Stillbirths (defined as fetal death within 24-48 hours after delivery) remains a major problem on dairy farms. Across several large studies, stillbirth rates have ranged from as low as 4.3% to as high as 10.3%. Dystocia is blamed for the vast majority of stillbirths and rates are significantly higher in heifers than they are in multiparous cattle. Unfortunately many employees on our modern dairy farms have not been trained on how and when to intervene with difficult calvings and are unaware of how to resuscitate calves after dystocia. An emphasis on veterinarians working with producers and training employees on proper intervention is critical to reduce stillbirth rates.

Table 1. A summary of stillbirth rates in dairy cattle reported in various studies.

<table>
<thead>
<tr>
<th>No. of calvings</th>
<th>Stillbirth rate</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Not reported</td>
<td>10.3%</td>
<td>Berglund et al. (1)</td>
</tr>
<tr>
<td>13,608</td>
<td>6.6%</td>
<td>Bicalho et al. (2)</td>
</tr>
<tr>
<td>32,299</td>
<td>6.5% (10.7% heifers in 4% in cows)</td>
<td>Bicalho et al (3)</td>
</tr>
<tr>
<td>7,380</td>
<td>8.2%</td>
<td>Lombard et al. (4)</td>
</tr>
<tr>
<td>182,026</td>
<td>4.3% (7.7% in heifers and 3.5% in cows)</td>
<td>Mee et al. (5)</td>
</tr>
<tr>
<td>666,341</td>
<td>11% in heifers and 5.7% in cows</td>
<td>Meyer et al (6)</td>
</tr>
<tr>
<td>319,720 heifers and ~1.27 million cows</td>
<td>10.4% in heifers and 3.6% in cows</td>
<td>Norman et al. (8)</td>
</tr>
</tbody>
</table>

In addition to the loss of the calf, there is economic impact on cows that have a stillborn calf. Studies have shown that these cows have a significantly increased risk of culling or death throughout their lactation and increased days open as compared to cows that had live calves.2 Another study showed cows that had stillborn calves had reduced milk production as compared to cows that had live calves.3 Therefore economic losses from stillbirths are not just limited to the dead calf.
Steps to Limit Stillbirths

1) Genetic selection- Certain selecting sires appropriate for breeding is a critical part of the process to avoid dystocia. Beef bulls generally have EPD’s for birth weight and low birth weight bulls should be selected for heifers. Dairy bull sire summaries will have data such as sire calving ease and daughter calving ease. Sire calving ease (SCE) is an estimate of the difficult births (dystocias) seen from that bull in first lactation heifers. Bulls with SCE values above 8 are not recommended for heifers or small cows. Daughter calving ease (DCE) measures the ability of the daughters from that sire to calve easily. In Holsteins, the breed average is roughly 6% and values higher than that are associated with increased dystocia rates.

2) Nutrition- Although not a lot of specific data is available, nutrition is thought to be important in limiting dystocia and stillbirths. For example, trace mineral deficiencies might increase the rate of dystocias as well as cows that are over-conditioned at the time of calving. In humans, women with high non-esterified fatty acids (NEFAs) can have slow labor and are associated with higher rates of stillbirths which may also be the case in cattle.

3) Pen management- It is important to avoid moving cattle until Stage 2 of labor (feet present outside of vulva). Farms that move cattle to the calving area during Stage 1 labor (cow restless, vulva swollen, teats distended) will experience more stillbirths. Particularly in heifers, they may “stop” the process of labor when moved and then re-start later resulting in higher death loss.

4) Train employees on management of dystocia- Since most stillbirth are related to dystocias, it is critical that employees understand how to help. They should understand the stages of labor a cow goes through as well as when and how to intervene or give assistance. They should also understand when they need to contact someone else (labor not progressing normally) and how to care for the newborn calf.

Normal labor takes about 60-70 minutes and classically recommendations have been to intervene 90 minutes after the appearance of the amniotic sac. Rapid intervention can result in cervical or uterine tears when we have not given the cow (particularly heifers) time to properly dilate. However a recent study showed that earlier intervention may not be harmful to cattle. In this study involving 257 calvings, employees were first trained on how to properly intervene and assist with calf pulling. Then they were allowed to assist with labor 15 minutes after feet were present in the birth canal. Only human force was allowed (no calf jacks) and calves were divided into those that did not need assistance (NA), those where early assistance was successful (EA) and those where assistance wasn’t given until after an hour had passed (LA). Late assistance calves had higher stillbirth rates and reduced vigor as compared to calves born normally or those that received early assistance.

When assistance is needed in the calving process cows should be moved to a location where they can be appropriately restrained. The perineal area should be cleaned to avoid metritis and abundant lubrication should be used. Make sure employees are trained to put obstetrical chains on correctly and to pull the calf along with the cow’s contractions. Be careful about letting employees routinely use the calf jack as this is where a lot of our problems occur. The cow normally pushes the fetus with about 75 kg of force where as 2 humans pulling on the chains generates about 150 kg of force. In contrast, one person and a calf jack can easily generate over 400 kg of force which can cause things to rip and tear. My typical recommendation is to teach
employees to use only human force with a maximum of 2 people. If they are unable to remove the calf – then the manager or a veterinarian should be contacted. Calf jacks can be a useful tool in the hands of a well trained person – but they can cause problems as well.

**Resuscitation of the Calf After Dystocia**

Immediately after the calf is born we should place it in sternal recumbency so it can expand both lungs. Hanging the calf upside down for any period of time is detrimental to respiration and should not be done. You can clear fluid from the mouth or nose with your hands or with a bulb syringe (turkey baster). Stimulate the calf to breathe by rubbing it with a towel and sticking your fingers in its ears and/or nose. Employees should have a good understanding of “normal” calf behavior after delivery. For example – the calf should be able to lift its head within 3 minutes after birth, should be sitting up on its own within 5 minutes of birth, should be trying to stand after 20 minutes and should be standing after an hour. A calf vitality (VIGOR) scoring system has been developed by the University of Guelph where employees can be trained to score calves based on visual appearance, their general responsiveness, mucous membrane color, heart rate and response to reflexes. Using this system can allow us to predict which calves need extra attention after birth. Signs of calf distress include meconium staining, prolonged time to sternal recumbency, irregular respiration rate, cyanotic or blue mucous membranes, hemorrhages in the sclera and/or a swollen tongue or head.

Other techniques that can be used to stimulate breathing include acupuncture (place a needle directly on the midline of the nasal philtrum and insert it all the way to the bone) to stimulate the inspiratory reflex, pouring ice cold water over the calf’s head or into the ear to stimulate a gasp reflex or potentially even administering caffeine. Although it hasn’t been specifically studied in calves, caffeine has been used extensively in preterm infants with apnea for years. Caffeine is also used in neonatal foals to stimulate their cardiac and respiratory systems at an oral dose of 10 mg/kg. Anecdotally, there are positive reports of caffeine administration to weak calves after birth. Most often this is done by giving calf a “5 hour-energy drink” that contains 200 mg of caffeine. Although more research is needed to assess the efficacy of this practice in resuscitating calves after dystocia, there are many reports of dull calves responding to caffeine and becoming alert within 15-30 minutes. Multiple studies have also shown a NSAID like meloxicam can improve vigor, suckle reflex and weight gain during the first week in calves born after dystocia. Veterinarians often do a good job recognizing that dystocia is painful for the cow, but it can also be quite painful for the calf.

In conclusion, stillbirths continue to be a major problem in the dairy industry. Although there are multiple reasons for this, training employees on proper calving management and calf care after birth is critical to maximize calf survival.

**References**