

## Why producers should look seriously at a new mastitis detection test

# Bugs beware!

Six months on and results from NML's new PCR mastitis test is throwing out some interesting data on the prevalent mastitis causing pathogens in UK dairy herds. But how helpful is this information and could it make real inroads into reducing cell counts and result in more accurate treatment of mastitis?

text **Karen Wright**

Shropshire vet Benno Veenstra from Stapeley Veterinary Practice, Minsterley welcomes more accurate identification of pathogens through the polymerase chain reaction (PCR) technology. "It's very accurate and always gives a result. Plus it identifies more pathogens than previous bacteriology tests. And if we know the main pathogens causing the problem we can be far more accurate with treatment."

NML – part of the NMR group – introduced PCR technology in February this year. The PCR test, which identifies the DNA of mastitis causing pathogens, has replaced almost all of the plate

culture techniques for identifying bacteria in milk samples. It brings huge benefits to producers, their milk buyers and vets – and ultimately consumers – in that it can identify nearly twice as many pathogens and in hours rather than days compared to traditional culture techniques.

PCR results from the first 1,700 bulk milk and individual cow milk samples have revealed some interesting results with the environmental pathogens like Strep uberis and E coli dominating the breakdown of pathogens. But in both the bulk and individual cow milk tests a surprising 66% and 62% of samples respectively were identified with CNS – a

staphylococcus bacterium normally associated with freshly-calved heifers and classified as a minor pathogen.

### New threat

"CNS is more typically found in heifers," says Mr Veenstra. "This pathogen has never really been considered a major problem in the past, but these results indicate that it may be more prevalent than we think and it could reflect the increasing number of heifers in our herds perhaps. We don't know too much about it so there's more work to be done here."

The presence of environmental pathogens like Strep uberis and E coli isn't quite as surprising to Mr Veenstra, but it confirms what was suspected. "Like many dairy practices, we had a purge on reducing cell counts in our herds and about five years ago we focussed on treating or culling cows with Staph aureus to prevent it infecting more cows. It significantly reduced the level of this pathogen among cows."

The results from the bulk milk PCR tests show that although 59% of samples were positive for Staph aureus, only 6% were at 'medium' levels with the rest being present at a low level.

NML has made sure the reporting of PCR results is accurate and practical. "We report on the presence of each of the 11 pathogens that can be identified and we rank their presence into low, medium and high categories," says NML's Hannah Pearse, who headed the development of the new service.



Hannah Pearse: "Medium or high presence of a pathogen flags up a problem"



Benno Veenstra: "PCR means we can be far more specific with antibiotic use"

"While a low level of a pathogen isn't necessarily a cause for concern, it does indicate a potential risk. But a medium or high presence of a pathogen flags up a problem area that needs attention."

In the case of CNS, Strep uberis and E coli positive bulk milk samples, half were present at medium levels and a third of CNS-positive individual samples were at medium levels. This confirms the prevalence and threat of these environmental pathogens.

Leading on from this, Mr Veenstra can see, from the results, why the use of penicillin has not been successful in a number of cases in the past and producers have complained that cell counts have not fallen significantly after treatment.

"PCR can identify penicillin resistant pathogens – these can be Staph aureus

or CNS pathogens with the beta-lactamase enzyme; an enzyme that attacks and destroys the penicillin.

### Non-effective treatments

"The early results from NML identified beta-lactamase in 76% of bulk milk samples and 45% of individual cow samples that were positive for Staph aureus or CNS. Prior to PCR results, we would have no way of knowing this information accurately. Had these cows been treated with penicillin tubes it would have been a waste of money – at least four out of 10 would have been resistant to the treatment."

Looking ahead, Mr Veenstra hopes more producers will use PCR bacteriology. "You could hardly blame producers for resisting bacteriology testing when they didn't get any results because of the high

numbers of 'no growths' in plate culture testing. It was a waste of their time and money. Now PCR will almost always give a result and it's easy. There's no extra sampling, just a request to the NML lab. Individual cow samples can be submitted using special kits but from September samples taken for the routine NMR quality tests will be used.

"But we are in the early days and need to learn to work with the results. PCR is very sensitive so it's a case of identifying the main culprits and not over-reacting to pathogens that might be present at only low levels or those that may have come from the environment rather than from in the udder."

The great value of PCR is that it can be adapted to best suit each herd. "I'm using it at drying off in organic herds where the use of antibiotic is limited. We can be far more specific with antibiotic use if we know what they're treating."

Other herds use PCR on a bulk milk sample then 'cherry pick' high cell count cows for individual testing. "This is good practice too," adds Mr Veenstra. "It gives a fuller picture and we know what we're dealing with. And PCR will identify dead bugs too so a test can be done post treatment to see if it's been effective. There are lots of options – there's a big future in the PCR test."

Mr Veenstra refers to Scandinavia where cows cannot be treated with antibiotic tubes unless the vet knows exactly which bug is causing the problem. "So she must have a bacteriology test first. While we might not go that far in the UK, there's a drive to reduce antibiotic use and be more specific with treatments. It's a good initiative and, when you consider that a case of mastitis costs around £150, a PCR individual cow test costing from £15 is money well spent." |

PCR has shown that environmental pathogens and those affecting heifers are more prevalent than previously thought



## NML PCR tests

- Takes four hours to complete the test – results usually back in a day
- Reliably detects 11 pathogens and the susceptibility of Staphylococci to penicillin
- Requires no extra sampling for bulk milk samples
- Bacto breakdown available for bulk milk samples including plant hygiene analysis (£45 plus VAT) and individual cow milk samples (from £15 plus VAT)