

**CANINE ZONOSSES IN ABORIGINAL COMMUNITIES:
THE EFFECTS OF A CANINE BREEDING
AND PARASITE CONTROL PROGRAM
IN THE KIMBERLEY REGION,
WESTERN AUSTRALIA**

VOLUME 1

**This thesis is presented for the degree of Doctor of
Philosophy of Murdoch University**

by

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Dedicated to my parents,
Michelle, Dick and George.

I declare that this thesis is my own account of my research and contains as its main content work which has not previously been submitted for a degree at any tertiary education institution.

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ABSTRACT

The hypothesis central to this study is that the implementation of a canine breeding and parasite control program in Aboriginal communities results in a reduction in the reservoir of zoonotic parasites within communities. The effect of the parasite and breeding control program on the health status of dogs as well as the population characteristics of dogs in communities was also investigated.

The study was conducted in 17 Aboriginal communities of the Kimberley region of Western Australia, divided into three regions according to cultural and geographical attributes. All dogs from each community were permanently identified using a microchip system. Owners of dogs were asked the usual location of their animals, the origins of their dogs and the whereabouts of any missing animals at subsequent visits. Every three months dogs were treated with 200µg/kg ivermectin (a potent endo- and ecto-parasiticide) subcutaneously and adult female dogs were treated with an injectable contraceptive (10-30mg/kg proligestone) at the request of their owners. At the time of treatment, dogs were assessed for ecto-parasites and photographs taken for later comparison and diagnosis of alopecic skin conditions. Faecal and blood samples were collected every three to six months and skin scrapings were collected from dogs that were refractory to treatment. The samples were used to determine internal parasite prevalence (using formal ethyl acetate sedimentation), blood parameters (for anaemia status) and evidence of scabies or *Demodex* infestation.

A pilot study at one group of communities, involving weekly assessment of dogs after one ivermectin treatment, showed that the treatment was effective in reducing the prevalence of scabies (as determined by clinical evaluation), hookworm and ticks. The treatment resulted in improvement in animal health as evidenced by a reduction in the number of dogs with anaemia.

The long-term use of the ivermectin treatments at the other communities showed that over a period of three years, the prevalence of scabies and hookworm had reduced at most areas. The

initial scabies prevalence varied from 17 to 52% and reduced to below 10% for all communities. The hookworm infection rates were affected by seasonal factors, as was evidenced by a seasonal variance in prevalence. Animals that were treated with ivermectin, though, had lower prevalences of hookworm than those that were not.

There was a reasonable compliance rate for contraceptive treatments for female dogs (greater than 60% at each visit) and fewer puppies were born within communities when compared with rates before and after the establishment of the treatment program. High rates of acquisition of puppies from other communities continued to maintain the dog population numbers despite the reduction in breeding within communities.

The dog population was young, biased towards male dogs, and very unstable (almost 50% of dogs died or went missing in a one year period). The rate of dog ownership across the Kimberley varied according to the region investigated and always remained higher or equal to ownership rates at the town centres of the Kimberley Region (as determined by a survey conducted during the study).

Overall the canine parasite and breeding control program resulted in a reduction in scabies and hookworm prevalence in dogs (and hence a reduction in the potential zoonotic transmission), a reduction in dog breeding within communities, an improvement in dog health, and an understanding in the dynamics and health status of dogs within communities.

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