

Comparison of on-farm point-of-care diagnostic with conventional culture in analysing bovine mastitis samples

Geoff Jones^{1*}, Olaf Bork², Scott A. Ferguson³ and Andrew Bates⁴

¹ Institute of Fundamental Sciences, Massey University, New Zealand

² Mastaplex Ltd, Dunedin, New Zealand

³ Department of Microbiology and Immunology, University of Otago, New Zealand

⁴ Vetlife Ltd, Temuka, New Zealand

Short title: **On-farm diagnostic for mastitis**

*Correspondence: Geoff Jones
IFS (Statistics)
College of Sciences
Massey University
Private Bag 11222
Palmerston North 4410
New Zealand
phone +64-6-951 7627
FAX +64-6- 355 7953
E-mail: g.jones@massey.ac.nz

Summary

This research paper investigated the performance of a new point-of-care diagnostic (Mastatest), an on-farm test designed to identify bacteria and provide antibiotic sensitivity testing information from milk samples compared with standard microbiological culture methods. A total of 292 milk samples from clinical mastitis cases on New Zealand dairy farms were aerobically cultured and tested using the new point-of-care diagnostic and compared to standard culture techniques performed by a commercial laboratory. Latent class analysis was used to estimate the performance characteristics of both tests.

Two hundred and fifty-six samples (87.7%) demonstrated bacterial infection in standard culture, and 269 (92.1%) using the point-of-care diagnostic. The most common bacterial species detected was *Streptococcus uberis*, found in 195 samples (66.8%) using standard culture and 190 (65.1%) using point-of-care diagnostic.

The latent class analysis found no significant differences in test characteristics between the point-of-care diagnostic and standard culture, except possibly higher sensitivity for the point-of-care diagnostic for some targets. The estimated sensitivity and specificity of the point-of-care diagnostic against all targets combined were 94.6% and 72.1% respectively; the corresponding estimates for standard culture were 90.5% and 73.9%. Comparison of antibiotic susceptibility testing using point-of-care diagnostic and the reference method showed similar trends and, in some cases, identical MIC₅₀ and MIC₉₀ values, with at most one antibiotic dilution difference.