



**THE ANIMAL
WELFARE SCIENCE
CENTRE
ANNUAL REPORT
2009-2010**

FOREWORD

Background

The Animal Welfare Science Centre (AWSC) was established in 1997 and currently AWSC comprises 4 collaborative partners – Department of Primary Industries, Victoria (through the Future Farming Systems Research Division), The University of Melbourne (School of Land and Environment and Faculty of Veterinary Science), Monash University (School of Psychology and Psychiatry and Department of Physiology) and The Ohio State University (Department of Animal Sciences and College of Veterinary Medicine).

The AWSC together with the Centre for Animal Welfare and Ethics of The University of Queensland (CAWE), the Animal Welfare Unit of CSIRO and 2 New Zealand organisations are designated as an OIE Collaborating Centre for Animal Welfare Science and Bioethical Analysis.

The Centre has considerable research and teaching capacity in animal welfare science and has made a number of important national and international contributions to research, teaching and training.

Operating Environment

Human-domestic animal relationships are inevitably unequal, involving human management and control of animals. Thus the management of animals by humans is basically governed by two important principles and applies to a range of animal uses from individual pets to livestock production. These are, on the one hand, management to comply with the objectives of human profit, benefits or pleasure, and on the other hand, management responsibilities under a duty of humane care of animals. The latter is based on the widely-held view in our community that the use of animals by humans is acceptable provided that such use is humane.

Animal welfare is an increasingly contributing perspective in society, strongly influencing views on animal use in society and the acceptability of various animal management options. It has its origins in an array of experiences, which can arouse strong sentiments but disparate individual targets for attention.

Stakeholders in the animal welfare domain thus include the public, generally as consumers, owners or concerned observers, special interest groups, businesses based on the commercial supply of animals and animal products and those developing, implementing or auditing compliance with relevant policy at government or community level. Thus consumer and public attitudes to animal welfare have the potential to dramatically affect the use of animals in society, influencing for better or for worse, the operations of livestock industries, medical research, the management of feral and wild animals and the care of recreational and companion animals.

Failure to assure these stakeholders that the welfare standards for domestic animals are underpinned by sound science will not only risk the adoption of new technology in the animal industries, but has the potential to adversely influence the profitability and viability of these industries by affecting specific animal uses.

While consumer and public attitudes to animal welfare ultimately determine society's use of domestic animals, science has a critical role in underpinning society's decisions on animal use and the attendant conditions and compromises. Lack of awareness of factual information means that many people are ignorant of the conditions under which domestic animals live, how they are treated and their species-specific requirements.

Thus there are basically four key areas of activity necessary to rationally address animal welfare:

- **animal welfare science**
- **understanding public and consumer attitudes to animal welfare**
- **public education** and
- **industry education**

It is important to gain an understanding of public and consumer attitudes. Reliable and valid measures for monitoring community attitudes about animal welfare will assist Governments, industry and scientific and community groups in establishing research, education and regulatory policy in animal welfare. It is clear that policy makers and the livestock industries need to be able to respond to these community concerns either through appropriate public education programs, supporting research and/or by changing industry practices.

For example, research on contentious welfare issues is required to underpin welfare standards. Furthermore, through public education, science has a critical role in underpinning society's decisions on animal use and the attendant conditions and compromises.

Finally, while research can be utilised to underpin the establishment, amendment or validation of industry welfare standards and practices, it is critical to deliver industry education, through staff selection and training strategies, and modify legislation, codes of practice and/or welfare QA programs to achieve these welfare standards.

The Animal Welfare Science Centre has built upon key discipline strengths of animal behaviour, stress physiology and psychology and their importance in studying human/animal interaction, animal housing and husbandry and community attitudes/behaviour.

Animal Welfare Science Centre activities

The Centre conducts research across 3 programs areas:

1. Welfare methodology.
2. Housing and husbandry effects on animal welfare.
3. Attitudes to animals and animal welfare, and farmer, consumer and community behaviour.

These programs support the fourth program area:

4. Tertiary and post-graduate education and training

Through these programs, the Centre aims to:

- Develop scientifically defensible welfare methodology.
- Use scientifically defensible methodology to establish, amend or validate animal welfare standards and practices.
- Develop and support industry education and training strategies and provide scientific advice to support the modification of codes of practice and the development of quality assurance programs to introduce scientifically defensible welfare standards in the animal industries.
- Understand public and consumer attitudes to animal welfare to assist Governments and industry in
 - developing animal welfare policy
 - assuring local and international consumers, public and other governments of the sound welfare standards for Australian domestic animals.
- Ensure tertiary students entering the animal industries are better prepared to provide sound, science-based advice on animal welfare practices to industry, interest groups and the public.
- Provide high quality postgraduate and postdoctoral training for the next generation of researchers and teachers in animal welfare science.

The Centre's activities are guided by our vision and mission:

Our Vision

“Animal welfare and its constant improvement are societal and cultural norms”

Our Mission

“To contribute to improved animal welfare as a world leading provider of expert information, advice and education underpinned by rigorous research”

CENTRE PERSONNEL

Staff of the Centre

The Centre's research and teaching capacity is considerable with scientific expertise and experience in the key disciplines of animal behaviour, psychology, stress physiology and veterinary medicine.

Scientists

Paul Hemsworth	University of Melbourne, (Director AWSC)
Andrew Fisher	University of Melbourne
Brian Leury	University of Melbourne
Ian Bland	University of Melbourne
Peter Cakebread	University of Melbourne
Lauren Edwards	University of Melbourne
Alan Tilbrook	Monash University, (Deputy Director AWSC)
Grahame Coleman	Monash University
Pauleen Bennett	Monash University
Samia Toukhsati	Monash University
Linda Marston	Monash University
Ellen Jongman	Department of Primary Industries, Victoria
Mariko Lauber	Department of Primary Industries, Victoria
Gervaise Gaunt	Department of Primary Industries, Victoria
Sue Hides	Department of Primary Industries, Victoria
Steve Moeller	The Ohio State University
Candace Croney	The Ohio State University
Naomi Botheras	The Ohio State University

Current Centre Associate Scientists

Greg Cronin	The University of Sydney,
Rebecca Morrison	Rivalea Australia

Administration and technical staff

Jeremy Skuse	Executive Officer
Melanie Conley	The University of Melbourne
Judy Nash	The University of Melbourne
Maxine Rice	The University of Melbourne
Tracie Storey	The University of Melbourne
Leila Greenfield	Monash University
Tim Hancock	Department of Primary Industries, Victoria
Bruce Schirmer	Department of Primary Industries, Victoria

Postgraduate students

Rachael Bindloss	Masters, Melbourne
Linda Beer	Masters Melbourne
Jo Coombe	PhD, Melbourne
Anoma Dilrukshi	PhD, Melbourne
Joanna Engel	PhD, Melbourne
Sally Haynes	PhD, Melbourne
Marcus Karlen	PhD, Melbourne
Sonja Laine	PhD, Melbourne
Cameron Ralph	PhD, Melbourne
Bronwyn Stevens	PhD, Melbourne
Catherine Webb	Masters, Melbourne
Mia Cobb	PhD, Monash
Lauren Hemsworth	PhD, Monash
Tiffani Howell	PhD, Monash
Tammie King	PhD, Monash
Kate Mornement	PhD, Monash
Vanessa Rohlf	PhD, Monash
Jordan Schaan	PhD, Monash
Sara Crawford	PhD, Ohio
Jessica Pempek	Masters, Ohio

Board of Management

Professor Mike Rickard	Chair
Dr. Ron Prestidge	Future Farming Systems Research, DPI, Victoria
Professor Rick Roush (alternate)	School of Land & Environment, The University of Melbourne
Professor Ken Hinchcliffe (alternate)	Faculty of Veterinary Science, The University of Melbourne
Professor Iain Clarke	Department of Physiology, Monash University
Professor James Kinder	Department of Animal Sciences, The Ohio State University
Professor Paul Hemsworth	Director AWSC, The University of Melbourne
Professor Alan Tilbrook	Deputy-Director AWSC, Monash University

Advisory Committee

<i>Dr. Peter Penson</i> , Chair	Animal welfare consultant
<i>Dr. Onn Ben-David</i>	Caulfield South Veterinary Clinic
<i>Mr. Alan Bowman</i>	Victorian Farmers Federation
<i>Ms. Michelle Edge</i>	Biosecurity Victoria
<i>Dr. Robert Holmes</i>	Animal Behaviour Clinics
<i>Dr. Michelle Jones-Lennon</i>	DPI
<i>Mr. Noel Maughan</i>	MLA (Ret)
<i>Professor David Mellor</i>	Animal Welfare Science and Bioethics Centre, Massey University
<i>Dr. Denise Noonan</i>	University of Adelaide
<i>Ms. Glenys Oogjes</i>	Animals Australia
<i>Professor Clive Phillips</i>	Centre for Animal Welfare and Ethics, University of Queensland
<i>Mr. Nick Renyard</i>	United Dairyfarmers of Victoria
<i>Mr. Kenton Shaw</i>	Rivalea Australia
<i>Dr. Stephen Tate</i>	Bureau of Animal Welfare

AWSC REPRESENTATION ON COMMITTEES

AAWS Production Animals Subcommittee	Andrew Fisher
AAWS RD&E Subcommittee	Paul Hemsworth
AAWS Education Subcommittee	Grahame Coleman
AAWS Animals in Research and Teaching Subcommittee	Paul Hemsworth Mike Rickard
AAWS Animals used in work, sport, recreation and on display Working Dog Subcommittee	Mia Cobb
AECL Hen Welfare Advisory Group	Paul Hemsworth
Animal Welfare Advisory Committee	Paul Hemsworth Grahame Coleman (alt)
Animal Welfare Advisory Committee Working Group 1	Grahame Coleman
APL Specialist Group (Environment & Welfare)	Paul Hemsworth
APL Specialist Group (Industry capability & technology transfer)	Jeremy Skuse
Cattle Welfare Standards Reference Group	Andrew Fisher Paul Hemsworth
DA Animal Welfare Reference Group	Paul Hemsworth Andrew Fisher
Live Trade Animal Welfare Partnership Project Advisory Committee	Andrew Fisher
Livestock Transport Working Group	Ellen Jongman
National AW RD&E Framework Steering Committee	Paul Hemsworth
National AW RD&E Framework Working Group	Jeremy Skuse
Poultry CRC Welfare Program Manager	Paul Hemsworth
Responsible Pet Ownership Advisory Committee	Grahame Coleman
Sheep Welfare Standards Writing Group	Andrew Fisher

AWARDS

RSPCA Australia Alan White Scholarship for animal welfare research	Mia Cobb
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SUMMARY OF CENTRE RD&E PROJECTS and competitive funding if applicable

Program 1 Welfare methodology

Assessing animal welfare: understanding biological functioning and preferences in animals.

Investigators:	Hemsworth, Tibbrook and Leury
Students:	Stevens (PhD) and Ralph (PhD)
Funding:	Poultry CRC, APL and DPI (Vic)
Commencement date:	July 2006
Completion date:	December 2010
09/10 Funding	\$ n/a

There is uncertainty within science on the concept of animal welfare. This uncertainty arises basically because scientists differ in their concept of animal welfare and thus how animal welfare should be measured or judged. Scientists have basically used two methodologies to study animal welfare: the welfare of animals has been assessed on the basis of either biological functioning or animal preferences. The first approach is an integrated one measuring behavioural, physiological, health and fitness responses to assess biological functioning on the basis that difficult or inadequate adaptation will generate welfare problems for animals. The second uses animal preference testing on the basis that animal preferences are influenced by the animal's emotions, which have evolved to motivate behaviour in order to avoid harm and facilitate survival, growth and reproduction. An important question in addressing this scientific uncertainty is "Does depriving animals of their more preferred resource result in biological dysfunction". One of these PhD programs (Stevens) is examining this question and has provided limited evidence that deprivation of a highly preferred resource may result in biological dysfunction.

The other PhD program (Ralph) is directed at improving our understanding of the measurement of biological functioning. The current stress assessment methodology most commonly involves measuring changes in plasma glucocorticoid (corticosteroids) concentrations, specifically free cortisol, bound cortisol or total cortisol. Thus an elevation of plasma glucocorticoid concentration, particularly the free hormone, is used as evidence that the animal is stressed. This method is widely accepted as an adequate technique to assess the stressed state of an animal. However recent data indicate a lag-time between glucocorticoid secretion into plasma and the appearance of the effects of glucocorticoids on target tissue, the sites in which glucocorticoids exert their biological consequences. This PhD program is studying the relationship between plasma glucocorticoids and intracellular glucocorticoids to improve our understanding of the connection between changes in plasma glucocorticoids and the pathway to physiological changes in the animal. Such knowledge is important in studying and appreciating the

impact of stress on the biological fitness of animals and consequently the welfare implications.

Animal preferences: effect of environmental and animal factors on the choice behaviour of laying hens

Investigators: Hemsworth, Cronin and Petherick
Student: Laine (PhD)
Funding: Poultry CRC
Commencement date: September 2009
Completion date: August 2010
09/10 Funding \$ n/a

The preferences of animals may tell us what is important to them and thus provide an indication of what is required to optimise their welfare. Animal preference tests conducted in a Y-maze apparatus, where an animal is offered a choice between two resources, one in each arm, may appear to be relatively straightforward. However, aspects of the design of the Y-maze test may have the potential to influence animal motivation and thus the choice made by the animal, leading to spurious results that are not reflective of the animal's true preferences.

The results of this research have important implications for the design of preference test methodology and interpretation of results. If scientists are to use preference tests to determine what is necessary for improved welfare, it must be assured that it is a rigorous methodology that reflects true preferences. The current work has demonstrated the Y-maze design factors, which may have been overlooked in the past, such as the quantity of reward, interval of testing and quality of resource on offer, are likely to be important influences on choices made by animals. It is apparent that preference test design requires further research to determine the most appropriate methodology that accurately reflects animals' preferences.

Novel peptide mediates the inhibitory effects of stress on female reproduction

Investigators: Tilbrook, Clarke and Hemsworth
Students: Papargiris (PhD) and Keating (PhD)
Funding: ARC Discovery
Commencement date: January 2009
Completion date: December 2011
09/10 Funding \$ 120,000

Stress inhibits reproduction in females but the specific mechanisms driving this inhibition are unknown. This project offers a novel approach to elucidating stress-induced inhibitors of reproduction. A novel peptide, gonadototropin inhibitory hormone (GnIH),

which is present in the brain, is proposed to be the principle protagonist in mediating the inhibitory effects of stress on sexual behaviour and secretion of reproductive hormones in the female. This project will determine the impact of stress on the synthesis and secretion of GnIH and will quantify the effects of GnIH in mediating the inhibitory effects of stress on reproduction in females.

In the first year we showed that stress did not influence the level of mRNA of GnIH in the hypothalamus and we established a working GnIH radioimmunoassay. We also showed that GnIH administered centrally did not influence the secretion of luteinizing hormone in ovariectomized ewes. It was also reaffirmed that the stress hormone cortisol inhibits sexual receptivity but not sexual motivation or the ability of females to attract males. Further, we established that the mechanism of action of cortisol to inhibit receptivity does not involve disruption of the oestradiol signal to induce oestrus.

We plan to generate data to assist in the mechanisms by which stress inhibits sexual motivation and sexual attractivity including the role of GnIH and other relevant neuropeptides.

We have published three journal articles to date and have presented data at national and international laboratories. We have submitted an abstract to the International Congress of Neuroendocrinology. To date, publications and presentation of data at international laboratories has generated substantial debate to the point where requests to collaborate internationally have been forthcoming.

Program 2 Housing and husbandry effects on animal welfare

The effects of group housing during gestation on sow welfare and reproduction

Investigators:	Hemsworth, Morrison, Cakebread and Tilbrook
Student:	Karlen (PhD)
Funding:	Australian Pork Limited
Commencement date:	July 2007
Completion date:	December 2010
09/10 Funding	\$175,682

There is increasing community concern with society's treatment of animals. Confinement housing of livestock such as those common in modern pig and poultry production appear to be at the forefront of these concerns. In relation to pig housing, the most contentious animal welfare issue is housing of dry (non-lactating) sows. Increasing community concern about confinement housing has led internationally to legislation, consumer and retailer pressure to increase the use of group housing for gestating sows. Housing sows in stalls is being phased out in the European Union by 2013 and in New Zealand by 2015 except for the first 4 weeks of gestation. Recent changes in the Australian Model Code of Practice for the Welfare of Animals – Pigs recommend restricting the duration of housing gestating sows in stalls to early gestation.

Industry experience however indicates that the opportunity for group housing to improve sow welfare is presently limited by the high levels of aggression that is commonly observed in newly formed groups of sows after mixing: this aggression, especially if intense and prolonged, may lead to injuries and stress. While stress and injury clearly have welfare implications, stress has been shown to inhibit reproduction in many species, including pigs. Furthermore, injury is responsible for a large number of early culls and deaths in breeding sows and thus injury increases the cost of production by increasing replacement rates. For example, it has been reported that an average of 9% of sows, with a maximum of 19% of sows, die on Australian farms, with many sows having injuries severe enough to result in early culling. There are few rigorous recommendations in the scientific literature on the design features of sow group housing that reduce aggression.

This project is examining the effects of floor space and group size on aggression, stress, injury, lameness and reproduction in sows housed in groups during gestation. Recent research by the group found that the practice of housing sows in stalls immediately after mating and delaying mixing in large groups on deep litter until pregnancy is confirmed, by reducing aggression at mixing, may provide some distinct welfare advantages over housing sows either in stalls or in large groups on deep litter for the entire gestation. This 'hybrid' system is also presently being investigated in this current APL Project.

Effects of aggressive characteristics of individual sows and mixing strategies on the productivity and welfare of group-housed gestating sows

Investigators:	Hemsworth, Morrison, Cronin, Tilbrook and Widowski
Student:	Verdon
Funding:	Australian Pork Limited
Commencement date:	January 2010
Completion date:	June 2012
09/10 Funding	\$96,229

High levels of aggression are commonly observed in newly formed groups of sows after mixing: this aggression, especially if intense and prolonged, may lead to injuries and stress. However, there are few rigorous recommendations in the scientific literature on the design features of sow group housing that reduce aggression. While the problem of pig aggression has received considerable attention, detailed studies of aggressive behaviour have generally used staged paired encounters or small group sizes. These research settings are very different from commercial settings.

While space, time of mixing and provision of feeding stalls may reliably reduce aggression and stress in group-housed sows, it is clear that a better understanding of the effects of the composition of the group, particularly aggressive behaviour of individual sows, may have important implications for both the welfare and reproductive performance of the group as a whole. For example, the opportunity arises to assemble groups that perform well in terms of overall welfare and reproductive performance based on the composition of the group if (1) the composition of the group in terms of aggressiveness of its individuals is related to the overall stress level in the group and (2) this behavioural characteristic is stable over time and/or is heritable.

Therefore, project is examining whether the composition of groups, particularly in terms of the aggressive behaviour of individual sows, is related to the welfare and reproductive performance of the group as a whole. Furthermore, this project will also examine the use of boars, straw enrichment and dietary supplements on aggression in sows at mixing.

This project will provide fundamental knowledge to the Australian pig industry on basic principles of mixing pregnant sows. Such knowledge is essential as the industry moves to more use of group housing systems for breeding females. Furthermore, such knowledge is required to develop and defend science-based recommendations on sow housing during gestation.

Importance of rearing environment, space and nests for laying hens in cages

Investigators:	Hemsworth, Tilbrook and Widowski
Student:	Engel (PhD)
Funding:	Australian Egg Corporation Limited
Commencement date:	September 2009
Completion date:	April 2012
09/10 Funding	\$ 89,435

The two most contentious issues in relation to cage housing and hen welfare are space and the need for a nest. The literature on space allowance in cages shows that in general as floor space increases, within a range of 300 to 650 cm²/hen, welfare generally increases, based on decreased mortality and higher egg production and body weight. At the lower space there is also evidence of increased stress. A recent AECL project that included measures of stress showed that in cages with a space allowance of 750 and 1500 cm²/hen, while there were effects of group size there were no effects of space allowance on hen welfare. Similarly, a recent AECL project on nests in cages showed that about 30% of hens consistently chose to lay eggs on the cage floor and that the presence or absence of a nest had no effects on a number of stress-related measures indicative of a chronic stress response.

This project is using the 2 most common methodologies to assess animal welfare, measuring animal preferences and biological functioning. Preference tests are used by scientists to draw inferences on animal welfare on the basis that these preferences are influenced by the animal's emotions (or feelings), which are prime determinants of its welfare. Measuring biological functioning involves the integrated use of behavioural, physiological, health and fitness measures.

Determining how space allowance and nests in cages affect hen welfare will assist the egg industry both by demonstrating that cages may be an appropriate environment for laying hens and in any negotiations with Government on future space allowances and/or requirement for nests for laying hens.

The effects of up to 32 hrs food and water deprivation on the physiology of spent laying hens

Investigators:	Edwards, Hemsworth, Tilbrook and Rice
Funding:	Australian Egg Corporation Limited
Commencement date:	April 2010
Completion date:	December 2010
09/10 Funding	\$ 116,725

This experiment will be conducted to examine the physiological effects of up to 32 hrs food and water deprivation in laying hens, and to specifically compare the effects of 24 hrs vs. 28 and 32 hrs of deprivation for significant differences. The deprivation periods were chosen by the Australian Egg Corporation Ltd, who requested that this research be conducted. This period was based on anecdotal reports from the egg industry regarding the duration of transport between remote farms and the processing plant. These results will be significant in determining whether the welfare of hens transported from distant farms in QLD to the processing plant is compromised, and whether these farms must consider alternative means of transport.

A single experiment will be conducted over a 33hr period at Kinross farm. 120 spent laying hens will be removed from their cages and placed in plastic transport crates that are representative of commercial transport conditions. The hens will then be deprived of food and water for up to 32 hrs (deprivation periods are 0, 12, 24, 28 and 32 hrs), after which they will be decapitated and their trunk blood collected. This blood will be used to determine the hydration status of the birds, as well as corticosterone concentrations and blood glucose levels.

The results of this study will be confidential as this is a piece of contracted research.

Transport of bobby calves

Investigator:	Jongman
Funding:	Department of Primary Industries, Victoria
Commencement date:	October 2008
Completion date:	June 2011
09/10 Funding	\$ n/a

Transport of bobby calves is a major welfare issue for the dairy industry in Victoria. There is no recommendation for loading density for bobby calves during transportation in Victoria, for either short or long duration journeys. The only guideline for loading density offered in the Code of Accepted Farming Practice for the Welfare of Cattle suggests that during transportation, bobby calves should have sufficient space to lie down.

This project aims to provide scientifically-validated recommendations for the stocking density, age and conditions for the transport of bobby calves by:

- identifying the space allowance requirements for transport of bobby calves;
- gaining an understanding of factors such as age, distance travelled and flooring that minimise risks to welfare during transport of bobby calves; and
- developing understanding of how age affects ease of handling, which may indicate ease of loading and unloading and handling at the abattoir.

So far 6 loads of 36 calves have been transported, with treatments including ages varying from 3 to 10 days old, flooring consisting of solid metal, mesh or straw and stocking densities of 0.2, 0.3 or 0.5m² per animal.

Another 6 loads of 36 calves are planned for later 2010.

Effect of age on physiology and recovery behaviour of calves transported for 10 hours in individual pens

Investigator:	Lauber and the late Barnett
Funding:	Department of Primary Industries, Victoria
Commencement date:	July 2009
Completion date:	July 2010
09/10 Funding	\$ n/a

This study examined the physiological and behavioural effects of transport on young calves comparing age, transport or no transport, and time. Analysis of variance found no age, treatment, time or interaction effects. For example, time spent lying was not different between the transported and the control calves. Repeated measures analysis of variance showed significant age and time of testing main effects for total blood cortisol levels; 3-day-old calves had significantly higher levels than 10-day-old calves regardless of treatment. There were no significant treatment main effects, but there was a significant time x treatment interaction effect. No main age, treatment or time of testing effects on white blood cell counts or packed cell volume were observed. Significant time, time x treatment and treatment x age interaction effects were found for lymphocyte counts, with lymphocyte counts increasing over time and across age although lymphocyte counts were within normal ranges at all times throughout the study. Therefore, the results suggest minimal impacts of individual transport under 'ideal' conditions on calves aged 3, 5 and 10 days.

Benchmarking welfare indicators for the dairy industry

Investigator:	Jongman
Funding:	Department of Primary Industries, Victoria
Commencement date:	September 2007
Completion date:	June 2010
09/10 Funding	\$ n/a

Animal welfare is an issue of increasing interest and concern to the broader community and both government and livestock industries are looking to better assess and monitor their performance in addressing animal welfare issues. The concept of benchmarking and compliance has the potential to assess industry performance in relation to animal welfare. It is important that animal industries can demonstrate compliance with welfare codes and standards industry wide, so that consumers (both domestic and overseas) have confidence in the standards under which production occurs. A literature review conducted last year identified recording systems and benchmark data being used overseas. Particularly in Europe an extensive program is being funded by the EU (Welfare Quality) to implement a benchmarking system across all EU countries.

While animal welfare may not be used as a trade barrier, concerns in Europe about imports from countries with lower welfare standards will no doubt be used in marketing EU products. Therefore it is important that Australia not only has similar welfare standards to the EU, but is also able to confirm this through reliable benchmark data on animal welfare. A welfare monitoring scheme should include animal-based measures, resource-based measures and management-based parameters. During a previous project of the Animal Welfare group at DPI Victoria an extensive Dairy Welfare Reference Manual was developed addressing welfare standards recommended in the Code of Practice as well as incorporating 'Good' and 'Best' practice. Some of the issues identified in this project are currently being implemented in industry QA systems.

An assessment will be made of animal welfare on farm using these protocols as well as information from the Reference Manual, and an assessment of farmer training and attitude. This very comprehensive assessment will be analysed to identify the best predictors and risk factors for animal welfare on dairy farms.

The aim is to come up with a select few indicators of welfare that can be used in company QA and benchmarking exercises.

Welfare Quality protocols, used in the EU have been adapted to Australian conditions.

An animal management survey has been developed, based the Dairy Welfare Reference Manual.

The protocols and survey have been piloted on 8 commercial dairy farms and results are currently being analysed to determine the most useful indicators to be used for an on-farm assessment and benchmarking system. How these are used in the future depends on the purpose and the user, and further validation work may need to be conducted.

Welfare of lambs in intensive finishing systems. Part 1.

Investigator: Hemsworth, Coleman, Campbell, Leury, Jongman, Toukhsati

Funding: Department of Primary Industries, Victoria

Commencement date: March 2010

Completion date: December 2010

09/10 Funding \$ n/a

Intensive feeding of lambs is likely to increase in the future due to pressure from climate change and natural resource management. Systems include opportunity feedlots, containment feeding in emergency situations, as well as feedlotting. Current scientific opinion is that some of the variation in lamb performance (and welfare) can be attributed to design features (eg stocking density, feeder space, etc.), shy feeders, feed adaptation, subclinical disease and breed effects.

Public attitudes of intensification of animal production are seen as posing a “high risk” to this development and the sheep meat industry as a whole (eg association of sheep meat production with typical intensive industries). Therefore it is also important to understand public and farmer attitudes to the welfare of lambs in intensive finishing systems in developing R&D policy. Furthermore, such an understanding can be used by government and industry in developing animal welfare policy. Understanding how individuals perceive animal welfare issues can also assist in developing strategies for managing public perception in the broader community.

In this preliminary project, the most contentious issues in intensive feeding systems and containment of lambs will be identified through conducting a literature review of the relevant scientific literature on the welfare implications of confinement systems together with the use of attitude questionnaires assessing both the public and farmers attitudes to farm animal welfare, particularly those welfare issues concerning the lamb production in intensive finishing systems.

The results of the project will be used by the Centre and DPI to assist in the planning of a proposed subsequent major animal experiment studying the most contentious and likely contributors to poor lamb welfare.

Develop and evaluate a model to monitor and benchmark the welfare of animals in research institutions

Investigator: Jongman
Funding: DAFF (AAWS)
Commencement date: June 2009
Completion date: October 2010
09/10 Funding \$ 22,000

This project will develop and evaluate a model to monitor and benchmark the welfare of animals in research. Current and previous research at Australian research institutes will be used and the model will be evaluated on sheep used for research conducted under Animal Ethics Committee (AEC) approved protocols. It has been decided to use sheep as a model in this pilot project as they are commonly used in disease models in biomedical studies as well as livestock production research.

Several indices of animal welfare will be recorded for this RAWMP project, to evaluate those indicators that may be practical and predictive of animal welfare. The results of this study may therefore be used to develop a benchmarking system of animal welfare within and between species and institutions. Recordings for the present pilot project will include animal health and fitness indices such as mortality and morbidity, environmental parameters (“resources”) and animal behaviour responses.

Presently AEC protocols may not consistently include detailed estimates and expectations of outcomes of the most important welfare indices such as mortality, morbidity and culls (specifically due to fitness problems), and therefore the AEC (and the scientists) may not be aware when these indices exceed predictions and problems may be occurring.

This RAWMP project will utilize observations and reports by both the RAWM project team researchers and the experimenters undertaking the AEC approved experiments.

Optimising dairy cow behaviour and welfare within flexible feeding systems

Investigators: Fisher, Jongman, Mansell, Pyman, Auldish and Wales
Students: Dilrukshi (PhD) and Coombe (PhD)
Funding: Department of Primary Industries, Victoria
Commencement date: February 2010
Completion date: June 2012
09/10 Funding \$

Dairy farmers in south eastern Australia are challenged by the need to feed their dairy cows profitably in the face of increased climate variability which directly impact on the availability of water for grazed forage production. More recently, that grazed pasture constitutes less than 50% of a cow's diet annually, with the remainder being made up of

expensive, high-energy concentrates. By necessity this simple system is being replaced with flexible systems that integrate mixed rations, fed on feed pads with grazed pastures (Partial Mixed Rations-PMR), while optimizing cow behavior and welfare.

This project will address specific questions relating to cow comfort and behavior within PMR systems and the success of this project will enable dairy farmers to adopt strategies that optimize cow behavior and welfare within flexible feeding systems.

The anticipated outcome of this large project is to facilitate the ability of dairy producers to adopt more flexible, more profitable feeding systems while achieving appropriate standards of cow health and welfare.

Determining a suitable time off feed for bobby calf transport under Australian conditions

Investigators: Fisher, Mansell, Jongman, Hides and Lauber

Funding: Dairy Australia

Commencement date: July 2009

Completion date: May 2010

09/10 Funding \$ 139,457

The recent development process for the Australian Standards and Guidelines for the Welfare of Animals: Land Transport of Livestock highlighted that the transport and management of bobby calves remains a contentious area. Debate has centred on determining a suitable maximum period that calves may be 'off-feed' during the transport process.

The objectives of this project are: 1) to determine the welfare and metabolic state of 5- to 10-day-old dairy calves in response to increasing time off feed- up to 30 hours, in conjunction with three transport scenarios; and 2) to use these results to provide objective scientific evidence, along with published information, to support the Australian development of an appropriate standard for maximum permissible time off feed for the bobby calf supply chain.

Identification of Risk Factors for Racetrack Injuries in Greyhounds in Victoria

Investigators: Campbell, Fisher and Stafford
Student: Beer (MSc)
Funding: University of Melbourne, Greyhound Racing Victoria
Commencement date: December 2009
Completion date: June 2013
09/10 Funding \$ n/a

This project aims to analyse data collected at greyhound race tracks across Victoria to determine the prevalence of injuries sustained by greyhounds during racing, and to identify possible factors that may increase or decrease the likelihood of a greyhound sustaining a serious injury during a race.

Effect of Cage Enrichment and Predictability on Health Outcomes of Shelter Cats.

Investigators: Croney and Lord
Students: Stella (PhD)
Funding: Morris Animal Foundation
09/10 Funding \$ n/a

The goal of this project is to improve the behavior and well-being of shelter cats using environmental enrichment as an intervention.

Preliminary data has been collected and project protocol has been refined to mimic shelter environment in a research cat colony to facilitate data collection and test proof of concept

Domestication and Development of Social Cognition in Dogs, Wolves & Pigs

Investigators: Croney and Shreyer
Students: Buch (MSc)
Funding: The Ohio State University
09/10 Funding \$ n/a

Theory of mind, the ability to reason about thoughts, beliefs, and desires of others, allows for successful navigation of human society. However, this skill may not be uniquely human; nonhuman primates demonstrate basic theory of mind skills such as understanding pointing

In dogs, complex social-cognitive skills may have evolved during the domestication process, allowing them to navigate human society. Evidence for the domestication hypothesis comes from the extraordinary performance of dogs on several social cognitive tasks as well as striking failures of a closely related non-domesticated species, the wolf, on similar tasks. Thus, domestication may account for dogs' success and wolves' failures on social cognitive tasks, and may lead to similar results when comparing the outcomes on social cognitive tasks of other species of domesticated animals such as pigs with their respective wild relatives, such as warthogs and Babirusa pigs.

Since domestic dogs and pigs have mastered social-cognitive skills foundational to theory of mind, they may be capable of more complex skills, such as understanding intentions. In humans, recognition of intentions develops later than other similar skills (i.e., eye gaze and pointing), generally appearing by 12 months (Saxe et al., 2004; Woodward et al., 2001); therefore, recognition of intentions appears to be a cognitively demanding process.

This project is currently in its planning phase with data collection anticipated to begin August 2010.

Behavioural assessment of adult shelter dogs: Development and validation of the Behavioural Assessment for Re-homing K9's (B.A.R.K.) protocol

Investigators: Bennett, Toukhsati and Coleman
Student: Mornement (PhD)
Funding: Monash University (AWSC) and RSPCA Australia
09/10 Funding \$ n/a

Shelter dogs typically undergo a behavioural assessment (or "temperament test") prior to being made available for adoption. However, very few such tests have been evaluated for their validity, reliability and feasibility. This is a welfare concern because dogs that pass are made available for adoption whereas those that fail are generally euthanased. Decisions made on the basis of an invalid assessment are therefore problematic. This research has several aims: To review shelter dog assessment protocols currently used in Australian shelters and to develop and validate a standardised shelter dog assessment protocol. We also investigated the attitudes of the Australian public towards shelter dogs, their behaviour and the assessment of their behaviour to ascertain what they considered to be important for inclusion in a shelter dog assessment protocol.

Part 1- In the first year we completed a review of the assessment protocols used by several Australian shelters (n=11). This involved observing assessments on individual dogs (n=52), collecting instructions and scoring protocols for the various assessments and interviewing shelter workers responsible for assessing dogs. The results of this review, which showed a significant lack in standardisation, reliability and validity of the tests, will be published this year in Applied Animal Welfare Science.

Part 2- The Behavioural Assessment for Rehoming K9's (BARK) protocol was then developed on the basis of the results of Part 1 and focus group sessions with experts on canine behaviour. The BARK protocol is a standardised assessment and was implemented into several Australian animal shelters to evaluate its reliability and validity.

Measures of test-retest, inter-rater reliability and predictive validity are currently being analysed.

Part 3 – Community attitudes towards shelter dogs, their behaviour and the assessment of their behaviour were explored via an online survey. Data on the 1647 completed surveys are currently being analysed.

The results of this research so far have been presented at numerous National and International conferences and our first paper will be published in Applied Animal Welfare Science in July this year (2010). This research has the potential to improve the way shelter dogs are assessed for their adoption suitability and has generated much interest from welfare agencies in Australia and overseas.

Program 3 Attitudes to animals and animal welfare, and farmer, consumer and community behaviour

Welfare of lambs in intensive finishing systems. Part 1.

Investigators:	Coleman, Jongman, Hemsworth, Campbell, Leury and Toukhsati
Funding:	Department of Primary Industries, Victoria
Commencement date:	March 2010
Completion date:	December 2010
09/10 Funding	\$ 96,000

Intensive feeding of lambs is likely to increase in the future due to pressure from climate change and natural resource management. Systems include opportunity feedlots, containment feeding in emergency situations, as well as feedlotting. Current scientific opinion is that some of the variation in lamb performance (and welfare) can be attributed to design features (eg stocking density, feeder space, etc.), shy feeders, feed adaptation, subclinical disease and breed effects.

Public attitudes of intensification of animal production are seen as posing a “high risk” to this development and the sheep meat industry as a whole (eg association of sheep meat production with typical intensive industries). Therefore it is also important to understand public and farmer attitudes to the welfare of lambs in intensive finishing systems in developing R&D policy. Furthermore, such an understanding can be used by government and industry in developing animal welfare policy. Understanding how individuals perceive animal welfare issues can also assist in developing strategies for managing public perception in the broader community.

In this preliminary project, the most contentious issues in intensive feeding systems and containment of lambs will be identified through conducting a literature review of the relevant scientific literature on the welfare implications of confinement systems together with the use of attitude questionnaires assessing both the public and farmers attitudes to farm animal welfare, particularly those welfare issues concerning the lamb production in intensive finishing systems.

The results of the project will be used by the Centre and DPI to assist in the planning of a proposed subsequent major animal experiment studying the most contentious and likely contributors to poor lamb welfare.

ProHand® Pigs in US

Investigators: Moeller, Botheras, Hemsworth and Coleman
Student: Crawford (PhD)
Funding: The Ohio State University (AWSC) Funded
Commencement date: March 2010
Completion date: December 2012
09/10 Funding \$ n/a

Today in the United States there are more pigs being raised under contract production than ever. In a study completed by the USDA, it was reported that the total number of hogs raised under contract increased from five percent in 1992 to 67 percent in 2004 (USDA). However, little information is known about contract producers with regard to their attitudes, behaviors, gender, or previous swine production experience, to name a few characteristics.

This project will study the contract producers with two primary objectives in mind:

1. To assess baseline stockperson/contract grower beliefs and attitudes toward grower-finisher pigs and assess the subsequent behaviors toward pigs as they influence pig fear responses, and
2. Assess the efficacy of ProHand Pigs stockperson training in modifying existing attitudes, beliefs and behaviors of stockperson toward pigs, with the ultimate goal of developing a version directed toward contract grower-finisher production settings.

Data collection will be beginning in the second quarter of 2010 on 32 Ohio farms and will continue into 2011

The relationships between human attitudes, human behaviour and the behaviour and welfare of dogs in shelters and veterinary clinics.

Investigators: Hemsworth and Coleman
Student: Haynes (PhD)
Funding: University of Melbourne (AWSC)
Commencement date: March 2009
Completion date: March 2012
09/10 Funding \$ n/a

Previous research has demonstrated the existence of a significant sequential relationship between stockperson attitudes, stockperson behaviour and animal

behaviour and animal welfare in livestock settings. Routine stockperson behaviours used to inspect and handle animals may have profound effects on the behaviour and stress physiology of livestock, in turn affecting livestock productivity and welfare.

Despite more than 37% of Australian households owning one or more dogs, there is a limited understanding of the link between human attitudes and behaviour and canine behaviour and welfare. This project will study the human-canine relationship in several well-defined settings, each setting defined and differing in terms of the duration and nature of human contact. Veterinary clinics and animal shelters will be used to examine the relationships between the attitudes and behaviour of 'handlers' to dogs, for example shelter attendants and veterinarians, and the behavioural response of dogs to both the handler and to humans in general. The opportunity will also be taken to examine outcomes in these settings such as ease of handling and subsequent responses to the veterinary clinic as well as rehousing outcomes in animal shelters. The results of these studies will contribute to the handling recommendations for dogs in shelters and veterinary clinics to improve dog behaviour, ease of handling and outcomes as well as providing valuable scientific knowledge regarding the human-canine relationship.

If these are significant relationships between the attitudes and behaviour of 'handlers' in these settings to dogs and the behavioural response of dogs to both the handler and to humans in general, the opportunity arises to utilise training programs to target attitudes and behaviours to improve human-animal interactions in these settings and thus some behavioural and perhaps welfare outcomes for the dogs.

Human-animal interactions in the turkey industry

Investigators:	Botheras and Hemsworth
Students:	Pempek (MSc) and Enigk MSc)
Funding:	Midwest Poultry Research Program, Cooper Farms, Ohio Poultry Association
Commencement date:	July 2009
Completion date:	June 2010
09/10 Funding	\$ 12,861

Research in several farm animal industries, including the laying hen and broiler chicken industries, has demonstrated the significant effects of human-animal interactions on animal fear of humans, and animal welfare and productivity. No such research has been completed in the turkey industry. The aims of this study are to investigate fear of humans in commercially-raised turkeys, and the possible relationships with bird welfare and productivity, and stockperson behaviour

- Raw data collection was completed in late December 2009. A total of 31 groups of birds (~5800 birds/group) were visited at 4, 8 and 12 weeks of age.
- A stroll test was used to record the number of turkeys within close proximity of a novel human as they walked around the barn at 1 step/s for 30 s, and then paused for 30 s, then walked again, and so on.

- Stockpeople were asked to keep a log for 1 week prior to each visit to record the amount of time they spent in the barn each day and the activities completed while they were in the barn.
- Blood samples were collected from 30 randomly selected turkeys in each barn at the end of the 12 week old visit, for 16 of the barns. The blood samples were analysed to determine heterophil:lymphocyte ratios, a measure of long-term stress.

Production records were obtained, including feed efficiency, mortality, and number of birds condemned at the processing plant.

Farm animal welfare in Ohio: Assessing public concern and implications for the food animal industry

Investigators:	Lobao, Coleman, Eastridge, Hemsworth and Botheras
Students:	Deemer (MSc) and Pempek (MSc)
Funding:	Ohio Agricultural Research and Development Center
Commencement date:	April 2006
Completion date:	December 2010
09/10 Funding	\$ 21,658

Farm animal welfare has long concerned animal scientists, social scientists, and the food animal industry. However, relatively little is known about the U.S. population's recent views regarding farm animal welfare. Much of our knowledge is based on case-studies or other research with limited generalized inferences. Among the questions consistently raised by analysts is the relationship between the public's knowledge of farm animals and their attitudes and food consumption behaviour. Our research addresses the gap in the literature by examining the public's knowledge of farm animals, as well as other key covariates and their relationship to attitudes and food consumption behaviour. Data are from a large, random sample of the Ohio population (N=1,000) and a comparative smaller nationwide sample taken during 2007. Along with variables measuring knowledge about farm animal production, we evaluated the relevance of key demographic variables, such as rural-urban residence, gender, income, and ethnicity. Multiple regression models using different dependent variables of animal welfare attitudes and behaviour were employed. Across these models, the most consistent correlates of greater concern with farm animal welfare were gender (women) and urban residence. Based on these and other control variables, knowledge of farm animal production had little impact on attitudes and behaviour. These results suggest that educational outreach to improve knowledge of farm animal production may have limited impact on attitudes and behaviour relating to farm animal welfare.

The next step is to evaluate the manner by which the farm animal industry (with focus on dairy and swine producers) is adapting to new protocols for animal treatment. We contacted food retailers/processors and they provided us with some information from which we developed a survey instrument. The survey will be conducted with producers to evaluate the degree to which they will adopt animal-welfare friendly protocols.

The welfare of recreational horses in Victoria: the occurrence of and factors associated with horse welfare

Investigators: Coleman and Jongman
Student: L. Hemsworth (PhD)
Funding: Bureau of Animal Welfare
09/10 Funding \$ n/a

In Australia, the number of horse welfare problems investigated by the Royal Society for the Prevention of Cruelty to Animals (RSPCA) relative to other domestic animal problems remains high, with significant time and resources utilised in dealing with these problems. Research by Pearson (2004) found that owner attributes that were specifically correlated with reduced horse welfare were lack of commitment to horse ownership, the belief that horses made good companion animals, the belief that horses were difficult to care for, a low education and residing in the outer metropolitan area or the outer-fringes of the city. While this study highlighted the opportunity to reduce welfare issues in domestic horses by understanding owner characteristics, this study provided little information on the extent of animal welfare problems in recreational horses or indeed the extent of this relationship between owner characteristic and horse welfare in the broader and larger horse recreational group.

The Victorian Animal Welfare Advisory Committee's Working Group on the Welfare Issues Associated with Unidentified Horses, Cats and Dogs has concluded that very little is known about the horse ownership in Victoria, mainly because of the lack of compulsory identification and registration of horses and the difficulty in contacting horse owners that are not members of horse clubs.

There is therefore an obvious need to identify horse numbers in Victoria and the circumstances surrounding their ownership such as participation in horse clubs and activities, foals produced, and surrender and euthanasia. Furthermore, understanding the occurrence and extent of horse welfare problems, as well as factors associated with these welfare problems would provide valuable information for the development and implementation of state and local government policy on responsible horse management.

Identifying 'ideal' companion dogs for Australia

Investigators: Bennett and Marston
Student: King (PhD)
Funding: Pet Industry Advisory Service and Bureau of Animal Welfare
09/10 Funding \$ n/a

With differing lifestyles and an increase in urban living it is likely that the characteristics of an 'ideal' pet dog i.e. one that is well suited to a modern lifestyle, have changed. The aim of this study is to a) determine what behavioural characteristics people consider 'ideal' in a pet dog today, b) develop a standardised behaviour assessment to measure a desirable canine personality trait and c) evaluate the assessment's reliability and validity.

Previously developed behavioural assessments have not been assessed for their validity, reliability and predictive qualities. Some have been developed to assess working dog traits and are not relevant to the average pet owner. None have been designed using a systematic scientific approach. The initial phase of this study identified that people prefer a dog which exhibits affectionate, friendly and calm behaviour. These characteristics are related to the canine personality trait; amicability, which has been previously described in the literature. A canine behaviour assessment protocol was developed, which was designed to elicit behaviour indicative of the trait 'amicability' in pet dogs.

Currently 200 adult dogs are being assessed to determine which behavioural variables accurately reflect this trait. This assessment has the potential to objectively assess amicability without using owner reports, which are subjective and often unreliable. The development of a behavioural assessment which has been scientifically tested for reliability and validity, to measure amicability of companion dogs, could be of great benefit to large range of dog-related organisations and paves the way to the development of a wider range of tests characterising canine behaviour.

We have published one journal article to date and have presented data at numerous national conferences and seminars. Three abstracts were recently submitted to international conferences (ISAZ, IAHAIO and CSF). Two abstracts have been accepted for oral presentations. The third is pending. To date, publication and presentation of the data has sparked great interest within the dog owning community and the general media.

Program 4 Tertiary and post-graduate education and training

Animal Welfare Education Project

Investigators:	Lauber, Coleman, Hemsworth and Skuse
Funding:	Department of Primary Industries, Victoria and the Telematics Trust
Commencement date:	July 2009
Completion date:	September 2010
09/10 Funding	\$ 67,272

Key concepts in animal welfare will be introduced along with an introduction to the topic of human-animal interactions and the impacts of these interactions on animal. Issues of supervision and care, attitudes and handling will be discussed as a strong emphasis is placed on the pivotal and often underestimated role that humans play in the welfare of animals and those human behaviours that can compromise the human-animal relationship. The package will be delivered in a flexible, self-paced manner and nor require expert teachers for delivery.

Mapping ProHand® stockperson training packages against current livestock industry competencies and establishing recommendations for future accreditation

Investigators:	Skuse, Edge
Funding:	DAFF (AAWS)
Commencement date:	June 2010
Completion date:	June 2011
09/10 Funding	\$ 13,000

This project will address the above by first, mapping in detail, all of the available ProHand program(s) to all of the relevant livestock industry competency units (within several different diplomas), including the core assessment requirements. This exercise will also provide insight into future revisions of ProHand that may include specific assessment tools required to fulfill the applicable competency requirements of the mapped units.

The project will also examine options for accrediting the ProHand packages. There are several ways this may be examined – first, as part of quality assurance certification, where the package may be accredited in relation to specific standards, and second – registration of the packages as a formal course in accordance with the policies specified by the National Training Information Service and State Training Authorities. Depending on the mapping exercise, ProHand may be more suitable for the latter option, especially as it is likely that the program may only meet part of the guidelines of existing Training Package(s) or accredited course(s). The objective of the project will be to produce a report with two parts: 1) the mapping of ProHand against the core competency assessment requirements for relevant livestock units and 2) discussion on the options for accreditation of the ProHand packages based on the findings for part 1.

ProHand® Pigs program update

Investigator:	Coleman
Funding:	Australian Pork Limited
Commencement date:	July 2009
Completion date:	December 2009
09/10 Funding	\$ 7,500

Participants at a ProHand Facilitators workshop identified some aspects of program which needed revision. The revised ProHand pigs program will be more functional and will reflect new APL branding.

Delivery of “Animals in Society” as part of the “Human and animal interactions” cluster at The Ohio State University.

Investigator: Bennett, Osborne
Funding: The Ohio State University
Commencement date: July 2007
Completion date: ongoing
09/10 Funding \$ n/a

“Animals in Society” (AIS) is an introductory course designed to introduce students to the social, cultural, economic and legal frameworks within which current human-animal relationships exist. The course was developed by the Animal Welfare Science Centre in collaboration with the Department of Animal Sciences at OSU. AIS fulfils a Social Science elective and was offered for the first time during the Autumn 2007 quarter.

Students in this course, explore a wide range of current animal roles with a view to broadening their understanding of how integral our relationships with animals are in maintaining human physical, social and psychological health and well-being. Currently, there is a wide range of views about animals, often based on misinformation and poorly informed value-based judgments. AIS is designed to equip students with the knowledge and critical thinking skills necessary to address questions concerning how animals can best co-exist with human societies.

Students learn to appreciate the physical, social and psychological interdependence between species and be able to use the knowledge acquired to objectively, critically, and sensitively evaluate and comment on emerging issues regarding animals in society.

Delivery of “Animals in Society” as a breadth subject at the University of Melbourne.

Investigator: Hemsworth, Lauber, Edwards, Stevens, Chamberlain
Funding: The University of Melbourne
Commencement date: July 2008
Completion date: ongoing
09/10 Funding \$ n/a

This course is offered as a breadth subject throughout the University and is designed to encourage students to begin to think about how and why animals are so integral to human society.

The course investigates the human-animal relationships, where they originated, during domestication, and where they are now. Also examined in detail are some key relationships between humans and animals, including animals as pets, in agriculture, as research subjects, in educational roles and as pests.

A key topic is a study of the changing attitudes of humans towards animals throughout time and humankind's moral and ethical obligation to animal wellbeing. The course animal welfare science and discusses some of the current animal welfare issues in livestock industries around the world. The course looks to the future and where the relationship between humans and animals may be headed.

CENTRE RD&E COMMUNICATIONS

1. Books / book chapters

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3.b Other Conference publications

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Botheras, N.A., (2010). Effects of Handling on Behavior, Welfare and Production. Minnesota Dairy Welfare Symposium, May 18, 2010, St. Paul, MN.

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Croney, C.C., (2009). Ethics, animal and science. Midwest Veterinary Medical Conference. Columbus, OH.

Croney, C.C., (2009). Ethical implications of the human-animal bond. SAVMA. Columbus, OH.

Croney, C.C., (2010). Scientific, Educational and Ethical Challenges Facing the Dairy Industry. ADSA Discover Conference. Nashville, IN.

Croney, C.C. and Botheras, N.A., (2010). Scientific and Ethical Challenges Facing the Dairy Industry: Maintaining a Social License to operate. Tri-state Dairy Nutrition Conference. Fort Wayne, IN.

Croney, C.C., (2010). Should farm animal welfare policies be regulated in the U.S., and on what basis? Midwest Veterinary Medical Association Annual Conference. Columbus, OH.

Croney, C.C. and Botheras, N.A., (2010). Scientific, Educational and Ethical Challenges Facing the Dairy Industry. Northeast Dairy Producers Association. Syracuse, NY.

Croney, C.C., (2010). Ethical implications of the human-animal bond. Buffalo Academy of Veterinary Medicine. Buffalo, NY.

Croney, C.C., and Botheras, N.A., (2010). Animal welfare issues and the dairy industry; challenges and opportunities. National Mastitis Council. Albuquerque, NM.

Fisher, A.D., Martin, P.A.J. and Paton, M.W. (2009.) Using risk assessment for lifetime welfare comparisons. How well does it perform? Australian College of Veterinary Scientists, Science Week Conference, Gold Coast, July 2009.

Fisher, A.D. (2009). The economic benefit of well-being. Boehringer Symposium Care and Comfort for Production Animals, Cairns, July 2009

Fisher, A.D. (2010). Animal welfare- Let's be on the front foot. MLA Meat Profit Day, Melbourne, April 2010.

Lee, C., Paull, D.R., Fisher, A.D. and Colditz, I.G. (2010). Flystrike management in absence of mulesing - 4. Skintraction™. Australian Veterinary Association, Annual Conference, Brisbane, May 2010.

Rohlf, V.I., Bennett, P.C., Coleman, G.J., and Toukhsati, S.R. (2009). Attitudes of owners influence various dog health care practices. Proceedings of the Minding Animals Conference, Newcastle, Australia, 12-18 July, 2009.

Toukhsati, S.R. and Dalley, J. (2009). Recovery of a Stray Cat Population following a one-time Capture, Neuter and Return Program in the Asia-Pacific. Proceedings of the Minding Animals Conference, Newcastle, Australia, 12-18 July, 2009.

Toukhsati, S.R., Coleman, G.J., and Dalley, J. (2010). The influence of cultural factors on behaviours relating to stray animal management strategies in Asia. Proceedings for the Asia for Animals Conference, Singapore, 15th-19th January 2010.

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4. Research Reports

Cronin, G.M. and Hemsworth, P.H., (2009). Final Report to the Australian Egg Corporation Limited for Project UM-65: The welfare of laying hens in cages. September 2009, 96 pp.

Edwards, L. E., (2010). The relationship between shed cleanliness and hen productivity – submitted to the Australian Poultry CRC, February 2010. Project No: 09-32: UMelb.

Fisher, A., Mansell, P., Stevens, B., Conley, M., Jongman, E., Lauber, M. and Hides, S., (2010). Determining a suitable time off feed for bobby calf transport under Australian conditions. Final Report to Dairy Australia, Project No. TIG124.

Marston, L. C. and Bennett, P. C., (2009). Characteristics of pets who visit veterinarians. A Report to the Bureau of Animal Welfare, Department of Primary Industries, Victoria.

Marston, L. C. and Bennett, P. C., (2009). Owner experiences of adopting a shelter cat. A Report to the Bureau of Animal Welfare, Department of Primary Industries, Victoria.

5. Theses

Edwards, L.E., (2009). The human – animal relationship in the laying hen. PhD thesis, The University of Melbourne.

Morris, H., (2009). Effects of environmental enrichment on learning and adaptability in chickens. PhD Thesis, The Ohio State University

ANIMAL WELFARE SCIENCE CENTRE SEMINARS

July '09

Theme: *Livestock Handling.*

Speaker: Dr Temple Grandin, Professor of Animal Science, Colorado State University, USA.

“Reducing livestock stress during handling in yards, lairage & transport “.

August '09

Theme: *Animal welfare issues and RD&E requirements*

Speakers: Prof. Grahame Coleman, AWSC, Monash University.

“Human attitudes and behaviour: can an understanding of these human characteristics improve animal welfare?”

Dr. Pauleen Bennett, AWSC, Monash University.

“Thinking critically about animals in society: is this where animal welfare education should be heading?”

Prof. James Kinder, AWSC, The Ohio State University, USA.

“Animal welfare education and training developments in the USA”

Prof. Paul Hemsworth, AWSC, The University of Melbourne.

“Handling and housing: how important are they to an animal’s welfare?”

Assoc. Prof. Andrew Fisher, AWSC, The University of Melbourne.

“Painful husbandry procedures: how can they be improved to reduce pain?”

Prof. Alan Tilbrook, AWSC, Monash University.

“Understanding stress responses: can we develop strategies to reduce stress and improve welfare?”

Dr. Ellen Jongman, AWSC, DPI Victoria.

“Benchmarking animal welfare: can this development improve animal welfare?”

February '10

Theme: *Building better dogs: using what we've learned about genetic and experiential effects on dog behaviour to improve dog welfare*

Keynote speakers: Dr. Pauleen Bennett, AWSC, Monash University.

“Why behaviour is as important as conformation when selecting breeding dogs.”

Prof. Mike Goddard, The University of Melbourne and DPI Victoria.

“Genetics of dog behaviour and breeding programs to improve canine welfare.”

Assoc. Prof. Paul McGreevy, The University of Sydney.

“Breeding for quality of life.”

Dr. Kate Schoeffel, Australian Association of Pet Dog Breeders.

“A model for an association of professional pet dog breeders.”

April '10

Prof David Mellor, Animal Welfare Science and Bioethics Centre, Massey University, NZ.

“Pain & Slaughter.”

June '10

Theme: *AWSC Student Presentations*

Speakers: Anoma Dilrukshi, PhD candidate, AWSC, The University of Melbourne.

“Defining dairy cow behaviour and welfare in feeding systems based on total mixed ration fed in conjunction with grazed pasture.”

Jo Coombe, PhD candidate, AWSC, The University of Melbourne.

“The effects of flexible feeding systems on the health and welfare of dairy cows.”

Catherine Webb, Masters student, AWSC, The University of Melbourne.

“Establishing a validated methodology for assessing the aversiveness of dog training devices.”

Tiffani Howell, PhD candidate, AWSC, Monash University.

“The utility of minimally-invasive electroencephalography (EEG) in dog cognition research.”

Sally Haynes, PhD candidate, AWSC, The University of Melbourne.

“Relationships between human attitudes, human behaviour and the behaviour and welfare of dogs in animal shelters and veterinary clinics.”

Lauren Hemsworth, PhD candidate, AWSC, Monash University.

“The Welfare of Recreational Horses in Victoria.”

Lauren Edwards, Post-doctoral research fellow, AWSC, The University of Melbourne.

“The human-animal relationship in the caged egg industry.”

Joanna Engel, PhD candidate, AWSC, The University of Melbourne.

“The Importance of Space and Nest Boxes for Laying Hens in Cages.”

Sonja Laine, PhD candidate, AWSC, The University of Melbourne.

“Animal preference tests: importance of design factors.”

Marcus Karlen, PhD candidate, AWSC, The University of Melbourne.

“Is aggression a contributing factor to sow lameness?”

Bronwyn Stevens, PhD candidate, AWSC, The University of Melbourne.

“Effects of deprivation of a preferred resource, feed or social contact, on the biological functioning of pigs.”

Copies of the Animal Welfare Science Centre Annual Report 2009 – 2010 are available on request from:

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