



## Thermo Scientific PathoProof Mastitis PCR Assays



*Revolutionary, rapid and reliable identification of  
mastitis-causing bacteria from bovine milk*



## Thermo Scientific PathoProof Mastitis PCR Assays

PathoProof™ Mastitis PCR assays identify mastitis-causing bacteria from bovine milk in just four hours. The assays are based on an accurate and sensitive technology known as PCR. The tests can be used for analyzing fresh and preserved quarter milk samples, milk recording samples, and bulk tank milk samples.

### From sample to results in four hours

The PathoProof Mastitis PCR assays are revolutionary tests for identifying all the main mastitis-causing bacteria from bovine milk samples, without any bacterial culturing steps. The results are obtained in just four hours, with only two hours of hands-on time. This is a dramatic improvement over conventional bacterial culturing, which routinely takes 48 hours, and up-to seven days for *Mycoplasma bovis*.

### Analysis from different sample types

The PathoProof Mastitis PCR assays can be used for mastitis testing from quarter milk samples, milk recording samples as well as from bulk tank milk samples. The samples can be preserved (for example with bronopol), which eliminates bacterial growth during transportation. This enables shipment of samples at room temperature. The ability to use milk recording samples makes mastitis testing incredibly convenient for the dairy producers. Testing bulk tank milk samples is an efficient way to simultaneously screen an entire herd for contagious mastitis bacteria, such as *Streptococcus agalactiae* and *Mycoplasma bovis*.

### Sensitive and accurate results

In addition to identifying viable mastitis bacteria, the PathoProof Mastitis PCR assays also detect growth-inhibited microorganisms. This is a major advantage compared to the conventional bacterial culture method, where up to 40% of “no growth” results are a problem for laboratories, veterinarians, and dairy producers.

The PathoProof Mastitis PCR assays simultaneously detect all of the targeted bacterial species (see list on last page) present in the milk sample, overcoming the common problem of ‘mixed growth’ results of bacterial culturing. Validation studies indicate superior analytical specificity and sensitivity for the assays, making them the most accurate mastitis test method available.

### Results interpretation and reporting made easy

The PathoProof Mastitis Software performs automated interpretation and reporting of the results obtained using the assays. Unlike with identification of bacteria from culture plates, all users of the PathoProof Mastitis PCR assays can now reach the same very high level of accuracy.

## Results in four hours

- all main mastitis-causing bacteria identified
- *Mycoplasma* identified
- antibiotic sensitivity determined

4 hours  
↓  
BACTERIAL CULTURING

- Plate samples

24 hours

- Check growth

48 hours

- Determine antibiotic sensitivity or
- Check growth



## Three simple steps

### Step 1: Milk sample preparation

DNA of the bacteria present in the milk sample is purified from all other milk components.

### Step 2: Automatic analysis of bacteria

The purified bacterial DNA is amplified to a detectable level using an automated real-time PCR instrument. All mastitis-causing pathogens are identified and quantified simultaneously. Loading of the sample plates into the instrument is the only manual step required.

### Step 3: Reporting results

The PathoProof Mastitis Software is designed for automatically interpreting, reporting and storing the results.

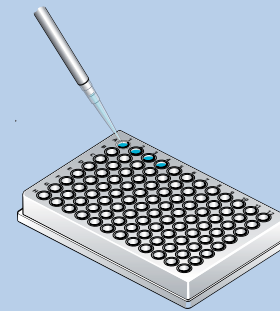


## Advantages

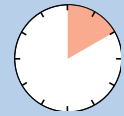
- No bacterial culturing required
- Accurate identification of all major mastitis-causing pathogens
- From sample to results in just four hours
- High sensitivity, even for samples that show "no growth" in culture
- Suitable for preserved milk samples
- Can be used with milk recording samples
- Samples can be shipped at room temperature

Polymerase chain reaction (PCR) technology is used for amplifying DNA in a test tube. Amplification enables further analysis of DNA. Millions of copies of any desired DNA fragment can be synthesized in less than one hour. Advanced PCR technology called real-time quantitative PCR even allows determination of the original amount of DNA present in the reaction. In the PathoProof Mastitis PCR assays, several bacterium-specific DNA fragments are amplified from a milk sample in order to determine which mastitis-causing pathogens are present in the sample and how much of each pathogen the sample contains.

## Workflow



**2 hours**  
(hands-on time 1 hour)



**1.5 hours**  
(hands-on time 15 minutes)

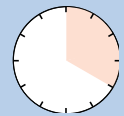


Sample	<i>S. aureus</i>	<i>S. uberis</i>	<i>E. coli</i>
123	-	+	-
124	+	+	-
125	+	-	-
126	-	+	-
127	-	-	-

**30 minutes**  
(hands-on time 5 minutes)



Total time required  
**4 hours**



72 hours

7-10 days

- Determine antibiotic sensitivity

- Analyze *Mycoplasma*



## How to get started

The PathoProof Mastitis PCR assays are based on technology typically applied in molecular biology laboratories. We can assist you in setting up this technology in your laboratory. To get started with the PathoProof technology, the following items are needed:

- PathoProof Major-3 or PathoProof Complete-12 reagent kit
- Starter Pack – for your convenience, we have assembled a starter pack which includes all the basic laboratory equipment needed for the assay
- PathoProof Mastitis Software for analyzing results
- Agilent Mx3005P™ qPCR System – a real-time PCR instrument for automatic analysis of bacteria

## Comprehensive training included

We will provide both the instrument installation and thorough hands-on training for the laboratory staff. The training session covers all the steps from sample preparation to proper use of the real-time PCR instrument and results interpretation using the PathoProof Mastitis Software.

*“Sky is the limit.”*

*Jere High, Lancaster DHIA, U.S.*

*“Sample collection for mastitis testing has always been time consuming and inconvenient, which means it often didn't get done. The fact that the DHI sample can now be used makes it incredibly convenient”.*

*Richard Cantin, CanWest DHI, Canada*

*“This test will be of significant benefit in any farm mastitis control programme and hence to dairy farming in the UK.”*

*Paul Burr, Biobest Laboratories Ltd, UK*

Permissible use. This product is intended to be used for the purpose of detection and/or analysis of microorganisms in milk for quality assurance and quality control purposes (Food Testing Applications), as well as for identification, enumeration, or count of microorganisms in raw material sample, process control sample, or finished product sample of an industrial process for the purpose of detecting the presence, absence or amount either of a contaminant or of an intended component (Industrial Microbiology Applications). Not for use in veterinary diagnostic procedures. The quality system of Thermo Scientific PathoProof is certified according to standard SFS-EN ISO9001:2008.

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800-255-6730



*PathoProof Mastitis Starter Packs contain all the necessary laboratory equipment for performing the PathoProof Mastitis PCR Assay.*

### PathoProof Mastitis Complete-12 Kit identifies:

1. *Staphylococcus aureus*
2. *Staphylococcus* spp. (including all major coagulase-negative staphylococci)
3. *Streptococcus agalactiae*
4. *Streptococcus dysgalactiae*
5. *Streptococcus uberis*
6. *Escherichia coli*
7. *Enterococcus* spp. (including *E. faecalis* and *E. faecium*)
8. *Klebsiella* spp. (including *K. oxytoca* and *K. pneumoniae*)
9. *Serratia marcescens*
10. *Corynebacterium bovis*
11. *Arcanobacter pyogenes* and *Peptoniphilus (Peptostreptococcus) indolicus*
12. Staphylococcal  $\beta$ -lactamase gene (penicillin resistance gene)

### PathoProof Mastitis Major-3 Kit identifies:

1. *Mycoplasma bovis*
2. *Staphylococcus aureus*
3. *Streptococcus agalactiae*

### Ordering information

Order Code	Description	Size
PF0870S	PathoProof Mastitis Complete-12 reagent kit, sufficient for 50 tests	
PF0870SB	qPCR reagents for use with PF0870S	Must always be ordered/delivered with PF0870S
PF0870L	PathoProof Mastitis Complete-12 reagent kit, sufficient for 4x96 tests	
PF0870LB	qPCR reagents for use with PF0870L	Must always be ordered/delivered with PF0870L
PF0914S	PathoProof Mastitis Major-3 reagent kit, sufficient for 50 tests	
PF0914SB	qPCR reagents for use with PF0914S	Must always be ordered/delivered with PF0914S
PF0914L	PathoProof Mastitis Major-3 reagent kit, sufficient for 4x96 tests	
PF0914LB	qPCR reagents for use with PF0914L	Must always be ordered/delivered with PF0914L
PF0888A	PathoProof Mastitis Software License	
PF0889S	PathoProof Mastitis Starter Pack for users of Small kits	
PF0889L	PathoProof Mastitis Started Pack for users of Large kits	
PF0889C	PathoProof Mastitis Starter Pack for users of Small and Large kits	
PF1449N	Agilent Mx3005P™ qPCR System (110 V) with notebook computer (includes one year warranty)	
PF1457N	Agilent Mx3005P™ qPCR System (230 V) with notebook computer (includes one year warranty)	

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