An unseasonal rise in SCC and Bactoscans puts focus on bug identification

Know your udder enemies

A warm wet summer has caused a blip in the declining trends and satisfactory low levels of somatic cell counts and Bactoscans on many dairy units. And while producers might be tempted to settle for a blanket antibiotic treatment, this might not be the best solution. Bug identification is essential.

text **Karen Wright**

NML has seen average somatic cell counts (SCC) and Bactoscans reach unseasonably high levels in July and August. Average SCC for all bulk milk samples tested through NML peaked at 232,000 cells/ml in mid July compared with a peak of 214,000 cells/ml in 2011. Likewise Bactoscans shot up to 35 in July 2012 compared with 28 in July 2011. As a result, 58% more samples have arrived with NML for microbiology testing during the past three months in a quest to identify the pathogens causing the problems.

The University of Liverpool's Jo Oultram has also seen herds developing higher than usual bulk milk somatic cell counts. But while producers assumed this was weather and environment related, a closer look at the milk records partly disproved this.

New infections

"The monthly cell count data showed that infection had begun months previously in the form of new infections, which became repeated and chronic. These were more likely to be contagious, or they implicated straw-bedded yards and a failure to cure Strep uberis cases."

The typical procedure at Liverpool is to carry out bacteriology to identify the causes of clinical mastitis and raised cell counts. "Knowing the bacteria involved in high somatic cell counts and raised Bactoscans, or in cases of clinical mastitis, is vital in order to choose appropriate drugs and to advise on the probable source and on improving routines," says Ms Oultram.

"Some producers still tend to start treatments before taking a milk sample and identifying the pathogens. The qPCR test is an advantage here as it enables us to test animals after treatment has started as the antibiotics do not interfere with the test.

"Many of the cases we tested this summer yielded contagious organisms or a mix with environmental pathogens, which we picked up through bacteriology tests and qPCR.

"Milk samples from cows with high cell counts or clinical mastitis were qPCR tested and results could tell us whether any of the 12 listed pathogens were present. As with bacteriology, the samples need to be uncontaminated and taken cleanly in order that the test identifies the bacteria in the udder. Preserved milk samples could be used for qPCR, which was very convenient.

"We also found it invaluable to identify the penicillin-resistance gene in any staphs present and choose our treatment with this knowledge. This was a vital part of our decision making process and of making the most efficient use of the available treatments."

Wiltshire-based vet Peter May has recently carried out a 'belt and braces' mastitis pathogen identification on a 350-cow high yielding herd with a history of high cell counts, averaging 204,000 cells/ml but fluctuating from 150,000 cells/ml to 290,000 cells/ml and Bactoscans that varied from 30 to 240.

Peter May: "Belt and braces identification"

Jo Oultram: "Test are vital for decision-making"

Speed is of the essence when it comes to milk quality

Cell count and Bactoscan results can be accessed through NMR's on-line iReports as soon as tests are completed. This will normally be within several hours of the sample arriving in the lab. Producers can access their iReports on a smart phone, iPad or PC. It keeps producers right up to date and allows any further tests to be actioned without delay.

Results from Bactobreakdown, Parlour Hygiene Suite and Mastitis ID tests are also available online through Herd Companion. "When it comes to milk quality, speed is important," says NMR's Jonathan Davies. "It's all about resolving any problems and getting the herd back on track. The iReports bring current data straight back on to the farm."

Watch out for penicillin resistance

A third of samples infected with the mastitis-causing pathogen Staph aureus also contain the Beta-Lactamase gene, which infers resistance to penicillin. So if these cows are treated with a penicillin it will have little or no effect.

Published by NML's microbiology group, these findings are based on results from Bacto-breakdown and mastitis identification tests on 3,000 individual milk samples from January 2010 to September 2012. "We found that 32% of the individual cow samples had Staph aureus and the Beta-Lactamase gene present," says NML's Caroline Best. "So this means that, of the samples with Staph aureus present, 72% also contained the penicillin-resistant gene."

"This was a good opportunity to demonstrate the usefulness of the bug identification procedures," says Mr May. "While many farms will not need to carry out all tests, many will need to dip in and out of the mastitis identification tests to keep control of milk hygiene and cow health."

Weekly Bacto-breakdown tests through NML, using a bulk milk sample already held in the lab, were initiated. These tests included bacteriology of parlour-associated pathogens – the Parlour Hygiene Suite service – and the qPCR test for mastitis pathogen identification. The Parlour Hygiene Suite will show up groups of bacteria normally associated with environmental pathogens and is usually adequate for pinpoint areas to tackle Bactoscan problems.

qPCR tests on bulk or on individual cow milk samples will name species of pathogens for which DNA has been detected, giving an overview of the pathogens that are challenging the herd for bulk samples or which pathogens are found in the udder for individuals.

Milking hygiene problem

"The Parlour Hygiene Suite identified pathogens that suggested intermittent faecal contamination problems related to milking-time hygiene," adds Mr May.

With an improved wash cycle and better protocols, we saw average Bactoscan drop to less than 20 within eight weeks and reduced levels of coliform, Psychrotroph and Thermoduric counts.

"Somatic cell counts remained more of a problem," Mr May says.

"We selected a group of cows showing clinical signs of mastitis and carried out qPCR tests and, simultaneously, carried out culture tests through our own lab.

"Both tests identified individuals with Staph aureus and Strep uberis, both of which could be transmitted from cow to cow at milking.

"Interestingly, there was a large amount of agreement between the qPCR and culture test results, but there were significant benefits of using qPCR. Firstly, cows that were already undergoing treatment could be sampled and tested through qPCR," he adds.

"And, for convenience, preserved samples could be used for qPCR tests so growth in transit can be eliminated and we got results within several days." |

Know your enemy: identifying the bacteria involved in raised cell counts or Bactoscans is only a milk test away