North Star Veterinary Services Monthly Newsletter August 2020

Down Cow Series - Part 2: Milk Fever and Subclinical Hypocalcemia

There are 3 main causes of a down cow. Of course there are lots of reasons a cow can go down, but over the next 3 months we will cover the 3 most common reasons- the "3 M's"- milk fever, mastitis, and musculoskeletal (injury).

Due to the high calcium demands for milk and colostrum production, it is difficult for dairy cows to maintain a normal level of blood calcium. Calcium is essential for muscle, nerve, and heart function. Most 2nd+ lactation cows experience some decrease in blood calcium after calving. Low blood calcium (hypocalcemia) occurs in the first couple days after calving and can be classified in two categories: milk fever (clinical hypocalcemia) and subclinical hypocalcemia. Milk fever is one of the more treatable causes of down cows.

Milk Fever

- Down and unable to rise
- Low body temperature and decreased circulation (cold ears)
- Muscle twitching
- Decreased rumen function (bloat, stiff manure, decreased rumen contractions)
- S-shape curve in neck (see picture)

Milk fever is more common in older cows and Jerseys. No more than 2% of cows in your herd should have clinical milk fever. One case of milk fever will cost roughly $300 which includes treatment, labor, lost milk, potential culling, and associated diseases.

Subclinical Hypocalcemia

Cows with subclinical hypocalcemia will not show signs of milk fever. However, subclinical hypocalcemia has a greater economic impact on dairy farms through milk yield, reproductive performance, and transition disease. Cows that experience chronic subclinical hypocalcemia during the first 4 days in milk will have decreased milk yield (4 lbs. per day), increased risk of metritis and DAs, and are less likely to become pregnant at first service. Roughly 30-40% of 2nd+ lactation cows will experience chronic subclinical hypocalcemia. The cost per case is around $125. Blood samples can be taken for testing.

Prevention Strategies

The best way to prevent milk fever is through a properly balanced dry cow ration. There are two strategies for dry cow rations: rations with anionic salts (DCAD diets) or low calcium rations. Feeding a DCAD diet makes cows slightly acidic which helps them mobilize stores of calcium and absorb calcium from the diet. DCAD diets include ingredients such as ammonium chloride, magnesium sulfate, and calcium chloride which may decrease dry matter intake. Commercial protein feeds treated with hydrochloric acid have been developed to prevent intake decreases. Calcium supplements are also added to the diet. To ensure your herd is truly benefiting from the added cost of the DCAD diet, urine pHs should be monitored weekly. Testing should be done weekly on dry cows with a target pH of 5.5-6.5 in 80% of cows. Large herds should be testing 12-15 cows at a time.

Another type of dry cow diet to help prevent hypocalcemia is actually a low calcium diet. Low calcium diets are formulated with less than 40 grams of calcium per cow per day. These diets are generally corn silage, triticale, and straw based. Ingredients high in calcium such as alfalfa and calcium supplements are excluded. These diets help prime the cow to start mobilizing her own calcium stores and not rely on feed before she calves. Time on the dry cow diet and proper levels of phosphorus and magnesium are also important for success. Both low calcium and DCAD diets can keep milk fever rates under 2%. However, even herds with successful dry cow rations have cows with subclinical hypocalcemia that can benefit from oral calcium boluses.

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Treatment Strategies

Clinical Milk Fever

Down Cows
- 1 bottle 23% calcium borogluconate IV slowly over 15 mins
- 1st Bovikalc bolus when standing and swallowing
- 2nd Bovikalc Bolus 12 hours later

* If cow stays down, consider other reasons for being down (mastitis, metritis, injury). Consider blood test for other mineral deficiencies.

Standing Weak Cows
- 1st Bovikalc bolus immediately
- 2nd Bovikalc bolus in 12-24 hours

* DO NOT GIVE IV CALCIUM
(Always a risk of stopping heart or causing a rebound hypocalcemia)

With IV calcium, the cow's blood calcium will peak and return to normal within 4 hours. It corrects calcium rapidly, but 25-38% of cows will relapse and go down again. To prevent this a Bovikalc bolus should be given when the cow is standing and can swallow. The bolus will dissolve rapidly in 30 minutes in the rumen. All calcium boluses are not created equally. Look at the ingredient list to make sure the first ingredient is calcium chloride not calcium carbonate. Calcium carbonate is harder to absorb so the cow won't be able to use it. They should also provide around 43 grams of calcium. The Bovikalc bolus will keep blood calcium at a normal level for around 12 hours. Boluses have a layer of fat that protects the mouth and esophagus. Calcium gels can be used but need to be used with caution. If given incorrectly they can cause sores in the mouth.

Subclinical Hypocalcemia

- Treat lame cows, cows that produced more than average last lactation, and old cows.
- 1st Bovikalc bolus shortly after calving
- 2nd Bovikalc bolus 12-24 hours later
- Blanket treatment is not cost effective.
- Do not treat 1st lactation cows without clinical signs.

Milk fever and subclinical hypocalcemia are manageable transition cow diseases! Record all cases of milk fever to assess whether or not this is a problem on your farm. If you are concerned that your herd has a problem, please contact us with questions. Researchers at Cornell are studying subclinical hypocalcemia to help us improve testing, treatment, and prevention.

Fun Fact: In New Zealand, farmers will dust their pastures with calcium and magnesium for their grazing herds to get the minerals they need.