# Calving Management and Its Influence on Calf Health

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## Bovine Respiratory Disease Complex Series

**FAST FACTS**

- 41 percent of disease burden in calves could be attributed to a difficult birth
- Calving Difficulty Scoring: 1 = unassisted; 2 = little difficulty /hand assistance; 3 = little difficulty with mechanical calf puller; 4 = slight difficulty, assisted with calf puller; 5 = moderate difficulty with assistance; 6 = major difficulty, with more than 30 min of assisted delivery; 7 = caesarean birth

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When we think about the detrimental effects of dystocias (difficulty calvings) on a cow/calf operation, we often associate them with dead calves, retained placentas, uterine infections, calving paralysis, decreased future conception rates, and vaginal and uterine tears (Fourchon, 2000). These are all very detrimental and costly consequences. However, there is one consequence of dystocias that is often overlooked. This is the effect that a dystocia has on the health and survival of calves up to several months after the difficult delivery has occurred. In one study, 41 percent of the disease burden in calves could be attributed to their difficult birth (Sanderson 2000). Snowder et al. (2005) described the incidence of Bovine Respiratory Disease Complex (BRD) in pre-weaned beef calves and found that, on average, as calving difficulty score increased, so did the incidence of BRD in the calves. The average age of calves with a difficult birth that developed BRD was about 60 to 80 days, indicating long-term effects of their difficult birth.

Calves that survive difficult calving events are at risk of failure of passive transfer of immunoglobulins (FPT) (Beam 2009). If a calf is stuck in the birth canal for a prolonged period, they can develop low oxygen levels in the blood (hypoxia) that can result in stillbirth or lower likelihood of survival after birth. Calves can be born weak with poor ability to both suckle and absorb colostral antibodies, resulting in a greater risk for illness and the calf's ability to regulate its body temperature. The effects of hypoxia are to create a weak calf that becomes acidotic. Calves with acidosis are more likely to have FPT of immunoglobulins (Besser 1990).The effects of hypoxia may affect calf survival for 30 to 60 days, or even longer.

Failure of passive transfer is a major risk factor for calf respiratory disease. In a recent study, beef calves with FPT (serum IgG1 concentra-

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- The most common cause of dystocia in beef cattle is the mismatch between the size of the calf and the size of the cow or heifer.

tration ≤ 800 mg/dL) were more than twice as likely to have a pre-weaning illness, including respiratory disease, compared with calves classified as having adequate passive transfer (serum IgG1 concentration > 1,600 mg/dL) (Dewell 2006). In calves, FPT is the failure of the calf to receive and absorb colostrum (first milk) from its dam. Calves that have FPT have a higher likely hood of getting pneumonia before they are three months of age (Virtala 1999; Stokka 2010).

Severe dystocias are also associated with low body temperatures in calves as well as low cortisol levels (Bellows 2000). Investigators into this issue concluded that calves involved in a difficult birth would have lower cold stress tolerance. The stresses associated with lower cold tolerance could influence immune system function and result in disease.

**Risks for Dystocias**

Because of the consequences to calf health after a dystocia, particularly as a risk for calf respiratory disease, prevention of dystocia is key. There are many risk factors that lead to difficult calvings. The following list includes several of the risk factors that can be managed.

**Long Calving Season** -- Having a defined and narrow calving season makes it easier for the rancher, ranch hands, and the cows. Calving over a long period of time can exhaust those individuals that need to observe and assist. Some cows or heifers that need attention could get missed. In the 2007-2008 NAHMS study of beef cattle, only about two-thirds of operations had a 4 month or less calving period (USDA-NAHMS 2009).

**Lack of adequate help to observe calvings** -- From the 2007 NAHMS beef study, 92.7 and 89% of operations reported regular observation of heifers and cows, respectively. Of operations that reported they regularly observed heifers during calving, 4 of 10 (39.1 percent) observed heifers 3 or more times in an average 24-hour period. Overall, almost 4 of 10 operations (38.7 percent) allowed heifers to labor 3 hours or more before assistance was given. Overall, almost one-half of operations (46.8 percent) allowed cows to labor 3 hours or more before assistance was given. Because heifers are more likely to have a dystocia than cows, they need to be observed at least every three hours.

**Large calves** – The most common cause of dystocia in beef cattle is the mismatch between the size of the calf and the size of the cow or heifer (Nix 1997). Before the day of calving, the producer should have considered the calving ease of the bulls being used on the heifers and should have paid attention to the body condition of the heifers and cows. Although we know that fat cows could have a difficult birth, very thin cows may not be able to calve normally either.

**Length of gestation** -- The average length of gestation for cattle is 280 days, with a normal range of 273 to 296 days. A twin pregnancy will average 3 to 6 days less. If gestation lasts longer than normal, the calf may be larger than normal or could be abnormal in another way, contributing to a difficult birth. In cattle, gestation length is influenced by factors such as the breed of the cow and bull and calf gender, Cows carrying bull calves had a slightly longer gestation

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compared to cows carrying heifer calves. Environmental factors including nutrition, ambient temperature, and the season of the year have a smaller influence. The breed of cattle has the greatest influence on gestation length.

**Twinning** – Twin calves are often involved in dystocias, more so than single calf births. The incidence in one Nebraska study was 47 percent dystocias in twin births compared to 21 percent for singles (Echternkamp 1999). Identification of those cows with twins at pregnancy diagnosis and records of their potential due date can be used to set times for more intensive observations for the need of assistance at calving.

**Small cows/heifers** – Heifers are much more likely to have a difficult calving compared to cows (USDA-NAHMS 2009). If the pelvic area of the cow or heifer due to calve is small, they may not be able to calve normally. The heritability of pelvic area ranges from 36 to 92 percent with an average of 61 percent (Deutscher, 1989). Pelvic area measurements can be made before breeding to determine risk for calving difficulty (Patterson, 1997).

**Lack of training to handle dystocias** – Everyone tasked with watching and handling cows should be trained in the proper way to deliver calves, handle dystocias, and know when to call the veterinarian for help. Training can be accomplished by the ranch veterinarian or with assistance from Extension.

**Nutrition and health of cows and heifers** – Because very fat cows and very thin cows put the calf at risk, a review of the diet throughout the breeding season and during gestation is warranted. Inadequate protein during gestation, in addition to some other factors, can result in *Weak Calf Syndrome* and calves with poor survivability (Moore 2009).

**Where to Calve**

Where cows calve can have as much an influence on calf health as how they are managed during calving. One management practice to help reduce calf exposure to disease agents is by separating cows due to calve from cow-calf pairs. In the recent USDA-NAHMS Beef study, only 14 percent of all operations separated cow-calf pairs from cows yet to calve (USDA NAHMS 2009). However, in operations with more than 200 cows, 46 percent did so. The average number of days after calving that cow-calf pairs were separated was 6 days.

Although designed specifically for preventing scours in young calves on range, the Sandhills Calving System can help to prevent a number of disease risks (Smith 2003). There is evidence in dairy calves that the occurrence of diarrhea in neonatal calves increases their chance of respiratory disease before weaning (Rossini 2004), thus, reduction of one disease could lead to reduction of the other. The Sandhills Calving System requires that the calving grounds be fenced off into separate calving areas, the number of which is determined by the length of the calving season.

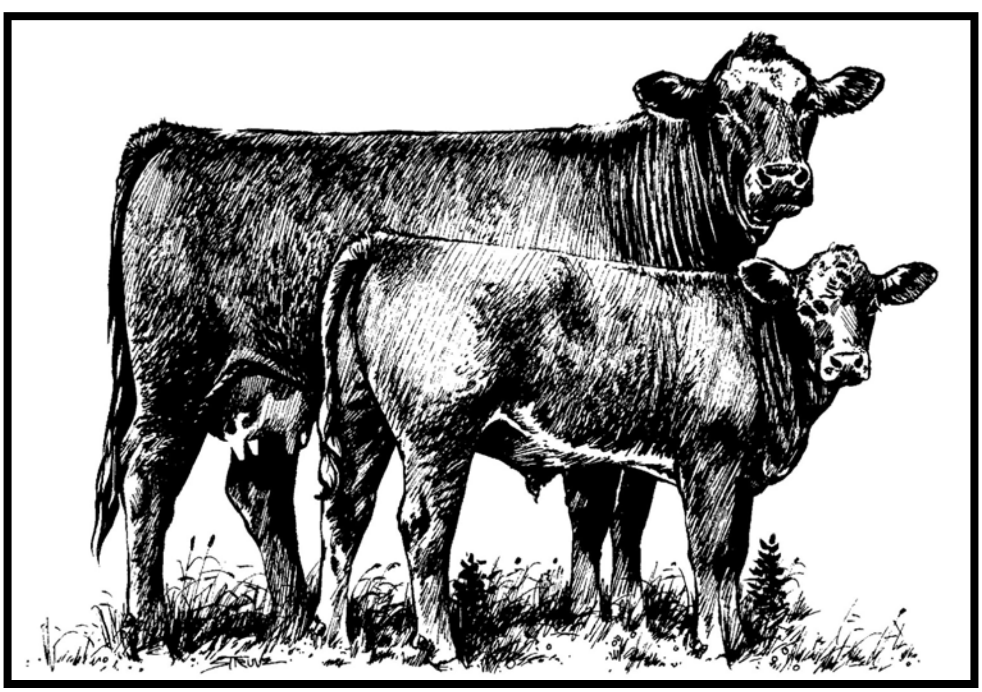
**FAST FACTS**

- Clean ground for calving, will make sure that the calf's exposure to pathogens is minimized.

The first set of cows that calve remain in the first pasture. At two weeks, cows due to calve are moved. Every week thereafter, cows due to calve are moved to "clean" ground. Clean ground for calving, whether using the Sandhills system or another calving management system, such as rotating the calving area every year, will make sure that the calf's exposure to pathogens is minimized.

**Conclusions**

Difficult calvings affect both the cow and the calf. Paying attention to and preventing the risks for dystocia and exposure to pathogens will help prevent the consequences of poor calf survivability and risks for disease later on including BRD.



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