Appendix B
Calving Assistance Guidelines
Calf Resuscitation

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I. 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.

Stage 2 -
Intervention is needed if any of the following occur:
1. If the water sac has been visible for 2 hours and you have not seen any progression (the cow is not trying).
2. If the cow has been trying for over 30 minutes and making no progress.
3. 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.
4. 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.
5. 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.

3. 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.
   1. If the birth canal is abnormal it is time to call for professional help.
   2. If the cervix is not fully dilated the cow should be given more time for dilation or checked for other signs of milk fever.
   3. If the calf's head is too large to fit through the birth canal forced extraction should not be performed.
   4. 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 a early as possible and the decision to pull the calf should be based on a realistic assessment of the likelihood of success.
   5. If the decision is made to pull the calf, you should know when to keep pulling and when to quit.
   6. Be sure to always correct any malpositions prior to forced extraction.
7. 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.

8. 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.

4. When to call for professional assistance.
Professional assistance may not always mean a veterinarian, it may just be someone with more experience then yourself.
Call for assistance if:
- You cannot assess the problem.
- You know what you are dealing with but you do not know how to correct it.
- You have been trying to correct the problem for 30 minutes and have not made any progress

II. Special Care for the Dystocia Calf
- Calving difficulty, sometimes called dystocia, affects between 13 to 15% of Holstein calves.
- 48-hour survival rates drop drastically for calves when deliveries require 2 or more persons, mechanical or surgical intervention compared to unassisted births.
- 120-day survival rates for calves when deliveries require 2 or more persons, mechanical or surgical intervention are 70% less than unassisted births.
- Treatment rates are higher for dystocia calves (scours 17%, pneumonia 70%) compared to calves experiencing unassisted births.
- Providing special care, both in the first few hours and first two weeks, can cut both death losses and treatments for scours and/or pneumonia.

Lots of stimulation during first few hours. When these calves hit the ground they typically are “out of it.” Compared to calves with unassisted deliveries, usually they are
- less alert,
- slower to lift their head and roll onto their belly,
- longer to attempt to stand,
- slower heart beat,
- sub-normal body temperature,
- erratic breathing and
- less responsive to stimulation (for example, tweaking nose with a piece of straw to encourage breathing). Actions for the first 15 to 30 minutes? Using a large cloth (for example a bath-size towel) rub the calf. Keep at it. Use more than one towel. Get the calf hair coat “fluff-dry.” Work at getting a strong breathing pattern. Experience suggests that
lots of attention to the neck and shoulders helps. The name of the game here is stimulation – as intense as you can manage and be persistent. Increase the oxygen:carbon dioxide exchange rate – regular breathing is our goal to overcome oxygen deprivation. Normal heart rate should be in the range of 100 to 150 beats per minute.

If oxygen is available start supplementation as soon as the calf is on the ground. Welding grade oxygen will work if medical-grade is not available. Start oxygen flowing through a small plastic tube. Adjust the flow to get a gentle flow on your cheek. If you do not have a mask slip the tube up into the calf’s nose roughly the width of your hand. If you can tape the tube in place fine. At least keep oxygen flowing until the calf is too active to keep the tube in place.

Feeding colostrum? It is fairly common for calves with unassisted deliveries to nurse within one to two hours. Unless there is a lot of swelling in the tongue and mouth that clearly prevents nursing and you cannot feel any suckling response within two hours, work at getting the dystocia calf to drink from a nursing bottle. If necessary, come back several times in the first three to four hours. Compared to feeding with an esophageal tube feeder using a nursing bottle provides a good opportunity to persistently stimulate the calf. Use this opportunity to do more rubbing with a towel. Try to get the calf to stand.

**Follow up for the next two weeks**
- Be sure the persons giving calf care know which calves had hard deliveries.
- Encourage identification of dystocia calves. Mark the pen or hutch – use duct tape, colored clothes pins, or shower curtain rings. Mark the calf as soon as she is dry – keep an all-weather livestock marker (for example, Twist-Stik, LA-CO Markal) right in the calving area.
- Routinely plan to give extra attention to these flagged calves. In individual pens watch to see how quickly she gets up and moves at feeding time. Look for abnormally loose manure. At feeding time keep track of whether or not she drinks all her milk. Is she slower than usual in drinking today? Any cloudy or discolored nasal discharge? In group pens have a checklist to be sure every flagged calf is observed carefully at least four times a day. Look for signs of scour – wet soiled tail, slowness in getting up and moving around that might be a sign of dehydration. Look for signs of a respiratory infection – shallow breathing, more rapid than normal breathing rate, abnormal discharge from her nose – amount and color.
- Timely treatment is essential for successful therapy. Work with the herd veterinarian to establish the appropriate antibiotic therapy for these “high-risk” calves. Agree on the drug, dose, duration and route of administration. Write this down. Train every calf care person to achieve timely and consistent treatment.

**III. Assisted-Birth Calf Care Checklist**

Have you selected the appropriate procedures? Do they provide the opportunity for your employees to work to their full potential in providing quality calf care at assisted-birth calvings? Let’s consider your procedures for calf care at calving time. Compare your actions with the standards in this checklist. When making this evaluation I like to use these scores: 1=never, 2=seldom, 3=often, 4=usually, and 5=almost always.
1. I provide a clean, dry place for the calf at birth and see that her navel is dipped.
2. I feed four quarts of clean, high quality colostrum as soon as possible after birth, certainly within the first six hours.
3. I make certain the calf can breathe by clearing her airways. Normal behavior is the first breath within 30 seconds.
4. I do NOT hold calves upside down more than 90 seconds. Most of the fluid draining after this length of time comes from the abomasum rather than the airways. Further, an extended upside down position interferes with normal diaphragm action for breathing.
5. If necessary I help the calf onto her chest and keep her there. This maintains normal pressure in the lungs. Normal behavior is to first lift the head and then to roll onto the chest within 2-6 minutes. Moderate-pull calves may take from 5-8 minutes. Hard-pull calves may take from 6-12 minutes. Over 20 minutes to lift head and roll onto chest is an indicator of very high mortality.
6. I use a towel to dry the calf and to rub her for stimulation. Rubbing in the neck and head areas is most effective for stimulating breathing.
7. I am prepared to diagnose fractured ribs. Given that one in five assisted births results in fractured ribs [40% in vet assisted deliveries], I know how to get a calf on her chest and feel for symmetry (not fractured) and folding (fractured).
7. I identify high-risk calves as early as possible and immediately begin support measures. “High risk” calves include (a) premature delivery, (b) birth trauma, (c) premature placental separation, (d) meconium staining, and (e) fractured ribs.
8. I give supplemental oxygen to high-risk calves. Shortage of oxygen in the blood (hypoxemia) is present in nearly all newborn calves. High-risk calves may be very hypoxemic and benefit greatly from oxygen supplementation. There is no evidence that oxygen supplementation has detrimental effects.
9. Working with my veterinarian, I have injectable respiratory drugs on hand to treat high risk calves.

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IV. CALF BLANKETS
All of us have heard of calf blankets. Many of us have seen them in use but only a few of us have actually used them. What are they and what are the pros and cons of their use?
WHAT ARE CALF BLANKETS?
They are calf-size coats. Often they fasten in place with straps and/or ties. Velcro is a popular fastener. They are made of insulating-type fabrics such as wool, polyester blends and insulating foams. Producers prefer those that are machine washable. Costs seem to range from about $22 to $40 each.
WHY WOULD A CALF NEED A COAT OR BLANKET?
The obvious answer is to keep warm in cold weather. But, what’s “cold” to a newborn calf? There is a temperature range where the amount of body heat produced by a calf is balanced by her body heat losses. That range is called “thermoneutral.” For an eighty-five pound newborn
calf this range is about 55 to 78 degrees (assuming she is dry and in a draft-free environment). As temperatures fall below 55 for an extended period of time she has to burn extra energy to maintain her body core temperature.

WAYS HEAT ESCAPES FROM A CALF
Now, let’s do a quick review of four ways heat escapes from a calf no matter what the weather. **Evaporation.** Heat from her body is used to evaporate water primarily on her skin and hair coat. This is easy to solve at birth. After her dam licks her off, just finish the drying and fluff up her coat. For more information on drying calves see [www.atticacows.com](http://www.atticacows.com), click on Calving Ease and select the section “Calving Ease Back Issues: 2009-2010.” Scroll down to the March 2010 issue, “Drying Off a Calf.” Calf Blankets How well does her housing during the first month provide a dry place to keep out of rain and snow? A water repellent blanket can keep her dryer.

**Conduction** is another way heat moves away from a calf. Most calves less than a week old spend ninety percent of their time lying down. But, on what kind of bedding are they lying? Dry wood shavings? Dry straw? Wet bedding? Direct contact with wet straw results in three times as much heat loss (conduction) as contact with dry wood shavings. A moisture repellent blanket can slow down conduction heat losses through damp bedding.

**Radiation** losses occur when heat is transferred through the air from a warm object (calf) to a cold one (concrete, snow). These losses are reduced for calves if they can lie down some distance away from the cold object. A blanket can serve as an insulating barrier to reduce heat moving away from the calf’s body.

**Convection** losses occur when air passes over the calf’s body. On one hand, when the housing is draft-free and a calf can snuggle down into a bed of straw, these losses are minimal. On the other hand, when the bedding does not allow any hollowed out nest and the pen is wide open for air movement (as in most greenhouse-like structures or pole barns), convection losses can be higher. A blanket can serve to minimize heat loss by radiation that is subsequently carried away by convection.

**SO, HOW DO BLANKETS FIT?**
First, the smaller the calf the greater the potential for her to lose body heat. That’s because her ratio of surface to body mass is much greater than for even a 130 pound heifer. These small calves may be the youngest ones or calves with especially low birth weights like twins. Rather than just depending on extra bedding (I always bedding these little girls with an extra flake or two of straw), blankets can used. Second, the greater the air movement around the calves, the greater potential benefits of calf blankets. Housing that does not allow calves to seek out a draft-free environment may have considerable potential for calf blankets (for example, open pens in a barn). This is especially true for very small and the young calves. Third, the greater the difference between the calf’s body temperature and the air around her, the greater the potential for benefits from using calf blankets. In very cold weather, North Dakota State University researchers demonstrated an increase of 0.2 pounds average daily gain (1.2# without blankets and 1.4# with blankets from birth to four weeks) using blankets in hutch-housed calves.

**MANAGEMENT TIPS**
Blankets are more effective when put on dry calves rather than wet ones. Aim for a “fluff-dry” hair coat to take maximum advantage of blankets. The drier and cleaner the blanket, the better it will insulate a calf. Aim for bedding that keeps blankets relatively clean and dry. Blankets are most cost effective for short-term use. With a limited number of blankets, give priority in cold weather to blanketing smaller and younger calves.
Commercial Sources of Calf Blankets
Select Sires is the U.S.A. distributor for Woolover brand blankets. Check your local yellow pages for Insemination Services – Artificial. Marting Manufacturing produces the “Cafghan” blanket. (Fax 641-843-4432 or 800-392-5632). Breslin Canvas Works in Cannon Falls MI makes a blanket with a nylon outer shell and thinsulate lining (Fax 507-263-3065, 
sales@breslincanvasworks.com)