

Using Calving Behaviors to Promote Successful Calving Outcomes

Erika Edwards, Graduate Research Assistant

Peter Krawczel, Associate Professor

Department of Animal Science

Calving is one of the most stressful events a dairy cow will experience during a production cycle. During this time, the cow must be able to cope with a painful labor along with changes in her environment and regrouping with other cows. When cows are unable to deal with these changes, they can become risk factors for dystocia, which may lead to a reduction in performance or postpartum illness. Dystocia is defined as a prolonged, abnormal or difficult birth that typically requires assistance during delivery of the calf. The 2007 USDA National Animal Health Monitoring System (NAHMS) report stated that 17.2 percent of all cows that calved in 2006 required assistance while giving birth. The report also mentioned that 12.9 percent of cows had infertility

problems (not pregnant 150 days after calving), 3.5 percent experienced a displaced abomasum and 7.8 percent retained their placenta for more than 24 hours. The placenta can be considered retained at 12 to 24 hours post-calving. According to “Veterinary Reproduction and Obstetrics,” the incidence of retained placenta generally ranges from 4 percent to 18 percent in dairy herds. A difficult calving will negatively affect the cow’s and calf’s health, as well as the cow’s production and fertility (Table 1). Therefore, it is important to be able to identify a cow’s normal calving behaviors and understand the normal calving process in order to recognize when she may be experiencing dystocia and to avoid illness after calving.

Table 1. Research from Iowa State University, Colorado State University and the US Department of Agriculture discusses the negative impacts of dystocia on cow health, production, and fertility and calf health.

Cow Health	<ul style="list-style-type: none"> As severity of dystocia increased, the percent of death loss increased from 0.24 percent to 4.12 percent. Cows are at increased risk for contracting uterine disease, mastitis, milk fever and retaining their placenta.
Cow Production	<ul style="list-style-type: none"> As severity of dystocia increased, the total loss of milk weight for a 305-day lactation increased from 73.79 kg to 703.58 kg. As severity of dystocia increased, the total loss of milk fat for a 305-day lactation increased from 2.52 kg to 24.08 kg.
Cow Fertility	<ul style="list-style-type: none"> As severity of dystocia increased, the number of days open increased from 7.36 to 32.64.
Calf Health	<ul style="list-style-type: none"> Calves that are born using forced extraction are 4.22 times more likely to die 21 days after birth. As severity of dystocia increased, the percentage of respiratory disease incidences increased from 18.6 percent to 35.4 percent. As severity of dystocia increased, the percentage of digestive disease incidences increased from 11.7 to 19.1 percent. Dystocia affects health until at least 30 days of age. Calves have difficulty absorbing colostrum and regulating their body temperature.

Normal Calving Process and Behaviors

The cow's well-being can benefit from farm personnel understanding the normal calving process and behaviors. This knowledge will allow personnel to implement best management practices on the farm. Calving is described as occurring in three stages in "Arthur's Veterinary Reproduction and Obstetrics" (Table 2). During stage one, the cervix will dilate and uterus will begin to contract. This stage can vary greatly. It often lasts 4 to 24 hours and only can be confirmed with palpation of the

cervix. While these changes may not be visible from the outside of the animal, some indirect physical cues provide an indication that the cow is in stage one of labor. These include an engorged udder, relaxation of the pelvic ligaments, and discharge from the vulva, which reflects dilation of the cervix. Stage two begins with abdominal contractions, and the calf moving into the birth canal. It is now evident the cow is giving birth because she is actively pushing and the amniotic sac is visible. After 1 to 3 hours, this stage ends with expulsion of the calf. Stage three is characterized as expulsion of the placenta.

Table 2. The calving process occurs in three stages. These stages can be identified with physical and behavioral cues.

Stage 1 (4 to 24 hours)	Stage 2 (1 to 3 hours)	Stage 3 (3 to 8 hours)
<ul style="list-style-type: none"> • Dilation of the cervix. • Engorged udder. • Discharge from the vulva. • Relaxation of the pelvic ligaments. • Isolation from the herd. • Frequent change in posture. • Tail raising. • Sniffing the ground/nest building. 	<ul style="list-style-type: none"> • Abdominal contractions. • Calf moves through birth canal. • Laying on side. • Reduced eating and drinking. • Paying attention to abdomen. 	<ul style="list-style-type: none"> • Expulsion of the placenta.

In conjunction with physical cues, a normal calving also can be recognized using behavioral cues. The time at which the cow's behavior begins to change varies based on the cow's environment at calving. Research from the Swedish University of Agricultural Sciences reported cows housed in an extensive, pasture-based system begin to show signs of calving by isolating themselves from the herd and seeking a secluded area that is dry and has natural forage cover (i.e., trees and bushes), which normally occurs on the day of calving. This behavior promotes bonding with the calf and is part of a cow's prey-predator instinct. The change in behavior can be less obvious for cows housed indoors at calving. However, some cows that are housed indoors may still try to express the same behaviors they would if calving outdoors. Researchers from University of British Columbia's Animal Welfare Program reported cows that calve indoors begin isolating themselves from other cows 8 hours prior to calving when a shelter is provided in the maternity pen. Researchers also reported that feeding time decreased on the day of calving by 32 percent (approximately 65 minutes). Research conducted at University of Edinburgh stated cows become restless, change positions and raise their tail more frequently during the 6 hours leading up to the time of calving. The number of times a cow lies down will nearly double and number of tail raises triples. Furthermore, researchers at Aarhus University reported cows spend more time paying attention to their abdomen during the final 2 hours of labor. Cows turned their head to their abdomen 16 times as compared to only 2 times several hours prior to calving. Farm personnel can use these physical and behavioral indicators to check the cow more often and ensure calving is progressing normally. The 2007 NAHMS report recommends



Photo 1: Cows isolated themselves in the shelter leading up to calving. (Courtesy of Katy Proudfoot, University of British Columbia Animal Welfare Program)

checking on a cow that's close to calving at least once every 3 hours. Once it appears that a cow is in stage two labor it is best to check more frequently as a cow should make progress every 15 to 20 minutes. This means she is actively pushing and the calf is moving further through the birth canal. If progression is not apparent, position of the calf needs to be assessed along with an estimation of calf size for feasibility of moving through the birth canal. Research from the Ohio State University suggests cows should be assisted 65 minutes after feet are seen and no further progress has been made. It is critical for farm personnel to be properly trained in calving assistance for the safety of the cow and calf or a veterinarian should be contacted.

Recommendations for Calving Environments

Along with other management practices, a suitable environment for calving allows the cow to express her natural calving behaviors. Whether in the pasture or indoors, the calving area should be secluded from high traffic areas of the farm to prevent distraction and a prolonged labor. The area also should be bedded, clean, dry, quiet and well ventilated. The flooring of the area is important to consider as cows are getting up and down frequently leading up to calving, so appropriate traction is needed. Research from University of Wisconsin-Madison suggests cows be bedded with 6-8 inches of loose bedding (i.e., straw or sand) compared to mattresses or rubber mats. The “knee test” can be used to determine if the bedding is clean and dry enough. Kneel on the bedding for 5 to 10 seconds. If your knees are wet and/or dirty when you stand, the bedding needs to be changed. This practice is critical for cow comfort and preventing the spread of disease. Stocking density also affects the cows’ ability to express normal behaviors. Cows need enough room to lie down and give birth as well as potentially be able to isolate themselves from herd mates if group-housed. Therefore, veterinarians from the University of Wisconsin-Madison recommend cows housed in maternity pens be provided with a minimum of 120 square feet of resting space.



Photo 2: An example of a clean, quiet and well-ventilated calving area.

Another important factor to consider is when cows will be moved to this environment, as time of relocation can affect calving behavior. Researchers from the University of British Columbia’s Animal Welfare Program in collaboration with Aarhus University report that cows should not be moved during late stage one labor as this causes stage two labor to prolong by 30 minutes. When cows were moved at this time, their normal calving behaviors were disrupted. Cows spend less time lying as they explore their new pen to ensure it is a safe area for giving birth. Because research has not determined the optimal time for moving a cow to the maternity pen, keeping a record of calving difficulty and the time from pen movement to birth of the calf can provide valuable information to decide best management practices. For example, a 5-point scale could be used to assess calving difficulty: 1=no problem; 2=slight



Photo 3: A cow in stage two labor with a well-bedded, clean environment. (Courtesy of Amanda Lee, University of Kentucky)

problem (hand pull); 3=needed assistance (obstetrical chains); 4=considerable force (calf jack); 5=extreme difficulty (cesarean). It’s also beneficial to note any malpresentation of calves and stillborn calves (born dead or die within 24 hours of birth). Using this information in conjunction with calving behaviors can play a key role in deciding when it is time to move a cow to the calving area and creating an environment for a successful birth.

Using Behavior to Identify Dystocia

Some calving behaviors can indicate if a cow is more likely to experience dystocia and require assistance. Research from the University of British Columbia’s Animal Welfare Program suggests that cows that experience dystocia have a greater reduction in feed intake during the 24 hours prior to calving. Dystocic cows reduced their feeding time by an additional 35 minutes compared to non-dystocic cows during the 24 hours prior to calving. Additionally, research from University of Edinburgh suggests cows requiring assistance become more restless and raised their tail more frequently and for a longer period of time compared to an unassisted cow. Signs of these changes in behavior typically begin 4-6 hours before calving. Being able to recognize these deviations from normal calving behaviors can allow farm personnel to closely monitor cows that are more likely to experience dystocia. This will allow personnel to intervene and provide assistance at the necessary time.

Calving Behaviors Matter

The calving event will affect the cow and calf’s health, production and fertility. The cow is vulnerable to the stress and changes she experiences around the time of calving, which makes her more susceptible to contracting multiple illnesses. A long and stressful labor also has negative impacts on the health and future potential of calves that survive the process, as they are often prone to contracting multiple illnesses. The ability to recognize normal and abnormal calving behaviors can provide great value when monitoring the calving process, as it provides personnel with the ability to determine when assistance is necessary.

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