

Industry supports a cow energy monitoring tool

Energy challenge warms up



Producers strive to keep ahead of the game in cow management and pre-empt problems. It usually costs less than treatment, reduces management hassle and it's better for cow health. Routine monitoring of a cow's energy status would be a huge step forward towards this goal and the development of an easy tool to do this is where an industry-led project is heading.

text **Karen Wright**

Knowing a cow's energy status, sooner rather than later could lead producers and their advisers to a new level of cow management and enable them to pre-empt metabolic problems before they start. Linked to the cow's fatty acid profile and a number of genetic and management factors, the TSB-funded project is investigating links between energy, fatty acids and genetics. At the moment producers might rely on changes in body condition score as an indication of a cow's energy status. Too little energy and the cow loses condition – a scenario typically seen post calving and in early lactation. Too much energy and the cow gains condition, which is a situation seen in late lactation or during

the dry period. The implications can be costly with problems such as calving difficulties, ketosis, displaced abomasum, retained placenta, cows failing to reach production potential and fertility issues. Identifying where condition loss or gain occurs during the lactation will show where remedial action needs to be taken. A recent study in France showed that cows with high body condition scores (BCS) had a poorer dry matter intake, experienced greater negative energy balance and had the highest concentration of Non-Esterified Fatty Acids (NEFAs) in the first seven weeks of lactation. The presence of NEFAs is a sign that the cow is mobilising body fat reserves and an excessive amount can

lead to accumulation of fat in the liver, leading to poor liver health and ketosis. Work at Scotland's Rural College (SRUC) is looking at measures, using infra-red technology, to determine a 'signature' from which individual cow milk profiles can be measured. Using this signature the work aims to predict changes in energy levels of individual cows and it will hopefully enable the development of a cow energy monitor.

"Very simply, we want to give producers and advisers an indication of a cow's energy status from the normal milk recording sample that they can then use to monitor and manage cows ahead of any significant problems caused by a lack of or excess of energy," says SRUC's Eileen Wall. "Future developments aim to use this data to predict breeding values for energy turnover in the cow so that producers could then begin to select bulls for such traits."

Validation

A vital stage in the development of this 'signature' – or fingerprint – from the milk sample is its validation. This is currently underway and, as part of the work, herds in the M&S producer group have been condition scored at regular intervals throughout 2013 and changes, related to stage of lactation, monitored.



"The actual changes in condition score will be used to compare against cow energy status predictions derived from SRUC's new measure," says NMR's Victoria Hicks. "This will tell us whether the predictor tool is an accurate indicator of the energy status based on real-life results."

Carried out by NMR recorders, with veterinary input, the results have shown

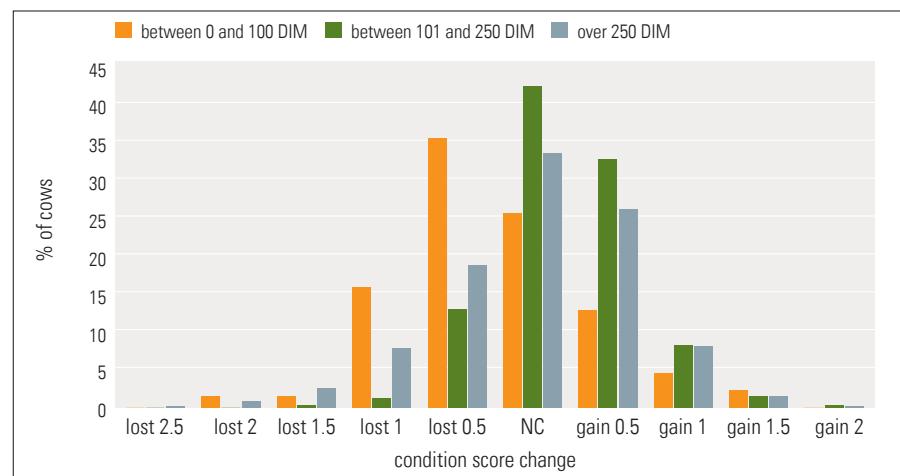


Figure 1: Condition score change at different lactation stages.

interesting trends. Figure 1 shows how many cows lost or gained condition during different stages of lactation. The greatest loss of condition can be seen within the first 100 DIM as expected, although nearly 19% of cows lose more than 0.5 BCS in this period. A lot of change in BCS after 250 DIM is also seen. Ideally any change in BCS should be limited to ± 0.5 BCS at this stage of lactation, but around 20% of cows see their BCS exceed this.

The summer showed the greatest period when cows lost condition, particularly for those in later lactation. These cows are more than likely to be grazing in a 'low' group and the results could suggest that the grass was not providing sufficient energy for production and pregnancy at this time.

Although highly reliable, accessing energy status of individual cows by blood testing is invasive and time-

consuming. And while routine body condition scoring is currently important, it is also a time-consuming and subjective approach.

Milk sample test

"A far more efficient technique would be an accurate milk sample test," adds Ms Hicks. "But like any of these energy measures, it is important that they are used routinely to monitor changes over time and interpreted alongside stage of lactation and other management and nutritional factors."

"We hope that the industry will be able to offer producers a service using the milk recording sample for accurately assessing a cow's energy status at regular intervals. The benefits of more preemptive management that this energy status information brings could easily be seen in yield, health and welfare benefits – and the bank balance."

Milk profiles and cow health

Five hundred British milk producers are a year into a four-year project that uses data from milk tests to measure health characteristics in cows. A key aim of the project is to use this data to develop new tools for improving production efficiency.

The project has been developed by NMR, in partnership with Marks & Spencer and Scotland's Rural College (SRUC), and is co-funded by the Technology Strategy Board. Twenty milk producers who supply Marks & Spencer have also been recruited

to take part in more detailed milk testing and data collection for individual cows. "More specifically, the project will carry out mid-infra-red tests on NMR milk samples to establish fatty acid profiles," says project manager Victoria Hicks. "The project will investigate the relationships between these profiles and aspects of cow health and performance that will hopefully lead to new prediction tools."

In addition, the fatty acid data may be able to deliver health benefits to milk and dairy products for human consumption. All milk producers involved in the project and participating feed companies, nutritionists, consultants and vets will have access to regular project briefings and results.

