One Test, Three Pathogens

AntelBio Contagious Mastitsis PCR

Mastitis is generally caused by pathogenic microorganisms that can be divided into two groups based on their source: environmental pathogens and contagious pathogens. The major contagious pathogens are Staphylococcus aureus, Streptococcus agalactiae, and Mycoplasma spp. These three organisms, which gain entrance into the mammary gland largely through the teat canal generally produce long-term infection that often results in elevated bulk tank or herd average SCC scores.

Direct economic losses from contagious mastitis' impact on milk production and treatment costs are frequently significant. However, the impact on milk quality and the revenues jeopardized as a result of milk antibiotic residues, as well as manufacturing and nutritional quality issues, while more difficult to quantify, are no less important.

The Contagious Mastitis PCR Panel is a tremendous advancement in mastitis diagnosis providing enhanced sensitivity, improved result availability, and flexibility in testing programs; proving that today, there really is a better way!

Advanced Technology

- **Reduced inconclusive "no growth" results with quantification of bacterial DNA, accurately detecting viable, growth-inhibited and dead bacteria**
- **Rapid results availability provides answers as quickly as 24 hours•, much faster than culture**
- **Special sample handling eliminated enabling analysis of fresh, frozen and DHI collected milk**
- **Superior Sensitivity enables bulk tank milk testing as a routine screening tool**

Superior Diagnosis

The Contagious Mastitis PCR Panel identifies the presence of S. aureus, S. agalactiae and Mycoplasma bovis DNA in milk samples. The test is quantitative and positive results are reported as +, ++ and +++ as well as a numeric CT score, both based on the amount of bacterial DNA present in the sample.

This test has 100% sensitivity and specificity for all pathogens, and can produce results in as little as 24 hours• as opposed to culturing which can take several days to complete. Also, unlike culturing, this test doesn't need special handling or sterile vials because it is unlikely that environmental contamination contributes to detection of these pathogens in milk. Therefore, sampling protocols can be effectively designed for hand-stripped or DHI-collected (bronopol-preserved) samples.

This test is effective on a wide variety of sample types (fresh, frozen, or preserved), because it determines the type of bacteria by identifying its DNA which, also unlike culture, is not compromised by poor viability or antibiotic residues. The superior sensitivity of the Contagious Mastitis PCR Panel also enables testing of bulk tank samples, making it an efficient way to simul-

Table 1. Interpretation of Ct values from the Contagious Mastitis PCR Panel for each major contagious pathogen.†

	Bacterial DNA Quantity Classification‡				
	Negative	-/+	+	++	+++
Staphylococcus aureus	Nd	>37	30-37	24-30	<24
Streptococcus agalactiae	Nd	>37	32-37	24-32	<24
Mycoplasma bovis	Nd	>37	32-37	22-32	<22

†Ct values represent the PCR cycle in which amplified target DNA was statistically detectable. Therefore, Ct values are inversely related to the quantity of pathogen DNA present in the original sample.

‡Classification of bacterial DNA content: (negative) not detected, (-/+) very low, (+) low, (++) intermediate, and (+++) high quantities.

taneously screen an entire herd for contagious mastitis bacteria. See Table 1 for interpretation of results from the Contagious Mastitis PCR Panel.

Customizable Detection Strategies

Progressive mastitis control has proven benefits. Improvements in production alone have been shown to return over $120/cow annually. This goes a long way towards the cost of implementing common mastitis control measures.

But one control program does not fit all dairies. In addition to testing suspected cases, a routine monitoring program is strongly suggested as the contagious nature of these pathogens can turn isolated cases into an epidemic in short order. New additions to the milking string, including heifers, can bring these pathogens into the milking parlor to initiate new rounds of infections. Even in closed herds essentially free of contagious mastitis pathogens, a routine bulk tank screening program can provide advanced warning of potential outbreaks that can be identified and resolved before significant consequences arise.

Using specific testing and pooling strategies, summarized in Table 2, cost-effective options can be customized to provide a variety of management information.

Testing strategies

- **Whole Herd Testing.** Rapid identification of infected cows for herds experiencing contagious mastitis: submit hand-stripped or DHI samples; individual milk samples are pooled 5-to-1 facilitating follow-up testing of positive pools to identify infected animal(s).
- **Selected Cow Testing.** Routine screening to monitor introduction of contagious mastitis pathogens: submit hand-stripped or DHI samples from fresh cows; individual samples can be pooled 5-to-1 with or without follow-up analyses.
- **High SCC Cow Testing.** Targeted screening of high SCC cows: submit DHI samples for individual testing; predetermined threshold established, may include SCC above a fixed value (i.e. 500,000; 1,000,000); top percentage of SCC (i.e. 10%; 5%); highest SCC (i.e. top 20; 10 animals).
- **Bulk Tank Screening.** Economical screening of bulk tank: submit tank sample at appropriate testing intervals.

Don't let contagious mastitis rob productivity and profits! Contact AntelBio to learn more about the Contagious Mastitis PCR Panel and let us help you design effective testing strategies.

Table 2. Summary of Testing Strategies

Test Strategy	Uses*	Samples†	Procedure‡	Fee
Whole Herd	Diagnosis	Stripped/DHI	Pooled	$25 per pool**
Fresh/New	Screening	Stripped/DHI	Pooled	$25 per pool**
High SCC	Diagnosis	DHI	Individual	$25 per animal
Bulk Tank	Screening	Bulk Tank		$25 per sample

*Diagnosis is detection of individual mastitis cases when infection is strongly suspected; screening refers to protocols that, used regularly, detect introduction of contagious mastitis pathogens.

†For either hand-stripped samples or DHI samples, care should be taken to minimize contamination.

‡In Pooled testing, individual animal samples are pooled 5-to-1 prior to analysis, and if the pool is positive, the individual samples can be tested to identify specific cows (individual analysis is elective). In Individual analysis, each sample is tested separately.

** If follow-up testing on positive pools is elected, the initial pool fee is credited back, offsetting the cost of individual animal tests ($25/sample).