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Mastitis in two experimental herds: A case study in organic and conventional dairy systems

A thesis presented in partial fulfillment of the requirements for the degree
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1. ABSTRACT

Mastitis costs amount to about 11% of the productive capacity of the dairy industry. In New Zealand, practices for its control have been adapted to constitute the SAMM plan (Seasonal approach for managing mastitis), with a selective use of Dry cow therapy (DCT, a long lasting antibiotic) based on individual somatic cell counts (SCC) and clinical cases records from the previous lactation.

Nowadays, restricted use of antibiotics constitutes an important factor in dairy production. Organic production methods, which constrain the use of conventional medicines and treatments, are consequently increasing in importance.

Research in conventional herds has shown the prevalence of different pathogens in New Zealand, highlighting the importance of *Streptococcus uberis* around calving and of Coagulase-negative staphylococcus (CNS) and *Staphylococcus aureus* later in lactation. However, there is no comparable data coming from organic herds.

The present study assessed the mastitis infection status of two farmlets located at the Dairy Cattle Research Unit of Massey University. Single quarter milk samples from 95 cows, 45 under organic production (first and second year of organic certification) and 50 under a conventional system were taken on four occasions: mid-lactation (frozen); prior to dry-off (season 2003-04); after calving and 14 days post-calving (season 2004-05). Milk samples were cultured for bacterial analysis. SCC from monthly herd tests, and clinical mastitis cases were recorded and analyzed.

Significant differences between herds were shown only for growth of *Staphylococcus aureus* in all four periods, and for cows positive for *Streptococcus* spp. 14 days post-calving, with a higher percentage of infections in the organic herd in all cases.

Somatic cell counts data from individual cows in season 03-04 showed mean values of 116 and 102 (thousand cells/ml) for the organic and conventional herd respectively, with no significant differences between them, not during the first half of season 04-05, where the mean values were 91 and 67 (thousand cells/ml).

No differences were shown in clinical mastitis cases between herds. However a slightly higher frequency of cases was present in the organic herd (31%) compared to the conventional herd (28%) for the season 03-04. The frequency of clinical cases for the first half of season 04-05 was 16% for the organic herd and 17% for the conventional herd. Further studies in these two herds should be performed to analyze the effect of *Staphylococcus aureus* over time, especially in the organic herd.

Results suggest that infections caused by *Staphylococcus aureus* in organic herds could spread due to the prohibition of antibiotics. Control of this contagious pathogen is important in all herds, but especially in organic conditions, where further preventive and control methods should be established to avoid increasing infections.

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