



THE ANIMAL WELFARE SCIENCE CENTRE ANNUAL REPORT

2008-2009

FOREWORD

The Animal Welfare Science Centre was established in 1997 to provide focus and direction for the partner organisations' academic and research resources in animal welfare.

Aims of the Centre:

1. Conduct strategic and basic animal welfare research to address major animal welfare issues.
2. Targeted industry, public and tertiary education to improve animal welfare and productivity and to assure local and international consumers, the public and Governments that the welfare standards for Australian animals are underpinned by sound and well-accepted science.

Outcomes from the Centre:

1. All animals are managed according to best animal welfare practices through informed, confident and proactive 'industries'.
2. The discussion on animal welfare is facilitated in the general community through well-informed and confident stakeholders.
3. Recognition of high welfare standards in Australia and preferential sourcing by purchasers of Australian products through informed and confident public and markets.

Outputs from the Centre:

1. Develop scientifically defensible welfare methodology.
2. Use scientifically defensible methodology to establish, amend or validate industry welfare standards and practices.
3. 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.
4. Understand public and consumer attitudes to animal welfare to assist Governments and industry in (1) developing animal welfare policy and (2) assuring local and international consumers, public and other governments of the sound welfare standards for Australian domestic animals.
5. 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.
6. Provide high quality postgraduate and postdoctoral training for the next generation of researchers and teachers in animal welfare science.

RD&E activities of the Centre:

The Centre's activities can be described under four major program areas:

1. Animal welfare methodology.
2. Housing and husbandry effects on animal welfare.
3. Attitudes to animals and animal welfare, and farmer, consumer and community behaviour.
4. Industry, tertiary and post-graduate education and training.

A strong relationship in research and teaching with The Department of Animal Sciences and College of Veterinary Medicine at The Ohio State University (OSU) has been cemented in 2009 with OSU becoming the fourth partner of the Centre.

The Centre is a partner in the World Organisation for Animal Health (OIE) Animal Welfare Collaborating Centre. Other partners in the collaboration include CSIRO's Division of Livestock Industries, the Centre for Animal Welfare and Ethics at the University of Queensland, the Animal Welfare Science and Bioethics Centre at New Zealand's Massey University and the AgResearch Animal Behaviour and Welfare Research Centre, also in New Zealand.

The Centre has strong collaborative links with research providers in Australia and overseas and has established memoranda of understanding with Massey University and the West Australian Department of Agriculture and Food.

The Centre's research and teaching capacity is considerable, with scientific expertise and experience in the key disciplines of animal behaviour, ethology, psychology, stress physiology and veterinary medicine. There are currently 11 scientists and 14 associate researchers operating within the Centre across the partner organisations. The Centre's activities are supported by a full-time Executive Officer.

Centre scientists also undertake a number of education and training activities. Postgraduate programs, with both local and international students, are a significant and critical part of the Centre's successful research programs. There are presently 19 post-graduate students studying under the auspices of the Centre.

Centre staff teach several animal welfare-related subjects to animal science students at the University of Melbourne and have recently developed and delivered the course Animals in Society for The Ohio State University.

There are substantial specialised research and teaching facilities associated with the four partner organisations that are utilised by the scientific personnel working within the Centre. These facilities include research and housing facilities for farm, companion and laboratory animals, endocrine laboratories, multimedia publication laboratories and classroom and seminar facilities for teaching and training.

Centre staff have participated in a range of industry and scientific meetings. Furthermore, the Centre has continued to offer a series of public and scientific meetings on relevant animal welfare topics in order to facilitate discussion and awareness of development of issues and research findings in animal welfare.

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

Board of Management

Professor Mike Rickard, Chair

Dr. Ron Prestidge, Future Farming Systems Research, Department of Primary Industries, Victoria

Professor Rick Roush, Melbourne School of Land & Environment, The University of Melbourne (alternates with Prof. Hinchcliffe)

Professor Ken Hinchcliffe, Faculty of Veterinary Science, The University of Melbourne (alternate with Prof. Roush)

Professor Iain Clarke, Department of Physiology, Monash University

Professor James Kinder, Department of animal Sciences, The Ohio State University

Professor Paul Hemsworth, The University of Melbourne

Scientists

Professor Paul Hemsworth (The University of Melbourne, Parkville and DPI Werribee) – Director of the Centre: A research career studying the behaviour and welfare of farm and companion animals, particularly examining the influence of the social and physical environment on farm animal behaviour and welfare and the influence of human-animal interactions on animal welfare and productivity.

Professor Grahame Coleman (Head of the School of Psychology, Psychiatry and Psychological Medicine, Monash University, Caulfield and Clayton) – Deputy Director of the Centre: Grahame has followed a research career in aspects of human and animal behaviour associated with biological rhythmicity and sleep and changes in stress-related and reproductive hormones. Current research interests focus primarily on human-animal interactions in farm and companion animals and public attitudes to animal welfare.

Professor Alan Tilbrook (Physiology, Monash University, Clayton) – A research career in endocrinology and behaviour of domestic animals. Particular interests include the endocrine and neuroendocrine control of reproduction in males, the effects of stress on reproduction and endocrine and behavioural responses to stress.

Associate Professor Andrew Fisher (Veterinary Science, The University of Melbourne) – A research career in welfare issues in animal health and production. Interests include Pain and analgesia in animals, long distance transport and animal welfare and regulatory approval of the use in animals in scientific research.

Dr. Pauleen Bennett (Psychology, Monash University, Caulfield) – Research career studying behavioural neuroscience related to animal learning and memory formation. Recent research interest in human-animal interactions, particularly with respect to companion animal species.

Dr. Ellen Jongman (DPI, Werribee) - Research interests include the effect of housing, husbandry procedures and management on the welfare of sheep and dairy cows

Dr. Samia Toukhsati (Psychology, Monash University, Caulfield) – Research interests include animal cognition and welfare, and her recent research has included understanding human-animal interactions, particularly with regard to companion animal owner attitudes and behaviours.

Dr. Mariko Lauber (DPI, Attwood) – Research interests include behavioural development in dairy calves and its implication in assessing animal welfare implications of new practices and technologies. Current activities focusing on industry, public and tertiary training in animal welfare.

Dr Linda Marston (Psychology, Monash University, Caulfield) - Research interests include human-animal interactions, particularly with respect to companion animal species.

Dr. Sarah Chaplin (The University of Melbourne, Dookie) - Research interests in the effects of management practices on dairy cow behaviour and welfare.

Dr Jacqui Ley, (Psychology, Monash) – Veterinary behaviourist, research interests include measuring personality in dogs.

Associate Researchers

Ian Bland, (The University of Melbourne)

Peter Cakebread, (The University of Melbourne)

Naomi Botheras, (The Ohio State University)

Steve Boyles, (The Ohio State University)

Candace Croney, (The Ohio State University)

Maurice Eastridge, (The Ohio State University)

Sue Hides, (Department of Primary Industries, Victoria)

Joe Hogan, (The Ohio State University)

Jim Kinder, (The Ohio State University)

Brian Leury, (The University of Melbourne)

Steve Moeller, (The Ohio State University)

Linda Lobao, (The Ohio State University)

Linda Lord, (The Ohio State University)

Mike Lilburn, (The Ohio State University)

Administration

Mr. Jeremy Skuse (BAgSc hons) – Executive Officer of the Centre, significant professional livestock experience derived from operating in senior management, quality assurance and extension roles in Australia, Asia and the United States.

Current Postgraduate students

Rachael Bindloss	Masters, Melbourne
Felicity Butterly	PhD, Monash
Mia Cobb	PhD, Monash
Sara Crawford	PhD, Ohio
Joanna Engel	PhD, Melbourne
Sally Haynes	PhD, Melbourne
Lauren Hemsworth	PhD, Monash

Tiffani Howell	PhD, Monash
Renee Huggard	Masters, Melbourne
Marcus Karlen	PhD, Melbourne
Tammie King	PhD, Monash
Sonja Laine	PhD, Melbourne
Kate Mornement	PhD, Monash
Jessica Pempek	Masters, Ohio
Cameron Ralph	PhD, Melbourne
Vanessa Rohlf	PhD, Monash
Jordan Schaan	PhD, Monash
Bronwyn Stevens	PhD, Melbourne
Catherine Webb	Masters, Melbourne

Current Honours students

Rachel Bloomfield	Melbourne
Vivian Ewe	Monash
Alan Gatt	Melbourne
Jaipal Gill	Melbourne
Lauren Roberts	Melbourne
Jonathan Roe	Monash
Samantha Rokx	Melbourne
Nicole Telfer	Monash
Lara Thompson-Hollingsworth	Melbourne
Zhengzhou Lee	Melbourne

Technical Staff

<i>Melanie Conley</i> (Melbourne)	<i>Carter Lui</i> (Monash)
<i>Melanie Monk</i> (Melbourne)	<i>Alanna Sawyer</i> (Monash)
<i>Judy Nash</i> (Melbourne)	<i>Samantha Borg</i> (DPI)
<i>Maxine Rice</i> (Melbourne)	<i>Tracie McCallum</i> (DPI)
<i>Melanie Webber</i> (Melbourne)	<i>Lisa Newman</i> (DPI)
<i>Danielle Bullen</i> (Monash)	<i>Bruce Schirmer</i> (DPI)

International Associates

<i>Professor David Mellor</i> , Massey University, NZ	<i>Dr Adele Arnold</i> , Dairy NZ
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Advisory Committee

Dr. Peter Penson, Chair, Animal welfare consultant

Dr. Onn Ben-David, Caulfield South Veterinary Clinic

Mr. Alan Bowman, Victorian Farmers Federation

Ms. Michelle Edge, Symbio Alliance

Dr. Robert Holmes, Animal Behaviour Clinics

Mr. David Marland, DPI

Mr. Noel Maughan, MLA (Ret)

Professor David Mellor, Animal Welfare Science and Bioethics Centre, Massey University

Dr. Denise Noonan, Univ. Adelaide

Ms. Glenys Oogjes, Director, Animals Australia

Professor Clive Phillips, Centre for Animal Welfare and Ethics, University of Queensland

Mr. Nick Renyard, United Dairyfarmers of Victoria

Mr. Kenton Shaw, QAF Meat Industries

Dr. Stephen Tate, Bureau of Animal Welfare

FUNDING FOR MAJOR CENTRE RD&E PROJECTS 2008/2009

Major Research Projects (source, title, principle investigators, and amount)

Program 1 Welfare methodology

Australian Pork Limited (APL)

Welfare methodology – relationships between biological functional and preference methodologies in studying animal welfare, pigs

Hemsworth, Barnett

\$ 82,500

Poultry Cooperative Research Centre (Poultry CRC)

Welfare methodology – relationships between biological functional and preference methodologies in studying animal welfare, poultry

Hemsworth, Barnett

\$ 82,335

Program 2 Housing and husbandry effects on animal welfare

Australian Pork Limited (APL)

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

Hemsworth, Tilbrook, Karlen

\$ 327,722

Australian Egg Corporation Ltd (AECL)

The welfare of laying hens in cages

Hemsworth, Cronin, Barnett

\$ 98,586

Department of Primary Industries, Victoria (DPI)

Transport of bobby calves

Jongman

\$100,000

Meat and Livestock Australia (MLA)

Review national animal welfare standards for livestock processing establishments

Barnett, Edge

\$80,000

Bureau of Animal Welfare (BAW)

Behavioural assessment of adult companion dogs: Development of national standards for identifying shelter dogs suitable for re-homing

Mornement, Bennett

\$25,000

Petcare Information and Advisory Services (PIAS)

Behavioural assessment of adult companion dogs: Development of national standards for identifying shelter dogs suitable for re-homing

Mornement, Bennett

\$27,500

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

Ohio Agricultural Research and Development Centre (OARDC)

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

Coleman, Hemsworth

\$ 82,650

Bureau of Animal Welfare (BAW)

Scoping proposal for Mandatory Desexing project

Marston, Bennett

\$7,000

What happens to cats that are adopted from shelters?

Marston, Bennett

\$52,671

An Evaluation of the effectiveness of the introduction of mandatory desexing by Councils

Marston, Bennett

\$22,250

Petcare Information and Advisory Services (PIAS)

Are owner-dog relationships influenced by canine personality, canine behaviour and owner characteristics?

Ley, Bennett

\$52,000

Midwest Poultry Consortium USA (MPC)

Behavioural responses of turkeys to humans, and relationship to bird welfare and productivity

Botheras

\$17,148

Program 4 Tertiary and post-graduate education and training

Mintrac/Meat Livestock Australia (MLA)

ProHand for the livestock processing industry: a professional livestock handling package – training the trainers

Hemsworth and Coleman

\$ 10,650

Total Funding (Major Projects)

\$ 1,068,012

SUMMARY OF CENTRE RD&E PROJECTS

Program 1 Welfare methodology

Welfare methodology – relationships between biological functional and preference methodologies in studying animal welfare, pigs

Hemsworth, Barnett

APL Funded

This project addresses the key area of developing objective measures of animal welfare. There are, in general, two major approaches used by scientists to study animal welfare: functioning and preference approaches. The first is an integrated approach measuring behaviour, physiology and health and the consequent fitness responses to assess biological functioning on the basis that difficult or inadequate adaptation will generate welfare problems for animals. The second is the use of animal preference (and behavioural demand) testing on the basis that these preferences are either influenced by the animal's emotions, which have evolved to motivate behaviour in order to avoid harm and facilitate survival, growth and reproduction, or reflect important biological requirements of the animal. While generally considered separately, the functioning and preference approaches nevertheless show considerable convergence that is not widely recognised. For example, it is animals are likely to be motivated to choose those resources (or behaviours) that maintain homeostasis to optimise their fitness and maintain normal biological functioning.

The aim of this project is to compare these two main approaches to welfare assessment, the functioning approach and the preference approach. Such knowledge is essential to the development of a well-accepted methodology or methodologies to study animal welfare. The finding that the resources that are the most preferred by animals are the same resources that animals, when deprived of them, show the most extreme coping attempts (e.g. a chronic stress response), would indicate that both approaches are measuring the integrated physical, physiological and psychological states of the animal. If this can be demonstrated it would assist in achieving a wider consensus on welfare assessment through progressing a single, and more encompassing, scientific concept of animal welfare.

Welfare methodology – relationships between biological functional and preference methodologies in studying animal welfare, poultry

Hemsworth, Barnett

Poultry CRC Funded

The specific objectives of this project are (1) to develop a suitable methodology for choice (or preference) testing to measure the animal's longer term choice for specific resources and then (2) compare the two main approaches to welfare assessment: "normal biological functioning" and "animals choices" approaches. This will enable us to study the relationship between these two approaches, that is whether or not the resources that are the most preferred by animals are the same resources that animals, when deprived of them, show the most extreme attempts to cope and adapt.

This research will thus provide an understanding of the relationship between fundamental biological requirements and preferences of animals with the opportunity to integrate these two approaches into a single animal welfare model that incorporates these two concepts of animal welfare. Such knowledge is essential in the development of a well-accepted methodology or methodologies. The finding that the resources that are the most preferred by animals are the same resources that animals, when deprived of them, show the most extreme attempts to cope and adapt, would indicate that both approaches are valuable and complementary in assessing welfare.

Program 2 Housing and husbandry effects on animal welfare

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

Hemsworth, Tilbrook, Karlen

APL Funded

Recent changes in the Australian Model Code of Practice for the Welfare of Animals – Pigs, will restrict the duration of housing gestating sows in stalls to early gestation. As a result, the Australian pork industry is likely to consider several housing options. In addition to continuous group housing during gestation, there will be increasing interest in a combination of stall housing of sows for 6 weeks post-mating followed by group housing for the remainder of gestation.

This project will examine the effects of space allowance, group size, time of mixing and feeding system on aggression, stress, injury, lameness and reproduction in sows housed in groups during gestation.

The welfare of laying hens in cages

Hemsworth, Cronin, Barnett

AECL Funded

The housing of laying hens in cages is a contentious welfare issue which has already impacted negatively on public sentiment and lead to the introduction of regulations that modify both cage size and stocking density. Further additional and expensive regulations may be introduced in the future.

The aim of this project is to gain an improved knowledge on the relationships between specific hen behaviours such as pre-laying pacing, nest-site selection behaviours, etc., and welfare (stress) parameters for laying hens in cages.

Outcomes from this project will include:

- Factors that may determine the choice of the nest box or cage floor as the egg-laying site and consistency of use of the site by hens
- The relationship between pre-laying behaviour and hen welfare
- Factors that are important to the welfare of hens around egg laying.

Transport of bobby calves

Jongman

DPI Funded

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;
- developing understanding of how age affects ease of handling, which may indicate ease of loading and unloading and handling at the abattoir.

Review national animal welfare standards for livestock processing establishments

Barnett, Edge

MLA Funded

There are several new drivers facing the industry that contribute towards the need to demonstrate compliance with the Standards. These include higher community/consumer expectations regarding animal welfare practice, increasing customer requirements and the revision of Codes of Practice into mandated legislative Standards. All indicate the need to demonstrate adoption of and compliance with the industry Standards and developing a mechanism by which industry can report the national position on animal welfare supported by industry statistics.

This project will utilise the current Standards and revisions as they occur to assess compliance across the industry for both domestic and export establishments. The data will be analysed to determine 'critical' compliance areas for: 1) improving compliance and 2) ongoing benchmarking and monitoring.

The project will provide a framework for industry to utilise these 'critical' compliance areas for ongoing coordinated monitoring (ie annually); this will help meet consumer demands for meat products in domestic and export markets.

Behavioural assessment of adult companion dogs: Development of national standards for identifying shelter dogs suitable for re-homing

Mornement, Bennett

BAW Funded

Pet dogs sometimes behave in ways that cause personal injury, property damage, community disputes and owner dissatisfaction. In Australia, thousands of dogs are relinquished to animal shelters and pounds every year. Before these dogs are made available for adoption, they are typically screened for adoption suitability by way of a “temperament test” or behavioural evaluation. Unfortunately, many such tests lack standardisation and objectivity. This may result in unsuitable dogs being adopted out or conversely, dogs that are suitable for adoption may be euthanased. This has welfare implications for both the Australian community and the dogs in the shelter/pound system.

Currently, there is no scientifically validated canine behavioural assessment protocol available for use by Australian shelters and pounds to assess the behaviour (and adoption suitability) of the dogs in their care.

The first aim of this project is to develop the Behavioural Assessment for Re-homing K9s (B.A.R.K.) protocol based on a comprehensive review of current assessment practices in Australia and overseas. The second aim is to validate the B.A.R.K. protocol so that it may be used nationally to evaluate the behaviour of adult dogs held in welfare shelters. It is anticipated that this research will greatly improve the welfare of shelter dogs and the community at large.

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

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

G.Coleman, L.Lobao, M.Eastridge, P.Hemsworth, J.Sharp, N. St-Pierre

OARDC Funded

The livestock industries are facing new public pressures on a wide range of issues including animal welfare, but little is known about the US population’s views and behaviour regarding the welfare of farm animals. A few opinion surveys have been used to collect information on animal welfare concerns, but questions about perceived treatment of food animals are even rarer. Because public attitudes have potential to dramatically affect use of animals, it is critical that we identify and understand these attitudes in a scientific and unbiased manner before making decisions. This project consists of two parts.

The first part is studying public attitudes and behaviour regarding farm animal welfare by identifying the range of attitudes about farm animal welfare that exist in the population and among key stakeholders and the social, economic, and demographic determinants of these attitudes, as well as investigating the degree to which attitudes affect consumption behaviours and community behaviours, such as political action for/against livestock farming.

The second part is studying the livestock industries' responses by determining the extent to which public and organizational pressures are affecting industry practices concerning animal welfare and the extent to which producers in these industries will adopt new protocols for animal treatment.

An Evaluation of the effectiveness of the introduction of mandatory desexing by Councils

Marston, Bennett

BAW Funded

There is a strong push from certain groups within the community for regulators to enforce compulsory desexing of companion dogs and cats. This is viewed by some people as the solution for a perceived pet over-population problem. However, little is currently known about the long-term effectiveness, community acceptance and compliance, sustainability, costs, resource requirements and enforcement issues that pertain to such regulation.

This review documented available scientific literature describing previous attempts to introduce compulsory desexing programs, highlighting any reported costs and benefits. In the absence of a significant body of knowledge being available, a research proposal will be formulated with the aim of addressing identified limitations in existing knowledge relevant to this issue.

What happens to cats that are adopted from shelters?

Marston, Bennett

BAW Funded

Currently a far greater number of cats are admitted to welfare shelters than can be re-homed, resulting in almost half of all cats admitted to welfare agencies being euthanased. One way to reduce shelter admissions is to increase the retention of owned cats.

Recent research has identified that a large percentage of those cats admitted to shelters with implanted microchipped (who formed a very small percentage of total admissions) had been implanted in a shelter within a few months prior of their current admission. This suggests that, at least some of the animals re-homed by shelters may be prone to straying after re-homing, yet there is little post-adoptive data available to either support or refute this hypothesis. Previously a survey of people who adopted shelter dogs identified many factors that affected the success of the adoption and high-lighted the problems experienced.

The information gained from this study enabled some shelters to increase the rate of adoption, strategically target problem behaviours in pre-adoptive rehabilitation and provide post-adoptive training. This has resulted in fewer returns and greater owner satisfaction. It is possible that similar benefits could be identified for cats. During a recent cat tracking study, permission was obtained from 435 people who had adopted a cat, enabling us to collect post-adoptive information from them.

Are owner-dog relationships influenced by canine personality, canine behaviour and owner characteristics?

Ley, Bennett

PIAS Funded

Dog owners are often advised to purchase certain breeds or types of dogs believed to have characteristics that will make them suitable companions. Very little research, however, has examined exactly what canine characteristics are important in determining the success of the human/dog relationship, what dogs display these characteristics and also, whether different types of owners are more or less satisfied with different types of dogs.

The aim is to use the internet to collect and collate, from a large number of dog owners, information about the relationship they have with their dog and how satisfied they are with this relationship, information about their own characteristics, and information about the dog's personality and behaviour. This will allow us to describe different types of owners and the personality and behavioural profiles of those dogs that make the best companions for these different owner types.

At the end of the study we should have a much clearer understanding of how owner and dog characteristics interact to influence the strength of the dog-owner relationship and owner satisfaction.

Behavioural responses of turkeys to humans, and relationship to bird welfare and productivity

Botheras

MPC Funded

Behavioural responses of turkeys to humans, and relationship to bird welfare and productivity

The long-term goals of the research are to better understand human-animal relationships in the turkey industry, and the potential to manipulate these relationships through education and training programs to ultimately enhance bird welfare and productivity. The impetus for this research is the substantial body of evidence in a number of other farm animals, including laying hens, broiler chickens, pigs and dairy cattle, that these human-animal relationships have significant impact on animal welfare and productivity.

The research will specifically investigate fear of humans in commercially-raised turkeys of different ages, and the possible relationships with human behaviour and bird productivity and welfare. Stockperson behaviour, physiological and behavioural responses of turkeys towards humans, and bird productivity and welfare, will be assessed.

Program 4 Tertiary and post-graduate education and training

ProHand for the livestock processing industry: a professional livestock handling package – training the trainers

Hemsworth and Coleman

Mintrac / MLA Funded

The current training materials for managing and handling animals in lairage at Australian abattoirs have been rewritten in 2005/6 to incorporate the new National Animal Welfare Standards. It was apparent in redeveloping these materials that while they deal well with the procedural and regulatory aspects of managing and handling animals at abattoirs, they may be deficient in providing detailed advice and instruction on the attitudes and behaviours that best achieve the desired results.

The project firstly assessed the current attitudes and performance of stock handlers and secondly developed a multimedia training package to influence attitudes and behaviour of stock handlers when handling cattle and sheep in the lairage.

With the further refinement of the QA standards for the livestock processing industry, there is the need to underpin the standards on a sound basis. One important strategy to underpin these standards is appropriate training support in the area of animal handling and stockpersonship.

While there was considerable variation between stockpeople in their attitudes and behaviour, there were some significant correlations between stockperson attitudes and behaviour as well as some significant correlations between stockperson behaviour and acute stress responses in sheep and cattle at Australian abattoirs. These observed relationships indicate the opportunity to improve stockperson behaviour at Australian abattoirs by targeting attitudes (and behaviour) for improvement with appropriate educational and training material, which is the focus of the remainder of this research project.

The final stockperson training package has been delivered to Mintrac for integration into their existing training programs and the Centre is currently training industry trainers so that they may deliver the package.

CENTRE RD&E COMMUNICATIONS

1. Books

Fisher, A.D., Paull, D.R., Lee, C., Atkinson, S.J. & Colditz, I.G. (2008). New research on pain-alleviating methods for farm animals. In: *Scientific Assessment and Management of Animal Pain*. Eds. D.J. Mellor, P.M. Thornber, A.C.D. Bayvel and S. Kahn. OIE Technical Series, Vol. 10. p 145-156.

Hemsworth, P.H., & Coleman, G.J. (2008/9). Managing poultry: Human-bird interactions and their implications. In I. Duncan (Ed.), "The Welfare of Domestic Fowl and other Captive Birds".

2.a Research publications in refereed journals

Barnett, J.L. and Hemsworth, P.H. (2009). Welfare-Monitoring Schemes: Using Research to Safeguard Welfare of Animals on the Farm. *Journal of Applied Animal Welfare Science*, 12(2): pp 114-131.

Coleman, G.J., Hall, M., Hay, M., (2008). An evaluation of a pet ownership education program for school children, *Anthrozoos*, Volume 21, No. 3, 271-284.

Coleman, G.J., (2008) Public perceptions of animal pain and animal welfare, OIE Technical Series (World Organisation for Animal Health) Vol. 10, 2008, 26-37

Cutler, R. and **Cronin, G.M.**, 2008. Sow stalls and animal welfare. *Australian Veterinary Journal*, 86: 417-418.

Colditz, I.G., Lloyd, J.B., Paull, D.R., Lee, C., Giraudo, A., Pizzato, C. & **Fisher, A.D.** (2009). An assessment of the welfare of suckling lambs following intradermal injection of cetrimide as a non-surgical alternative to conventional surgical mulesing. *Australian Veterinary Journal* 87: 12-18.

Colditz, I.G., Lloyd, J.B., Paull, D.R., Lee, C., Giraudo, A., Pizzato, C. & **Fisher, A.D.** (2009). The effect of the non-steroidal anti-inflammatory drug carprofen on some physiological and behavioural responses of weaned sheep to non-surgical mulesing by intradermal injection of cetrimide. *Australian Veterinary Journal* 87: 19-26.

Fisher, A.D., Morton, R., Dempsey, J.M.A., Henshall, J.M. & Hill, J.R. (2008). Evaluation of a new approach for the estimation of the time of the LH surge in dairy cows using vaginal temperature and electrodeless conductivity measurements. *Theriogenology* 70: 1065-1074.

Fisher, A.D., Roberts, N., Bluett, S.J., Verkerk, G.A. & Matthews, L.R. (2008). Effects of shade provision on the behaviour, body temperature and milk production of grazing dairy cows during a New Zealand summer. *New Zealand Journal of Agricultural Research* 51: 99-105.

Hemsworth, P.H., Barnett, J.L., Karlen, G.M., Fisher, A.D., Butler, K.L. and Arnold, N.A. (2009). Effects of mulesing and alternative procedures to mulesing on the behaviour and physiology of lambs. *Applied Animal Behaviour Science*, 117: pp 20-27.

Volant, A., Gullone, E. and **Coleman, G.J.** (2008). The relationship between family violence and animal abuse, *Journal of Interpersonal Violence*, 23: PP 1277-1295

2.b Research papers in press

Barnett, J.L., Tauson, R., Downing, J.A., Janardhana, V., Lowenthal, J.W., Butler, K.L. and Cronin, G.M., (2008). The effects of a perch, dust bath and nest box, either alone or in combination as used in furnished cages, on the welfare of laying hens. *Poultry Science*.

Edge, M.K. and **Barnett, J.L. (2008).** Development of animal welfare standards for the livestock transport industry; process, challenges and implementation. *Journal of Veterinary Behaviour: Clinical Applications and Research*.

Fisher, A.D., Colditz I.G., Lee, C. and Ferguson, D.M. (2009). The impact of land transport on animal welfare in extensive farming systems. *Journal of Veterinary Behavior*:

King, T., Marston, L.C. and Bennett, P.C. (2009) Describing the ideal Australian companion dog. *Applied Animal Behaviour Science*.

Ley, J., Bennett, P.C., & McGreevy, P. (2009). Inter-rater and test-retest reliability of the Monash Canine Personality Questionnaire – Revised *Applied Animal Behaviour Science* accepted March 2009

Ley, J., Bennett, P., & Coleman, G. J. (2009). A refinement and validation of the Monash Canine Personality Questionnaire (MCPQ), *Applied Animal Behaviour Science*.

Marston, L.C. and Bennett, P.C. (2008). Admissions of cats to animal welfare shelters in Melbourne, Australia. *Journal of Applied Animal Welfare Science*.

Paull, D.R., Lee, C., Colditz I.G. & **Fisher, A.D. (2009).** The effects of a topical anaesthetic formulation and systemic carprofen, given singly or in combination, on the cortisol and behavioural responses of Merino lambs to castration. *Australian Veterinary Journal*.

Rohlf, V. I., Toukhsati, S., Coleman, G.J. and Bennett, P. C. (2009). Addressing dog obesity: can dog owners' feeding and exercise intentions and behaviours be predicted attitudes? *Journal of Applied Animal Welfare Science*.

2.c Research papers submitted to refereed journals

Hemsworth, P.H., Barnett, J.L. and Coleman, G.J. (2008). The integration of human-animal relations into animal welfare monitoring schemes. *Animal Welfare*, (submitted November 2008).

Mornement, K.M., Bennett, P.C., Toukhsati, S.R. and Coleman, G.J. (2009). A review of behavioural assessment protocols used by Australian animal shelters to determine adoption suitability. *Journal of Applied Animal Welfare Science*, (submitted April 2009).

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3. Conference publications

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Ley, J., & **Bennett, P.C.**, (2008). Identification of factors influencing the breeding of companion dogs in Victoria, Australia. Poster Presentation at Australian Animal Welfare Strategy 2008 International Animal Welfare Conference. Gold Coast 2008

Marston, L. C., **Bennett, P.C.** (2008). Defining the 'unwanted' cat problem. Proceedings of the Australian Animal Welfare Strategy 2008 International Animal Welfare Conference. Gold Coast 2008

Mornement, K., **Coleman, G.J.**, **Toukhsati, S.**, **Bennett, P.C.**, (2008). Assessing shelter dogs for adoption suitability – An Australian prospective, Canine Science Forum, Budapest, 2008

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4. Research Reports

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

Marston, L. C., Bennett, P. C. (2009). Characteristics of Pets Who Visit Veterinarians. A Report to the Bureau of Animal Welfare, Department of Primary Industries, Victoria.

Jongman, E.C. and Butler, K. (2009). Does confinement affect the welfare of domestic cats? Final report to the Bureau of Animal Welfare, May 2009.

5. Theses

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

Ley, J. (2008) Describing and Assessing Canine Personality. PhD thesis, Monash University, November 2008.

Engel, J. (2008). The human – animal relationship and its effects on the behaviour and welfare of laying hens. Masters thesis, The Ohio State University.

Smith, K. (2008). Studying pig welfare using animal preferences. Masters thesis, The Ohio State University.

ANIMAL WELFARE SCIENCE CENTRE SEMINARS

July '08

Theme: Dairy cow welfare: Solutions for current problems.

Speaker:

- John Webster (Emeritus Professor of Animal Husbandry, The University of Bristol, UK) – “Dairy cow welfare: Solutions for current problems.”

August '08

Theme: Animal Companions for Life.

Speakers:

- AWSC Scientists and students

October '08

Theme: Pain and consciousness.

Speakers:

- Craig Johnson (Massey University) – “The role of electroencephalography in animal welfare research.”
- David Adams (Consultant) - “Physiological aspects of humane killing in animals.”

December '08

Theme: AWSC Farm Animal Research Planning Day.

Presentations:

- Animal Welfare Science Centre
- Australian Wool Innovation
- Dairy Australia
- Australian Egg Corporation Ltd
- Australian Pork Ltd
- Bureau of Animal Welfare
- Animals Australia
- RSPCA (Vic)

March '09

Theme: Pig transport.

Speaker:

- Prof. Tina Widowski (University of Guelph, Canada) - "Effects of Handling Procedures and Transport Conditions on Welfare and Meat Quality of Pigs."

May '09

Theme: Welfare of the laying hen.

Speakers:

- Prof. Tina Widowski (University of Guelph, Canada) – "Urges, needs, preferences and priorities – coming to terms with the welfare of the laying hen."
- Philip Szepe (Kinross Farm, Victoria) - "An Australian perspective on EU layer hen housing."

June '09

Theme: Assessing Animal Welfare.

Speakers:

- Prof Berry Spruijt (University of Utrecht, Netherlands) - "What cognitive abilities are indispensable for experiencing welfare?"
- Dr Don Lay, (Research Leader, Livestock Behavioural Research Unit, USDA, USA) - "Using physiology and behaviour to assess welfare in farm animals: research of the United States Department of Agriculture."

Copies of the Animal Welfare Science Centre Annual Report 2008 – 2009 are available on request from:

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