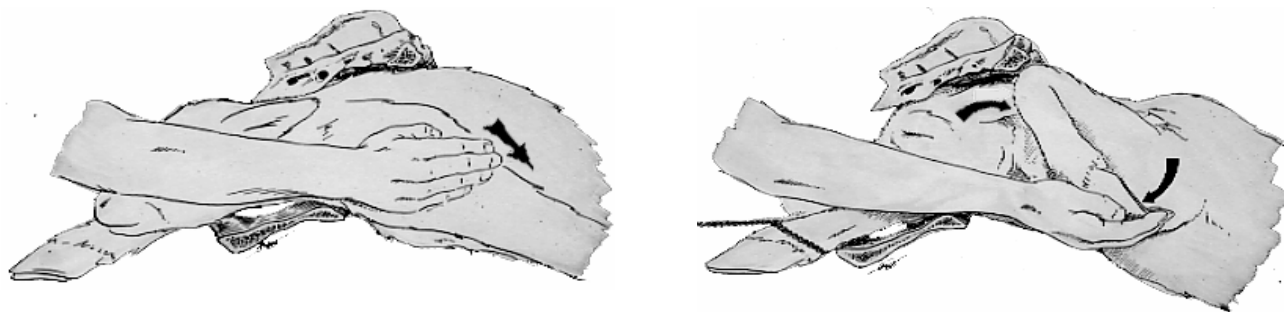


Figure 9: Correction of retained forelimb step 1. Slipping hand down below elbow to convert leg to flexed knee or carpus and Figure 10: Step 2 of correction. Simultaneous movement of hoof toward midline of calf and knee laterally before pulling leg into extended posture

To correct, now opposing forces need to be applied simultaneously. The knee should be repelled by one hand in a forward-upward-lateral direction and traction on the hoof in a medial-backward

direction by the other hand. These directions are relative to the cow. It may be necessary to use a small rope or chain and place around the leg above the fetlock and between the digits of the hoof if getting both arms in the cow is a problem. If the other leg is retained, it is corrected in a similar fashion.

Retained hindlimb or Backward presentation, breech posture

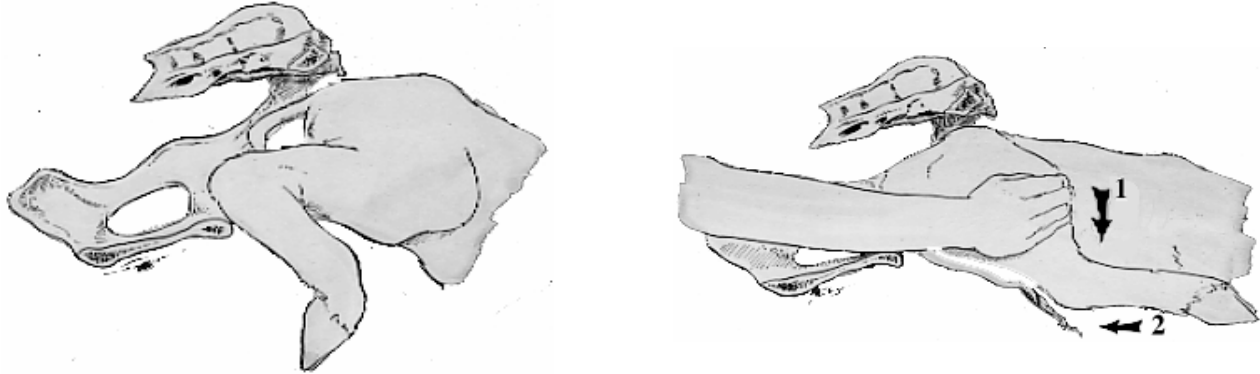


Figure 11: Retained hindlimb in flexed hock posture and Figure 12: Step 1 in correction of retained hind limb. Sliding hand down leg to level of hock then converting limb to flexed hock

The correction of this abnormal posture is the same as the retained forelimb. First, you find the hock and pull it until it is in the flexed position. Then, you slip your one hand down to cup the hoof. The hock should be repelled by one hand in a forward-upward- lateral direction and traction on the hoof in a medial-backward direction by the other hand.

In some instances, the calf has to be repelled back into the uterus before correction can be made. Occasionally, it is difficult to get both hands into the cow for correction. In these instances, the use of a toilet plunger a repulsion device against the rump of the calf has worked effectively. (Figures 11,12, & 13)

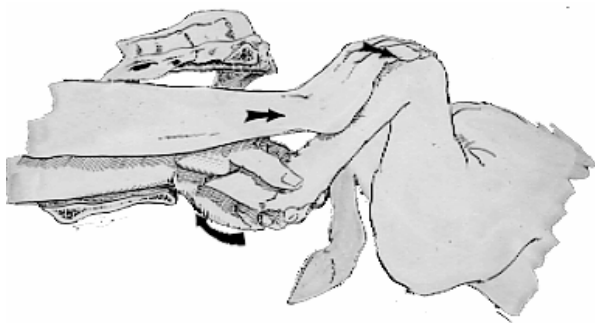


Figure 13: Correction of flexed hock by medial-posterior movement of hoof while lateral-forward repulsion of the hock

Transverse presentation

Occasionally, calves lie with their back against the pelvic opening or with all four limbs extended into the birth canal. Determine the hind from the forelimbs and if possible, deliver hind limbs first so you don't have to worry about the head. Since the calf is on its side, it's easier to rotate the calf's body by the hind legs than the forelegs. This requires repulsion of the forelimbs of the calf and usually the trunk of the calf as well. In most instances, this is a difficult correction to make. (Figure 14)

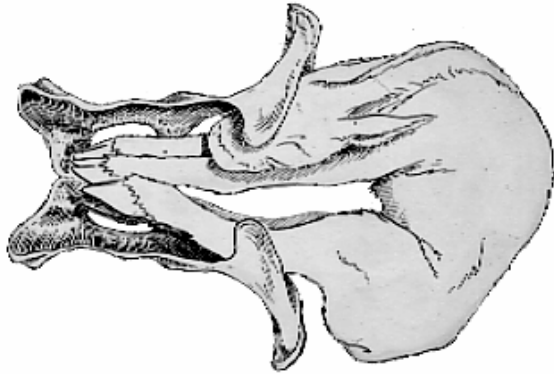


Figure 14: Calf in transverse presentation

Twins

If twins enter the vagina one at a time, there is generally no problem due to a smaller size. However, occasionally twins are presented together and block the birth canal. In most of these cases, one comes frontward and the other backward. Extract the closest twin first. If in doubt, first extract the twin presenting hind legs, after first repelling the other twin back into the uterus. (Figure 15)

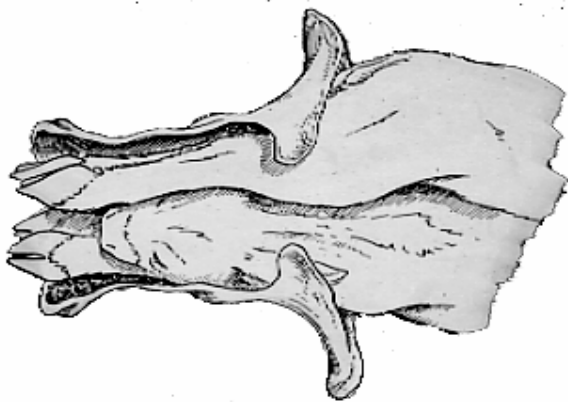


Figure 15: Twins with one each of frontward and backward presentation

C-section and fetotomy

Cesarean section is now a routine obstetric procedure in cattle practice. **It is the method of choice when you are dealing with a live calf and want to optimize calf survivability. In those cases where the calf is already dead, fetotomy is the method of choice due to optimal cow survivability.** Remember, C-section is the most invasive of the two procedures.

The reasons for surgery include the most causes of dystocia but analysis of published cases shows that the following five major indications account cumulatively for 90% of all C-section or fetotomy procedures:

- Fetal oversize
- Incomplete dilation of cervix
- Irreducible uterine torsion
- Fetal deformity or monsters
- Uncorrectable abnormal presentation, position or posture of fetus.

It has been my observation that the success of the surgical procedure has been more due to the timely decision-making of the producer than to the surgical skills of the veterinarian. Therefore, I recommend you make the decision in a timely fashion for greatest survivability of the calf and the cow.

Questions about the above procedures may be directed to the author at the aforementioned address or

via FAX at (970) 297-1275 or email

bmortime@colostate.edu

Good luck with your calving problems!