



### Minimize Stress at Birth

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Maximizing calf health is not an easy task. Calves face numerous challenges during the first days of life: the calving process is a major risk factor, acquiring adequate immunity from colostrum during the first hours of life to reduce the risk of future disease challenges, avoiding infectious disease challenges while the immune system is still developing during the first 6 weeks of life, the stress of weaning, dehorning and vaccination all impact the health of the calf. Due to these challenges, pre-weaned calves have the highest mortality rates of any age group on a dairy farm.

#### Calf Mortality

- 8.1% of calving's are stillborn
- 7.8% of heifers die prior to weaning
- 1.8% of heifers die after weaning

Setting priorities in your calf management program with help maximize calf health and also reduce feed, labor and vet costs. This is the first in a series of articles addressing five factors in a calf management programs. The first being—Minimizing stress at birth.

#### 5 Factors of a Calf Management program

1. Minimize stress of birth
2. Maximize passive immunity
3. Meet nutrient requirements of calf
4. Optimize rumen development
5. Maintain animal health

The fetus is ultimately responsible on deciding the time of birth. As it matures its adrenal gland produces increasing amounts of cortisol. This cortisol causes the placenta to start producing estrogen, which in turn decreases the circulated progesterone. These hormonal changes signal colostrogenesis is the mammary gland and initiates the birthing process. Cortisol is necessary for maturation of the calf's lungs and gut function. As progesterone decrease, uterine contractions begin and relaxin concentrations increase.

Allowing the process to occur naturally—not inducing labor allows for development of the calf's lungs and gastrointestinal tract, as well pelvic relaxation and colostrogenesis in the dam.

Inducing labor, especially before 260 days of gestation can lead to many challenges. The calf's lungs and gastrointestinal tract is not fully mature and the calf may not survive; if it does survive it may perform poorly throughout its lifetime. Due to the interrupted hormonal cascade,

colostrogenesis does not occur and the placenta is often retained.

#### Signs of parturition

- **Shape of cow.** For most of the dry period, the cow appears barrel shaped when viewed from behind. During the final week of gestation the calf shifts, making the cow pear shaped. On the day of calving, the calf seems to disappear as it moves into the birth canal.
- **Swelling of the Vulva.** The vulva starts to swell prior to calving, although this varies by breed. For example, Jerseys will often show vulva swelling several weeks prior to calving, while other breeds have little noticeable vulva swelling until the day of calving.
- **Discharge.** The viscosity of the mucus produced in the reproductive tract also changes. Normal discharge appears opaque and viscous. As parturition draws near, the discharge becomes clear and free-flowing.
- **Pelvic relaxation.** The hormone relaxin causes the ligaments around the tailhead to loosen in the final week. During the last 24 hours the ligaments becomes completely slack, moving more than one inch. The tail will also become more flexible as the ligaments between the vertebrae loosen.

#### Stillbirths:

Calf death loss relates directly to calving difficulties. Calf mortality increases steadily with increasing calving ease scores. Nearly 50% of calves will be stillborn following a birth with a calving score of 5. However, it is important to note that calf mortality is increased even with slight assistance at calving. This suggests that even slight assistance is detrimental to the survival of the calf, and points out the need for extreme restraint when assisting at delivery.

Most stillbirths are associated with a lack of oxygen during delivery, although a surprisingly high number result from trauma. Trauma stillbirths often reflect inappropriate timing of assistance or the use of excessive force.

A stressful birth can have carry-over health effects. Approximately 40% of calves that were highly stressed at birth die by 3 weeks of age. Calves born from difficult deliveries often have trouble maintaining body temperature. This inability to regulate body temperature increases death losses, especially during cold or windy conditions.

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All calving's should be carefully monitored with the position of the calf determined early in labor. Repositioning a calf is far easier early in the process. If the position of the calf is normal, assistance should only be provided when the cow or calf appears to be in distress. This can be difficult to assess, however, the following rules can help:

**Observe the color and reflex responses of the tongue.** Pinch the tongue—a lack of a reflex response indicates a distressed calf. A darkening of the tongue that persists between uterine contractions or a lengthening of the tongue at any time also suggest distress. Normally, when the contractions are coming hard and fast, the tongue will darken because the umbilical cord is compressed by the contractions of the uterus and then lighten during the rest periods. Persistent darkening indicates persistent oxygen deprivation, and lengthening, or loss of muscle tone in the tongue, is indicative of severe acidosis.

**Look for blood or the appearance of pieces of cotyledon during delivery.** This indicates that the placenta has been torn and damaged as the calf rotated and entered the birth canal. Visible blood belongs to the calf, which is slowly bleeding out in the uterus. The delivery of the calf solves this problem by rupturing the umbilical cord and separating the calf from the “wounded” placenta.

**Do not provide assistance based on the length of time the cow has been in labor.** Cows can become distracted during the delivery process and may actually stop active labor for hours. For example, labor often slows after one or both of the sacs surrounding the calf break. This occurs for two reasons. First, the loss of fluids lessens the pressure on the cervix that drives active labor. The calf must fill this space before active labor resumes. Second, the cow instinctively consumes all of the fluids that have soaked her bedding. This is probably a defensive instinct—removing evidence of the birth process from predators. In many cases, it can take up to 45 minutes for labor to resume. Producers often rush to assist because the cow was only monitored in intervals. The cow is first observed in hard labor with the tips of hooves and nose of the calf visible. The water bags break, the cow does not resume labor for 45 minutes, and the person returns to find that the cow has made virtually no progress in the last hour. However, this delay is a normal part of the birth process. Just as with human deliveries, cervical dilation is the key factor in the birth process. The cervix must expand to allow the calf's head and shoulders to push through. This can take 5 to 15 minutes, and generally requires no assistance. Physically pulling a large calf through an inadequately-dilated birth canal will almost

always injure the calf and potentially injure the cow.

When assistance is necessary during delivery, gentle traction should be provided in concert with uterine contractions. As a thumb rule, use no more than 150 pounds of force when assisting Holstein cows and no more than 75 pounds when working with Jerseys. As an example, one average sized man can generate about 150 pounds of force during a hard pull. The use of forces greater than 150 pounds will not speed cervical dilation, rather it forces the calf through the cervix before it can fit. Roughly a third of cervical dilation occurs after the feet and nose are visible as the cervix expands to accommodate the shoulders of the calf.

Veterinarians and producers often use chains to better grip the calf when applying this pressure. If used, chains should be double-half-hitched on both legs—above the fetlock on the cannon bone and below the dew claw—to distribute the force of the pull. Sterilize chains after each delivery. Lubrication also reduces the force of the pull. However, do not use soap and water inside the reproductive tract as it removes the natural lubricants in the birth canal. Instead, use commercial lubricants designed for this purpose. Lubricants used on breeding sleeves when artificially inseminating cows are acceptable.

Calves will normally rotate from left to right as they are born and flex downward after delivery of the shoulders. These positional changes minimize the chances of hooking the hips of the calf on the pelvis of the cow. Therefore, calves should be pulled parallel to the angle of the rump of the cow until the head and shoulders are completely delivered, then the angle of delivery is closer to 45 degrees. Stop traction after the last rib is delivered, allowing the rest of the body to deliver on its own. This allows time for the transfer of blood from the placenta to the calf prior to umbilical rupture.

Patience is again required to allow the calf to begin breathing before the umbilical cord ruptures. That's because compounds produced in the calf's lungs after the first breath of air, called bradykinins, travel to the umbilical cord and help constrict the blood vessels. And, stretching and tearing of the cord stimulates a reflex constriction in the umbilical arteries near the point where the rupture occurs. Calves allowed to tear the umbilical cord naturally have improved oxygenation compared to those delivered without allowing blood transfer to occur.

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