

Mastitis PCR



Q. What are the benefits of using mastitis PCR?

- Identifies pathogens responsible for 95% of clinical mastitis in New Zealand.⁴
- Increased sensitivity
 - * Up to 29% of clinical mastitis samples in New Zealand can be culture negative^{1,3,4}
 - * PCR has been shown to identify pathogenic bacteria in 43-52% of culture negative mastitis samples.^{2,6}
- Identification of pathogens in contaminated samples
 - * Up to 8% of samples from clinical mastitis in New Zealand will be contaminated which may obscure pathogen identification.^{1,4}
 - * PCR can still identify pathogens in contaminated samples.⁵
- Identification of pathogens despite previous treatment
- Can identify DNA from dead bacteria or those inhibited by inhibitory substances
- Inclusion of the most common β -lactamase penicillin resistance gene (blaZ)
- Inclusion of *Mycoplasma bovis*
- Semi-quantitative

Q. Can we test bulk milk BM samples?

Currently the mastitis PCR is not validated for use in bulk milk

Q. Does *Mycoplasma bovis* testing occur automatically on every sample?

No but it can be added if initial PCR is negative

Q. How is the β -lactamase penicillin resistance reported?

Presence or absence of the β -lactamase blaZ gene which is the most commonly identified penicillin resistance gene in staphylococci.

Q. What does the β -lactamase result mean?

It means the *Staphylococcus* spp. will be resistant to Penicillin G.

Q. Can you get false positives?

As no mastitis diagnostic tests are 100% sensitive and specific, false positives and negatives can occur. The high sensitivity of the PCR may result in false positives in successfully treated quarters with dead organisms, spontaneously cured mastitis or samples contaminated with target organisms.

Q. What is the sensitivity and specificity of the PCR?

PCR is more sensitive than culture in that it can detect pathogens in culture negative samples. When compared with culture of the target pathogens during validation, there was strong correlation between mastitis PCR and routine culture.

Q. Can we hold samples and do sensitivity pending results of PCR?

Yes, but ideally culture should be performed within 48hrs of samples being received.

Q. If the PCR is negative does that mean there are no significant pathogens present?

No, it only means the target species are not present. If clinical signs and SCC results indicate an infection, culture and/or sensitivity testing are recommended (fresh sample preferable) to determine what other organisms may be present.



Please refer to our current price book for sample types, test turn-around times and pricing. If you have any questions or would like any further information, please contact your local Gribbles Veterinary laboratory or Territory Manager.

Q. Does the PCR provide antibiotic sensitivity results?

It provides the presence of the blaZ β -lactamase resistance gene which is the most common antimicrobial resistance gene identified in staphylococcal mastitis in New Zealand. Culture is required to determine other antimicrobial sensitivities.

Q. If the PCR is positive can I be certain the organism detected is a significant finding?

As with other tools for mastitis, results should be interpreted in light of the clinical history, somatic cell counts and herd test results.

Q. Will I incur an extra charge for a culture/sensitivity on a positive result?

Yes, standard list pricing applies.

Q. Does the semi-quantitative result compare to the light, moderate, heavy growth we get with cultures?

Not always, as the PCR can detect DNA from both live and dead bacteria in a sample.

Q. Will any further organisms be added to the PCR panels?

We are currently investigating more options.

Notes:

- As with other tools for mastitis, results should be interpreted in light of the clinical history, somatic cell counts and herd test results.
- Clinical mastitis samples that are negative using PCR should be cultured for other potential pathogens.
- If *Mycoplasma bovis* is clinically suspected in cases of mastitis, MPI should be contacted immediately on 0800 809966.

References:

1. McDougall S. Bacteriology, cure rate and herd level risk factors for clinical mastitis in dairy herds. *Proceedings of the Society of Dairy Cattle Veterinarians of the NZVA Annual Conference*. VetLearn Foundation, 2002.
2. Taponen S, Salmikivi L, Simojoki H, Koskinen MT, Pyörälä S. Real-time polymerase chain reaction-based identification of bacteria in milk samples from bovine clinical mastitis with no growth in conventional culturing. *Journal of Dairy Science*. 92, 2610-17, 2009
3. S McDougall, J Niethammer & EM Graham. Antimicrobial usage and risk of retreatment for mild to moderate clinical mastitis cases on dairy farms following on-farm bacterial culture and selective therapy. *New Zealand Veterinary Journal*. 66, 98-107, 2018
4. McDougall S, Arthur DG, Bryan MA, Vermunt JJ, Weir AM. Clinical and bacteriological response to treatment of clinical mastitis with one of three intramammary antibiotics. *New Zealand Veterinary Journal*. 55, 161-70, 2007
5. Hiitö H, Riva R, Autio T, Pohjanvirta T, Holopainen J, Pyörälä S, Pelkonen S. Performance of a real-time PCR assay in routine bovine mastitis diagnostics compared with in-depth conventional culture. *Journal of Dairy Research*. 82, 200-208, 2015
6. Koskinen MT, Wellenberg GJ, Sampimon OC, Holopainen J, Rothkamp A, Salmikivi, L, van Haeringen WA, Lam TJ, Pyörälä S. Field comparison of real-time polymerase chain reaction and bacterial culture for identification of bovine mastitis bacteria. *Journal of Dairy Science*. 93, 5707-15, 2010



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