



Northwest Veterinary Associates, Inc.

Kent Henderson, DVM
Stephen Wadsworth, DVM
Peter Averill, DVM
Allison Maslack, DVM
Jennifer Hull, DVM
Blake Nguyen, DVM

6 FAIRFIELD HILL ROAD • ST. ALBANS, VERMONT 05478 • (802) 524-3222 • FAX (802) 524-3177 • nwvavet@comcast.net

Newsletter Prepared by Blake Nguyen, DVM

Milk Fever is More Than Down Cows

Hypocalcemia, or milk fever, is a disease of calcium availability affecting cows, especially at the start of lactation. *Clinical* hypocalcemia affects a small proportion of fresh cows that show signs such as weakness, decreased gut motility, cool extremities, inability to rise, and, in severe cases, complete paralysis and eventual death. A down milk fever cow should be considered severely affected and will need intravenous calcium, as well as follow-up care.

Subclinical hypocalcemia is a problem affecting about 50% of all fresh cows entering their 2nd or greater lactation, and these cows will have *no* observable signs of disease. Higher lactation cows, high producing cows, Jerseys, and over-conditioned cows are at greater risk. This form of the disease is not discussed nearly as much but it should be, and addressing it is a great opportunity for improving performance in your herd. The cost of subclinical hypocalcemia is great: Each case of subclinical hypocalcemia (cows that *look* completely normal) produces an average of 5.7 lbs less milk per day for her entire lactation, is 3 times more likely to get a DA, and has a 30% lower conception rate at first service compared to her herd-mates that do not have subclinical milk fever. Remember, this condition is affecting 50% of cows!

Prevention is key, and there are many management changes that can help reduce hypocalcemia in a herd. Managing the close-up ration for lower potassium, lower phosphorous and higher magnesium can favorably alter the way the dairy cow regulates calcium in her system. This might include feeding dry cows with grass silage rather than alfalfa or clover mixes and working with your nutritionist to supplement Mg. Anionic salts fed in a pre-fresh ration can further improve transition cows' calcium regulation. The "DCAD" diet refers to the difference in positively and negatively charged electrolytes in the feed and is fine tuned by the addition of anionic salts depending on electrolyte levels that are in your forages. Ration palatability, or taste, can be an issue with DCAD diets however, and you should work closely with your veterinarian and your nutritionist if you are considering this strategy. Cow comfort, stocking density, and feeding space must be optimal for the transition cows if a fully DCAD diet is going to prevent hypocalcemia without increasing other transition issues. When managed correctly, DCAD diets can reduce the incidence of subclinical hypocalcemia from about 50% down to 15%.

Oral calcium supplementation can be a good strategy for helping fresh cows meet their calcium demands. The cow's blood contains about 3.6 grams of calcium at any given time, but



her needs for milk production, muscle function and immune system support are about 30 grams per day! That means a whole lot of calcium must come from somewhere to provide the cow with what she needs, and the main source of calcium is absorption from the gut. A 500mL bottle of 23% calcium gluconate contains about 10.7 grams of calcium, so it raises the blood calcium *concentration* dramatically when given IV, in fact it overshoots the normal concentration by several times. This is why a down milk fever typically needs only a bottle of calcium to stand up and responds quickly in uncomplicated cases. However, those 10.7 grams that spike the blood concentration are gone in about 4 to 6 hours and do not meet the cow's total calcium needs for even one day. She needs to continue absorbing calcium from her gut or else a relapse will occur.

Repeated IV or subcutaneous treatments are common, but there is a complex problem with supplementing subclinical cows with injectable calcium. The body wants to keep blood calcium concentrations normal by absorbing the right amount from the gut or secreting the right amount into urine. There are hormones that control these actions by constantly sampling the blood and telling the gut, kidneys etc. what to do. When a bottle of calcium is given, the spike in blood calcium can actually tell the body that calcium is too high and the regulatory hormones stop absorption from the gut. This is bad for the fresh cow with subclinical hypocalcemia who should be ramping up calcium absorption from the gut as she begins to produce milk. Therefore, for subclinically affected cows, oral calcium supplements are an advantage. Much more calcium, for example 43 grams in one bolus, can be given orally and absorption from the gut will never result in an overshoot of blood calcium concentration. There are many oral calcium supplements available. They have different amounts of calcium in them as well as different forms of calcium, some that are available fairly quickly, others that are more slowly dissolved, and combinations of each. Talk to your veterinarian about implementing a hypocalcemia prevention program for your fresh cows and capture this performance opportunity.