

# Mastitis and On-Farm Milk Cultures – A Field Study

*This article discusses the results of a research project undertaken by Dr. Tim Olchow, Senior Lecturer in Livestock Medicine, School of Veterinary Science University of Queensland, Gatton. The project was funded by Subtropical Dairy and was endorsed by the Subtropical Dairy South-east Queensland Regional Group.*

## Introduction

Knowing what type of bacteria (gram positive (+) or gram negative (-)) is causing clinical mastitis has several advantages:

- Anti-microbials work on gram-positive bacterial infections;
- Anti-microbial drugs are wasted on treating infections (unless the infection becomes toxic) caused by gram-negative bacteria. This can be as high as 50% of treatments;
- It reduces the volume of milk that must be discarded due to antibiotic treatment;
- It reduces the risk of antibiotic contamination in the vat.
- Fewer cows require injections, reducing the likelihood of needle injuries.

Traditionally, laboratory testing has been used to identify whether mastitis is caused by gram + or – bacteria. Turn-around time for culture results is usually several days. This project evaluated an on-farm testing programme which takes 24 hours to complete.

## Methods

The study was conducted on a year-round calving dairy farm in south east Queensland milking approximately 250 predominantly Friesian cows. Milk samples were collected during the period of November 2016 to May 2017.

A short training program was run on the study farm with the participating producer and herdsman prior to the start of the study. The training covered the proper collection and handling of milk samples, use of culture plates, use of the milk sample applicator, and interpretation of culture results.

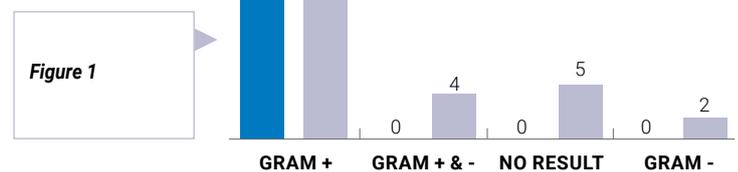
Milk samples were collected from quarters of cows with signs of clinical mastitis. For this study, clinical mastitis was defined as either abnormal appearance of milk or abnormal appearance of both milk and quarter. Milk samples were cultured on-farm using culture bi-plates containing selective bacterial growth media and in a microbiology laboratory (School of Veterinary Science, University of Queensland, Gatton, QLD) using both standard microbiology laboratory methods and the same culture bi-plates as used on the study farm.

All culture bi-plates were examined and reported after 24 hours of incubation. Samples processed by the microbiology laboratory using standard microbiological methods were examined and reported after 24 hours (preliminary results) and again after 48 to 72 hours (final results) incubation.

The culture results from the bi-plates were interpreted as growing gram-positive bacteria (such as *Streptococcus*, *Staphylococcus*, *Enterococcus*), gram negative bacteria (such as *E. coli*), or having no bacterial growth.

## Results

A total of 135 milk samples were used to compare the results of the microbiology laboratory and the on-farm culture bi-plate system. Results are shown in Figure 1.



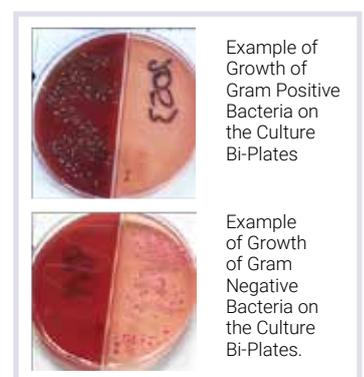
Of the 135 laboratory cultured samples, 43 gram-positive infections were detected. In comparison, on-farm testing detected 32 gram-positive infections, four results with both gram-positive and gram-negative, five with no growth and two gram-negative. Based on this result, if the management decision was made to treat cows based on farm testing results of either gram positive identification, identification of both gram positive and negative, or no growth, this would have treated 95% of gram-positive mastitis infections. It should be noted of the other 92 non gram-positive laboratory results, the farm testing protocol identified two false gram-positive results.

## Cost saving

Overall, if the total cost of testing and treatment is considered, there is a cost saving of \$10 per mastitis infection on-farm. This does not include savings in additional milk sold because of no withholding, or risks associated with injections or vat contamination. For a farm with 200 mastitis cases per year, the saving is a minimum of \$2,000 per year.

## Constraints

- Accessing plates for testing is a problem at the moment.
- There is also some training required in plating techniques and interpretation.
- Not suitable for eradication program (i.e. *Streptococcus agalactiae*).
- No automatic routine quality control (QC) program, unlike commercial lab.



To read the full reports from this work, please visit [dairyinfo.biz](http://dairyinfo.biz).

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