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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 Massey University, Palmerston North, New Zealand

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By Katrina Ivy Parker
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.
Sometimes an opportunity arises before us, apparently out of nowhere and we take it, because it 'feels right', despite the fact there are some sacrifices that we know we are going to have to make because of it. Then, as the consequences and experiences that come about because of this opportunity surpass all expectations and far exceed your greatest hopes, you know that you WERE supposed to take that opportunity and you ARE where you are meant to be right now.

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“We also rejoice in our sufferings, because we know that suffering produces perseverance; perseverance, character; and character, hope.” Romans 5:3

So glad you got to see it finished MUM!
Table of contents

ABSTRACT ............................................................................................................ 2
AIMS ....................................................................................................................... 2
MATERIALS AND METHODS ............................................................................. 2
RESULTS ............................................................................................................. 2
CONCLUSIONS ................................................................................................... 3

ACKNOWLEDGEMENTS .................................................................................. 4

TABLE OF CONTENTS .................................................................................. 6

TABLE OF FIGURES ..................................................................................... 11

TABLE OF TABLES .......................................................................................... 14

CHAPTER 1 LITERATURE REVIEW ON HEIFER MASTITIS IN DAIRY HEIFERS ...... 19

INTRODUCTION ................................................................................................. 19

REVIEW .............................................................................................................. 20

EPIDEMIOLOGY OF HEIFER MASTITIS ............................................................. 20

BACTERIOLOGY OF MASTITIS IN HEIFERS ..................................................... 22

RISK FACTORS FOR MASTITIS IN HEIFERS .................................................. 22

Herd level risk factors for heifer mastitis ......................................................... 22
Heifer level risk factors for mastitis ................................................................. 23
Effect of existing intramammary infection on risk of new intramammary infection.. 25
# CHAPTER 4 SUBCLINICAL AND CLINICAL MASTITIS IN HEIFERS FOLLOWING THE USE OF A TEAT SEALANT PRE-CALVING

## ABSTRACT

## INTRODUCTION

## MATERIALS AND METHODS

- **Bacteriology**
- **Statistical analysis**

## RESULTS

- **Objective 1**
- **Objective 2**
- **Objective 3**
- **Objective 4**
- **Objective 5**
- **Objective 6**

## DISCUSSION

- **Objective 1**
- **Objective 2**
CHAPTER 5 QUARTER LEVEL ANALYSIS OF SUBCLINICAL AND CLINICAL MASTITIS IN PRIMIPAROUS HEIFERS FOLLOWING THE USE OF A TEAT SEALANT AND/OR AN INJECTABLE ANTIBIOTIC PRE-CALVING

ABSTRACT

INTRODUCTION

MATERIALS AND METHODS

Bacteriology

Data Handling

Data analysis

RESULTS

Effect of treatment on cure of existing IMI

Effect of treatment on incidence of new IMI

Effect of treatment on prevalence of IMI post-calving

Effect of treatment on incidence of clinical mastitis

DISCUSSION

CONCLUSIONS

REFERENCES
Table of Figures

Figure 1 From (Barkema et al 1998c). Distribution of the incidence rate of clinical mastitis (IRCM) relative to the day of calving for heifers and older cows .......21

Figure 2 The mean (SEM) herd (n=250 herds) proportion of heifers (grey) and cows (white) diagnosed with lactational clinical mastitis from calving to approximately 120 days into lactation for each calendar month. The proportion of cases of clinical mastitis/herd for cows and heifers was compared using chi-squared analysis, the significantly different proportions are indicated * (p<0.05). ...........................................58

Figure 3 Predicted proportions (SEM) of heifers with clinical mastitis over the first 120 days of lactation for ranges of percentage of cows in a herd with clinical mastitis during the first 120 days of lactation. The predicted proportions were adjusted for mean production of milk solids (i.e. 270 kg MS/cow/lactation), mean number of cows per person milking (i.e. 170 cows/person), single milking mob and in the Waikato region. The trendline represents linear line of best fit...............................................................59

Figure 4 Predicted proportions (SEM) of heifers with clinical mastitis over the first 120 days of lactation for the average number of cows per person milking. The predicted proportions were adjusted for mean production of milk solids (i.e. 270 kg MS/cow/lactation), mean herd proportion of cows with clinical mastitis of 7.7-13.4%, single milking mob and in the region Waikato. The trendline is the linear line of best fit for the model.................................................................60

Figure 5 Predicted proportions (SEM) of heifers with clinical mastitis over the first 120 days of lactation for average milk production per herd (i.e. kg milk solids/cow/lactation calculated using farm production for the 2002/2003 season/number of cows at the start of the 2003/2004 season). The predicted
proportions were adjusted for mean herd proportion of cows with clinical mastitis of 7.7-13.4%, average number of cows/person milking (i.e. 170 cows/milkers), a single milking mob and in the region Waikato. The trendline is the linear line of best fit from the model................................................................. 61

Figure 6 The four treatment allocations randomly assigned to groups of four sequentially presented heifers within a herd. Each large box represents the four glands within a heifer with the smaller boxes one of the four glands, clockwise from top left; left front, right front, right rear, left rear. TS = teat sealant infused, S = sample taken, S+ TS = sample taken and teat sealant infused, C = control ........................................... 86

Figure 7 Mean (± SEM) prevalence as a percentage of glands with intramammary infection (IMI) by day post-calving at milk sampling.............................................................. 87

Figure 8 The cumulative incidence of clinical mastitis (±SEM) within herd from which any pathogen was isolated by week of calving relative to the median calving week for heifers within a herd.............................................................. 88

Figure 9. Prevalence of glands with intramammary infection (IMI) post-calving (%) by day at sampling.............................................................. 111

Figure 10. Raw gland level prevalence of post-calving intramammary infection (IMI, %) (dotted) and relative risks (RR) of post-calving IMI calculated from the final model (solid line), by body condition score day 0-5 post-calving ........................................... 112

Figure 11. Incidence of new intramammary infection (IMI) (%) of any pathogen by minimum teat height for all glands, with a linear trend line fitted through the raw data.............................................................. 113

Figure 12. Raw gland level incidence of clinical mastitis (%) occurring within the first 14 days after calving that cultured any pathogen by treatment group (infusion of
all glands with teat sealant (grey) or untreated glands (white)), blocked by the pre-calving IMI status for each gland.

Figure 13. Predicted somatic cell counts (SCC) from the final model in heifers throughout lactation following treatment approximately 39 days pre-calving with infusion of teat sealant in all four quarters within heifers ( ) or no treatment with teat sealant ( ).
Table of Tables

Table 1 From (Barkema et al 1997). Variance components and intraclass correlation (ICC) for infected quarters within cow and within herd. ICC > 0.2 is considered large enough to require analysis to account for clustering of the data. .............................................. 43

Table 2 Number of herds (n=250) in which potential risk factors (variables) for clinical mastitis in each level for the categorical variables, the bivariate odds ratio (OR) and bivariate probability (P) that that variable was associated with the proportion of heifers in a herd with clinical mastitis. .......................................................... 62

Table 3 Descriptions (mean, standard deviation (Std Dev), minimum (min), maximum (max) and number of herds (n)), bivariate odds ratio (OR) and bivariate probability (p) for potential risk factors that were continuous variables for the proportion of heifers with clinical mastitis. .......................................................... 64

Table 4 Odds ratios (OR) and 95% confidence intervals (CI) with probability values (p) calculated from the multivariate final model for the outcome variable proportion of heifers with clinical mastitis in a herd. .......................................................... 65

Table 5 Count (n) and percentage (%) of glands with intramammary infection (IMI) on average 31 days before the start of a seasonal calving period pre-calving for glands, which were sampled with no further treatment (S) or sampled and then infused with a teat sealant (TS+S). ........................................................................... 81

Table 6 Count (n) and percentage (%) of glands with intramammary infection (IMI) within 4 days after calving for glands within heifers not sampled or treated (C), infused with a teat sealant (TS) pre-calving, sampled only pre-calving (S) or sampled and infused with a teat sealant pre-calving (S+TS). ........................................................................... 82

Table 7 Count (n) and percentage (%) of bacteriological glands within all clinical mastitis glands from heifers diagnosed from 3 days before to 14 days post-calving, from glands treated approximately 31 days before the start of a seasonal calving
programme with nothing (C), infused with a teat sealant (TS) pre-calving, sampled only (S) or sampled and infused with a teat sealant (S+TS).

Table 8 Relative risks (RR) from the multivariate analyses and 95% confidence intervals (CI) with probability values (P) calculated from the final logistic regression models for the dependent variables. Models 1-5 include pre-calving bacteriology status (n=503) as a variable in the model, models 6-10 do not (n=1006). Herd is included in all models as a fixed effect. Days from calving to sampling were included as a categorical variable in all post-calving IMI models (models 1-3, 6-8) and days calved relative to the group median calving date in the clinical mastitis models (models 4-5, 9-10).

Table 9 Crude relative risks (RR) with 95% confidence intervals (CI) and probability values (P) for the outcome post-calving intramammary infection (IMI), in the presence or absence of a pre-calving IMI with coagulase-negative staphylococcus (cns).

Table 10. Number and percentage (within treatment group) of bacterial species isolated from the mammary gland secretion collected on average 39 days before calving from 4164 glands from heifers subsequently treated with injectable tylosin (5g for 3 days at 24 hourly intervals), or infused with an intramammary teat sealant into all 4 glands (teat sealant), or treated with injectable tylosin (5g for 3 days at 24 hourly intervals) and infused with an intramammary teat sealant into all 4 glands (teat sealant and tylosin) or nothing (control).

Table 11. Number and percentages (within treatment group) of bacterial species isolates from the glands sampled by 0 and 5 days after calving (n=4164 glands) from heifers subsequently treated with injectable tylosin (5g for 3 days at 24 hourly intervals), or infused with an intramammary teat sealant into all 4 glands (teat
sealant), or treated with injectable tylosin (5g for 3 days at 24 hourly intervals) and infused with an intramammary teat sealant into all 4 glands (teat sealant and tylosin) or nothing (control) ........................................................................................................................................................................... 106

Table 12. Number and percentage of bacterial species isolated from glands diagnosed with clinical mastitis 14 days post-calving within treatment group from heifers subsequently treated with injectable tylosin (5g for 3 days at 24 hourly intervals), or infused with an intramammary teat sealant into all 4 glands (teat sealant), or treated with injectable tylosin (5g for 3 days at 24 hourly intervals) and infused with an intramammary teat sealant into all 4 glands (teat sealant and tylosin) or nothing (control). ........................................................................................................................................................................... 107

Table 13. Relative risk (RR) and 95% confidence intervals (CI) and probability values (P) of post-calving IMI for heifers treated with injectable tylosin (5g for 3 days at 24 hourly intervals) or infusion of an intramammary teat sealant into all 4 glands, approximately 39 days pre-calving ........................................................................................................................................................................... 108

Table 14. Relative Risk (RR) and 95% confidence intervals (CI) for new intramammary infection (IMI) with any pathogen between approximately 39 days pre-calving and 0-5 days post-calving in heifers treated with injectable tylosin (5g for 3 days at 24 hourly intervals) or infusion of an intramammary teat sealant into all 4 glands, approximately 35 days pre-calving ........................................................................................................................................................................... 109

Table 15. Relative risk (RR) and 95% confidence interval (CI) of glands being diagnosed with clinical mastitis up to 14 days post-calving from which bacterial pathogens were isolated in heifers treated with injectable tylosin (5g for 3 days at 24 hourly intervals) or infusion of an intramammary teat sealant into all 4 glands, approximately 39 days pre-calving ........................................................................................................................................................................... 110
Table 16. Number of heifers treated (n), calving date, breed, prevalence of intramammary infection (IMI) pre and post calving, cumulative incidence of clinical mastitis (%) in the first 2 weeks post-calving, milk solids production (fat + protein kg/cow/d) and geometric mean SCC at each of the herd tests for heifers treated with infusion of teat sealant into all 4 glands (Teat sealant), treatment with 3 X 5g of parenteral tylosin (Tylosin), both infusion of a teat sealant and tylosin treatment (Teat sealant and tylosin) or with nothing (Control) ~ 39 days before calving.

Table 17. Number of quarters (n) per heifer diagnosed with clinical mastitis and of those the number and percentage of quarters per heifer that isolated no bacteria for heifers treated with infusion of teat sealant into all 4 glands (Teat sealant), treatment with 3 X 5g of parenteral tylosin (Tylosin), both infusion of a teat sealant and tylosin treatment (Teat sealant and tylosin) or with nothing (Control) ~ 39 days before calving.

Table 18. Relative risk (RR) and 95% confidence intervals (CI) of post-calving intramammary infection (IMI) for heifers treated approximately 39 days pre-calving with nothing (Control; 243 heifers), infusion of teat sealant in all four quarters (teat sealant; 246 heifers) or injection of 5 g of tylosin on 3 occasions at 24 h intervals (tylosin; 246 heifers) or with both infusion of teat sealant in all four quarters and injection of 5 g of tylosin on 3 occasions at 24 h intervals (teat sealant and tylosin; 246 heifers) calculated from the multivariate analysis.

Table 19. Relative risk (RR) and 95% confidence intervals (CI) of clinical mastitis diagnosis for heifers treated approximately 39 days pre-calving with nothing (Control; 243 heifers), infusion of teat sealant in all four quarters (teat sealant; 246 heifers) or injection of 5 g of tylosin on 3 occasions at 24 h intervals (tylosin; 246 heifers) or with both infusion of teat sealant in all four quarters and injection of 5 g of
tylosin on 3 occasions at 24 h intervals (teat sealant and tylosin; 246 heifers) calculated from the multivariate analysis.

Table 20. Factors affected somatic cell counts (SCC) in heifers following treatment approximately 39 days pre-calving with nothing (Control; 243 heifers), infusion of teat sealant in all four quarters (teat sealant; 246 heifers) or injection of 5 g of tylosin on 3 occasions at 24 h intervals (tylosin; 246 heifers) or with both infusion of teat sealant in all four quarters and injection of 5 g of tylosin on 3 occasions at 24 h intervals (teat sealant and tylosin; 246 heifers) calculated from the multivariate analysis.