

Dairy Newsletter

KETOSIS

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WHAT IS KETOSIS?

SPRING 2019

Ketosis, or acetonemia, is a very common condition in early lactation dairy cattle, in which the cow has increased levels of ketone bodies in circulation. Interestingly, the currently very popular “Keto Diet” claims to allow people to lose weight as the diet puts them into a state of ketosis. The condition is not completely understood, but occurs typically in early lactation as the cow is mobilizing extreme amounts of energy to produce the many litres of milk she has been genetically programmed to produce. Many of these cows cannot physically eat enough feed to keep up with the demands of making milk, leading to a state of negative energy balance. When the body is in a state of negative energy balance, it starts mobilizing its own fat stores to make up for the deficit. This is when we see the cow “milking off her back”, a state in which she is losing condition because her body requires this extra fat to make milk. Ketosis most often occurs in the immediate timeframe post calving, from 2 weeks fresh to 6 weeks post calving, the period which coincides with peak milk yields. Overall, about 7-14% of all early lactation dairy cows will experience ketosis in each lactation; many of these will be “subclinical” cases that are not displaying obvious clinical signs of the condition.

CLINICAL SIGNS OF KETOSIS

Cows with subclinical ketosis may have elevated ketones in their blood, milk, and urine as their sole indicator of the condition; however, it has been shown that these subclinical cows often will have decreased milk production, poorer fertility, and increased risk of developing clinical ketosis. Signs we see in cows with clinical ketosis include inappetence/anorexia (“off feed”), decreased milk production, dehydration, and decreased rumen fill. In more severe cases, neurological disease may be seen in which the cows are uncoordinated or wobbly, displaying abnormal chewing behaviours, bellowing, and in some cases becoming aggressive.



WHY SHOULD I CARE ABOUT KETOSIS?

Ketosis is often the underlying cause and a predisposing factor for developing many fresh cow diseases. Most notably, ketotic cows are very susceptible to displacement of their abomasum. This occurs as the cow is off feed; gas builds through the gastrointestinal tract, and the gas-filled abomasum displaces (90% to the left).

Another prevalent condition that is often associated with clinical ketosis is fatty liver, whereby the liver cannot fully function owing to increased fat deposits within it. Fatty liver is more often seen in cows that were fat at calving, but this is not always the case. Ketosis has been associated with decreased immune function and increased inflammation. This state increases the risk of other costly fresh cow diseases such as metritis, mastitis, decreased fertility, and decreased milk production. As you can imagine, all of these diseases can add up financially quite quickly between treatment costs, lost milk, and increased days in milk - so we really should care about our ketotic cows.



DIAGNOSIS OF KETOSIS

Some people are lucky enough to be able to smell ketones on the breath of ketotic cows. It is supposed to smell like acetone or nail polish remover. For those of us that are unable to smell ketones on the breath, there are several different tests available. Historically, the two more common tests were a urine or milk strip that would change colour depending on how ketotic the cow is. More recently, we have discovered that we can use the human glucometers originally

designed for people with diabetes. Instead of glucose strips we can use the ketone strips in the meter with only a drop of blood. This meter gives us an accurate value of the ketones in the cow. A value between 1.1 and 2.2 indicates mild to moderate ketosis. A value greater than 2.2 indicates severe ketosis. The best time to test for cases of subclinical ketosis is between 2 and 9 days in milk.

TREATMENT OF KETOSIS

The treatment of ketosis has changed over the years as we learn more about the disease. In the past, a steroid was given to the cow in the hopes of encouraging the liver to produce more glucose and balance out the energy levels. However, this is no longer recommended as a steroid can further suppress the cow's immune system which could worsen other fresh cow diseases. The current treatment recommendation for mild to moderate cases (blood ketones between 1.1 and 2.2) is 3 days of oral glycol or ketamalt. For severe ketosis (blood ketones greater than 2.2) it is recommended to give half to one full bottle of dextrose IV and 5 days of oral glycol or ketamalt. For cows that were fat at calving, and thus more prone to fatty liver, it is also recommended to give a multivitamin such as hemostam, vitamaster, or newcells for 5 days as well. It is also important to note that even if these ketotic cows are being appropriately treated for their condition they are still at risk of displacing their abomasum so it is pertinent to call the veterinarian if the cow suddenly drops in feed intake or milk production, or seems to not be improving while she is being treated for ketosis.

PREVENTION OF KETOSIS

The most important way to prevent ketosis is good transition cow management. Appropriate dry cow nutrition and maintenance of body condition through the dry period are the best ways to prepare the cows for lactation and prevent ketosis. It is also important that the cows actually eat their dry cow and fresh cow rations. It is always a good idea to get both your nutritionist and veterinarian involved when you are having issues with ketosis.

