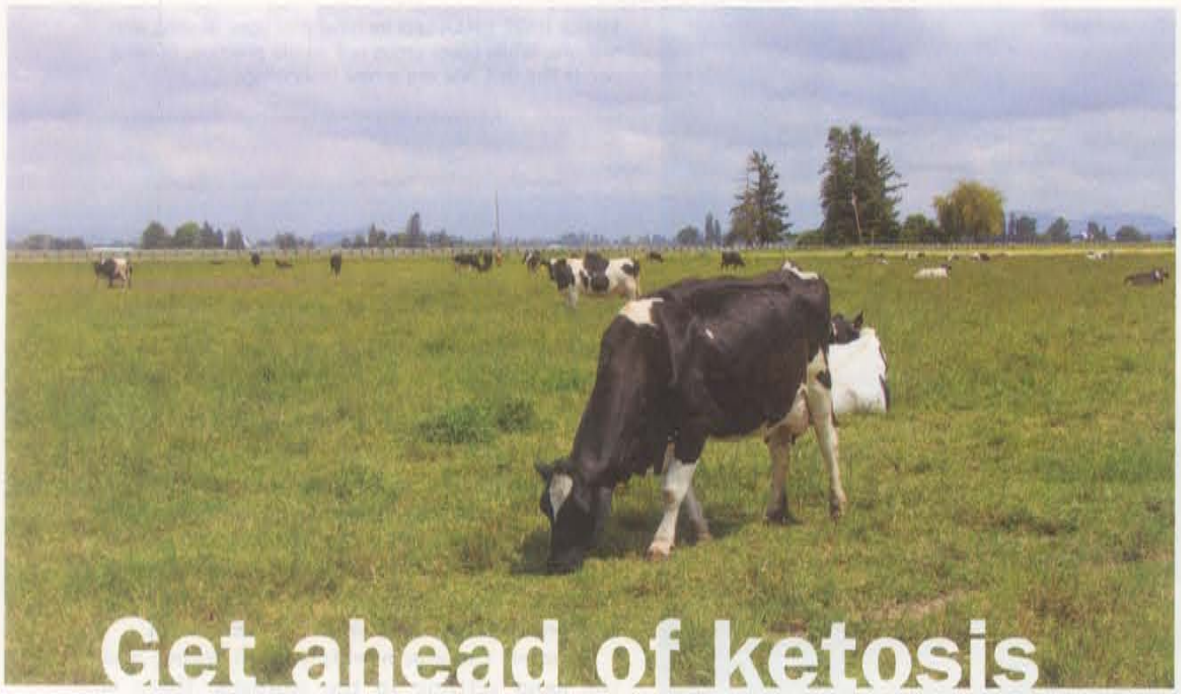

Get ahead of ketosis

There's now a cheaper, faster blood test. Use it to check problem cows or track how well fresh cows are doing.

by Neil Michael, D.V.M.

MANAGING fresh cow performance is a challenge. When there is ketosis and cows start slowly, you can expect significant losses due to direct treatment costs, plus lost future income. The good news is that there are new tools available to more accurately detect ketosis on individual cows and predict overall metabolic risk in your herd.

What can be wrong

Much of variation in how well cows go through transition can be explained by changes in cows, feedstuffs, and the cow environment. Cow factors such as long previous days in milk and days dry, excessive body condition, and older age all are contributing factors that raise the risk of metabolic disease and culling.

Likewise, cow environment factors like overstocking, pen changes near calving, heat stress, and inadequate cow comfort also raise the risk of poor fresh cow performance. Lastly, common nutritional factors that contribute to fresh cow problems include poor bunk management, sorting, poor dry matter intakes, and forages with elevated levels of butyric acid.

All of our cows experience some degree of negative energy balance after calving due to a combination of lowered intakes and greater energy demands. The liver produces ketones as it converts body fat in the form of nonesterified fatty acids to provide energy during the transition period.

The major ketones produced are acetate, acetoacetate, and beta-hydroxybutyrate (BHBA). Although cows can utilize ketones as a source of energy for many body functions (not milk), ketosis occurs when excessive amounts of ketones build up within the bloodstream.

Herd prevalence of ketosis has been reported to be 30 to 50 percent based on work by multiple researchers in recent years. Cows experiencing ketosis eat less, resulting in additional body condition loss and lowered milk production. Clinically, cows often are off-feed and may have an acetone smell on their breath. Most importantly, it is well documented that cows experiencing ketosis are at greater risk for other problems, including metritis, mastitis, and displaced abomasum. That's in addition to reduced milk production and fertility.

Although we can measure ketones in blood, urine, and milk, the gold standard for measurement of ketone levels in dairy cows is blood beta-hydroxybutyrate (BHBA). Despite being the preferred test, blood BHBA historically required that you send samples to a commercial laboratory. This process was expensive (more than $15 per sample) and resulted in a lag period of several days.

As a result, people typically used test strips for urine or milk samples to identify ketones. Although these test strips are more economical, they are less accurate, and they test for acetone or acetoacetate ketone substrates instead of BHBA.

Recently, some people have started taking advantage of a new technology that allows them to test blood BHBA at a fraction of prior costs using a small handheld meter originally targeted for human diabetics (Precision Xtra™). The Precision Xtra meter uses testing strips targeted for BHBA substrate and yields results comparable to commercial BHBA laboratory tests. As a result, nutritionists, veterinarians, and herd managers are using cowside BHBA to evaluate both metabolic risk of the herd and detection of ketosis on individual cows.

You can use blood BHBA testing routinely to monitor metabolic risk in groups of fresh cows. Individually, test a target group of 12 cows that are 2 to 15 days in milk using the blood BHBA meter. If two or more of the 12 cows have BHBA results of 1.2 mmol/L or greater, your herd metabolic risk is considered high, and you should investigate possible influencers. If fewer than two cows are found to have BHBA results above 1.2, you are doing a good job with your transition cow health.

Many people have elected to use blood BHBA meters to test individual cows at 4 and 11 days in milk instead of routine urine or milk tests. Because the BHBA tests enable you to accurately detect animals at very low levels of ketones, we suggest ketosis protocols be thoroughly reviewed and separated into progressive levels (from conservative to aggressive treatment). Progressive protocols have the advantage of avoiding overtreatment expense and limiting the number of cows that go off-feed. There are examples of progressive protocols for ketosis in the table.

Help them adjust

Craig Goeser is an owner of Goeser Dairy, LLC, near Plymouth, Wis. Last December, Goeser started using the Precision Xtra meter to check for ketosis in every fresh cow on the 1,100-cow dairy. Cows are checked on Day 4 and again on Day 11. He said this has proven to be very effective because it identifies problems early and minimizes the treatments cows need. Goeser said the tool has enabled his team to quickly adjust nutritional and management strategies as needed.

"It's been very enlightening to see how effectively this tool allows us to identify and treat animals early," Goeser said. "Cow health has improved, and performance is much better."

B. J. Jones, D.V.M., of Center Hill Veterinary Clinic in Darlington, Wis., has implemented progressive protocols with some of his clients. One of the biggest benefits has been reduced use of dextrose IV. In the past, his clients used this treatment regularly to treat ketosis and prevent displaced abomasums. However, new research indicates that the high dosage of dextrose IV actually may cause displaced abomasums.

"Farmers used to say, 'Some is good. More is better,'" Jones said. "But that's not always the case."

Even in cases of high-risk ketosis, cows only receive half (250cc) of the dextrose IV. Jones said that's because the cow's body can't really use more than that, and the extra simply is excreted without actually helping the cow.

Jones said testing BHBA levels on a herd basis also has improved preventive care. Herdsmen will sample 12 to 15 cows every other week to identify trends in metabolic risk. By keeping accurate records over time, they then are able to link subclinical ketosis with factors such as previous days in milk, days dry, and days in the close-up pen. This helps producers better manage transition cows and solve the root of ketosis rather than treating the symptoms.

Example of progressive ketosis treatment protocols using blood BHBA

Risk	BHBA	Clinical	Treatment
Normal	<1.3	Eating	No treatment
Mild	1.3-2.5	Eating	8 oz. propylene glycol (orally) 10 cc vitamin B complex I.M. Repeat treatments once a day for three days
Moderate	2.5-3.5	Eating	Fresh cow drench (5 gal. warm water with sources of electrolytes and/or probiotics and/or nutrients such as alfalfa meal or 8 oz. propylene glycol) 10 cc vitamin B complex I.M. Repeat above treatments once a day for three days
High risk	>3.5	Not eating Dull eyes/ears High BCS Long dry period	Fresh cow drench as above 10 cc vitamin B complex I.M. Repeat above treatments once a day for three days Dexamethasone 10 cc IV (once only) 250 cc 50% dextrose IV once (off-feed cows only)

The author is director of Dairy Initiatives at Vita Plus, Madison, Wis.