KENPAL FARM PRODUCTS INC

Dairy Briefs

The Latest Information on Dairy Cattle Nutrition

Nutrition Strategies to Prevent Milk Fever

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As milk fever occurs in around 5% of cows most dairy farmers are familiar with the problems associated with this condition. Milk fever in a cow can impact her productivity and health status. There are many factors that can impact the risks associated with milk fever, and some of these can be managed nutritionally.

Milk fever, or hypocalcemia, is a condition in fresh cows that literally translates to "low blood calcium". Cows that develop milk fever have very low levels of calcium in their blood after calving. This drop in blood calcium occurs because dry cows don't actually need much calcium to maintain themselves and their calf. This shuts down the active calcium absorption system in the gut. When a cow calves and produces colostrum, suddenly she needs a lot of calcium and she needs it fast. Unfortunately the active calcium absorption system can take 24 – 48 hours to get back up to speed. This leaves a gap of time in which the cow is pumping a lot of calcium into milk and not having enough in her system to support that production.

With today's expectations of high milk production in cows some milk fever should be expected in high risk cows (>2 lactations). Some researchers suggest that milk fever frequency under 10% in these high risk cows is reasonable. Older cows produce more colostrum than heifers and this may be one of the reasons that older cows have a higher risk for developing milk fever than first-calf heifers (Table 1). First-calf heifers are also still actively growing their bones at the time of calving and are better able to pull calcium back out of their bones than older cows. Jersey cows have a higher calcium content in their milk than Holsteins and as a result have a higher risk of developing milk fever.

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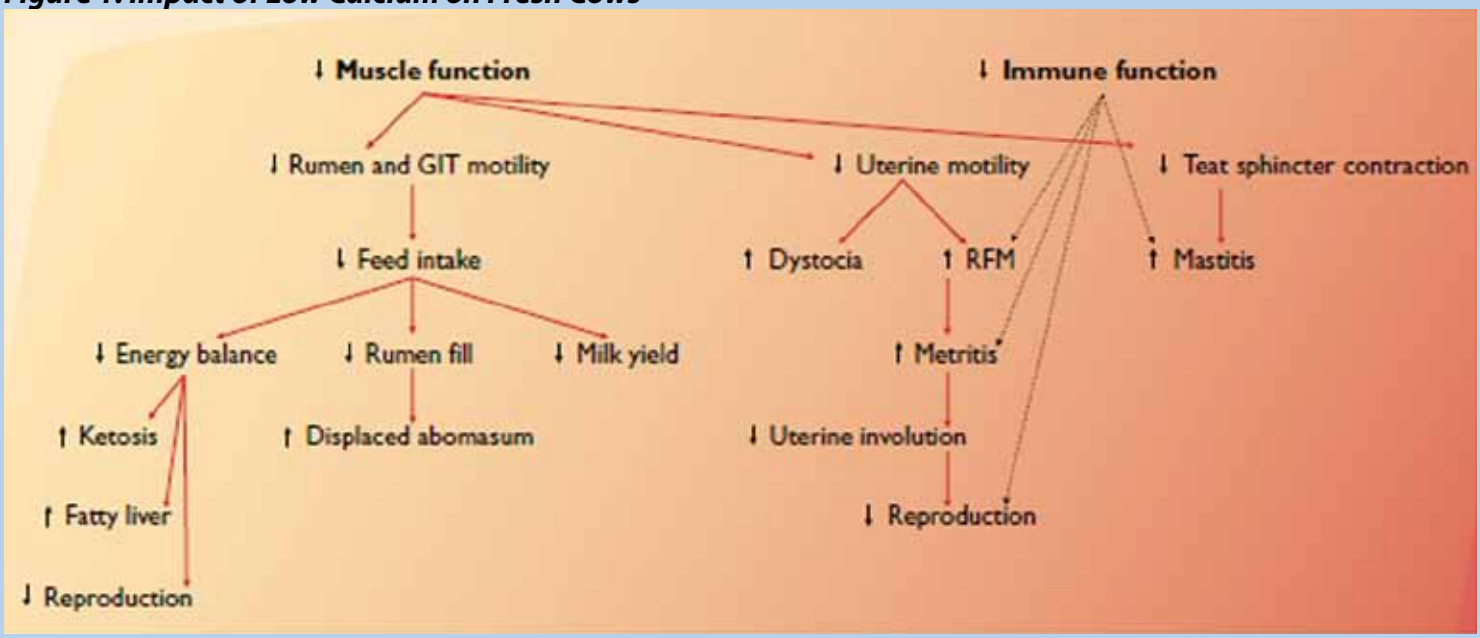
Table 1: Prevalence of Milk Fever in Holsteins Cows Depending on Lactation Number

Lactation Number	Milk Fever Prevalence
1	1%
2	4%
3	7%
4	10%

Source: adapted from US National Animal Disease Centre data

Most of the symptoms associated with milk fever, like weight shifting, weakness, inactive digestive tract, etc., relate to calcium's role in the nervous system and in controlling muscle contraction (Figure 1). Stage III milk fever, or when a cow goes down, is the point when muscle function is so impaired that the leg muscles can no longer support the cow. Reduced muscle function impacts a lot of different systems, reducing reproductive fitness and milk production and increasing the risk of developing diseases. Even after the milk fever has been resolved, cows are more likely to develop ketosis, displaced abomasum, retained placenta, metritis and mastitis than cows that did not get milk fever. All these consequences can add up and reduce the profitability of the herd.

Figure 1: Impact of Low Calcium on Fresh Cows



Source: Mulligan et al. 2006. Production Diseases of the Transition Cow: Milk Fever and Subclinical Hypocalcaemia, Irish Veterinary Journal.
Note: RFM refers to retained fetal membranes/retained placenta

A common practice in North America is to feed anionic salts for 21 days before calving. This lowers the DCAD (dietary cation-anion difference) of the diet, essentially acidifying the diet. This tricks the cow's system into restarting the active calcium absorption system early so that it is ready for the demands of milk production after calving. Using anionic salts is popular in North America because the forages grown here are often high in potassium. Potassium is positively charged and makes the DCAD equation more positive; DCAD = (Sodium + Potassium) – (Chlorine + Sulphur). Adding anions (chlorine and sulphur) to the diet to make this equation negative will acidify the diet.

While feeding anionic salts can reduce milk fever incidence it does come with some challenges. Anionic salts are bitter and can put cows off-feed, which is exactly what you don't want right before calving.

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Kenpal Robot Pellets & kickSTART®

Cows love robot feed and have increased visits to the feeder with kickSTART®

Mike, Ben, Rose, Jeff Van Miltenburg & Larry Merner

Ben and Rose VanMiltenburg, along with their sons Mike and Jeff, own and operate Miltenview Holsteins Ltd. in Seaforth, ON. They have been dealing with Kenpal and their salesman Larry Merner for the last 23 years.

Once they installed the milking robot they started to feed Kenpal's Robot Pellet. The pellets contain Kenpal's Herbageum Condiment flavouring agent. Ben and Rose said "the Herbageum Condiment makes a huge difference! The cows love it and we won't order feed without it."

Then they decided to add Kenpal's kickSTART®; a molasses based liquid feed supplement. It wasn't long after when they started to see results. One of the main benefits they saw was the cows increased number of visits to the robot. They are now getting an average of 2.6 visits/cow/day. Their production also went up, currently at 34.7 litres/cow/day, and as high as 36 litres/cow/day.

The VanMiltenburg's like working with Larry and Kenpal and haven't switched since they started feeding with Kenpal 23 years ago. Ben adds "If there is something better out there, we haven't found it yet."

Ben, Rose, Mike and Jeff Van Miltenburg
Miltenview Holsteins Ltd.
Seaforth, ON

Contact your Kenpal Sales Rep for more information

Reduced intakes around calving can increase the risk for displaced abomasum, mastitis and retained placenta. Diets with extremely high potassium (or extremely positive DCAD) make it hard to lower the DCAD enough to prevent milk fever. Urine pH also needs to be measured when using anionic salts to ensure that the diets are acidified enough to promote calcium absorption. An effective anionic salt program should reduce urine pH to between 6.2 and 6.8 for Holsteins, and between 5.8 and 6.3 for Jerseys. Anyone who has tickled a cow to collect a urine sample knows this isn't the easiest thing to do. Anionic salts only need to be fed for 21 days and really only to >1 lactation cows. Producers using a one-group dry cow program aren't good candidates for an anionic program as the cows would be on the anionic salts for too long which may damage bone structure. Also feeding anionic salts to heifers going into their first lactation is typically a waste as they don't have a high risk for milk fever in the first place.

Another strategy to prevent milk fever is to feed extremely low calcium diets. Dry cows require as little as 35 – 45 grams of calcium per day in their diet to meet their needs. Feeding diets with only 15 – 20 grams of calcium per day will force the cow's system into calcium deficiency which will force the active calcium absorption system to remain active during the dry period. While depriving the dry cows of calcium may seem counter-productive and in fact cause low blood calcium, by feeding a diet high in calcium after calving (like most typical milk cow diets) the freshening cow is able to absorb calcium quickly into the blood stream and prevent milk fever. A review of milk fever research showed that this low calcium dry cow diet concept is highly effective in preventing milk fever, almost 100%. The problem with this strategy is that it is very difficult to get diets under 20 grams of calcium per day with typical dry cow feeds. The "golden diet" of corn silage and straw is the best chance of getting a calcium deficient diet. If using this method, it is important to analyze all the feeds to ensure that the diet is low enough in calcium, providing even just 35 grams of calcium will be enough to meet the demands of the dry cow and to shut down the active calcium absorption system. Using calcium binders to reduce the calcium in the dry cow diet can be effective but caution should be taken as they may bind other important nutrients.

There are some other factors that can increase the risk of milk fever but aren't directly related to the mechanism of low blood calcium. Diets that are too low in magnesium can compound the problem as cows are less able to pull calcium from their bones. NRC Dairy recommends feeding 0.35 – 0.40% magnesium in the dry cow diet to meet the needs at calving. Cows that are over conditioned (>4 BCS) are over 3x more likely to develop milk fever. It is thought that over-conditioned cows are more likely to go off-feed around calving and this increases their risk of milk fever.

Milk fever is a serious problem in the dairy industry. Cows that recover from milk fever are more likely to develop other metabolic diseases and to have lower milk production. The risk of milk fever can be reduced using nutritional strategies but both of these strategies discussed above have limitations. Discuss with your nutritionist what strategy will work best on your farm.