Honours Research Projects

Current Honours research projects available in the School of Veterinary Science
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Pilot study determining the efficacy of two commercial formulations of pergolide to treat Pituitary pars intermedia dysfunction (PPID) in horses.

PPID is a common disease afflicting horses (and ponies) throughout the world, with more than 20% of horses older than 15 years affected. Clinical signs of PPID include hypertrichosis, chronic infections; hyper- or anhydrosis and recurrent laminitis. Laminitis is a painful and incurable condition of horses resulting in loss of use, high veterinary and farrier expenses and decreased survival.

Elevated basal plasma adrenocorticotrophic hormone (ACTH) concentration is used to diagnose PPID. The dopamine agonist pergolide mesylate provides the most effective treatment for PPID. Dosages used to successfully control PPID range from 1 to 5 mg of pergolide daily. Treatment success is considered to be resolution of clinical signs and normalization of ACTH concentrations. There are anecdotal reports of high rates of treatment failures in horses and ponies being treated with liquid pergolide products. This may be because of inadequate dose or degraded drug because of inappropriate storage conditions and delays between manufacture and administration.

The proposed pilot study would enrol client owned horses and ponies with PPID. ACTH concentration will be periodically measured after treatment with a liquid and tablet formulations of pergolide. A dose escalation study will be performed until clinical signs and ACTH concentrations improve. The efficacy of liquid and tablet formulations of pergolide will be compared.

This project will only be available if funding is obtained.

Contact: Allison Stewart School of Veterinary Science email: allison.stewart@uq.edu.au phone 0417962127

Comparison of the effects of storage and temperature on the stability of Australian liquid formulations of pergolide.

PPID is a common disease afflicting horses (and ponies) throughout the world, with more than 20% of horses older than 15 years affected. Clinical signs of PPID include hypertrichosis, chronic infections; hyper- or anhydrosis and recurrent laminitis. Laminitis is a painful and incurable condition of horses resulting in loss of use, high veterinary and farrier expenses and decreased survival.

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Concentrations of pergolide in various commercially available products will be measured after exposure to various temperatures and periods of time using liquid chromatography-mass spectrometry (LC-MS).

This project will only be available if funding is obtained.

Contact: Allison Stewart School of Veterinary Science email: allison.stewart@uq.edu.au phone 0417962127
To 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

Improved management of skeletal injuries and disease in koalas by better understanding of koala bone physiology and pathology

The koala is vulnerable to extinction due to threats mostly derived from human activity in Queensland – QLD¹, particularly traumatic skeletal injuries resulting in 10% of koalas admitted to QLD hospitals sustaining fractures. These fractures usually have a poor prognosis, particularly if the axial skeleton is affected, and only a small proportion are rehabilitated. [2, 3]. A number of koalas present with excessively proliferative callus formation in response to bone fractures. The causes of this abnormal fracture healing in koalas are not known the pathophysiology of fracture healing in koalas is poorly understood, as is the physiology of mineral homeostasis in koalas. It is critical that we understand mineral homeostasis in koalas so that better decisions can be made about treating and rehabilitating wild koalas presented because of skeletal injury or bone disease. The general aim of this project is to better understand mineral homeostasis in koalas and to determine if underlying metabolic bone disease is associated with skeletal deformities in wild koalas presented to wildlife hospitals in south east Queensland. Our hypothesis is that koalas with skeletal abnormalities will have hormonal and structural changes consistent with underlying mineral imbalances evidenced by elevated plasma parathyroid hormone, elevated plasma biomarkers of bone turnover and increased bone resorption evident in bone histomorphometry.

Aims and methodology

1. Identify skeletal disorders in a group of Koalas presented to Queensland wildlife hospitals by using screening radiographs and post mortems examination to evaluate koalas for fractures, abnormal fracture healing, bony exostoses, bowing of long bones, joint dysplasia or any other skeletal abnormalities. Histomorphometry, histology and advanced imaging of bone samples (SEM, microCT) will be used to evaluate for any osteomalacia, osteoporosis or fibrous osteodystrophy at the site of lesions or distant to lesions and in control samples.

2. Investigate calcium homeostasis in koalas and the possible role of mineral homeostasis in skeletal disease in koalas by measuring the plasma concentrations of calcium, phosphorus and mineral homeostasis hormones (PTH, 1,25(OH)2D3) and markers of bone turnover (BAP, OC, PYD, CTX-1) in Koalas with and without skeletal disorders.
Plasma samples and dead koalas will be sent to UQ Gatton from major south-east QLD wildlife hospitals, such as Australia Zoo and Moggill Koala Hospital. Necropsies, sample collection, storage and histopathology slide processing will be performed at UQ Gatton. Obtaining study animals, performing post mortems and the advanced imaging of bone samples will be carried out as part of a currently funded study. This application is requesting funding for the histology and radiology screening, and analysis of plasma hormones and bone biomarkers.

Contact: Dr Rachel Allavena  r.allavena@uq.edu.au

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, to a 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; Baran et.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; Black et.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
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Contact: Allison Stewart allison.stewart@uq.edu.au phone 0417962127
Can Near Infrared Reflectance Spectroscopy (NIRS) technology be used to assess the level of pasture contamination with infective nematode parasite larvae of important gastrointestinal nematode parasites of livestock or horses?

Internal parasites are a major constraint to both the livestock and equine industries, and anthelmintic resistance to multiple drug classes among many of the most pathogenic helminth species is widespread. The principles of integrated parasite management are essential in the sustainable management of parasites in these industries, which encompasses the management of parasite “refugia” (environmental stages of the parasite life cycle). The ability to prepare safe pastures for grazing by susceptible stock classes is fundamental to parasite management, however, there is no practical or convenient method of estimating pasture larval contamination.

Near infrared reflectance spectroscopy (NIRS) technology has been used for decades to predict the composition of plant and animals tissues as well as aspects of animal performance. In more recent years, research focus has expanded to consider other innovative uses of NIRS technology and widen its application.

The objective of this project will be to test the ability of NIRS to detect differences in pasture larval contamination with infective nematode larvae. An experiment will be conducted to seek proof of concept, where pasture plots spiked with known quantities of L3 larvae will be used to develop calibration models. These models will then be used to measure the spectral absorbance of some unknown test samples.

If NIRS is reliably able to detect differences in pasture larval contamination, future work could focus on expanding and refining the models to include variations in pasture types and species of nematode larvae. Positive findings from this pilot project may indicate a useful role for NIRS technology in parasite management worldwide.

Contact: Dr Anne Beasley a.beasley@uq.edu.au

Measurement of transdermal analgesia through cattle skin

This project will investigate the movement of local anaesthetics (lignocaine) through cattle skin. There is substantial interest for such a formulation since current approaches require parenteral (needle) delivery and can potentially cause more stress than not having a local anaesthetic effect. This project will screen a number of potential formulation (vehicles) to contain lignocaine and determine which most effectively drives the drug through skin. The intended outcome is to develop a topically-applied local anaesthetic formulation that will have similar or better efficacy to control pain following surgical incision as human formulations (e.g. Emla), reducing the pain and stress of these procedures in cattle.

Contact: Paul Mills p.mills@uq.edu.au

Can CT imaging be used to detect changes in bone density in horses?

Change in the structure of sub chondral bone is a common finding in lame horses. Many traditional assessments rely on subjective evaluation of radiographs. By incorporating a standard “phantom” into diagnostic CT protocols it is possible to obtain a true measure of focal bone density. A student undertaking this study would use image analysis of equine CT cases and micro-CT samples to
determine if bone density measurements can be correlated with lameness and therefore provide additional criteria for diagnosing bone pathology.

Contact: Lisa Kidd l.kidd@uq.edu.au

The ‘dolphin chirp’ – a potential new dolphin vocal sound

The ‘dolphin chirp’ is a short, relatively low-frequency downsweep sound, which has been recorded (using a fixed hydrophone array) quite often off the coast of Peregian Beach on the Sunshine Coast. Groups of bottlenose dolphins are commonly seen around the hydrophone array therefore it is likely that this sound comes from bottlenose dolphins. However, this ‘chirp’ sound is quite unique, in that there are no similar sounds that have been attributed to bottlenose, or indeed any species, of dolphin in the literature. Preliminary work has acoustically positioned these chirp sounds to other dolphin sounds (click and whistle sounds) on a few occasions. These chirp sounds also seem to have little variation in structure, and may be significantly louder than other dolphin sounds, therefore may be a useful sound for acoustically monitoring this dolphin population. This project will carry out further analysis on the ‘chirp’ sounds to provide further evidence that this is a novel sound from bottlenose dolphins. It will estimate the variance in sound structure within and between chirp bouts, compare sound parameters with other commonly heard tonal dolphin sounds (whistles) and determine if there are any changes in the frequency of ‘chirp’ acoustic detections over time (2002 – 2015). Results of this study will likely add a novel sound to the bottlenose dolphin repertoire, and provide some evaluation of its potential to be used in acoustic monitoring of this population of dolphins.

Contact: Dr Rebecca Dunlop r.dunlop@uq.edu.au and Associate Professor Michael Noad m.noad@uq.edu.au

The use of surface-generated sounds in the presence of singers

Humpback whales emit two main communication sounds; vocal sounds and sounds generated on the surface (by breaching and slapping their pectoral and tail fins). Groups of whales tend to switch their communication strategy from using primarily vocal sounds, to using primarily surface-generated sounds, in higher wind noise. Whales also emit vocal sounds at higher levels in increased wind noise and therefore utilise two different methods to overcome potential deleterious effects communicating in noise. Interestingly, whales must also consider their social environment when signalling. Groups (especially females with a nursing calf) emit vocal sounds at lower levels in the presence of singing whales, despite the song being a potential source of noise. This is presumably to avoid the unwanted attention of a singing male. Therefore there are two competing effects; wind noise causing an increase in vocal level, and singing whales causing a decrease in vocal level. It is unknown, however, if whales emit fewer surface-generated sounds in the presence of singing whale (potentially to avoid the unwanted attention of the male), and if noise levels change this response. This project will determine if singing whales have an effect on the use of surface-generated sounds in humpback whale groups. It will also consider the potential effect of noise within this response to their social environment.

Contact: Dr Rebecca Dunlop r.dunlop@uq.edu.au
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:

1) The student will gain significant experience in study design, scientific data collection and statistical treatment of that information.

2) 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.

3) 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

Reliability and accuracy of activity trackers in dogs

The use of activity trackers in humans is widespread and nowadays common use. These are mostly used to objectively record people activity and to ensure that an adequate calorie-burning activities are done in day. Some companies have developed similar devices for dogs. These devices have some similarities but also more varied purposes. The initial goal of these device in companion animals was the ability to locate them via GPS application when lost. Nowadays the new generations of pet trackers are advertised to allow also monitoring of heart rate, respiratory rate as well as activity level. Up to now, there is no evidence of a study looking at the reliability and accuracy of these devices offered to the technology eager public of petowners. Some of the data generated by these tackers will without a doubt trigger questions to treating veterinarians. It appears important from a medical point of view to be able to provide a thoughtful insight based on sounded research on the validity of the
measurement obtained with these new devices. Moreover, should some of these devices be identified as particularly reliable and accurate from this study, follow-up research could investigate their use in the clinical setting for animals with cardiac, respiratory, orthopaedic or neurologic conditions.

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

Pharmacogenetics of CYP2C19 in Horses and Dogs: Functional and clinical implications

The enzyme cytochrome P450 2C19 (CYP2C19) is involved in the metabolism of a wide array of therapeutic drugs across many drug classes of importance in human and veterinary therapeutics. In humans, a number of mutations have been identified within the gene encoding CYP2C19, and shown to be associated with reduced efficacy of a range of clinically used drugs, such as antibiotics, antidepressants and antacids. Amongst these is the drug Omeprazole, which is commonly used in a veterinary context as a treatment for and prevention of ulcers. However significant differences in drug absorption, thereby affecting efficacy, has been observed in horses and dogs. Gastric ulceration is a major medical problem for both species.

This laboratory-based project will involve the use of molecular biology methods (including PCR and sequencing) to identify novel mutations in horses and dogs that explain the differences in clinical responses. Outcomes will potentially be informative and in the future help in development of optimal veterinary treatment for these animals.

Contacts: Dr Russell Lyons (r.lyons2@uq.edu.au) Phone: 07 54601975 and Professor Paul Mills (p.mills@uq.edu.au) Phone: 5460 1852.

Investigating the impact of the native legume Indigofera linnaei (Birdsville Indigo) on cattle reproduction in northern Australia

Indospicine is a toxic amino acid found only in Indigofera plant species which have widespread prevalence in grazing pastures across tropical Africa, Asia, Australia, and the Americas. Indospicine is an unusual in that it is non-proteinogenic and is cumulatively absorbed as the free amino acid into tissues of livestock grazing Indigofera plant species. It is a competitive inhibitor of arginine metabolic processes and in experimental studies causes both liver disease and abortion in cattle and sheep. The abortive effect has also been reported in pregnant rabbit does where feeding as little as 5% Indigofera in daily rations resulted in 100% stillborn when fed in the last 15 days of pregnancy.

Indigofera linnaei (Birdsville Indigo) has a widespread distribution in north Australia rangelands of northern Australia, and given the extensive nature of cattle production systems in these regions, foetal losses due to maternal consumption of indospicine may well occur and contribute to observed reproduction losses in these regions without any specific attribution. This project is laboratory based and is designed to measure indospicine concentration in serum samples collected from pregnant cows and investigate the relationship between the measured indospicine levels and pregnancy outcomes.

This project will be located in laboratories at Food and Health Sciences Precinct, Coopers Plains (Brisbane) and utilise Liquid Chromatography Mass Spectrometry (LC-MS).

Contacts: Dr Mary Fletcher (mary.fletcher@uq.edu.au) Phone: (07) 3276 6089 and Professor Michael McGowan (m.mcgowan@uq.edu.au)
Study of changes in semen quality in young tropically adapted bulls

Contact: Professor Michael McGowan (m.mcgowan@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

Improving cat and dog welfare in RSPCA Queensland.

Previous projects have investigated the benefits of gentling cats, behaviour assessment of dogs and microchipping dogs. Project would be developed in relation to the student’s interest and would involve joint supervision by SVS and RSPCA Qld.

Contact: Professor Clive Phillips (c.phillips@uq.edu.au) Phone +61 7 5460 1158

Welfare requirements of caged budgerigars and cockatiels

This research will investigate the optimum stocking density of budgerigars and cockatiels in an aviary, with measurements of flight paths, vertical or horizontal, stereotyped movements, bird weight gain or loss, antagonistic behaviour, feed consumption and feeding behaviour. The design will be a switchback changeover design, with birds experiencing varied space allowances by closing off sections of the aviary systematically to reduce space available per bird. If time permits birds' willingness to work for opportunities to fly long distances will be compared with other resources such as food, in a housed environment. Video cameras provided by CAWE will be used to ensure that behaviour can be recorded continuously without observer effects. An interest in animal welfare and ethics would be beneficial.

Contact: Professor Clive Phillips (c.phillips@uq.edu.au) Phone +61 7 5460 1158

Lateralised behaviour in dairy cows.

Previous research has developed simple tests of lateralised behaviour and how they relate to other indicators of emotions. We would continue this work using the cows at the College Dairy herd.

Contact: Professor Clive Phillips (c.phillips@uq.edu.au) Phone +61 7 5460 1158

Next generation analysis of gene expression exploring the effect of nutrition on skeletal growth in cattle

This project will involve analysis of differentially expressed genes in the growth plate and other tissue from biopsies in growing animals. A student would learn valuable skills in bioinformatics, cell
and tissue biology as it applies to real-world scenarios and aspects of nutrition and production of cattle. Students with a background in cell biology, animal or veterinary science, veterinary technology, biology, molecular biology, genetics or animal production would be ideal.

**Contact:** Dr Lisa Kidd (School of Veterinary Science) email: l.kidd@uq.edu.au, phone 0438 714 876 or Professor Dennis Poppi (School of Agriculture and Food Sciences) email d.poppi@uq.edu.au

**Phosphorus deficiency in cattle**

There are a number of projects available as part of a large study examining management strategies for the important problem of phosphorus deficiency in cows and heifers in northern Australia. The project involves analysis of bone and growth plate biopsies using histology, dynamic histomorphometry, bone cell populations and bone microstructure using micro CT. Students will gain skills in image analysis, histomorphometry, bone tissue histology in health and disease, CT and radiology imaging of bone and measuring dynamic indices of bone tissue in response to phosphorus deficiency or supplementation under wet and dry season conditions during pregnancy, lactation and recovery. Students with a background in agriculture, biology, animal or veterinary science, veterinary technology, molecular biology, nutrition, animal production or similar would be ideal. This project is in collaboration with staff from QAFFI and The UQ School of Biomedical Sciences.

**Contact:** Dr Lisa Kidd (School of Veterinary Science) on 0438 714 876 or email l.kidd@uq.edu.au

**For general enquiries on Honours studies in Veterinary Science, please contact:**

Dr Rebecca Dunlop r.dunlop@uq.edu.au for enquiries about the Bachelor of Science (Honours) – Gatton in Animal and Veterinary Bioscience [http://www.uq.edu.au/study/program.html?acad_prog=2354](http://www.uq.edu.au/study/program.html?acad_prog=2354)

Associate Professor Michael Noad mnoad@uq.edu.au for enquiries about the Bachelor of Veterinary Technology (Honours) [http://www.uq.edu.au/study/program.html?acad_prog=2422](http://www.uq.edu.au/study/program.html?acad_prog=2422)