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EPIDEMIOLOGY OF CANINE LEPTOSPIROSIS
IN NEW ZEALAND

A thesis presented in fulfilment of the requirements for the degree of
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I Abstract:

Leptospirosis is a disease of worldwide significance affecting dogs, livestock, and humans. It can be a severe clinical or subclinical disease, either of which contribute to shedding of leptospires in the environment. This work includes a detailed literature review of leptospirosis, the disease, and its prevention and epidemiology as it pertains to dogs worldwide and in New Zealand where the epidemiology is unique. Original work includes a nationwide sero-prevalence survey quantifying the risk of exposure for serovars Copenhageni, Hardjo and Pomona for New Zealand dogs. An additional survey of South Island farm dogs investigates the prevalence of exposure to and urinary shedding of leptospires in dogs exposed to livestock with a high prevalence of infection. This is the first study to investigate shedding of leptospires in dog urine in New Zealand, and challenges a long held perception that dogs may only serve as a maintenance host for serovar Canicola.

Conclusions:

Urinary shedding of *Leptospira* spp. was demonstrated in more than 12 (95% C.I.: 5-24) % of New Zealand farm dogs. It is speculated that these dogs may be serving as maintenance hosts for a number of serovars in addition to Canicola, and may contribute to the maintenance of this disease in a farm environment, and affected dogs may be a zoonotic risk. Urinary shedding of leptospires can occur in dogs with low or negative MAT titres. Exposure to serovar Copenhageni is common for New Zealand dogs, and farm working dogs appear to be at risk for exposure to serovar Hardjo. Serovar Pomona causes severe clinical disease in dogs in New Zealand. Veterinarians investigating clinical cases suspicious for leptospirosis should consider MAT testing for Pomona and Hardjo in addition to Copenhageni, and concurrent PCR testing on blood and/or urine may expedite a diagnosis. Completion of convalescent serology and culture of urine from suspected cases is strongly encouraged. There is a need for a vaccine to protect dogs at risk of infection with serovar Pomona, and consideration should be given to also including serovar Hardjo in the vaccine. Further work is needed to determine the prevalence and duration of urine shedding by dogs nationwide, with culture confirmation and identification of the serovars isolated.

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