

Does your dry-cow ration pass the 'acid' test?

Predict and prevent

Urine monitoring can check that your dry-cow ration and management are up to the challenge of preventing milk fever.

We spoke to the UK vet who developed a noninvasive and quick test that pin-points potential problems before they start.

text Rachael Porter

Are you feeding your dry cows a 'balanced' ration but still seeing problems with milk fever? Then perhaps it's not quite as balanced as you think.

Urine monitoring could have the answer. It's a tool that can pin point any nutritional problems prior to calving, helping UK producers, and their vets and nutritionists, to avoid costly cases of clinical and sub-clinical milk fever and get freshly calved cows off to a flying start.

Urine monitoring has been developed by vet James Husband and it's a simple method of testing takes a cow's eye view of the dry cow ration. "Urine macromineral analysis tells us if the macromineral balance in the ration is right and if it's doing what we want it to do," says James.

"The ration may look good on paper, but how is it feeding out and will cows calve down without any problems? That's what producers want to know and that's what this test will tell them."

Avoiding milk fever at and around calving is a major goal of any dry-cow ration and with just one case of the disease costing upwards of £250. If you include treatment costs, loss of production, increased chance of being culled and getting other metabolic diseases and the possible impact on fertility, it's obvious why producers are keen to get this vital area of dairy cow management right.

That said, it's an area that's sometimes over looked on dairy units, due to time and labour pressure.

True efficacy

This tool gives producers a window into the true efficacy of their dry-cow ration. It can help them to identify a problem before cows calve – giving them the chance to prevent milk fever. And it also gives them a trouble shooting tool if their best dry-cow management and nutritional efforts don't appear to be working and they're seeing milk fever in their fresh calvers.

Table 1: Target dietary macromineral concentrations for milk fever prevention

minerals	concentration (%)
Mg	0.35-0.45
P	0.30-0.35
Na	0.12
S	0.22-0.4
Ca	0.6-1.2 depending on the degree of acidification
pH	6.2-6.8 on a full-DCAB system, 7.8-8 on partial DCAB



James Husband: "Picking a ration problem prior to calving can prevent milk fever"

Something as basic as a variation in the grass silage potassium content within a clamp can throw out the macromineral balance in the ration and cause problems. Urine monitoring would pick this up and, since addressing the problem in the ration will change the metabolic status of the animals in just a couple of days, milk fever can be avoided.

Better predictor

Testing urine is a much better predictor of milk fever than blood testing. Not only does the latter require a vet to take the sample, a blood test would show normal levels of calcium in the blood in the days leading up to calving. "Everything appears normal in the blood until calving itself, so it's not a good predictor," says James. Dietary sodium and potassium levels are related to the risk of milk fever but blood levels are very tightly controlled so blood tests are of limited value. And that's where urine monitoring comes into its own.

"If producers are feeding an excess of sodium and, particularly, potassium in the ration then this literally comes spilling out into the cow's urine."

Urine monitoring is very much linked to the DCAB equation in the dry-cow diet, in other words the sodium and potassium levels in relation to chloride and sulphur. An excess of the former in relation to the latter makes milk fever much more likely.

"It's all about acidity or alkalinity. With a traditional full-DCAB ration, producers could test the pH of the cow's urine to check whether the addition of anionic salts to the dry-cow cow ration was likely to be effective in milk fever prevention. If dietary DCAB (dietary cation anion balance) is reduced to -100 to -150meq/kgDM, urine pH drops from the usual 8 to 8.5 to approximately 6 to 7.

Two recent sets of analysis and widespread experience on farm have identified appetite problems with using anionic

salts to achieve dietary DCAB levels of -100 to -150 meq/kgDM (the full-DCAB system) due to the unpalatability of the salts.

So there has been a general move away from the full-DCAB system towards the 'partial DCAB' system, where a smaller quantity of anionic salts is added to the ration and the DCAB is dropped to approximately 0 to 100 meq/kgDM. But with this system, which is more commonly used today, you don't see the drop off in urine pH to any great degree. "And that's why this testing tool is so useful – it looks at the calcium, magnesium, sodium, potassium and chloride levels in the urine, as well as the amount of dissolved carbon dioxide. The latter is linked to the amount of bicarbonate in the blood," explains James.

"If there's too much and the blood is excessively alkaline then the cow is also more likely to suffer with milk fever at calving."

He recommends that producers test a group of five or six dry cows twice a year, just to ensure that rations are 'on track'. There are about 50 practices in the UK who send samples off to North West Labs for analysis on both a routine and 'trouble shooting' basis. It costs around £125 to test a group of cows, including a full analysis and a report.

Common problem

"Vets are aware of the link between clinical and sub-clinical milk fever and problems like whites, retained cleansings and even mastitis – particularly in high yielding herds. Being able to suggest dietary changes based on what the cows are telling you rather than trial and error is proving very useful," says James.

The most common problem that he sees is cows that are not 'acidified' enough – normally there's too much potassium in the ration. "And we also pick up cows that are too 'acidified' – there's too much anionic salt and not enough calcium in the ration. This actually causes demineralisation and calcium leaches out into the urine, which we can spot."

But whatever the analysis reveals, the good news is that this test can ensure that problems are put right during the dry period and milk fever is prevented.

"Urine monitoring means that trial and error no longer has to have a 'milk fever' price tag. Problems can be picked up and corrected before cows calve, representing huge savings in vet and labour costs, as well as cow health, fertility and productivity," adds James. |