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Prevalence of selected infectious diseases in Samoan dogs

A thesis presented in partial fulfilment of the requirements for the degree of

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Abstract

Samoa has a tropical island climate ideally suited to many infectious diseases, and vectors for some infectious diseases are known to be present. Dogs are very commonly owned in Samoa with 88% of households owning an average of two dogs. Many canine infectious diseases are zoonotic and there is limited preventative medicine available for dogs in Samoa. There are very few studies into the presence of zoonotic pathogens in Samoa or other South Pacific islands, and the role of dogs as a reservoir for zoonotic diseases is unknown.

The prevalence of selected infectious diseases was evaluated in 242 dogs undergoing surgical sterilisation in Samoa in July 2010 and August 2011. Data were obtained from dogs’ owners by interview, including age, environment and any previous preventative medication. Serum and faecal samples were collected, and the skin examined for external parasites. Seroprevalence of Leishmania infantum, Anaplasma phagocytophilum, Ehrlichia canis, Borrelia burgdorferi and Dirofilaria immitis were assessed using point of care qualitative ELISA assays. Faecal flotation was performed on fresh faecal samples to screen for intestinal parasites. Ninety-three faecal samples were also tested for Giardia and Cryptosporidium spp.

The median age of dogs was one year, with a range of four months to eight years and 73.3% were male. The vast majority of dogs were owned, the remaining were stray animals. Prevalence of D. immitis was 46.8% and A. phagocytophilum seroprevalence was 8.4%. All serum samples tested negative for E. canis, B. burgdorferi and L. infantum. Prevalence of hookworm was 92.6%. Trichuris vulpis, Dipylidium caninum, Toxocara canis and Capillaria spp. were also detected. Prevalence of Giardia spp. was 29.0% while no Cryptosporidium was detected. Fleas were found on 83.7% of the dogs, ticks on 42.1% and lice on 8.1%. Identified ticks were Rhipicephalus sanguineus, with no Ixodes spp. found.

The results indicate a very high prevalence of hookworm, D. immitis, and external parasites in Samoan dogs. This study provides valuable information on canine health and suggests dogs could play a role in the spread of some zoonoses in Samoa. Further studies are required to review the public health implications of this study.
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This study design was approved by the Massey University Animal Ethics Committee.
# Table of contents

Abstract ........................................................................................................................................... ii  
Acknowledgements ........................................................................................................................ iii  
Table of contents ............................................................................................................................ iv  
List of figures and tables .................................................................................................................. vi  
Abbreviations ................................................................................................................................. ix  

## Chapter 1 Introduction and aims ................................................................................................ 1  

## Chapter 2 Literature review ........................................................................................................ 3  
  2.1 Samoa: Location, climate and demographics ..................................................................... 3  
  2.2 Canine health, husbandry and disease in Samoa ............................................................. 5  
    2.2.1 Dogs and public attitudes to dogs in Samoa ............................................................ 5  
    2.2.2 Canine disease and health in Samoa and the Pacific ............................................. 7  
  2.3 Intestinal parasites .................................................................................................................. 8  
    2.3.1 Canine hookworm ..................................................................................................... 8  
    2.3.2 Other intestinal parasitic helminths ....................................................................... 14  
    2.3.3 Enteric protozoa: *Giardia duodenalis* ................................................................ 17  
    2.3.4 Enteric protozoa: *Cryptosporidium* spp ................................................................ 22  
  2.4 Ectoparasites: Tick, fleas and lice ......................................................................................... 25  
  2.5 Vector-borne diseases .......................................................................................................... 27  
    2.5.1 *Dirofilaria immitis*: Canine heartworm .................................................................. 27  
    2.5.2 *Ehrlichia canis* ....................................................................................................... 34  
    2.5.3 *Anaplasma phagocytophilum* ............................................................................. 40  
    2.5.4 *Anaplasma platys* .................................................................................................... 47  
    2.5.5 *Borrelia burgdorferi* ............................................................................................. 50  
    2.5.6 *Leishmania infantum* ............................................................................................... 56  

## Chapter 3 Materials and methods .............................................................................................. 64  
  3.1 Sample population ................................................................................................................. 64  
  3.2 Sample collection .................................................................................................................... 64  
  3.3 Serologic testing ...................................................................................................................... 65  
  3.4 Faecal flotation ......................................................................................................................... 66  
  3.5 Detection of *Cryptosporidium* and *Giardia* by direct IFA coproscopy ...................... 67  
  3.6 Statistical analysis .................................................................................................................. 67
<table>
<thead>
<tr>
<th>Chapter</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>General results</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>4.1 Geographical distribution of samples</td>
<td>68</td>
</tr>
<tr>
<td></td>
<td>4.2 Questionnaire results</td>
<td>68</td>
</tr>
<tr>
<td>5</td>
<td>Prevalence of selected external and intestinal parasites in Samoan dogs</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>5.1 Results</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>5.1.1 Faecal examination results</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>5.1.2 Skin examination results</td>
<td>74</td>
</tr>
<tr>
<td></td>
<td>5.2 Discussion</td>
<td>75</td>
</tr>
<tr>
<td>6</td>
<td>Prevalence of selected vector-borne diseases in Samoan dogs</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>6.1 Results</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>6.1.1 Descriptive results</td>
<td>83</td>
</tr>
<tr>
<td></td>
<td>6.1.2 Association between prevalence of canine heartworm and age and area</td>
<td>85</td>
</tr>
<tr>
<td></td>
<td>6.1.3 Association between seroprevalence of Anaplasma spp. and area</td>
<td>87</td>
</tr>
<tr>
<td></td>
<td>6.2 Discussion</td>
<td>88</td>
</tr>
<tr>
<td>7</td>
<td>General discussion</td>
<td>95</td>
</tr>
<tr>
<td>References</td>
<td></td>
<td>99</td>
</tr>
<tr>
<td>Appendix 1:</td>
<td>Questionnaire completed by the owner of the dog</td>
<td>122</td>
</tr>
</tbody>
</table>
List of figures and tables

Fig 2.1 Map of Samoa ........................................................................................................ 3
Fig 2.2 The geographical regions used in the 2011 Samoa census: Apia Urban Area, North West Upolu, Rest of Upolu and Savai’i ......................... 4
Fig 2.3 A selection of Samoan dogs .................................................................................. 6
Tab 2.1 Results of a study investigating selected canine infectious diseases (Martin, 1999) .................................................................................................................. 7
Fig 2.4 Life cycle of canine hookworm ........................................................................... 11
Fig 2.5 Hookworm egg (x400) ....................................................................................... 12
Fig 2.6 Life cycle of Toxocara canis .............................................................................. 15
Tab 2.2 Assemblages and host range of isolates of Giardia duodenalis .............. 18
Fig 2.7 Life cycle of Dirofilaria immitis ...................................................................... 30
Tab 2.3 Summary of clinical signs of canine heartworm disease ......................... 31
Fig 2.8 Approximate worldwide geographic distribution of four Ixodes spp. tick vectors of Anaplasma phagocytophilum and their overlapping regions ...... 41
Fig 2.9 The lifecycle of Ixodes scapularis ................................................................... 51
Fig 2.10 Map of the global distribution of canine leishmaniasis due to Leishmania infantum and human visceral leishmaniasis .................................................. 56
Fig 2.11 Life cycle of Leishmania infantum ................................................................. 59
Fig 4.1 Map of Samoa marking the villages from which the 242 dogs sampled to study selected infectious diseases originated. The number of dogs sampled from each area is denoted by numbers in parentheses ................................. 68
Fig 4.2 Map of the Apia urban area marking the villages from which dogs sampled to study infectious diseases originated. The number of dogs sampled from each area is denoted by the number in parentheses ................................. 69
Tab 4.1 The household location of 242 dogs sampled to study selected infectious diseases compared to Samoan household distribution from the 2011 Samoa census (Reupena, 2012b) and the household location of 327 respondents to a questionnaire concerning attitudes to dogs in Samoa (Farnworth et al., 2012) .................................................................................................................. 69
Tab 4.2 The demographics and tests performed on 242 dogs in the study of selected infectious disease of dogs in Samoa. The number (n) and percentage (%) of dogs sampled for each variable of interest are provided ........................................... 71

Tab 5.1 Faecal examination data from the study of 242 dogs in Samoa sampled for selected infectious diseases. The number of positives/total tested (n), prevalence and 95% confidence intervals for faecal examination results are provided ........................................................................................................... 73

Fig 5.1 Prevalence of intestinal parasites in faecal examination from 242 dogs from Samoa ........................................................................................................... 73

Tab 5.2 Skin examination data from the study of 242 dogs in Samoa sampled for selected infectious diseases. Number of positives/total tested (n), prevalence and 95% confidence intervals for external parasites detected on skin examination are provided ........................................................................................................... 74

Fig 5.2 Prevalence of external parasites on 221 dogs from Samoa ......................................................................................................................... 74

Tab 5.3 Number of positives/total tested (n), prevalence and 95% confidence intervals for *Rhipicephalus sanguineus* infestations of dogs for each area. Data from the study of 242 dogs in Samoa sampled for selected infectious diseases ........................................................................................................... 75

Tab 6.1 Number (N) and percentage (%) of 237 dogs sampled in the study of selected infectious disease of dogs in Samoa for each variable of interest, and number and percentage (%) of samples with a positive ELISA test result for heartworm antigen and *Anaplasma* antibody for each variable .................. 84

Fig 6.1 The seroprevalence of selected vector borne diseases by ELISA in 237 Samoan dogs. *Dirofilaria immitis* (Di), *Anaplasma* (Ap), *Borrelia burgdorferi* (Bb), *Ehrlichia canis* (Ec) and *Leishmania infantum* (Li) ........................................................................... 84

Tab 6.2 Number of positives/total tested (n), prevalence and 95% confidence intervals for 237 Samoan dogs with positive heartworm antigen tests within the four age categories ........................................................................................................... 85

Fig 6.2 The seroprevalence of heartworm antigen in 237 Samoan dogs by age with 95% error bars ........................................................................................................... 85

Tab 6.3 Number of positives/total tested (n), prevalence and 95% confidence intervals for 237 Samoan dogs with positive heartworm antigen tests within three Samoan geographical areas ......................................................................................... 86
Fig 6.3  The prevalence of heartworm in 237 dogs in three main areas of Samoa with 95% error bars ................................................................. 86

Fig 6.4  The prevalence of heartworm in 237 dogs in three main areas of Samoa, divided into age groups ................................................................. 87

Tab 6.4  Number of positives/total tested (n), prevalence and 95% confidence intervals for 237 Samoan dogs with positive *Anaplasma* ELISA tests within three Samoan geographical areas ...................................................... 88
List of abbreviations

The following abbreviations are used within the main text and are defined in full when first used.

AHS  American Heartworm Society
AIDS  Acquired immune deficiency syndrome
APS  Animal Protection Society of Samoa
BVSc  Bachelor of Veterinary Science
CGA  Canine granulocytotrophic anaplasmosis
CLM  Cutaneous larva migrans
CME  Canine monocytotropic ehrlichiosis
ELISA  Enzyme-linked immunosorbent assay
HDU  Heartworm development units
HGA  Human granulocytic anaplasmosis
HrCLM  Hookworm-related cutaneous larva migrans
ICAM  International Companion Animal Management Coalition
IFA  Immunofluorescent antibody
L1  Stage 1 larvae
L2  Stage 2 larvae
L3  Stage 3 larvae
L4  Stage 4 larvae
OLM  Ocular larva migrans
PCR  Polymerase chain reaction
PCR-RFLP  Polymerase chain reaction-restriction fragment length polymorphism
VLM  Visceral larva migrans
WB  Western immunoblotting
ZSCT  Zinc sulphate centrifugation test