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**RISK FACTORS
AND
PREVENTION STRATEGIES
FOR MASTITIS IN
NEW ZEALAND DAIRY
HEIFERS**

**This thesis is completed as a partial
requirement for the Masters of
Veterinary Studies (Epidemiology) from
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New Zealand**

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Abstract

Aims

The aims of this thesis were to investigate herd level risk factors for heifer clinical mastitis and to test the efficacy of a pre-calving intervention on prevalence of post-calving IMI, incidence of clinical mastitis and somatic cell count (SCC) in heifers.

Materials and methods

A prospective survey (chapter 3) was used to collect data concerning farmers' management practices for rearing heifers and mastitis management. A proportion of herd-owners (n=250) subsequently provided data on the clinical mastitis cases in their herd occurring in the first 120 days of the subsequent lactation.

A pilot quarter level intervention study (n=1000 quarters; chapter 4) investigated the effect of pre-calving infusion of a teat sealant. Glands were randomly assigned to one of 4 treatment groups (no treatment; mammary gland secretion collection; infusion of a teat sealant; or sample collection with infusion of teat sealant) to identify the risk of each of these treatments on post-calving IMI and clinical mastitis.

A heifer level intervention study (n=1000 heifers; chapter 5, 6) investigated the pre-calving use of teat sealant infused into all four quarters and/or treatment with the injectable antibiotic tylosin. Analysis was undertaken at quarter level (chapter 5) and heifer level (including SCC data; chapter 6).

Results

The survey identified that the cumulative incidence of heifers with clinical mastitis was higher in herds with a higher per cow milk production, with more cows milked per person, in herds with a higher stocking rate, and in herds with a higher cumulative incidence of clinical mastitis in their multiparous cows. The cumulative incidence of heifers in a herd with clinical mastitis was lower in herds that managed the lactating cows in multiple groups.

The pilot study found that the presence of an IMI pre-calving increased the risk of an IMI post-calving and the incidence of clinical mastitis, relative to no IMI pre-calving. Infusion of the teat sealant reduced the risk of post-calving IMI due to *Streptococcus uberis* and the incidence of clinical mastitis. Sampling the glands pre-calving had no effect on post-calving IMI or on incidence of clinical mastitis.

The large-scale intervention study found that neither infusion of a teat sealant nor treatment with the injectable antibiotic increased the risk of cure of pre-calving IMI. Infusion of the teat sealant reduced the risk of quarter level new IMI. At both quarter and heifer level teat sealant reduced the risk of the prevalence of post-calving IMI, incidence of clinical mastitis. At heifer level the SCC was decreased throughout lactation following the use of a teat sealant. Tylosin had no effect on prevalence of IMI, incidence neither of clinical mastitis nor on SCC.

Conclusions

It was concluded that the risk of heifer clinical mastitis was associated with a number of herd level management factors and that further studies are required to elucidate the mechanisms behind these associations. Hence, it may be possible to reduce the incidence of clinical mastitis in heifers by modification of herd level management practices. Intervention with an intramammary teat sealant pre-calving decreased the incidence of new infections over this high-risk peripartum period, and may provide a useful tool for reducing the risk of subclinical and clinical mastitis in heifers.

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