Determine the best ketosis treatment

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Ask the Vet

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IN my line of work, looking at the “broken” fresh cow is a daily occurrence. Many dairy cows enter into heavy milk production right after calving, and some struggle to meet the high energy demand due to lower feed intakes. Cows overcome this negative energy problem by mobilizing fat tissue from their body and moving it to the liver as an energy source. Once the fat is in the liver, it is either burned for energy, stored as a triglyceride or diverted to ketone body production.

Ketone bodies can be used by tissues for energy, but excessive concentrations are associated with reduced milk production, lower immunity and greater chances of displaced abomasum. High concentrations of ketones in the blood end up in the urine and milk, which makes it possible to monitor ketone levels using small test strips. During this time of high ketone production, cows will typically have low circulating blood glucose and low insulin.

All treatments for ketosis are aimed at returning the cow to full feed, alleviating the low blood glucose and slowing down the fat mobilization.

Therapeutic agents

Several therapeutic agents are used to treat ketosis in the cow. The most common are dextrose, vitamin B, propylene glycol, corticosteroids and insulin. Some of these can have side effects if used excessively.

Dextrose is given intravenously to cows — usually one 500-milliliter bottle per treatment. After IV administration, blood glucose will rise sharply, as will the blood level of insulin. Both of these results will be short-lived unless other therapies are given concurrently.

Because a cow can only use a limited amount of glucose when it is given IV, the rest is excreted in the urine. Excessive excretions of glucose through the urine can lead to other electrolytes being carried out with it, such as potassium. Overuse of dextrose can lead to hyperglycemias, which can cause reductions in abomasal motility and decreased potassium levels. I have seen cases where overzealous use of IV dextrose has increased the number of displaced abomasums.

Steroids have been used concurrently with dextrose to help alleviate ketosis. Steroids help the liver make more glucose and redistribute the glucose through the body. After administration, steroids can keep blood glucose levels elevated longer than 48 hours. Some possible side effects with steroid administration are milk production drop, immune suppression and the risk for hypokalemia (low potassium in the blood). Low potassium will lead to poor muscle tone and an inability to rise. Single-dose administration of steroids usually does not cause hypokalemia, but the problem can arise where multiple doses are given over short periods of time.

Propylene glycol is a glucose precursor that is absorbed across the rumen wall. Glycol is absorbed into the bloodstream and used by the liver to make glucose and stimulate the pancreas to release more insulin. Treatment doses tend to be in the range of 300 to 500 ml a day orally.

Some potential problems associated with glycol administration are the potential for aspiration and for toxicosis when too much is given at one time. Some signs of propylene glycol toxicosis are overall depression, poor rumen motility and a very distinctive smell on the cow’s breath and in the milk. The odor has been described as garlic-like, and is the result of sulfur products being produced due to glycol fermentation in the rumen. If a cow starts having a garlic-like smell on her breath, stop the administration of glycol immediately.

As with all treatment protocols, work with your veterinarian to establish the correct ketosis treatment for your farm.

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