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The epidemiology of enzootic bovine leukosis in dairy cattle in New Zealand

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ABSTRACT

This thesis is a part of the research components associated with the National Enzootic Bovine Leukosis (EBL) Control Scheme in New Zealand. The objectives were to investigate the risk factors and temporal pattern of Bovine Leukaemia Virus (BLV) infection in dairy cattle. A case-control study was conducted using questionnaire information collected from 719 farms throughout New Zealand in 1996 and in 1997. A longitudinal study was conducted over the same period in 4 high BLV prevalence farms around Manawatu and Wairarapa regions. The results of the studies were:

(1) The presence of BLV infection was strongly related to management practices. Two predictors, namely large herd size and the purchase of stock from external sources, were strongly associated with the presence of BLV infection within herds. The number of years since farm establishment was also a risk factor which was most likely related to purchase patterns. Newly-established herds or large herds tend to buy stock from external sources and obtaining stock off-farm is likely to introduce infection. In addition, performing pregnancy testing late in the milking season and the absence of hygiene measures when undertaken mechanical dehorning of calves were significant risks which may explain within-herd transmission. The characteristics of managers from BLV-positive herds could be described as "progressive" since they were young, better educated and made used external advisers to assist with decision making.

(2) The presence of BLV infection can be diagnosed precisely by blood test using the ELISA technique. Vertical transmission may play an important role depending on the practice of calf rearing. New cases of BLV infection principally developed in animals within the first two years of age. Prevalence and cumulative incidence of disease are mainly influenced by the existing prevalence in the herd, rather than differences in management practices. The risk of seroconversion depends on herd management factors rather than factors relating to animals. Infected animals are likely to have higher production capacity but this may be due to the fact that these animals were retained in the herd because they were high producers. The factors that predict production capacity are BLV infection status, herd and interaction between herd and BLV status.

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As my period of postgraduate study comes to a close, I am reminded of the early days when I knew little of veterinary epidemiology, statistics and computing. These two years have made me achieve in what I have never expected and never realised in my potential.

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