The Massey University Working Dog Centre (MU-WDC), which began operation in 2008, has as its mission:

- to be a world leader in advancing working dog health and welfare
- to better the health and working life of service and working dogs in New Zealand
- to facilitate scientific investigation and enquiry through grant funding

The key stakeholders are the New Zealand Farming Sector, the New Zealand Police and Defence Forces, the Blind Foundation and numerous other agencies that use dogs in the workplace or to provide assistance to people. The Centre’s activities contribute to the health and welfare of New Zealand’s service and working dogs, which in turn assists our farmers, our community and the wider public.

Working Dog Centre – a brief history

The Massey University Veterinary Teaching Hospital treats a large number of working farm dogs and service dogs each year, including Police, Defence, Guide, MPI, Customs, Assistance, Aviation Security dogs. The WDC was conceived by Andrew Worth, Nick Cave and Kate Hill back in 2006, as a way for colleagues at the MUVTH to collaborate on projects that would benefit working dogs and their owners. Seed money was generously provided by IVABS, the Sheep and Beef Cattle Vets special interest branch (NZVA) and the Wairarapa Veterinary Association. In 2008 the Centre for Service and Working Dog Health (now rebranded as the Working Dog Centre) became a recognised research entity within Massey University and began contributing to veterinary education through scientific publication and conferencing. On his return from Dublin to NZ in 2008, Boyd Jones became the inaugural chairman of our board and garnered support from the veterinary industry in the form of corporate sponsorship. We are very pleased to announce that as of 2015, Vet Ent is our new principle sponsor. Our corporate sponsors are Hill’s Pet Nutrition NZ Ltd, Landcorp NZ Inc and Merial Ancare NZ Ltd.

We are now a successful funding provider for research on working and service dogs. The majority of our grants have been to Massey University based projects or practice/Massey collaborative projects. Each application is assessed on its merits with consideration for alignment with the WDC’s mission, robustness of design and likelihood of a publication.

In 2014 the MU-WDC granted $50,000 of funding towards research into working and service dog health. A total of seven applications were received of which five were funded. The projects were:
Current research projects - Massey Working Dog Centre

<table>
<thead>
<tr>
<th>Title</th>
<th>Study aims</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prospective, multi-centre investigation of the incidence of pro-dromal intra-condylar fissures as a risk factor for condylar fracture in working dogs.</td>
<td>To determine whether dogs presenting with fracture of one humeral condyle are affected by a concurrent fissure in the contra-lateral condyle. This may allow detection of potential fractures.</td>
</tr>
<tr>
<td>Development of a WDC-website data entry portal to capture case details for traumatic injuries in farm dogs in NZ.</td>
<td>To develop a web-based portal to capture data for prospective research into traumatic injury in NZ farm dogs. Multi-practice model within NZ.</td>
</tr>
<tr>
<td>Investigation of an unexplained myopathy in working and hunting dogs – so-called ‘Pig-Dog Myopathy’.</td>
<td>To determine the epidemiology of the myopathy, describe the pathology, increase awareness, and investigate potential causes.</td>
</tr>
<tr>
<td>The prevalence of internal parasites and incidence of anthelmintic resistance in working farm dogs in the South Island of New Zealand</td>
<td>Determine the prevalence and risk factors for intestinal parasitism, and association with anthelmintic treatment.</td>
</tr>
<tr>
<td>Computer model of the canine lumbo-sacral spine for simulation studies</td>
<td>To develop a 3D mathematical model of the German Shepherd LS spine from CT images.</td>
</tr>
</tbody>
</table>

This presentation briefly reviews some of the current research projects being funded and some of the projects that have been recently published.

An investigation of selected diseases and aspects of husbandry of working dogs on sheep farms and sheep and beef farms in New Zealand in 2010


The aim of this research was to describe the demographics, and husbandry and management of Livestock Herding (LH) Dogs in the Manawatau-Wanganui region of New Zealand. A cross-sectional survey of farms was carried out between July 2008 and July 2009. This survey generated data for 119 farms, 198 LH Dog owners, 1,194 LH Dogs and 768 pups.

Farms in the Manawatau-Wanganui region were randomly selected from AgriBase™. One researcher visited each farm to conduct face-to-face interviews with the LH Dog owners. The information gathered during the interview pertained to the farm, to the husbandry and management of LH Dogs, and to the demographics of the LH Dogs that were currently on the farm or that had been on the farm over the previous 12 months. In addition information about adverse health events experienced by the LH Dogs in the 12 months prior to the survey was collected, but the analysis is not presented in this thesis.

Of the 1,194 LH Dogs enrolled in the study, five hundred and seventy-two LH Dogs were New Zealand Huntaways and 415 were New Zealand Heading dogs. The median age of LH Dogs was four years (minimum = 0.50 years, maximum = 18.00 years). Of the 1,152 LH Dogs whose sex and neuter status was known 642 were entire males, 439 were entire females, 48 were neutered females, while 23 were neutered males. Of the 1,157 LH...
Dogs whose career stage was known 48 had not received any training, 87 had initiated training, 190 were partly trained, 698 were fully trained, 63 were semi-retired, and 71 were retired. Of the 1,173 LH Dogs whose life stage was known 918 were alive and on the farm at the time of the interview, 104 had been euthanised by the owner of the LH Dog, 42 had been sold, 38 had died, 37 had been given away and 34 had been euthanised by a veterinarian. One hundred and seven litters had been bred over the previous 12 months on 45 of the 119 farms producing a total of 768 pups. Four hundred and sixty-four pups had died of which 356 had been euthanised.

The median age at which training was initiated was known for 881 LH Dogs. This age was six months but this ranged from two to 84 months. Of the 1,180 LH Dog shelters reported on, 970 had been built by the farmer while 170 had been commercially acquired. An additional 40 LH Dogs were sheltered in ad hoc shelters such as farm sheds or vehicles. Two hundred and sixty-five LH Dog shelters had bedding within and 46 of these beddings had been changed over the previous 12 months. Eight hundred and fourteen of the 1,180 LH Dogs whose shelter description was obtained had their food placed on the floor of the shelter or run, while 363 had their food placed in a container. Twenty-four LH Dogs did not have access to water from the confines of their shelter. One hundred and seventy-seven LH Dog owners had fed their LH Dogs commercial dry food over the previous 12 months, and eleven had fed raw sheep offal. Two hundred and nine LH Dogs were fed less than once per day, 994 had been given anthelmintic drugs, 211 had been vaccinated, and 109 had been given a flea control treatment over the previous 12 months.

**Leptospirosis in working dogs**

**Cave NJ, Harland AL, Allott SK.** The serological response of working farm dogs to a vaccine containing *Leptospira interrogans* serovars Copenhageni and Pomona, and *L. borgpetersenii* serovar Hardjo. DOI:10.1080/00480169.2013.845072

Aims: To evaluate the serological response in dogs to a commercial vaccine for use in cattle containing cultured strains of *Leptospira interrogans* serovars Copenhageni and Pomona, and *L. borgpetersenii* serovar Hardjo.

Methods: Blood samples were obtained from 67 working farm dogs on 12 farms, and the microscopic agglutination test (MAT) was used to measure titres to the Leptospira spp. serovars Pomona, Hardjo, and Copenhageni. Samples with a titre of <1:25 were defined as seronegative. Dogs that were seronegative to both Pomona and Hardjo (n=33) were randomised to either the vaccination (n=20) or control (n=13) groups. Seven of these dogs were seropositive to Copenhageni. Vaccinated dogs were given the three-component vaccine subcutaneously on two occasions, four weeks apart. MAT titres were measured again in both groups two weeks after the second vaccination.

Results: Of the vaccinated dogs, 20/20 (100%) developed titres to serovar Pomona, with 16/20 (80%) having titres >100; for serovar Hardjo, 19/20 (95%) dogs had titres, with 18/20 (90%) being >100; and for serovar Copenhageni, 15/17 (88%) dogs that were initially seronegative had titres, with 6/17 (35%) being >100. The median titres for Pomona and Hardjo (200 (95% CI=179–359) and 200 (95% CI=176–379), respectively) were higher than for Copenhageni (50 (95% CI=26–124)) in dogs originally seronegative (p<0.001). There was no association between titres to the different serovars. Of the 13 unvaccinated dogs, two developed titres to serovar Pomona, and three to Hardjo. All titres were <100.
Conclusions: The tested vaccine was effective in raising antibodies to the three serovars, although the titres do not guarantee protection. Clinical Relevance: There has been a recent increase in cases of leptospirosis attributed to the serovar Pomona in dogs in New Zealand, but the vaccines licensed for use in dogs in New Zealand for the prevention of leptospirosis only protect against Copenhageni/Icterohaemorrhagiae. The vaccine tested in this study produced titres to Pomona and Hardjo that suggest the vaccine could be useful for reducing disease caused by these serovars in working dogs in New Zealand.


Aim: To investigate the prevalence of titres to four endemic leptospiral serovars in dog sera from the lower half of the North Island and the South Island of New Zealand submitted to diagnostic laboratories, and to explore the association between the prevalence of seropositive samples to leptospirosis and breed group, age group and sex.

Methods: Serum samples from 655 dogs residing in the central and lower North Island and from the South Island of New Zealand were sourced from the Massey University Veterinary Teaching Hospital and from submissions to New Zealand Veterinary Pathology in 2005. They were screened by the Microscopic Agglutination Test (MAT) against Leptospira interrogans serovars Copenhageni and Pomona and L. borgpetersenii serovars Hardjo and Ballum. Titres greater or equal to 96 were considered positive. Variables investigated for their association with the prevalence of seropositive samples to leptospirosis included serovar, breed, North vs. South Island, age and sex.

Results: Positive MAT titres to Leptospira interrogans serovar Copenhageni were found in 10.3% of dogs (95% CI=8.112.9), and were more common than positive titres to other leptospiral serovars. Small breeds did not have a lower prevalence of Copenhageni titres than other breeds. Positive titres to Leptospira borgpetersenii serovar Hardjo were associated with breeds of dogs used as farm working dogs. There was no significant difference in the prevalence of positive leptospiral titres between dogs from the North or South Islands. Dogs greater than 12 years of age were less likely to have positive titres to Leptospira than younger dogs. No association was found between positive titres and sex.

Conclusions: Breeds of dogs used as farm working were at greater risk of exposure to Leptospira borgpetersenii serovar Hardjo. Small breeds did not have a lower risk of seropositivity to Copenhageni than farm working breeds. Further study should be undertaken to confirm the prevalence of positive titres to leptospirosis in farm dogs and dogs resident in the South Island.

Clinical relevance: The risk of dogs being exposed to Leptospira interrogans serovar Copenhageni, and requirement for vaccination against serovar Copenhageni, cannot be determined by geographical location or breed group. Vaccination against Leptospira borgpetersenii serovar Hardjo is likely to be beneficial in working dogs.
Canine Infectious Respiratory Disease (CIRD) in working dogs in New Zealand

Canine Infectious Respiratory Disease (CIRD) is a multi-aetiological condition that especially affects intensively housed dogs. Pathogens that have been confirmed to cause CIRD world-wide include several bacteria (*Bordetella bronchiseptica*, *Streptococcus zooepidemicus* and *Mycoplasma* spp.), and viruses (CPiV, CAV2, CHV, CDV, Canine influenza virus (CIV), and Canine respiratory coronavirus (CRCoV)). Although vaccination is widely used, it is not uncommon for vaccinated dogs to develop clinical signs of CIRD. *S. zooepidemicus*, CIV, CRCoV have been considered ‘emerging’ canine pathogens in CIRD over several years in other countries.

Working dogs are commonly affected by respiratory disease outbreaks in New Zealand and research on the aetiology of CIRD in this country has been very limited to date. One retrospective study was performed investigating the seroprevalence of CIV and CRCoV in 251 serum samples from dogs in New Zealand. A seroprevalence of 29% and 0% was detected for CRCoV and CIV respectively. These findings confirmed that CRCoV is present in New Zealand, however its role in signs of respiratory disease in the dogs could not be confirmed due to the retrospective study design and the heterogeneity of the sample population (Knesl et al. 2009). CRCoV has been associated with milder respiratory signs but high morbidity in kenneled dogs abroad. The most concerning ‘emerging’ pathogens associated with CIRD include *S. zooepidemicus* and CIV. Both organisms have been shown to be highly contagious and may result in potentially fatal haemorrhagic pneumonia (HP). Research conducted over 2010–2011 in New Zealand confirmed *S. zooepidemicus* and *S. equismilis* isolation from oropharyngeal swabs in a number of working dogs without clinical signs in New Zealand. In addition, *S. zooepidemicus* has been isolated from upper and lower respiratory tract samples collected from referral medicine cases at the MUVTH. Especially Lancefield C Streptococci (*S. zooepidemicus*, *S. equismilis* and *S. equi*) may be important in working dogs as horses and farm animals may act as a reservoir for infection.

Vaccination for CIV and CRCoV is currently not recommended in New Zealand, but is available and has been recommended in intensively housed dogs in the US and UK.

The aims of this study include establishing the prevalence of infection with *B. bronchiseptica*, *S. zooepidemicus*, *Mycoplasma* spp., CIV and CRCoV in 100 working dogs with and without clinical signs of CIRD (number of dogs with clinical depending on the number of clinical cases that occur during the research period 2012–2013; Working farm dogs, Police dogs and Guide dogs will be included). In addition the study will investigate the prevalence of β-haemolytic Streptococci in the dogs and the prevalence of exposure to CIV and CRCoV by serology.
A non-invasive technique to measure energy expenditure in working dogs

The largest research grant to date was awarded in 2013 to researchers at Massey University, headed by Nick Cave, for a project entitled 'Defining the work type and energy expenditure of working New Zealand Police Dogs'. Nick is a specialist in Small Animal Nutrition with a PhD from Davis, California and one of the WDC’s directors. Physical fitness is very relevant to working dogs but at the same time is poorly defined. The physical requirements for a heading dog on a high country farm in the South Island are very different to those of a guide dog assisting an elderly person in the suburbs. Yet both are ‘working dogs’. Police dogs engage in a variety of activities, for which, ‘physical fitness’ is essential to maximise work-related performance, minimise injury and maximise working longevity. Organisations that use working dogs often want to test or quantify ‘fitness’. At present, there is no validated standardised test of fitness in any working dog type. Similarly the exact energetic and athletic demands of working New Zealand Police dogs have not been measured, and before fitness can be defined for New Zealand Police dogs, and before optimal testing and training regimes can be designed, it is essential that the planned physical activity is well described. Nick’s research aims to quantify and qualify the athletic demands of New Zealand Police dogs during their work. Activity will be measured using a combination of triaxial accelerometry (Hayrex) and GPS tracking, both attached to the dog’s collar. Energy expenditure will be measured using the doubly-labelled water technique, which measures the loss from the body of specific water isotopes over time, which are lost in proportion to energy expenditure.

Once it is known what type of athletic work these dogs are subjected to it will be possible to design appropriate testing and training regimes to improve performance, reduce injury and better distinguish between healthy unfit dogs and dogs that are truly diseased.