Epidemiology of Mastitis in Peripartum Dairy Heifers

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Abstract

An observational field study was conducted on 708 heifers in 30 spring-calving dairy herds in the Waikato region of New Zealand. The aim of the study was to describe patterns and determinants of intramammary infection (IMI) and clinical mastitis (CM) in the peripartum period. Mammary secretion samples for bacteriological testing were taken from all quarters approximately 3 weeks prior to the planned start of the calving period and within 5 days following calving, in addition to quarters diagnosed with CM within 14 days of calving. Pre-calving IMI was diagnosed in 18.5% of quarters, and of these coagulase negative staphylococci (CNS) were the predominant isolate (13.5% of quarters). Post-calving, *Streptococcus uberis* (*S. uberis*) prevalence increased four-fold to 10.0% of quarters. Prevalence of all pathogens decreased rapidly following calving. Clinical mastitis cases were predominantly associated with *S. uberis*. The hazard of diagnosis was higher in heifers than other parity groups combined and highest in the first 5 days of lactation. Intramammary infection was associated with an increased risk of removal from the herd and high somatic cell count (> 200 000 cells/ml) at subsequent herd tests, but neither CM nor IMI were associated with reduced milk yield or milk solids production. Multilevel logistic regression models in combination with path analysis were used to investigate postulated causal pathways between risk factors for CM and subclinical mastitis (SCM) post-calving. Significant risk factors for SCM were found to be pre-calving intramammary infection (IMI), low minimum teat height above the ground and poor udder hygiene post-calving. Significant risk factors for CM were pre-calving IMI, Friesian breed, low minimum teat height above the ground, udder oedema, and low post-calving non-esterified fatty acid serum concentration. Possible causal pathways for SCM and CM are discussed, and preventive measures against both environmental exposure and host factors recommended.

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Approval for this study was sought and gained from the Ruakura Animal Ethics Committee (Approval No. 13548)

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List of Abbreviations

BTMSCC = bulk tank milk somatic cell count

CNS = Coagulase negative staphylococcus species

CM = clinical mastitis

IMI = intramammary infection

ISCC = individual somatic cell count

SCM = subclinical mastitis

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