Honours Research Projects

Current Honours research projects available in the School of Veterinary Science

The Bachelor of Science (Honours) program is available to any student who holds a science-based Bachelor degree. This includes students who have a BVSc (Hons) degree, as long as the proposed field of research has not been assessed in their previous study.

For more information: **https://veterinary-science.uq.edu.au/study/honours**

Program enquiries can be directed to;

1. Bachelor of Science (Honours)Gatton, in Animal and Veterinary Bioscience
   http://www.uq.edu.au/study/program.html?acad_prog=2354
   Contact: Dr Frances Shapter f.shapter@uq.edu.au

2. Bachelor of VeterinaryTechnology (Honours), this is a clinical placement with a minor research project specifically for BVetTech graduates
   http://www.uq.edu.au/study/program.html?acad__prog=2422
   Contact: Associate Professor Ben Wood b.j.wood@uq.edu.au

3. The UQ School of Veterinary Science administration team vetenquiries@uq.edu.au

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Open projects

Exploring Spatial Dynamics of Short-Beaked Echidnas in SEQ QLD

Short-beaked echidnas, unique egg-laying mammals, offer a fascinating subject due to the limited robust information available on their distribution and abundance. By utilizing GIS techniques, this project aims to uncover valuable insights into the spatial dynamics of echidna populations using data sourced from the Wildlife Preservation Society of Queensland's Echidna Watch program. This opportunity is ideal for a student with an interest in or willingness to learn Geographic Information Systems (GIS) for spatial mapping of sightings, revealing spatial and temporal patterns within nine years' worth of data.

Contact: Dr Kate Dutton-register, k.duttonregester@uq.edu.au

Assessing the impact of a targeted free desexing program for cats on shelter intake and euthanasia rates – a pilot study.

In Australia, shelters and pounds report significantly higher euthanasia rates for stray cats (33%) compared to dogs (8%). Our study aims to evaluate the efficacy of a targeted cat desexing program, the Community Cat Program, in reducing the numbers of cats impounded by the City of Ipswich and surrendered to the RSPCA and Animal Welfare League shelters.

Initial data from the pilot site indicates a substantial decrease in cat intake and euthanasia, suggesting the potential of such programs to address the overpopulation and welfare concerns of stray cats in urban areas. The research project is being conducted at the RSPCA QLD Wacol Animal Hospital and it is collaborative research between The University of Queensland and the Australian Pet Welfare Foundation.

Contact: Dr Kate Dutton-register, k.duttonregester@uq.edu.au

Documenting the movement of free roaming restricted matter cats

This research project focuses on tracking the movements of free-roaming restricted matter cats. Stray cats brought into the RSPCA will undergo desexing and have a tracking collar placed around their neck before being returned to their original location. The study aims to analyse the activity and roaming behaviour of these cats to deepen our understanding of stray cat behaviour and the potential risk they pose to wildlife predation in specific target suburbs. The study will span a year, during which data will be collected continuously.
Simultaneously, a complementary study will deploy and retrieve images of wildlife in the target areas. The overarching goal is to develop more effective methods for managing stray cat populations than those currently in place. The research project is being conducted at the RSPCA QLD Wacol Animal Hospital and it is collaborative research between The University of Queensland and the Australian Pet Welfare Foundation.
Contact: Dr Kate Dutton-register, k.duttonregester@uq.edu.au

Honours projects investigating risk factors and hospital admission rates for foodborne and enteric zoonoses.

Foodborne and enteric zoonoses are a major cause of human morbidity worldwide and a leading cause of gastroenteritis-associated hospitalisations in many high-income countries, including Australia. Some of these infections have an animal origin through consumption of contaminated food products.

Despite the recognised importance of non-typhoidal *Salmonella* (NTS) and shiga-toxigenic *E. coli* (STEC) infections, the risk factors for severe human illness remain poorly described at the population level. Similarly, the proportion of infected cases that develop severe illness is difficult to predict. Data on hospitalisations serves as a marker for illness severity and a variety of pathogen-specific hospitalisation frequencies are reported in the published literature, yet the reasons for this variability are ambiguous. Variability in reported hospitalisation frequencies may stem from differences in patient risk factors between populations, virulence of the infecting pathogen, the surveillance systems used to collect data, and the epidemiological study type. A spectrum of symptomatology also exists amongst hospitalised cases, and susceptible patients may suffer from life-threatening complications. In 2022, UQ's Queensland Alliance for One Health Sciences have led systematic reviews and meta-analyses of 1) *Campylobacter*-associated hospitalisation rates and 2) risk factors for *Campylobacter*-associated hospitalisation. Using the methods developed during this previous work, the team aim to attract a highly motivated honours student to extend this investigation to include NTS- and STEC-associated hospitalisations.
Prospective honours students who are interested in zoonotic diseases are invited to approach the research team to discuss these projects further. Students will gain valuable skills in epidemiology, evidence-based research, systematic review and meta-analysis. This research will be completed within the Spatial Epidemiology Lab at UQ's School of Veterinary Science.
Please contact Assoc. Prof. Ricardo Soares Magalhães (r.magalhaes@uq.edu.au) or Thomas Callaghan (Thomas.callaghan@uqconnect.edu.au) for further information.

Time series analysis of canine tick paralysis cases

Tick paralysis resulting from bites from *Ixodes holocyclus* is a leading cause of emergency veterinary admissions. Information about periods of increased risk can help modulate behaviors that reduce exposures to ticks. This information can also improve awareness of owners for the need of lifesaving preventative ectoparasite treatment. Working with RSPCA data, this Honours project will apply time series models to canine and feline clinical records to identify factors associated with tick paralysis. This will help us learn more about why some years are worse for ticks than others. The project will also produce short-term forecasts of tick paralysis incidence that can be useful to clinicians. Interests in canine health and data analysis will be appreciated.

Working as part of a vibrant research team, students will benefit in the following ways: Script-based quantitative data analysis

Interacting with veterinarians to guide a joint research agenda

Contributing to the planning, writing and submission of peer-reviewed publication Data for this project are provided through a Data Sharing Agreement with RSPCA QLD. Contact: Dr Nicholas Clark; n.clark@uq.edu.au

Apoquel study

Canine allergic dermatitis is a complex pruritic (itchy) skin disease which is generally due to four main causes: flea, food allergies, contact and atopic dermatitis. Dogs with canine allergic dermatitis, regardless of the underlying cause, also present with bacterial and yeast skin infections which worsens pruritus or itch. Current treatments for canine allergic dermatitis include antimicrobial therapy, glucocorticoids, cyclosporin, antihistamines, bathing, lokivetmab and oclacitinib. Previous studies have indicated that dogs with allergic dermatitis have lower diversity of skin microbiota compared to healthy dogs and there is a higher abundance of *Staphylococcus* spp. Our recent case-control studies in referral and primary veterinary practices in Australia have demonstrated the sparing effect of oclacitinib on the prescription of antimicrobials. While these findings suggest a strong effect of oclacitinib on antimicrobial usage, the mechanisms through which such differences are enacted are largely unknown. It is suspected that oclacitinib may have further effects on the microbiome of the skin. This study will investigate the effects that commonly used veterinary therapies have on the skin microbiota of dogs with allergic dermatitis. The interested student will gain significant experience in study design, scientific data collection and clinical research as well as statistical treatment of that information and manuscript writing if time allows. The interested student will also gain significant exposure to the work of our GP clinicians and will learn a lot

about skin disease in dogs and their management. This project would therefore be particularly well suited to a BVetTech or BVetScience student. This project requires an individual who is highly motivated, hard-working and can be relied on for data collection and analysis. This project being based at the Small Animal Hospital at Gatton require a student who is local or someone who does not mind commuting to do the data collection. This project is already funded and has Ethic applications submitted with one already approved.

Contacts: If you are interested, please reach either Dr Justine Gibson (Gibson.j@uq.edu.au) or Dr Erika Meler (e.meler@uq.edu.au) to discuss further.

Current understanding and attitudes towards compassion fatigue and other mental health illnesses in SE Qld Veterinary Clinics

Charles Figley (1995) described compassion fatigue as equivalent to secondary traumatic stress, and defined compassion fatigue as the caregiver's reduced capacity or interest in being empathic or "bearing the suffering of clients;" and being "the natural consequent behaviours and emotions resulting from knowing about a traumatising event experienced or suffered by a person". There is a substantial body of evidence of occupational stress in personnel working in human health care and, toa lesser extent, in animal health care. Professionals who work with people or animals, particularly those who are suffering, must not only cope with the normal stress or dissatisfaction of work but also with their personal feelings and emotional response to that suffering.

Compassion fatigue in animal-related professions is most often considered to be a direct result of the impact of euthanasia. However, evidence to date suggests that negative feelings are also induced by other common occupational stressors such as client financial constraints, employee workload, long term care of patients with chronic diseases and, end of life care (Stamm, 1995; Figley, 1995; Figley& Roop, 2006; Rollin, 1987; Black et.al., 2011; Foster & Maples, 2011; Baran et.al., 2012). Compassion fatigue and the associated negative feelings can also be compounded by feelings of failing a patient, the client, or both (Joinson, 1992; Stamm, 1995; Figley, 1995; White & Shawhan, 1996; Arluke, 1991; Black et.al, 2011; Foster & Maples, 2011, Baran et.al., 2012). There is increasing dialogue on occupational stigma and the negative perception of various animal-related work tasks including broadly, the decision to euthanize, the use of animals in research and the global push towards the ideals of no-kill animal shelters (Rohlf & Bennett, 2005; Black et.al, 2011; Foster & Maples, 2011; Baranet.al., 2012; Davies & Lewis, 2010; Anderson et.al., 2013). This stigma may further compound the effects of occupational stress and compassion fatigue and lead to emotional dissonance and the potential for emotional contagion not only between those directly involved in these tasks but also to ancillary and support staff such as receptionists and other office workers (Rohlf & Bennett, 2005; Blacket.al, 2011; Foster & Maples, 2011; Baran et.al., 2012; Davies & Lewis, 2010; Anderson et.al., 2013).

Further to this, a study by Jones-Fairnie et.al. (2008) looked at the rate of suicide among veterinarians in two Australian States and reported that many older Australian veterinarians claim to know of at least one colleague who has committed suicide. The rate of suicide in paraprofessionals is also thought to be on the increase, however no research has been conducted to this end. These increases in suicide leads to the perception that veterinary professionals may be at considerable risk for suicide. Presently, however, there is no evidence that rates of suicide for Australian veterinarians differ markedly from that of the general population.

This study aims to gather information relating to veterinary personnel current understanding and attitudes towards compassion fatigue and other mental health illnesses in SE Qld Veterinary Clinics.

Contact: Dr Rebekah Scotney rebekah.scotney@uq.edu.au

Determining the feasibility of including 'mental health risk assessments' in animal ethics applications, research protocols and, teaching protocols that incorporate high risk tasks.

OH&S is a strong focus across all industries and occupations. Risk assessments are very important as they form an integral part of an occupational health and safety management plan. They help to create awareness of hazards and risk, identify who may be at risk (e.g., employees, cleaners, visitors, contractors, the public, etc.), determine whether a control program is required for a particular hazard, prevent injuries or illnesses, especially when done at the design or planning stage, prioritize hazards and control measures and, meet legal requirements where applicable.

Risk assessments comprise a major component in animal ethics applications, research protocols and teaching protocols. These specific situations or applications focus entirely on the physical risk of procedures, chemicals and interactions.

There is ever emerging literature (Scotney et.al., 2017) on the mental and emotional effects of those working in animal-related occupations and as such it is important to consider potential risk factors associated with 'high-risk' tasks in this area. By formally identifying high- risk tasks, it is then possible to put in place strategies and resources to aid in mitigating the effects of same.

The aim of this project is to determine the feasibility of including mental health risk assessments in animal ethics applications, animal research protocols and teaching protocols.

Contact: Dr Rebekah Scotney rebekah.scotney@uq.edu.au

The social and psychosocial construct of abattoir workers and the psychological effects of perceived dirty work.

There are limited studies which look at the mental well-being of those who work in abattoirs. Extant work regarding meatworkers has tended to focus on either the psychological well- being of workers (e.g., Dillard, 2008) or the potential health hazards for consumers, given food chain concerns (e.g., Nowak, Sammet, Klein, & Mueffling, 2006). Where attention has turned more toward the broader aspects of attitudes to animals within meat-working populations, the issues raised have been disturbing on both human and animal welfare fronts. In 2008, Dillard called for legal redress for "slaughterhouse workers" (commonly termed "meatworkers" in Australia/NZ) because of the psychological trauma caused by their daily experience of "large-scale violence and death" (p. 391) within an institutional culture that does little to reduce animal or human suffering (Richards et.al., 2013).

There are gaps in knowledge of the underpinning social and psychosocial construct of those who work in abattoirs. A better understanding of the prevalence of lowered mental wellbeing and psychological harm among abattoir workers needs to be achieved so as to bridge this gap and, to inform strategies and programs to aid mental wellbeing in those employed in abattoirs.

Contact: Dr Rebekah Scotney rebekah.scotney@uq.edu.au

Impact on carers of cat colonies that are subjected to differing methods of cat management– either carer-centred or enforcement centred management.

Approximately 3-9% of Australian adults care for cats they do not perceive they own. Some people care for six or more cats, which is then considered a cat colony. Most of these cats are unsterilized and free-roaming, which results in complaints to authorities about nuisance behaviours such as soiling and fighting, wildlife predation, and animal welfare concerns.
The dominant approach taken by local governments, known as enforcement-centred management, includes trapping stray cats and killing those that cannot be adopted. This method of cat management is reflected in the average euthanasia rate for cats in shelters and municipal pounds of 38% across Australia, with some pounds killing up to 98% of cats. This inhumane approach is in contrast to carer-centred management that focuses on sterilization of all cats, which has been shown to result in rapid improvement in cat welfare and a sustained decrease in cat numbers.
An enforcement-centred approach to stray cat management is distressing for cat carers. Those carers who experience forced removal and euthanasia of their cats report symptoms consistent with post-traumatic stress. However, the impact on quality of life, including mental health of cat colony carers, has been poorly characterized.
This study aims to use a quantitative methodology to determine and compare the effects on carers of cat colonies of carer-centred and enforcement-centred management methods. We hope that the results of this research will help to change stray cat management in Australia to a proactive and carer-centred approach based on assisting with sterilization of colony cats.

Contact: Dr Rebekah Scotney rebekah.scotney@uq.edu.au

Compassion fatigue and quality of life in people working in cat rescue

Volunteers with cat rescue groups have high empathy and are dedicating their spare time, labour and funds for the love of animals. They are dealing with an ever increasing number of requests to help cats and kittens that need a home. As the number of stray cats has increased over the years, so has the demand to help sick and injured cats and kittens. Due to the number of calls from the public about cats desperately needing assistance, rescue group members experience secondary trauma. They are also vulnerable to primary trauma in the form of mental, emotional and sometimes physical abuse from working in difficult and some dangerous environments.
While there has been research on compassion fatigue for professionals (paid workers with certified training etc), there does not appear to be research investigating the impact on rescue group members who are constantly overwhelmed by the number of cats and kittens needing help. The cat rescue groups do not have the resources, expertise or funds to proactively address compassion fatigue as do local governments or large animal welfare agencies. Cat rescue groups find it challenging to have sick leave, backup staff/volunteers, time for training etc and consequently experience burnout and high turnover of volunteers. There is a need to investigate the mental wellbeing and levels of compassion fatigue in cat rescue volunteers.

Contact: Dr Rebekah Scotney rebekah.scotney@uq.edu.au

Medical geography of Q-fever in Queensland

Q-fever is a notifiable zoonotic infection which causes debilitating disease in humans working with livestock and potentially the community. It is highly incident in Australia particularly in Queensland. The student will build a spatial model to identify the level of disease clustering in Queensland and the

role of individual, household and environmental factors that determine its geographical distribution.

Contact: Dr Ricardo Soares Magalhaes r.magalhaes@uq.edu.au Phone: 5460 1827

Clinical education in VTHs

If you are interested in education in veterinary science, I do have several projects in mind or ongoing to offer. Some projects look at the difference of case load between rural and urban areas, some look at the need of GP vets and how specialists can play a role in the concept of spectrum of care, and some other on what can be found on the web and how reliable the information is. Please contact me to discuss further.

Contact: Dr Erika Meler, School of Veterinary Science. Email : e.meler@uq.edu.au

Patterns and associations of feline upper respiratory pathogens in cats entering RSPCA Queensland shelters

The aim of this project is to determine if there are certain types of incoming animals more likely to be shedding the pathogens implicated in clinical feline upper respiratory tract infection ('cat flu').

Cat flu is a challenging endemic disease in many shelters worldwide and can pose a significant welfare issue for affected cats. It can delay adoption, increasing animals' length of stay within the shelter and ultimately contribute to draining precious shelter resources.

We have completed oropharyngeal and conjunctival swabbing of incoming cats over 11 months at the RSPCA shelter in Brisbane. These have been tested via PCR, and results have been collated and cleaned. The student will work with this data to explore any patterns that may be prevalent amongst animals shedding cat flu pathogens (feline herpes virus, feline calici virus, *Mycoplasma felis*, *Bordetella bronchiseptica*, *Chlamydia felis*). For example, are there certain sources or age groups of animals that are more likely to be carriers of any particular pathogen? If time permits, the student will also analyse whether the presence of certain pathogens or whether the presence of multiple pathogens is associated with final shelter outcomes (like length of stay and chance of being adopted).

Students with interests in animal sheltering, animal welfare, epidemiology and data analysis are particularly encouraged to apply. The interested student with gain experience in study design, statistical analysis and scientific writing. They will also gain an insight into the complexities of sheltering large numbers of animals and the considerations that apply to disease management in such systems.

Contact: Dr. Nicholas Clark, School of Veterinary Science, n.clark@uq.edu.au; Dr. Uttara Kennedy, School of Veterinary Science, uttara.kennedy@uq.edu.au

Determining the presence and persistence of colostral transfer of passive immunityagainst Hendra virus in foals, and their response to Hendra vaccination.

Hendra virus (HeV) is a uniquely Australian zoonotic virus of horses, posing significant economic, animal welfare, and public health concerns. The virus is transmitted from bats to horses.

An equine vaccine Equivac® HeV is available and antibody titres greater than 1:32 are considered protective. There have been no HeV cases in vaccinated horses. As there is no human vaccine for HeV, the most effective means of preventing human infection is through vaccination of horses. All horses at UQ are vaccinated, with foals vaccinated at 4-6 months of age.

Immunity in the equine neonate is conferred via transfer of passive immunoglobulins through ingestion of colostrum. Maternal antibody titres in foals may offer a short period of protection against HeV. The ideal time to vaccinate foals is unknown. The project will involve bleeding foals at birth and then every month until vaccination. Blood samples will also be collected after vaccination of different aged foals. HeV titres will be measured. PhD level projects may also involve laboratory work in the validation of other diagnostic tests to measure HeV antibody titres.

Contact Allison Stewart allison.stewart@uq.edu.au. Graduate student salary and tuition support is currently not included in the funds available for this project. Australian and Commonwealth students may be eligible for scholarships. We would welcome international students with home country financial support (academic performance greater than B+ and IELTS >6.5 overall and > 6 in each category). Limited UQ scholarships for international students are available for high outstanding applicants.

Validation of a scoring system for the histological assessment of multi-organ injury in large animal models of ischaemia and shock

Histopathological scoring is a tool by which semi-quantitative data can be obtained from tissues. Many scoring systems according to specific study requirements exist, yet there is no standardised approach to score multi-organ injury in large animal models of ischaemia and shock.
The aim of the project is to validate a scoring system that may become a broadly suitable and highly reproducible tool for investigating tissue-specific pathophysiology of shock and ischemia in clinically-relevant sheep models of critical illness, which are desirable models to facilitate clinical translation of novel interventions.
Three experimental models will be specifically analysed: ethanol-induced model of cardiogenic shock and pulmonary failure supported by veno-arterial extracorporeal membrane oxygenation, haemorrhagic shock model induced by stepwise venous blood withdrawal and model of orthotopic heart transplantation following donor brain death and heart preservation.

The student will gain skills in histopathological interpretation of tissue injury, data measures, statistical analysis and clinical correlations, in addition to improving written and oral communication skills. This study has the potential to be successfully expanded into a HDR project.

Contact: Professor Chiara Palmieri (c.palmieri@uq.edu.au)

Epidemiology and risk factors of feline and canine mammary tumours in Australia

Mammary tumours have been reported as the most common neoplastic disease in dogs with 50% of them being malignant. In cats, they constitute approximately 17% of feline neoplasms with a median survival time of 8 to 12 months post-diagnosis. This information, however, cannot be entirely applied to the canine and feline Australian population since most dogs are desexed before their first season or heat period and thus mammary tumours are quite an uncommon finding. The risk of a dog developing mammary tumours is 0.5% if spayed before their first heat, 8% after their first heat and approximately 30% after their second heat. Likewise, cats spayed before 6 months of age have a 7 times reduced risk of developing mammary cancer. Nevertheless, the low-moderate incidence of this tumour has created a big knowledge gap in understanding risk factors, potential aetiology or genetic predisposition, prognosis and response to treatment of this category of tumours. Unpublished novel findings from the research group of the University of Porto (Portugal) using cancer data from the Vet-OncoNet database have also revealed an interesting geographical clustering of canine and human mammary cancer in the Porto municipality, suggesting the potential contribution of environmental factors in the mammary gland carcinogenesis.
Therefore, the objectives of this study are:

- To establish the incidence of canine mammary tumours in the population of pet dogs and cats in Australia
- To quantify individual-level profile of dog and cat populations most at risk of developing mammary tumours through the identification of risk factors and variables most commonly associated with cancer development
- To identify "cancer hot-spots" through the identification of geographic clusters of mammary tumours in dogs and cats across Australia

We anticipate that our study will provide the much-needed information about major risk and prognostic factors of canine and feline mammary tumours that will help contribute to the evidence base and can aid the veterinary surgeons in the diagnosis, management and advice given to the clients.
Contact: Prof Chiara Palmieri, c.palmieri@uq.edu.au

Surveillance of efficacy of commonly used wormers against canine hookworms

Canine hookworms are one of the most prevalent and pathogenic gastrointestinal parasites infecting pet dogs. Hookworms reside in the gastro-intestinal tract of animals and feed on blood; infection in dogs leads to iron-deficiency anaemia, hypoalbuminemia, and enteritis, characterized by diarrhoea that may contain blood. As a principle means for treatment and prevention of hookworms in dogs, pyrantel or benzimidazole (BZ) drugs are used on a regular basis, particularly in shelters and kennels. These drugs are inexpensive and widely available. Veterinarians, pet owners and facility managers employ these drug classes on the basis that they are safe and highly effective at preventing hookworm infection. However, sustained use of these drugs over the last half century, particularly in intensive environments such as shelters, raises the possibility that drug-resistant worm isolates have been selected over time. Resistance to multiple drug classes has already been confirmed in canine hookworms around the world, including in Australia. This is not only a concern for canine health; inability to control hookworm infections via therapeutic means could present serious public health risks due to the ability of this parasite to cause disease in humans (zoonotic disease). Hence, there is a need for a deeper investigation into the likelihood of anthelmintic resistance among canine hookworms.
Hypothesis: Hookworms infecting dogs in SE Queensland have high levels of resistance to pyrantel and there is also a reduction in BZ efficacy against these worms.
The three main objectives of our study will be:

1. In vivo surveillance for pyrantel and BZ resistant hookworm isolates in Queensland
2. Corroborating laboratory analysis of hookworm field isolates, using in vitro assay techniques, for BZ resistance
3. Amplicon deep sequencing of DNA samples extracted from these hookworm field isolates for detection of genetic mutations (markers) associated with BZ resistance.

Contact: Dr Swaid Abdullah swaid.abdullah@uq.edu.au

Molecular characterisation of *Sarcocystis spp*. infecting bovine carcasses in QLD Australia

Sarcocystis spp. are ubiquitous protozoan parasites that can form cysts in striated muscle and CNS of cattle. Cattle hearts are commonly infected by microscopic sarcocysts. Signs in cattle acutely affected with *Sarcoystis cruzi* include fever, anorexia, cachexia, decreased milk yield, diarrhoea, muscle spasms, anemia, loss of tail hair, hyperexcitability, weakness, prostration, and death. Cows infected in the last trimester of pregnancy may abort. After recovery from acute illness, calves failed to grow well and eventually died in a cachectic state. Humans can get infected by consuming cattle meat containing these zoonotic parasites. The main finding is the presence of muscle cysts (sarcocysts), which could be microscopic or macroscopic, occasionally, eosinophilic myositis related to sarcocysts could arise. The presence of macroscopic sarcocysts and zoonotic species (*Sarcocystis hominis* and *S suihominis*) could cause meat condemnation and lead economic losses to meat industry. There is no effective treatment reported for the intracellular chronic stage (sarcocysts).

The study is looking into the prevalence and spatial distribution of sarcocystis infection in bovine carcasses samples collected from abattoirs within various regions of Queensland. The study will involve histopathological examination of tissue samples and will be running specific PCR assays and sequencing of positive samples for speciation.

Contact: Dr Swaid Abdullah swaid.abdullah@uq.edu.au

Study to evaluate the use of capsule endoscopy for the diagnosis of gastrointestinal worm infection in dogs

The advancement of a non-invasive, non-terminal method for evaluating anthelmintic drugs in companion animals greatly enhances animal welfare. Currently, the standard practice for assessing the efficacy of these drugs involves performing necropsies on dogs after treatment to determine the presence or absence of worms. The development and validation of a non-terminal approach marks a significant breakthrough in veterinary clinical research, eliminating the need for euthanizing study dogs. Furthermore, the video/images generated during this project will be used for the training and education of veterinary students.

This innovative study examines capsule endoscopy, a well-established minimally invasive imaging technique for the human small intestine, as a potential alternative to necropsy for diagnosing and potentially quantifying gastrointestinal hookworms in dogs.

Contact: Dr Swaid Abdullah swaid.abdullah@uq.edu.au

Estimating and exploring the utilisation of lipids in cattle ticks (Rhipicephalus australis) for predicting their survivability under pasture conditions

Cattle tick larvae store lipid as an energy source, which depletes progressively when these larvae quest for cattle to attach and feed. The amount of lipid and rate of lipid depletion depends on temperature

and humidity and can be used as a good indicator of the feeding history and assist in explaining the phenology of tick populations. However, existing gravimetric approaches to lipid measurement are relatively imprecise. To improve our ability to accurately measure lipid accumulation and metabolism in ticks, a microquantity colorimetric sulfophosphovanillan method of lipid estimation will be used to explore the seasonal variations in the lipid content of cattle tick larvae and predict their survivability in pasture conditions.
This exciting study will involve rearing adult engorged cattle ticks for egg laying and larvae hatching. The larvae will be subjected to a range of temperature conditions and their lipid content will be estimated using the sulfophosphovanillan method within the lab over a period of 4 to 6 months. The lipid data will later be correlated with the temperature and humidity data and modelled to understand depletion of lipid reserves.
Contact: Dr Swaid Abdullah swaid.abdullah@uq.edu.au

Proteomic and inflammatory lipid mediator analysis for a more objective and comprehensive understanding of heartworm disease progression in dogs

Heartworm disease (HWD) is a clinically important parasitic disease of dogs, caused by filarial nematode Dirofilaria immitis. Heartworm disease is clinically important for dogs in most of the tropical countries, since it can cause serious complications like pulmonary hypertension (PH), pulmonary thromboembolism (PTE), allergic pneumonitis, right heart failure (RHF), caval syndrome (CS), glomerulonephritis and reactive arthritis. Pathogenesis of canine dirofilariasis is very complex and involves parasite induced mechanic processes, the host's immune response against the adult worms and/or microfilariae, as well as the factors released by these parasites and the bacterial endosymbiont Wolbachia sp. Clinical manifestations of infection are strongly dependent on the type of the host immune response elicited by the parasite and its endosymbiont, triggering the release of proinflammatory and chemotactic cytokines by resident cells, which induce cellular infiltration and amplification of the inflammatory response.

Currently the diagnosis of Heartworm infection, but not heartworm disease (HWD), is based on identifying the microfilariae of Dirofilaria immitis and finding adult heartworm antigen in the dog's blood. The diagnosis of heartworm disease requires numerous diagnostic procedures, which can be expensive and needs expert radiologists. The treatment is again prolonged, challenging, and expensive. The proposed innovative approach of protein and lipid profiling will look for cardiopulmonary and renal biomarkers which can serve as indicators of serious clinical complications of HWD and can help understand the pathological processes and to assess the response to therapeutic interventions and improve palliative treatment.
The proposed study aims to use high-throughput proteomics and lipid mediator analysis to a develop a more objective and comprehensive method of accurately classifying heartworm disease (HWD) through Heartworm specific host serum cardiopulmonary and systemic biomarkers in dogs. Insights gained through this study will be helpful for better understanding of HWD and use of biomarkers for diagnosis, disease progress and response to treatment.
The study will be a collaboration between small animal clinicians of UQ Vets, and research academics of SVS, involving utilisation of SVS resources and expertise.
Contact: Dr Swaid Abdullah swaid.abdullah@uq.edu.au

Refining a veterinary ICD-11 coding system for recording and reporting mortality and morbidity data in companion animals

ICD-11 (International Classification of Diseases 11th revision) has been developed by the World Health organisation (WHO) as the international standard for systematic recording, reporting, analysis, interpretation and comparison of mortality and morbidity data. This coding system allows to count and identify the most pressing health issues by using an up-to- date and clinically relevant classification system. Each health condition is assigned a specific ICD-11 code resulting in data that can be used by different stakeholders to identify needs for intervention or research, measure the impact of specific health conditions or standardise clinical recording. In the context of the pressing need of a more structured disease coding in veterinary medicine, this honour project aims to adapt and refine the existing human ICD-11 to analyse mortality and morbidity data in companion animals in order to provide validated codes that can be used to establish a universal framework for comparing data, transcending language barriers and simplifying the analysis of health-related information.
The student will gain skills in coding, data interpretation and classification. The project can be completed under a remote working arrangement.
Contact: A/Prof Chiara Palmieri (c.palmieri@uq.edu.au)

The effects of settle, calm and train (SCT) on bridging the caps in the human-animal bond in dogs with behavioural problems

Mechanisms of animal learning have been widely researched for many years (Dess & Overmier, 1989; Elgier et. al., 2009; Mersmann et. al., 2011) and with the growing trend to consider dogs as integral members of one's family, it is imperative these bonds are maintained especially with owners of dogs that have behavioural problems. Furthermore, the treatment of dogs in behaviour modification for their issues should aim to repair their Human Animal Bond (HAB) and build the owner-pet relationship.

The use of behaviour modification to treat behaviour problems have a wide variety of protocols that can be followed; however, all protocols focus solely on the behaviour problem associated with the target directed behaviour. The use of counselling techniques are one of the only techniques used to assist owner when initial consults are conducted (Martin and Shaw, 2015). These techniques are commonly used to help aid the owner in
understanding the behaviour problem, prevention and early detection (Martin and Shaw, 2015).

There is little literature on the use of certain training techniques in building the human- animal bond in dogs with behavioural problems, as more literature looks at the effect of training on humans with mental issues (Langston, 2019). This gap in the literature outlines the need for a paradigm shift in the current protocols used in the treatment of behavioural problems and the rebuilding of the HAB. As the fractures in the HAB are critical in maintain longevity in the relationship and if not maintained can ultimately lead to relinquishment of dogs to shelters and animal management facilities, often resulting in euthanasia due to the behavioural problem.

This study aims to explore the use of the SCT method on HAB with clients of behavioural problem dogs, as well as investigate the behavioural changes in the canines in the use of the SCT method. The honours student will contribute to this project by investigating the changes in canine behaviour cues and categories under the use of the settle technique over the 8-week period.

Contact: Dr Rebekah Scotney **(**rebekah.scotney@uq.edu.au**)** or Dr Liam Clay (l.clay@uq.edu.au) for further information.

Exploring the role of acetate on the secretion of Glucagon Like Peptide 1 (GLP1) from intestinal L-cells in the equine hindgut

This project aims to explore the role of acetate on the secretion of Glucagon Like Peptide 1 (GLP1) from intestinal L-cells in the equine hindgut. The currently understood role of GLP-1 in the digestive tract is to respond to nutrients (primarily glucose) in the small intestine to then stimulate the pancreas to produce insulin. The presence of intestinal L-cells and secretion of GLP-1 in the equine hindgut has been demonstrated in previous studies. However, it is unknown if microbial byproducts will stimulate intestinal L-cells to produce GLP-1. This project will collect intestinal tissue to incubate in the presence of acetate or glucose to enable the measurement of secreted GLP-1 via an ELISA in the incubation medium.

Contacts: Dr Viviana Gonzalez Astudillo, v.gonzalez@uq.edu.au & Dr Danielle Fitzgerald, d.smith8@uq.edu.au

Hot and hormonal; The combined impacts of heat stress and endocrine disruption on fertility and sperm small RNAs in *Drosophila*

The modern world creates a hostile environment for reproduction, particularly due to two paramount concerns: climate change and endocrine disrupting chemicals (EDCs). The effects of both pose significant issues for reproduction across all species. Both have been studied in isolation, but the effects of heat stress x EDC interaction on reproduction have not been explored. As individuals are likely to be exposed to both heat stress and EDCs concomitantly, there is a clear need to study their combined impacts. The two major reproductive concerns stemming from heat stress and EDCs are resultant infertility in the exposed generation of parents and inherited epigenetic effects in offspring. Focusing on male reproduction, this project will explore these facets by analysing the combined impacts of heat stress and EDC (equol) exposure on the small RNA profile of spermatozoa in a *Drosophila* model.

Contact: Dr Taylor Pini (t.pini@uq.edu.au)

Shine bright like koala's tinkle: investigating factors influencing renal health

We are seeking an enthusiastic Honours student to investigate the role of Uromodulin (THP) in koala kidney disease, a critical but unexplored area despite the species' high prevalence of renal issues. This project will identify urinary biomarkers, characterize THP gene expression, and correlate THP levels with kidney pathology. The selected student will gain hands-on experience in advanced diagnostics such as PCR, and immunohistochemistry and clinical pathology. The student will contribute to the development of improved renal disease detection and treatment strategies for wildlife hospitals in south-east Queensland. This opportunity is ideal for those passionate about veterinary science, pathology, or conservation medicine, with direct implications for koala conservation.

Contacts: Dr Viviana Gonzalez Astudillo, v.gonzalez@uq.edu.au & Dr. Noman Naseem m.naseem@uq.edu.au.

Completed 2024: Sylvatic maintenance of *Ehrlichia canis* in the wild canid population

Ehrlichiosis is caused by the bacteria Ehrlichia canis, transmitted by the brown dog tick. It is a nationally notifiable disease in Australia. Dogs suffering from ehrlichiosis can be presented with a wide range of deliberating clinical signs that can persist for long term, if treatment fails. Because the disease has only recently been introduced to Australia, most dogs do not have immunity against the disease, making them high risk of severe disease and potential death. Recent findings suggest *E. canis* may be more widespread than reported and needs further investigation. This is the first survey to conduct *E. canis* surveillance on the wild canid populations and investigation into its maintenance cycle in Australia. This study aims to explore the potential existence and transmission of *E. canis* among wild dogs and foxes and the associated risk of further spread into other potential regions of Australia. It is expected that results will help more educated decision around prevention and control of this disease. The three main aims of our study will be:

1. Surveillance of *E. canis* in the wild dog and fox population in QLD.
2. Surveillance of *E. canis* in the tick population in QLD.
3. Deep sequencing to characterise *E. canis* in circulation in the wild dog, fox, and tick population.

The study will involve collection and identification of tick species infesting dogs, collection of blood and serum samples. The tick and blood samples will be subjected to PCR and sequence analysis. Apparent prevalence of ticks and *E. canis* will be calculated in each postcode from which samples were collected. This will be mapped and visualised using QGIS. Global and local auto-correlation analysis will be performed to identify spatial clustering.

The prevalence and risk factors data generated from this study will provide important fundamental information to allow reassessment of the risk of *E. canis* emergence and transmission in various regions of Australia.

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Assessing perceptions of tick and flea infestation risk in southeast Queensland

Paralysis ticks (*Ixodes holocyclus*) and cat fleas (*Ctenocephalides felis*) are two of Australia's most economically important ectoparasites. Both parasites cause morbidity in pets and can infest a diversity of wildlife species. This represents a substantial One Health issue, yet factors that influence risk of parasite infestation, and how people perceive this risk, are not known. This presents a challenge for animal health workers, as people's risk perception and knowledge of their pets' interactions with wildlife can influence parasite spread at the domestic animal – wildlife interface. This Honours project aims to understand factors that influence pet owners' perceptions of ectoparasite infestation risk. Voluntary questionnaires and requests for public parasite submissions will be used to identify factors influencing risk of paralysis tick and flea spillover between wildlife and pets in southeast Queensland. Data collected will be non-identifiable but will provide necessary information to (1) quantitatively assess environmental and demographic correlates with risk perception; and (2) contribute to spatial models of incidence risk. Interests in One Health, wildlife disease and spatial data analysis will be appreciated.

Working as part of a vibrant research team, students will benefit in the following ways:

- Community engagement from a One Health perspective
- Script-based quantitative data analysis and spatial modelling

Contributing to the planning, writing and submission of peer-reviewed publications. This project is funded and has ethics approval.

Contact: Dr Nicholas Clark; n.clark@uq.edu.au A/Prof Ricardo Soares Magalhães; r.magalhaes@uq.edu.au Prof Jenny Seddon; j.seddon1@uq.edu.au

Publication:
Proboste, T., Dennis, E., Magalhães, R. J. S., Abdullah, S., & Clark, N. J. (2024). Assessing perceptions of flea and tick infestation risk in Southeast Queensland, Australia. Veterinary Parasitology: Regional Studies and Reports, 54, 101087.

Evaluation of overall prevalence and phylogeography of methicillin resistant *Staphylococcus spp.* carriage in dogs and cats presented in two veterinary referral centres in the greater Brisbane

Methicillin-resistant *Staphylococcus* species are a major area of study worldwide due to their zoonotic potential and ability to develop multi-resistance to antibiotics. Methicillin-resistant *Staphylococcus* (MRS) infections as well as carriage have been shown in both people and animals. MRS carriage prevalence for dogs in North America is well known but its prevalence in Australia has not yet to our knowledge been reported. Australia is usually well-known for its overall low prevalence in infectious diseases so it is possible that the carriage rate could be different. The main goal of this study is to evaluate the overall prevalence of Methicillin- resistant *Staphylococcus* spp through the sampling of dogs and cats in different setting and location around the greater Brisbane area. The second goal would be to evaluate possible difference in carriage rates depending on location (urban vs rural area) and level of association with veterinary medical environment (general practice vs referral practice). The third goal would be to compare the strains obtained in animals to the ones most present in humans. The clinical and public health implications of this project are numerous and could lead to the development of collaborative projects with physicians and infectious diseases researchers as part of the One Health project.

The expected benefits of this project for a student are as follow:

- The student will gain significant experience in study design, scientific data collection and statistical treatment of that information.
- The preliminary data will be presented by the student at the end of the study period to the supervising staff in a 15 min oral presentation. The final data could be also submitted for presentation at a local, national or international congress.
- The data collected will lead to the writing of a scientific manuscript for publication in a peer reviewed journal. The student will be involved in the redaction of the manuscript for additional experience with writing of scientific article with the degree of involvement depending on the personal implication in the project of the student.

This project requires mainly an individual who is serious, highly motivated, hard-working and can be relied on for the collection of the study sample and data. An interest in microbiology, data analysis and statistics software will be appreciated but is not mandatory.

Contact: Dr Erika Meler e.meler@uq.edu.au

Publications:
Rynhoud H, Meler E, Gibson JS, Price R, Maguire T, Farry T, Bennett E, Hartono J, Soares Magalhães RJ.

Epidemiology of methicillin resistant *Staphylococcus* species carriage in companion animals in the Greater Brisbane Area, Australia. Res Vet Sci. 2021 May;136:138-142. doi: 10.1016/j.rvsc.2021.02.012. Epub 2021 Feb 18.

Rynhoud H, Forde BM, Beatson SA, Abraham S, Meler E, Soares Magalhães RJ, Gibson JS. Molecular Epidemiology of Clinical and Colonizing Methicillin-Resistant *Staphylococcus* Isolates in Companion Animals. Front Vet Sci. 2021 Apr 23;8:620491. doi: 10.3389/fvets.2021.620491. eCollection 2021.

Reference intervals for equine adrenocorticotropic hormone (ACTH) in Southeast Queensland

Pituitary *pars intermedia* dysfunction (PPID) is a common disease of older horses affecting more than 20% of horses older than 15 years of age in Southern Queensland. This condition is caused by neurodegeneration of the inhibitory dopaminergic hypothalamic neurons resulting in adenomatous hyperplasia of the *pars intermedia* and increased adrenocorticotropic hormone (ACTH) concentrations. The typical clinical signs of PPID are hypertrichosis, chronic infections and hyper- or anhydrosis but one of the most severe problems experienced by affected horses is recurrent laminitis.

Measurement of basal ACTH concentration is the most commonly used method to diagnose PPID; however, because of circannual variability (higher ACTH concentrations in autumn), seasonal reference intervals should be developed by individual laboratories to accurately interpret ACTH results. In addition to circannual variations, regional variations have been described, indicating that reference intervals established at a specific latitude are not valid at another latitude, limiting the extrapolation of results from other institutions.

The purpose of this study is to establish ACTH reference intervals in Southern Queensland to improve the diagnosis of PPID. To achieve this goal, plasma samples will be taken from 50 healthy, ≥ 15-yearoldhorses monthly and reference intervals will be established for Southern Queensland.

This project is funded and has ethics approval.

Contact: François-René Bertin, School of Veterinary Science, f.bertin@uq.edu.au.

Publications:
Horn, R., Stewart, AJ., Jackson, KV., Dryburgh, EL., Medina-Torres, C.,& Bertin, FR. 2020. *Clinical implications of using adrenocorticotropic hormone diagnostic cutoffs or reference intervals to diagnose pituitary pars intermedia dysfunction in mature horses.* DOI: 10.1111/jvim.16017

Assessment of the diagnostic value of a combined thyrotropin-releasing hormone stimulation test and 2-step insulin response test to simultaneously diagnose Equine Pituitary Pars Intermedia Dysfunction and Equine Metabolic Syndrome

Pituitary pars intermedia dysfunction (PPID) and equine metabolic syndrome (EMS) are the most common hormonal disorders in adult horses. Although both conditions have been described worldwide, those diseases have a specific significance in Australia where it has been shown that more than 20% of aged horses are suffering from PPID and that more than a third of them are also suffering from EMS. Both conditions have a huge impact on equine health as they both result in laminitis. Prevention of the first painful episode of laminitis is critical when managing horses at risk of developing hormonal dysregulation.
As early detection of horses at risk is paramount in order to prevent the development of the first episode of painful laminitis, new diagnostic tools are needed. This project aims at assessing the diagnostic value of combining two sensitive tests to diagnose both endocrine disorders at once. To achieve this goal, control horses and horses with PPID, EMS and both will be tested with this novel diagnostic tool.

This project has ethics approval and funding.

Contact: François-René Bertin, School of Veterinary Science, f.bertin@uq.edu.au.

Publications:
Horn, R. & Bertin, FR. 2019. *Evaluation of combined testing to simultaneously diagnose pituitary pars intermedia dysfunction and insulin dysregulation in horses*. 2019. DOI: 10.1111/jvim.15617

Hicks, G.R.; Fraser, N.S.& Bertin, F.-R. 2021. *Changes Associated with the Peri-Ovulatory Period, Age and Pregnancy in ACTH, Cortisol, Glucose and Insulin Concentrations in Mares*. Animals; 11, 891. https://doi.org/10.3390/ani11030891

Tracing the spillover of fleas (*Ctenocephalides* spp.) between native and domestic animals

Spillover of parasites between wildlife and pets is a threat to animal health. Cat fleas (*Ctenocephalides felis*) and related dog fleas (*C. canis*) are among the world's most economically important ectoparasites. Both can infest domestic pets as well as a diversity of wildlife species. Yet knowledge on their distributions, particularly among wildlife, is poor. To provide the first assessment of ectoparasite populations among Australia's wild mammals, our team is currently sampling parasites from native and feral mammals across urbanization gradients in Southeast Queensland. The aims of this Honours project are twofold: (1) to contribute to wildlife trapping andsurveying efforts; (2) to develop DNA markers that can be used to understand the influences of biotic and environmental features on the genetic population structure of cat fleas. Interests in genetics, wildlife sampling and data analysis will be appreciated.

Contact: Dr Nicholas Clark; n.clark@uq.edu.au and Prof Jenny Seddon; j.seddon1@uq.edu.au

Prevalence of *Toxoplasma gondii* and Feline Immunodeficiency Virus (FIV) inunowned cat populations in Brisbane, South-East Qld.

In Brisbane, feral cats are problematic and are subjected to ongoing management by local government. Unowned cats can reach high local densities, and potentially harbour and spread diseases of importance to public health and pets, livestock and wildlife conservation. There is increasing resistance from residents towards local government cat management programs. Information regarding the diseases carried by unowned cats, and the potential risks these may poseto residents, pets, livestock and wildlife, may assist local government to formulate informed awareness and education programs and may persuade more responsible pet ownership.

Limited studies indicate that feral or unowned cats can host a variety of endoparasites, ectoparasites and bacterial pathogens. Two diseases of particular concern include toxoplasmosis and Feline Immunodeficiency Virus (FIV). The prevalence of *T. gondii* and FIV in unowned cat populations in Brisbane is unknown, and implications for disease (and unowned and owned cat) management remain unclear.

This honours project will design and implement a study to investigate the prevalence of toxoplasmosis and FIV in unowned cats in the greater Brisbane City Council area. Specifically, this project will aim to sample unowned feral cats euthanized from management programs by Brisbane City Council. In Brisbane City Council, typically 800-1000 unowned cats per year are euthanized as part of ongoing management programs. Necropsy of selected animals provides the opportunity to sample a range of unowned cats for diseases of concern including toxoplasmosis and FIV. This project has strong support from Brisbane City Council, and will be jointly supervised by the University of Queensland, Brisbane City Council and Biosecurity Qld.
Contact: Rowland Cobbold; r.cobbold@scu.edu.au.

Compare total and ionised calcium levels in wild reptiles with those in captive reptiles

Hypothesis: That wild reptiles will have significantly higher total and ionised calcium levels than those kept in captivity

Reason: Metabolic bone disease, particularly nutritional secondary hyperparathyroidism, is common in captive reptiles. Artificial lighting is used in an attempt to prevent this problem, but it is not always effective. This project will demonstrate to veterinarians and pet owners the difference between wild and captive reptile calcium levels.

Method**:** Blood will be collected from wild and captive Carpet pythons and Bearded dragons and analysed for total and ionised calcium levels. The results will be analysed to see if there are significant differences.

Contact: Dr Bob Doneley r.doneley@uq.edu.au