

Calving and Calf Care on Dairy Farms

In the dairy industry, where the primary revenue source is milk production and sale, calf delivery and newborn calf management are undervalued as areas of concern. The problem of dystocia has been almost ignored. Very few dairy producers incorporate breeding strategies to decrease dystocia occurrence or have delivery management and newborn calf management protocols that specifically address the problem. Despite, or perhaps as a result of, the inattention the dairy industry has paid to calving difficulty, the rate of dystocia in dairy cattle animals is higher than in beef cattle. A national survey of dairies reported in 1994 that 18% of all deliveries of heifer calves required assistance, while the rate of dystocia delivery in first lactation animals was 32%. For comparison, the 1997 national survey of beef cow/calf operations reported that 17% of beef heifers and 3% of beef cows experienced dystocia. In a study performed here at Colorado State University by the Integrated Livestock Management program, local dairies were evaluated for the occurrence of dystocia and its effects on calves and dams. Dystocia rates on these dairies ranged from 30 to 40%, and more than 50% of first calf heifers required delivery assistance. Heifer calves born in dystocia had a 3 to 24 fold increased likelihood to die at birth, a 1.5 times greater likelihood to get sick before weaning, and an almost two fold greater death rate by the time of weaning.

The impacts of dystocia in dairy animals will logically include increased death and disease in calves, reduced productivity in the dams, increased disease in the dams, and the economic impacts that accrue from increased treatment costs, reduced calf performance, and reduced reproductive efficiency.

Dystocia

What is Dystocia?

Dystocia is defined as a difficult or delayed birth at any stage of labor. It is important to know the normal aspects of calving in order to determine if the cow/heifer is experiencing dystocia.

Causes of Dystocia

The causes of dystocia spring from many management choices ranging from breeding genetics and nutrition to management of the cow or heifer during delivery.

- Breeding - genetics can play a role in dystocia through birth weight and heifer development.
- Over conditioned dam - too much fat around the pelvis can lead to a small birth canal.
- Malformation of the calf or the dam.
- Shortened or lengthened gestation.
- Heifers often have dystocia because the birth canal (mainly the vagina and vulva) does not stretch enough for the calf to be delivered.
- Fetal-maternal incompatibility (the fetus is too large, or the cow's pelvis is too small) - most frequent cause of dystocia in beef cows/heifers.
- Malposition - infrequent cause of dystocia; occurs in less than 4% of all calvings in beef animals but may be more frequent in dairy animals.

- Other diseases - i.e., Milk Fever where there is a decrease in calcium which will decrease muscle tone causing the cow to become too weak to push out the calf, or uterine torsion where the cervix is twisted.

There are many things a producer can do prior to calving that will help decrease the amount of dystocia that he/she encounters during calving.

Preventive Measures to Decrease the Incidence of Dystocia

There are many causes of dystocia, some that can be prevented and others that cannot. Many times, there may be multiple causes involved in an individual dystocia incident. Even with all preventative measures, dystocia will occur in some animals. However, the most effective means of preventing dystocia losses is to manage animals to decrease occurrence.

- Breeding/Genetics - The sire, as well as the dam, contributes to the size of the calf. Some dystocias are caused by too large of a calf in a small cow or especially in a heifer. Always be sure to breed your heifers to sires that are proven not to produce high birth weight calves. However, you may not want to go to the other extreme and select sires that produce very low birth weight calves either; small calves tend to grow into small heifers.
- Nutrition - The cows/heifers should be supplied with enough calories to maintain body condition and fetal growth. The cows should not be under conditioned or over conditioned. Over conditioning may lead to calving disorders and metabolic problems, whereas under conditioning can lead to decreased production and reproductive performance. Over conditioned cows/heifers can accumulate fat around the pelvis causing a smaller birth canal. You should have a target body condition score of 3.25-3.5. You also want to be sure to maintain a normal calcium balance in the cows. This may be accomplished by feeding anionic salts and extra calcium prior to calving. If calcium levels drop you may have calving problems related to milk fever. If you are experiencing high rates of dystocia you may want to reevaluate your nutrition plan for your heifers and dry cows.
- Observation of the cows/heifers close to calving - early intervention can help prevent some of the more difficult dystocias and calf deaths.
- Educating your personnel - Knowing when to intervene and what to do is extremely important in decreasing the occurrence of more difficult dystocias and calf death losses.

Dystocia in Heifers vs. Cows

The different causes of dystocia in the cow versus the heifer is due to the differences between the two animals. A heifer is still growing, so she will be smaller than a mature cow. Also, a heifer has never had a calf before, so the tissues of the birth canal (cervix, vagina, and vulva) have not ever been dilated. Thus, dystocia in heifers is often due to the birth canal not dilating or stretching sufficiently. These dystocias can often be relieved by manually dilating the vagina and vulva.

When dystocia occurs in cows however, it is usually the result of a more serious problem. The size of their birth canal is less restrictive than that of a heifer so when dystocia occurs there may

commonly be another disease process going on (i.e., Milk Fever), the calf is extremely large, or the calf is malformed or malpositioned. For these reasons even mild dystocia in a cow may increase the likelihood of a stillbirth and live calves may be more significantly compromised than those born to a heifer with dystocia.

Effects of Dystocia

Any dystocia will have some impact on the calf and dam, but that impact typically becomes worse the more difficult the calving.

- Increased calf death losses due to increased trauma, increased disease, or inability to adapt to life outside of the dam.
- Increased dam death loss and culling rates due to trauma, decreased production, or decreased reproductive efficiency. Cows that experience dystocia have increased stress and are more prone to injury.
- Increased number of days open (decreased fertility).
- Decreased milk yield (especially in the first 30 days in milk).
- Decreased milk fat.
- Increased likelihood of future calving problems.
- Economic losses due to:
 - Calf losses
 - Treatment costs
 - Increased disease in the herd
 - Loss in reproductive performance
 - Some studies have found losses to be as high as \$380 in extreme calving difficulty)

Due to year-round calving on most dairies, it is important to keep good records to monitor the incidence of dystocia in order to determine if there is a problem.

Interesting Facts About Dystocia

- As calving difficulty increases, the percent of cow and calf deaths increases.
- Bull calves are usually more compromised than heifer calves because bull calves are usually larger.
- Some studies have shown that there is an increased incidence of dystocia in the winter verses the summer. This may be due to decreased exercise in the winter.
- Dystocia is the major cause of stillbirth.
- Approximately half of the calf losses from birth to weaning occur in the first day of life.

Dystocia Scoring System

Dystocia is usually put into categories according to difficulty. This is helpful in record keeping and in the communication between personnel.

An example of a record keeping dystocia scoring system:

0 - no assistance required

1 - easy pull - typically means a single person pulling

- 2 - hard pull - typically means 2 people pulling
- 3 - mechanical pull (calf jack used)
- 4 - c-section

An alternative example:

- 1 - no assistance required
- 2 - easy pull
- 3 - hard pull, mechanical pull, or veterinary procedure required

It is important that you develop a scoring system that works for your operation. You may want to include information about whether the calf was malpositioned, whether the calf was alive or dead at the time of assistance, etc. The system should be simple enough for everyone to understand and easily fit into your record keeping system.

Normal Calving

Calving is a continuous event but for explanation it is divided into three stages:

Stage 1

This stage, lasting 2-6 hours (can be a couple of hours longer in heifers), begins with initial labor and ends when the cervix is fully dilated, and the calf has entered the birth canal. The end of stage 1 is marked by the observation of the water sac. The cow may show signs of discomfort by kicking at her belly and becoming restless due to contractions. She may separate herself from the rest of the cows and urinate frequently. These signs are especially evident in heifers.

Stage 2

In this stage, which lasts 1-2 hours for cows and 2-4 hours for heifers, the cervix is fully dilated, the cow may lie down, contractions will increase and abdominal pushing is obvious. This stage ends with delivery of the calf.

The calf must enter the birth canal in a certain position in order to have a normal delivery. The terms presentation, position, and posture are used to describe how the calf is positioned in the birth canal. It is important that everyone on your operation dealing with calving have a basic understanding of these terms in order to communicate with each other and with your veterinarian in cases of dystocia.

Presentation refers to whether the calf is coming forward (anterior) with both front legs and head extended into the birth canal, backwards (posterior) with both hind legs extended into the birth canal (soles of the hooves up and toes pointed down), or transverse with either all four legs in the birth canal or the back of the calf entering the birth canal. Both forward and backward presentations are considered normal with forward being the most common. Keep in mind that a backward presented calf is a high-risk calving because the umbilical cord is pinched off before the calf's head is delivered. A transverse presentation is never normal.

Position refers to how the calf is positioned in relation to the cow. If the calf's back is up towards the cow's back (spine) it is considered right-side up (dorsal). This is the only position that is

considered normal. If the calf's back is down on the bottom of the pelvis it is upside down (ventral). The calf may also be on either of its sides; right-side down or left-side down.

Posture refers to where the calf's limbs and head are in relation to its body. The limbs and head should be extended into the birth canal. If the head or one or both of the limbs is retained the calf is considered malpositioned and needs to be adjusted prior to delivery.

The most common delivery is when the calf is in a frontward presentation, a right-side up position, and with both front limbs and head extended into the birth canal.

You will observe that the cow will have strong abdominal presses while delivering the head and chest of the calf, after which she will usually take a short break (5-10 minutes or less). During this time the umbilical cord is being pinched off and you should notice the calf begin to breathe on its own. After the short break, the hind limbs should be delivered uneventfully.

The water sac that is surrounding the calf's head should break during delivery of the head. If it does not break the calf could suffocate.

Stage 3

After the birth of the calf, the placenta should be delivered within 6 hours.

Determining if the Cow/Heifer Needs Your Help

Four decisions dramatically affect the outcome of delivery. They are:

1. Frequency of observation

Recommended frequency of observation is every 1-2 hours. The ability to perform this is based on staffing at your dairy.

Once a cow/heifer in stage 2 of labor the frequency of observation should increase to every 30 minutes. It is important to see if the dam is making progress in that time or not.

2. Knowing when to intervene

To make decisions about when to intervene it is important to know the normal range of time it takes for each stage of labor. All personnel should know the guidelines for intervention and understand why those guidelines are in place.

The guidelines below are based on the stage of labor:

Stage 1 - Usually lasts 2-6 hours. If you do not notice any progression to stage 2 after 4 hours the cow/heifer should be examined to determine if there is a problem. Low blood calcium (milk fever), uterine torsion, or a calf in breech presentation can prevent the cow from going into Stage 2 of labor. (See the glossary for an explanation of these terms.)

Stage 2 - Intervention is needed if any of the following occur:

If the water sac has been visible for 2 hours and you have not seen any progression (the cow is not trying).

1. If the cow has been trying for over 30 minutes and making no progress.
2. If the cow has quit trying for more than a 15-20 minute period of time after a period of progress. Rest periods normally should not last longer than 5-10 minutes.
3. If the cow or calf is showing signs of stress or fatigue -- like a swollen tongue in the calf, yellow staining (meconium) of the fetus, or severe bleeding from the rectum of the cow.
4. If you suspect that the calf is in an abnormal presentation, position, or posture.

Stage 3 - If the fetal membranes have not been passed within 12 hours after calving, intervention may be necessary. If they are retained, treatment may be indicated. In no instance should the membranes be manually removed. This may be detrimental to the cow's future reproductive performance.

It may be beneficial to cut the membranes close to the vulva in order to decrease the opportunity for contaminants (dirt, bacteria) to obtain entrance into the reproductive tract of the cow.

Be sure to consult with your veterinarian about proper treatment of retained fetal membranes in your dairy cows.

It is important to realize that early intervention provides the greatest benefit for calf survivability and future reproductive performance of the cow.

Determine if the calf can be delivered by forced extraction (pulling).

Once you have decided to intervene you should palpate the calf and the birth canal: 1) to determine if the calf is alive or not and 2) to see if it can be delivered through the birth canal of the cow.

- If the birth canal is abnormal, it is time to call for professional help.
- If the cervix is not fully dilated the cow should be given more time for dilation or checked for other signs of milk fever.
- If the calf's head is too large to fit through the birth canal forced extraction should not be performed.
- Studies have shown that calves delivered by c-section after forced extraction has failed have a decreased chance of survival compared to calves delivered by c-section alone. Therefore, the decision to perform a c-section should be made as early as possible and the decision to pull the calf should be based on a realistic assessment of the likelihood of success.
- If the decision is made to pull the calf, you should know when to keep pulling and when to quit if the decision is made to pull the calf, you should know when to keep pulling and when to quit.
- Be sure to always correct any malpositions prior to forced extraction.
- For a forwards (anterior) presented calf, the head and shoulders must be able to pass the pelvic canal, or the calf cannot be delivered. The shoulders of the calf are through the pelvis of the cow when the knees (carpi) of the calf are at the vulva. If you cannot get both knees to the vulva, the calf cannot be pulled without damage to the calf or cow.

- For a backwards (posterior) calf, if the hocks are one hand width beyond (outside) the vulva, the hips should be through the birth canal, and you should be able to deliver the calf.

When to call for professional assistance:

Professional assistance may not always mean a veterinarian, it may just be someone with more experience than yourself. Call for assistance if:

1. You cannot assess the problem.
2. You know what you are dealing with, but you do not know how to correct it.
3. You have been trying to correct the problem for 30 minutes and have not made any progress.