Animal Welfare Science Centre

Farm Animal Research Planning Seminar

December 5th 2008

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5th December 2008
9.30am – 3.45pm
DEPARTMENT OF PRIMARY INDUSTRIES VIC Attwood Lecture Theatre

Welcome to the Animal Welfare Science Centre's farm animal research planning day.

The Animal Welfare Science Centre was established in 1997 by the University of Melbourne as a collaborative centre for research, teaching and training in animal welfare, with Monash University and the Department of Primary Industries (Victoria).

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. There are currently 13 scientists, 13 post-graduate students and 13 support staff operating within the Centre across the partner organisations.

There are also substantial specialised research and teaching facilities associated with the three 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.

The Centre has developed memoranda of understanding with Massey University and the Department of Agriculture and Food in Western Australia.

The Centre also has a formal collaborative agreement with the Department of Animal Science at The Ohio State University (OSU). As part of this agreement, the Centre provides and delivers animal welfare teaching modules into course curricula at OSU, assists in the establishment and delivery of training programs on animal handling and welfare for the livestock industries in the US and partners OSU in collaborative animal welfare research.

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

The specific aims of the Centre are as follows:

To conduct:

- Strategic animal welfare research to resolve major animal welfare issues and student training

- Targeted industry, public and tertiary education designed 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.

In order to achieve these aims, the Centre conducts research and education in 4 program 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
4. Tertiary and post-graduate education and training

These programs are followed to achieve the Centre's targeted outputs:

- 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.

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"

Summary of the Centre's Research, Development and Education programs.

The Centre's four RD&E programs are summarized below:

Program 1. Welfare methodology

A key objective in this program is to develop further understanding of the approaches to animal welfare assessment, to further understand and define animal welfare. The welfare measures validated in this research will be utilised in both further research and in the field to provide scientifically-validated and defensible standards for the various animal industries.

Program 2. Housing and Husbandry effects on animal welfare

Research on pigs and poultry indicates that the design features of housing systems may be more important than the system per se for animal welfare and therefore through fundamental and applied research, it is important to determine the effects of design features (such as space, group size, social and human contact, furnishings) on the welfare of farm and companion animals in order to define welfare standards for these animals. The projects in Program 2 addresses the most contentious welfare issues both across and within industries, with contributions from the research conducted in Program 1.

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

In intensive management systems in agriculture, the competency of stockpeople/animal carers to manage their animals has a major impact on the welfare of a large number of animals. For example, extensive research in the pig and dairy industries demonstrates the critical role of the stockperson's attitude on ease of handling, productivity and welfare of farm animals. Through fundamental and applied research, research projects in program 3 continue to examine the impact of human-animal interactions in both agricultural and domestic contexts and this knowledge will be utilised through education, training and selection (in agriculture) of animal handlers/carers to enhance the welfare and productivity of these animals.

The relationships between knowledge of and attitudes towards animal welfare issues in the beef, dairy, pet, pigs, poultry and sheep industries and customer buying behaviour and general community behaviours is studied. This research will lead to the development of reliable and valid measures for monitoring community concerns about animal welfare, and the impact of these concerns on consumer decisions and community responses. Public education programs and tertiary education programs are developed with the objective of providing a social environment in which informed decisions can be made. The research outputs of the Centre will also provide scientifically based resources to government, industry and the community, which will assist in informing debate and the decision-making processes.

Program 4. Tertiary and post-graduate education and training

It is important that students entering the animal industries are able to provide sound, science-based advice on animal welfare practices to industry, interest groups and the public, and to be proactive in dealing with public sentiment. Teaching and training in animal welfare is delivered in the Centre via a range of subjects and courses. The Centre will continue to provide high quality postgraduate and postdoctoral training for the next generation of researchers and teachers in animal welfare science.

The Centre will continue to support the development and delivery of animal welfare modules that can be incorporated into existing core subjects in university courses and elsewhere. Animal welfare teaching modules for specialist groups, such as practising veterinarians and stockpeople in specific livestock will also be further developed.

Farm Animal Research Planning Seminar

The aims of today's program are to:

- highlight current farm animal research being undertaken at the Centre and

- identify priority areas for future research

The day will commence with presentations which will focus on current and recently completed research and will provide a snapshot of some of our work across all four program areas.

We will then present a brief summary of projects which the Centre is proposing for consideration for future research.

After lunch, we will have the chance to hear from industry representatives and animal welfare groups when they present their perspective on the major animal welfare issues which are likely to confront the farm animal sector over the next five years together with their views on what research will be needed to address these issues.

Later in the day participants will be given the chance to provide feedback on current and proposed research and to give their suggestions on priority areas for future farm animal research.

This event will be an important contributor to our farm animal research planning for 2009—2010.

It is a strategic planning exercise which will set future research direction and priorities while taking into account both stakeholder needs and the Centre's capability.

Program

9.30	**Session 1: Introduction & a selection of current projects**
	(Mike Rickard, Chair, AWSC Board of Management)

9.30	**Welcome and Introduction - The planning process**	Mike Rickard

9.35 Program 1 Welfare methodology (5 min presentations)

	Overview of welfare methodology research and its importance and challenges	Paul Hemsworth
	Poultry preference testing methodology	Sonja Laine

9.45 Program 2 Housing and husbandry effects on animal welfare (5 min presentations)

	The effects of group housing on sow welfare and reproduction	Paul Hemsworth
	Benchmarking welfare indicators in the dairy industry	Ellen Jongman
	Welfare implications of alternative mulesing procedures	John Barnett

Program 3 Attitudes to animals and animal welfare and farmer, consumer and community behaviour (5 min presentations)

	Human – animal relationships in the laying hen	Lauren Edwards
	Prototype stockperson training packages in EU	Grahame Coleman
	ProHand for the livestock processing industry	Grahame Coleman

10.15	**Discussion (15 mins)**
10.30	**BREAK**

10.45 Session 2: New Project Proposals (Chair - Robert Holmes, AWSC Advisory Committee)

10.45	*Animal welfare research, gaps in knowledge*	Paul Hemsworth
10.50	*Importance of space and nests for laying hens in cages*	John Barnett
11.00	*Transport effects on calves*	Ellen Jongman
11.10	*Welfare implications of tail docking in pigs at different ages*	John Barnett
11.20	*Human-animal relationships: Preliminary examination of fear responses and ease of*	
	Handling of ewes in response to handling	Paul Hemsworth
11.30	*Welfare audits in the pig industry – stockperson attitudes and behaviour*	Grahame Coleman
11.40	*ProHand for the livestock transport industry*	Grahame Coleman
11.50	**Discussion (15 mins)**	
12.05	**LUNCH**	

1.00 Session 3: Major welfare issues which are likely to confront Industry over the next 5 years and what research is needed to address these concerns (Chair, Allan Sheridan, DAFF)

1.00	Australian Wool Innovation
1.10	Meat and Livestock Australia
1.20	Dairy Australia
1.30	Australian Egg Corp Ltd
1.40	Australian Pork Ltd
1.50	Bureau of Animal Welfare
2.00	Animals Australia
2.10	RSPCA (Vic)
2.20	**Discussion and question session (15 mins)**
2.50	**BREAK**

3.15 Future Priorities for Research, Development, Education and Extension in animal welfare – How can the AWSC deliver? (Chair, Ron Prestidge, Executive Director Future Farming Systems Research, Department of Primary Industries Vic & AWSC Board member)

3.45 Summary and Close. (Noel Maughan, AWSC Advisory Committee)

Summary of Current and Recently Completed AWSC Projects

PROGRAM 1: WELFARE METHODOLOGY

Project Title	AWSC lead agency	Funding	Project leader
1. Welfare methodology – relationships between biological functional and preference methodologies in studying animal welfare, poultry*	The University of Melbourne	Poultry CRC	Paul Hemsworth
2. Welfare methodology – relationships between biological functional and preference methodologies in studying animal welfare, pigs*	The University of Melbourne	Australian Pork Limited	Paul Hemsworth
3. Fear / Stress model for beef cattle	Department of Primary Industries Vic	Beef CRC	John Barnett

PROGRAM 2: HOUSING AND HUSBANDRY EFFECTS ON ANIMAL WELFARE

Project Title	AWSC lead agency	Funding	Project leader
1. The effects of group housing during gestation on sow welfare and reproduction*	The University of Melbourne	Australian Pork Limited	Paul Hemsworth
2. Evaluation of welfare issues associated with extended lactation in dairy cows*	Department of Primary Industries Vic	Department of Primary Industries Vic	Ellen Jongman
3. Behavioural responses of dairy cows to mastitis: Indicators of pain and welfare and productivity implications*	The Ohio State University	Ohio Ag Research & Dev Center, Department of Primary Industries Vic	Naomi Botheras
4. Benchmarking welfare indicators in the dairy industry*	Department of Primary Industries Vic	Department of Primary Industries Vic	Ellen Jongman
5. Animal welfare performance measures: a model to monitor and benchmark the welfare of animals in research*	The University of Melbourne	DAFF	Paul Hemsworth & Ellen Jongman
6. Dissecting the impact of stress on reproduction: Novel peptide mediates inhibitory effects of stress on female reproduction*	Monash University	ARC Discovery	Alan Tilbrook
7. Calf transport pilot study*	The University of Melbourne	Animal Welfare Science Centre	Mariko Lauber
8. Time budgets and abnormal behaviour of individually housed shedded sheep*	The University of Melbourne	The Horsham Wool Factory	Mariko Lauber
9. Importance of nests for the welfare of laying hens	The University of Melbourne	Australian Egg Corporation Limited	Greg Cronin
10. Using machine vision to count hens and reduce egg breakage – "proof of concept"	Department of Primary Industries Vic	Poultry CRC	Greg Cronin
11. Welfare implications of alternative mulesing procedures	The University of Melbourne	Australian Wool Innovation	Paul Hemsworth
12. Effect of cleaning frequency of calving pads on calving pad hygiene, cow dirtiness and milk quality	The University of Melbourne	Goulburn-Murray Milk Quality Fund	Sarah Chaplin

PROGRAM 3: ATTITUDES TO ANIMALS AND ANIMAL WELFARE, AND FARMER, CONSUMER AND COMMUNITY BEHAVIOUR

Project Title	AWSC lead agency	Funding	Project leader
1. Human – animal relationships in the laying hen*	The University of Melbourne	Poultry CRC	Paul Hemsworth
2. Field trial of pig stockperson selection*	Monash University	Australian Pork Limited	Grahame Coleman
3. ProHand for the livestock processing industry: a professional livestock handling package*	The University of Melbourne	Mintrac	Paul Hemsworth & Grahame Coleman
4. Farm animal welfare in Ohio: Assessing public concern and implications for the food animal industry*	Monash University	Ohio Ag Research & Dev Center	Grahame Coleman
5. Human-animal interactions in the turkey industry: Behavioral responses of turkeys to humans, and relationship to bird welfare and productivity*	The Ohio State University	Midwest Poultry Research Program	Naomi Botheras
6. Welfare of working dogs on sheep properties in Western Victoria	The University of Melbourne		Sarah Chaplin

PROGRAM 4. TERTIARY AND POST-GRADUATE EDUCATION AND TRAINING

Project Title	AWSC lead agency	Funding	Project leader
1. "Animals in Society" as part of the "Human and animal interactions" cluster at The Ohio State University*	Monash University & The University of Melbourne	The Ohio State University	Pauleen Bennett
2. The subjects Animals in Society, Applied Animal Behaviour and Animal Welfare in the new science degree B.Sci. (Animal Science)*	The University of Melbourne		Paul Hemsworth Mariko Lauber
3. Animal welfare education package*	The University of Melbourne	Animal Welfare Science Centre	Mariko Lauber
4. "Minimising Handling Stress" - Prototype stockperson training packages for dairy, cattle, pigs and laying hens*	Monash University	EU 6th Framework	Grahame Coleman
5. Implementation of Animal Welfare Standards into the meat chicken industry's company QA programs	Department of Primary Industries Vic	Poultry CRC	John Barnett
6. Revision of Pig ProHand	Monash University	Australian Pork Limited	Grahame Coleman

N.B   * denotes current projects

Current and recently completed AWSC projects: Written summaries

PROGRAM 1

WELFARE METHODOLOGY

Project title: 1.1	Welfare methodology – relationships between biological functional and preference methodologies in studying animal welfare, poultry
Chief investigator:	Paul Hemsworth
Investigator(s)	*Sonja Laine, Bronwyn Stevens, Cameron Ralph, (PhD students)* John Barnett
Lead organisation:	The University of Melbourne
Collaborating organisation(s):	
Funding source(s)	Poultry CRC
Status	Current
Summary (including aims and objectives)	

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.

Outcomes:

Determine the complementarity of the two approaches to welfare assessment, biological requirements and animal preferences), that have the most scientific integrity.

Highlights:

- The effects on biological functioning of depriving laying hens of their most preferred resources are presently being examined.

Project title: 1.2	Welfare methodology – relationships between biological functional and preference methodologies in studying animal welfare, pigs
Chief investigator:	Paul Hemsworth
Investigator(s)	*Cameron Ralph, Sonja Laine, (PhD students)* John Barnett
Lead organisation:	The University of Melbourne
Collaborating organisation(s):	
Funding source(s)	Australian Pork Ltd
Status	Current
Summary (including aims and objectives)	

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.

Outcomes:

Determine the complementarity of the two approaches to welfare assessment, biological requirements and animal preferences), that have the most scientific integrity.

Highlights:

- Initial experiments indicate that deprivation of highly preferred resources leads to biological dysfunction in pigs.

Project title: 1.3	Fear / Stress model for beef cattle
Chief investigator:	John Barnett
Investigator(s)	
Lead organisation:	Department of Primary industries Vic
Collaborating organisation(s):	
1. CSIRO	
Funding source(s)	Beef CRC
Status	Completed
Summary (including aims and objectives)	

This project aimed to develop a fear model of chronic stress in cattle for use in subsequent experiments to develop tools for welfare assessment and thresholds, predominantly using gene expression methodologies to identify relevant biochemical pathways, both partially understood (e.g. HPA axis), and novel. The project is part of the CRC for Beef Genetic Technologies, under Program 3 of the CRC, 'Adaptation and Animal Welfare'.

Program 3 aims to develop and determine robust, scientifically defensible measures and critical thresholds that define the welfare status of cattle when exposed to conditions that elicit a sustained stress response; these thresholds (or lower levels) will be available for use by animal welfare policy makers, regulatory agencies and the beef industry by 2011.

This project evaluated the application of a combination of potential stressors, electric shock, novel object (falling bucket and ball) and flashing lights imposed individually either 3 or 5 times weekly for 4 weeks.

Outcomes:

A combination of the novel object, flashing light and electric shocks imposed individually for a total of 5-times a week resulted in a chronic stress response, compared to the control treatment.

Evidence of a chronic stress response is based on increased daytime mean cortisol concentrations, increased cortisol response to CRH and reduced growth rate.

Highlights:

- The successful outcome of this project resulted in subsequent stages of the project to identify gene markers of chronic stress in beef cattle being undertaken by researchers at CSIRO (Armidale).

Current and Recently Completed AWSC Projects: Written summaries

PROGRAM 2

HOUSING AND HUSBANDRY EFFECTS ON ANIMAL WELFARE

Project title: 2.1	The effects of group housing during gestation on sow welfare and reproduction
Chief investigator:	Paul Hemsworth
Investigator(s)	*Marcus Karlen, (PhD student),* John Barnett, Peter Cakebread, Rebecca Morrison
Lead organisation:	The University of Melbourne
Collaborating organisation(s):	
1. QAF Meat Industries	
Funding source(s)	Australian Pork Ltd & QAF Meat Industries
Status	Current - June 2011
Summary (including aims and objectives)	
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.	
Outcomes:	
Understand the impact of space allowance and group size on the welfare of group-housed gestating sows.	
Highlights:	
• The new experimental facilities, (shed and pen modifications), are completed and the first replicate, (780 sows), successfully introduced into treatments in September and October 2008.	

Project title: 2.2	Evaluation of welfare issues associated with extended lactation in dairy cows
Chief investigator:	Ellen Jongman
Investigator(s)	
Lead organisation:	Department of Primary Industries Vic
Collaborating organisation(s):	
Funding source(s)	Department of Primary Industries Vic
Status	Current
Summary (including aims and objectives)	

The objectives of this study are to examine the impact of extended lactation on animal welfare. While there are some possible positive effects, there may also be negative implications. Awareness of possible negative welfare impacts may assist in the management of herds with extended lactation. If extended lactation is found to have positive welfare consequences this may help to 'sell' this practice to farmers who are struggling to maintain spring calving. Practices with a negative welfare image such as the hormonal induction of calving may be unnecessary in most circumstances if farmers switch to a system with extended lactation, thus improving the welfare image of the whole dairy industry.

Periods when cows are most under metabolic pressure include end of lactation in the first milking cycle, around calving, during peak lactation and at the end of the second milking cycle, and at this time blood samples will be analysed for immunological parameters and milk samples will be analysed for cortisol. Cows will be assessed for lameness twice each year using a visual lameness scoring system. Additionally hoof condition will be assessed once a year, when cows are considered most at risk of lameness, by a trained veterinarian. Any veterinary treatment during the duration of the study will also be recorded. Live weight, white cell count, milk production and milking order will be compared between EL and control cows. In addition electronic observations will be made on time budgets, in particular walking, resting time and grazing. In the third year cows will be weighed shortly before calving as well as after calving. Calves will be tested for early development and the development of EL and control calves will be compared. Cows will again be assessed for white cell count and lameness at this time.

Outcomes:
Understand the impact of extended lactation on dairy cows.

Highlights:

Project title: 2.3	Behavioural responses of dairy cows to mastitis: Indicators of pain and welfare and productivity implications
Chief investigator:	Naomi Botheras
Investigator(s)	Paul Hemsworth, Ellen Jongman, Joe Hogan
Lead organisation:	The Ohio State University
Collaborating organisation(s):	
1. The University of Melbourne	
2. Department of Primary Industries Vic	
Funding source(s)	Ohio Ag Research & Dev Center, Department of Primary Industries Vic
Status	Current
Summary (including aims and objectives)	

The prevention and alleviation of pain are considered important factors in the ethical treatment and care of animals. Pain is also one of the most important aspects determining the welfare of farm animals. Mastitis (inflammation of the mammary gland) is the most prevalent disease in dairy cows and therefore, the welfare of many dairy cows may be at risk due to pain associated with this disease.

An experiment is being conducted to investigate behavioural, physiological, biochemical and production changes associated with experimentally induced mastitis, and also to evaluate an analgesic as an alleviator of clinical signs of pain and thus improvement in animal welfare and rapid return to peak performance.

Outcomes:

Understand the welfare implications of mastitis.

Highlights:
- Experiment completed and video records and hormone assays are being analysed.

Project title: 2.4	Benchmarking welfare indicators in the dairy industry
Chief investigator:	Ellen Jongman
Investigator(s)	
Lead organisation:	Department of Primary Industries Vic
Collaborating organisation(s):	
Funding source(s)	Department of Primary Industries Vic
Status	Current
Summary (including aims and objectives)	

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. This project aims to identify recording systems already in place in the dairy and lamb industries that can be used for this purpose. In addition, where existing data are lacking, it will recommend where recording systems (i.e. QA systems) need to be developed.

Outcomes:
Highlights:

Project title: 2.5	Animal welfare performance measures: a model to monitor and benchmark the welfare of animals in research
Chief investigator:	Paul Hemsworth
Investigator(s)	Ellen Jongman, John Barnett, Denise Noonan, Peter Penson, Mike Rickard
Lead organisation:	The University of Melbourne
Collaborating organisation(s):	
1. Department of Primary Industries Vic	
2. The University of Adelaide	
Funding source(s)	DAFF
Status	Current
Summary (including aims and objectives)	

This study will develop a model to monitor and benchmark the welfare of animals in research. The model will be evaluated using sheep and an emphasis will be place on how the animal is coping with its physical and social environment. The model is intended to identify the expected welfare outcomes for the animal as well as the actual welfare outcomes in order to consider what may have been an accepted welfare outcome for that specific experiment. This will allow for earlier identification and, potentially, remediation of welfare problems associated with the work. Competency of scientists will also be considered in risk management and a potential area for improvement in animal welfare.

Outcomes:

Successful completion of the project will allow for implementation of processes that will facilitate national benchmarking of animal welfare outcomes in the research institutions within this sector. It will thus allow for ongoing improvements in the welfare of animals used in research. However, a national interpretive framework will be needed to maximise the potential for benefits accruing from th eproject outcomes.

Key stakeholders will benefit as follows:

1 Commercial companies and funding organisations – will allow for identification of internal risks plus highlight 'best practice' approaches.

2 Companies, funding organisations, research providers – improve reliability of reserch outcomes and optimise animal-related costs of research.

3 General Public – increased information and transparency of sectoral performance wrt animal welfare should help improve confidence in the ethical status of the research sector

4 Government – general ability to 'drive' better outcomes through tied funding requirements related to national benchmarking. For the Australian Government and research providers in the global context the outcomes if applied would allow for demonstration of Australia's animal welfare credentails as an ethical provider of high quality animal research.

Highlights:

Project title: 2.6	Dissecting the impact of stress on reproduction: Novel peptide mediates inhibitory effects of stress on female reproduction
Chief investigator:	Alan Tilbrook
Investigator(s)	Iain Clarke, Paul Hemsworth
Lead organisation:	Monash University
Collaborating organisation(s):	
1. The University of Melbourne	
Funding source(s)	ARC Discovery
Status	Current
Summary (including aims and objectives)	
This research proposal offers a pioneering opportunity to develop treatments that overcome the negative impact of stress on reproduction. Specifically, knowledge generated in this project will be vital in the development of strategic defences against the impact of stress on reproduction. This project fundamentally addresses ARC Research Priority 2: *Promoting and maintaining good health.* Given that suppression of reproduction by stress occurs in all mammalian species including humans, domestic animals and wildlife, being able to prevent or overcome stress induced reproductive dysfunction will generate significant health, social, economic and ecological benefits.	
Outcomes:	
Better understanding of the impact of stress on reproduction.	
Highlights:	

Project title: 2.7	Calf transport pilot study
Chief investigator:	Mariko Lauber
Investigator(s)	John Barnett, Paul Hemsworth, Ellen Jongman
Lead organisation:	The University of Melbourne
Collaborating organisation(s):	
1. Department of Primary Industries Vic	
Funding source(s)	Animal Welfare Science Centre
Status	Current
Summary (including aims and objectives)	

This pilot study examined the effects of age over the maximum travel duration allowed for calves less than 3 months of age under the Draft Australian Livestock Transport Standards. Calves aged 3, 5 and 10 days were transported for 10 h in individual pens within a specially designed transport trailer.

The aim of this study was to assess the impact of age on stress responses to long transport on young calves. Blood cortisol concentrations, differential white blood cell counts, and packed cell volume was measured prior to, throughout and post the 10 hour journey. In addition, behaviour for 12 hours post journey was video recorded for analysis. The results were compared to those from a control group, housed for ten hours without access to food or water in pens of the same dimension as the trailer pens.

Outcomes:

Total cortisol analysis has yielded some interesting results; in particular, an age effect on total plasma cortisol concentration. We are currently waiting for free plasma cortisol concentrations to be analysed. The differential white blood cell count analysis indicated time, treatment x time and treatment x age effects for lymphocyte cell counts. No other main or interactions effects were noted for neutrophil cell counts, total white blood cell count or packed cell volume.

Behavioural data is currently being extracted and it is estimated that analysis on this data will be complete by mid-January 2009.

Highlights:

Project title: 2.8	Time budgets and abnormal behaviour of individually housed shedded sheep
Chief investigator:	Mariko Lauber
Investigator(s)	Paul Hemsworth, Judy Nash
Lead organisation:	The University of Melbourne
Collaborating organisation(s):	
1. The Horsham Wool Factory	
Funding	
Status	Current
Summary (including aims and objectives)	

The aims of this research are to quantify the time budgets and incidence and type of stereotypies or redirected behaviours in individually housed, shedded sheep, in the Sharlea production system in Victoria, Australia. The data generated would provide background and the basis for considering the need for future research examining the welfare implications of this production system.

Digital cameras will be placed above approximately 10% of the sheep in a shed. 48 hours of observations of each sheep would be recorded and then the video data analysed to provide time budgets for sheep in this type of housing, and the incidence and type of stereotypies displayed by the sheep, if any. In particular, time spent, standing, moving, lying, ruminating, eating, drinking and sleeping would be recorded. In addition, stereotypical behaviour would be classified and the percentage of time engaged in these types of abnormal behaviours would be determined using a combination of

- 15 minute scan samples of individuals over the 48 hour period to construct the time budgets; and

- continuous sampling of individuals in 3 hours blocks around the time of feeding and in the afternoon each day for the 2 day sampling period to quantify the expression and incidence of abnormal behaviour.

Outcomes:
Improved understanding of individual indoor housing of sheep.
Highlights:

Project title: 2.9	Importance of nests for the welfare of laying hens
Chief investigator:	Greg Cronin
Investigator(s)	John Barnett
Lead organisation:	The University of Melbourne
Collaborating organisation(s):	
1. The University of Sydney	
Funding source(s)	Australian Egg Corp Ltd
Status	Completed
Summary (including aims and objectives)	

The housing of laying hens in cages is a contentious welfare issue which has impacted negatively on public sentiment and lead to the introduction of regulations that modify both cage size and stocking density. One key criticism of cages for layer hens has been that hens become frustrated at the time of oviposition in the absence of a nest (box). Although nests are considered by some to be important for welfare, our research has shown that for commercial Hyline Brown hens, experienced with nests, only about two-thirds of the hens chose to use the nest for egg laying.

Data from Europe also indicate that fewer brown birds lay in nests (in furnished cages) than white birds; these data have been largely ignored. This raises questions as to both the welfare implications of nests and the attributes of nests that birds consider attractive. A review by Ekstrand and Keeling (1994) provides evidence to support the inclusion of nest boxes in layer cages. Duncan (1992) considered the lack of a nest site in conventional cages was the biggest welfare problem in this system of housing.

The importance of the nest box is based on evidence of preference tests and evidence of frustration in the absence of a nest box (see review by Ekstrand and Keeling 1994) and the strong motivation of hens to use a nest (Smith *et al.*, 1990). The project is assessing the importance of nest boxes for the welfare of hens in modern cages, and determining the factors that influence use of the nest box by hens.

This project focused on the relationships between nest boxes and their use by laying hens in cages, and physiological measures of hen welfare, in four experiments that examined the presence or absence of a nest box, group size and light schedules.

Outcomes:

Most hens chose a consistent site for egg laying by about the tenth egg. Over six experiments, about two-thirds of hens consistently laid in the nest box and about 27% consistently laid on the wire floor (consistent was defined as at least 80% of eggs at the one site).

There were no differences due to nest box or group size (2, 4 or 8 birds per cage) in egg corticosterone concentrations in the first 20 eggs laid.

At 23 weeks of age the presence of a nest box resulted in 33% higher plasma corticosterone concentrations, suggesting birds in cages with a nest box were more stressed. However, At 23 weeks of age, in cages with a nest box, birds that were classed as either 100% floor layers or 100% nest box layers (based on the previous 10 eggs laid) showed elevated corticosterone concentrations in egg albumen. However, the relationship was relatively short-lived and subsequently was not found at 29 or 35 weeks of age and none of the stress-related measurements were suggestive of any long-term change in HPA function and hence a chronic stress response.

Manipulation of the light-dark schedule to introduce a 3-h period of light during the night commencing at midnight, resulted in a shift in egg laying time with about three-quarters of the hens laying a proportion of their eggs in darkness (especially between 03.00 and 06.00 h), but did not alter the synchrony of egg laying times.

As most eggs laid by hens in the dark are laid on the wire floor with no impact on stress levels, this suggests that the nest box may not be important to hen welfare, at least when egg laying occurs in the dark.

Highlights:

- A unique feature of this project was the use of low-light video and infra-red light, whereby each bird was uniquely identified and able to be viewed on digital video to determine when and where each egg was laid.

Project title: 2.10	Using machine vision to count hens and reduce egg breakage – "proof of concept"
Chief investigator:	Greg Cronin
Investigator(s)	
Lead organisation:	Department of Primary Industries Vic
Collaborating organisation(s):	
1. Kinross Farms	
Funding source(s)	Poultry CRC
Status	Completed
Summary (including aims and objectives)	

Machine vision is defined as the ability of a computer to see. In a machine-vision system, video cameras supply information to a computer, and depending on the software, objects can be recognised, tracked and measured. Machine vision has been applied in industrial situations for over 10 years to automate decision-making and to record measurements on moving production lines. Labour is one of main cost factors affecting farm profitability. For the modern cage egg industry, machine vision offers a means to reduce unit labour inputs while increasing surveillance of the birds and mechanised processes such as egg collection.

Automatic monitoring of the birds should improve their management and potentially their welfare, while other aspects such as identifying blockages on egg collection belts before the belt moves could increase eggs sold by reducing the incidence of cracked and broken eggs. Thus, rather than a large proportion of stockperson time being spent in unprofitable monitoring activities, machine vision would monitor the birds and mechanical activities within the shed. In the event that a risk event occurs, it is detected by the machine vision and the stockperson is alerted to attend to the situation.

This project is testing the concept that machine vision can be used to 1) count the number of live hens per cage (with multiple hens/cage) and 2) identify potential blockages of the egg conveyor belt that may result in damaged eggs. It is feasible that in the future, this basic use of video image analysis will be coupled with other "smart sensing" technologies to enable the automatic monitoring of the health and welfare of individual birds.

Outcomes:

Two prototype machine vision systems were developed and evaluated. Counting hens in cages had a 79% accuracy, while over 90% of foreign objects were detected on the egg collection belt. Accuracy is likely to improve with further research and commercialisation.

Highlights:

- This project showed that the concept that machine vision can be applied to cage egg farms. Maximising the economic and social benefits is dependent on the development of better 'sensing technologies'.

Project title: 2.11	Welfare implications of alternative mulesing procedures
Chief investigator:	Paul Hemsworth
Investigator(s)	Adele Arnold, Greg Cronin, John Barnett
Lead organisation:	The University of Melbourne
Collaborating organisation(s):	
1. Department of Primary Industries Vic	
Funding source(s)	Australian Wool Innovation
Status	Completed
Summary (including aims and objectives)	

The operation of sheep mulesing has received considerable public attention in recent years, with claims of unacceptable welfare costs. The mules operation involves surgical removal of wool and skin from the breech region of the lamb. This results in permanent enlargement of bare and stretched areas of skin around the perineum which provides good life-time protection against fly strike. Breech strike is the major form of flystrike in Merino sheep in most years in Australia even though body strike can cause major problems in wet seasons or during prolonged periods of warm wet weather. Limited research has shown that the mulesing operation causes an acute response in plasma cortisol, with cortisol concentrations peaking at 15 minutes after the operation but still elevated at 48 h post-operation.

Several alternative non-surgical methods to mulesing are being developed in Australia with the aim of tightening the skin around the breech area and consequently stretching the bare breech area. These alternative procedures include intradermal injections of collagenase and other products, which cause skin necrosis and contraction of adjacent bare areas (Rothwell et al., 2005), and the use of skin clips that draw together loose skin on the lateral sides of the perineum so that the pressure imposed on the folds of skin enclosed between two clips results in atrophy of the skin folds due to the restricted blood flow.

This project will investigate the welfare implications of several alternative mulesing procedures that have been identified by AWI. The emphasis will be on the long-term responses to these procedures, rather than the acute responses, since the former has greater welfare implications. In Part 1, a behavioural study of 6 alternative mulesing procedures, together with surgical mulesing and 1 control, was undertaken to screen the most promising alternative mulesing procedures from a welfare perspective. In Part 2, a more comprehensive integrated approach will be used to examine the welfare implications of several alternative procedures identified in Part 1 as a promising procedure(s). Surgical mulesing and an appropriate control treatment will be included in this comparison in Part 2.

Outcomes:

To provide AWI with objective data on the welfare implications of several alternative mulesing procedures. Such information can be utilised by industry, government and other interested groups in determining acceptable industry practices, from an animal welfare perspective, to address fly strike of sheep.

Highlights:

- The findings of this experiment support previous research that shows surgical mulesing adversely affects the welfare of lambs, albeit for a longer duration. Furthermore, it also shows that the Clip treatment substantially improves welfare compared to surgical mulesing.

Project title: 2.12	Effect of cleaning frequency of calving pads on calving pad hygiene, cow dirtiness and milk quality
Chief investigator:	Sarah Chaplin
Investigator(s)	*Jess Eadon (3rd yr student)*
Lead organisation:	The University of Melbourne
Collaborating organisation(s):	
Funding source(s)	Goulburn-Murray Milk Quality Fund
Status	Completed

Summary (including aims and objectives)

Calving is a high-risk time for dairy cows when their health can be threatened both nutritionally and physically by a variety of diseases, including environmental and contagious mastitis. Early lactation mastitis is primarily caused by environmental pathogens, where infection usually occurs due to the udder and teat ends touching the ground during the calving process. Countdown Downunder guidelines recommend that faecal pat density be maintained at 2 pats/m^2 to reduce the incidence of mastitis but there is no evidence for the validity of this recommendation and no advice on how it might be achieved. This project aimed to test the effect of different cleaning frequencies on calving pad pat density and explore the consequences for cow dirtiness and milk quality.

Three identical calving pads were constructed with a sawdust-bedding surface in order to investigate how cleaning frequency (everyday, every second day and every third day) affected faecal pat density, bacterial growth on the bedding surface, cow dirtiness and milk quality. With only 3 cows on each pad at one time, 15 cows were calved on each calving pad over a period of 3-5 weeks.

Outcomes:

The Countdown Downunder recommended pat density of 2 pats/m^2 can be achieved by cleaning calving pads every 2-3 days. Although calving pads cleaned less frequently were visibly dirtier there was no difference in bacterial challenge, cow dirtiness or milk quality. No conclusions could be drawn about mastitis incidence. From the literature and changes in bacterial load over time, we believe that the lack of a roof on the calving pad and the dry weather conditions in some weeks helped to control the bacterial load. Cow dirtiness however was very constant, despite a sensitive scoring system, and it seemed that the biggest determinant of cow dirtiness was the individual cow: we think perhaps some cows are better at selecting a clean lying area than others. These results suggest that, for covered calving pads in a dry spring, labour can be saved by not cleaning calving pads every day without any negative consequences for cow dirtiness and milk quality.

Highlights:

- The student, Jess Eadon, has achieved extremely high grades for her work on this project.
- Dookie Dairy now has a new facility which enables three groups of three cows to be penned together in a sheltered area not far from the dairy.

Current and recently completed AWSC projects: Written summaries

PROGRAM 3

ATTITUDES TO ANIMALS AND ANIMAL WELFARE, AND FARMER, CONSUMER AND COMMUNITY BEHAVIOUR

Project title: 3.1	Human-animal relationships in the laying hen
Chief investigator:	Paul Hemsworth
Investigator(s)	*Lauren Edwards, (PhD student),* Grahame Coleman, John Barnett
Lead organisation:	Department of Primary Industries
Collaborating organisation(s):	
1. University of Melbourne	
2. Monash University	
Funding source(s)	Poultry CRC
Status	Current
Summary (including aims and objectives)	

This project focuses on the critical role of stockpeople to layer hen welfare. Research in a number of livestock industries has shown that interactions between stockpeople and their animals can limit the welfare of the animals (Hemsworth and Coleman, 1998). While these interactions may appear quite benign, this research has shown that the frequent use of some of these routine behaviours by stockpeople can result in farm animals becoming highly fearful of humans. It is these high fear levels, through stress, that limit animal welfare and productivity.

While this research on human-animal interactions in the livestock industries has generally focused on the dairy and pig industries, there has been some limited research conducted on meat chickens and laying hens that indicate that high fear levels may limit the productivity and welfare of poultry (Barnett *et al.*, 1992, 1994; Cransberg *et al.*, 2000).

This project will utilise environmentally controlled cage layer farms in both Australia and the USA. The project will i) determine whether previous findings on fear-productivity links are still valid in modern production facilities using current strains of birds; ii) determine the human behaviours that regulate fear of humans in laying hens, following preliminary studies on an ethogram of human behaviours in the poultry shed and developing methodologies to observe human behaviours; and iii) determine the human attitudes that regulate fear provoking behaviours in humans towards laying hens.

Outcomes:

Understanding stockperson behaviour appears to be the key to manipulating these human-animal interactions to improve poultry welfare. Appropriate strategies to train stockpeople in the egg industry are the desired outcome of this research.

Highlights:

- Research in both experimental and commercial settings shows that stockperson behaviour affects fear responses in laying hens with implications for both bird welfare and productivity. Furthermore, relationships between stockperson attitudes and behaviour and bird fear of humans in commercial settings indicate opportunities to target stockperson characteristics to improve the welfare of commercial laying hens.

Project title: 3.2	Field trial of pig stockperson selection
Chief investigator:	Grahame Coleman
Investigator(s)	
Lead organisation:	Monash University
Collaborating organisation(s):	
Funding source(s)	Australian Pork Ltd
Status	Current

Summary (including aims and objectives)
The Stockperson Selection Aid (SSA) was developed by researchers at Monash University's Animal Welfare Science Centre in collaboration with the Victorian Institute of Animal Science. Its development is based on the findings of several years of research undertaken with stockpeople in the Australian pig industry.
The SSA is a tool that can be used by employers in the pig industry to guide the selection of stockpeople. Selected individuals will potentially improve the quality of their work team, maximise productivity and welfare and improve company profits. It should be made clear, however, that the selection of staff should be based on a range of key indicators. Accordingly, *the SSA is just one factor which should be taken into account when making employment decisions*.
This project is designed to test the utility of the SSA in a commercial environment. It has been put on the web by EPredix, USA. The Over the next 18 months, several large pig producers will use the SSA to assist in stockperson selection and the usefulness of it will be assessed.

Outcomes:
Validation of the SSA as a useful selection tool for the pig industry.

Highlights:

Project title: 3.3	ProHand for the livestock processing industry: a professional livestock handling package
Chief investigator:	Paul Hemsworth and Grahame Coleman
Investigator(s)	John Barnett
Lead organisation:	The University of Melbourne
Collaborating organisation(s):	
1. Monash University	
Funding	National Meat Industry Training Advisory Council Limited
Status	Current
Summary (including aims and objectives)	

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 proposed project will firstly assess the current attitudes and performance of our stock handlers and, if necessary, secondly address skills and attitude problems by enhancing out training programs.

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.

Outcomes:

Will lead to the implementation of a training program for sheep and cattle handlers across Australian abattoirs, through existing networks and training providers, to improve animal welfare and meat quality. Furthermore, this research will demonstrate to the key stakeholders the impact of improved training and animal handling on animal welfare and productivity, through obtaining data on bruising, meat quality and livestock handling following implementation.

Highlights:

- While there was considerable variation between stockpeople in their attitudes and behaviour, there 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.

Project title: 3.4	Farm animal welfare in Ohio: assessing public concern and implications for the food animal industry
Chief investigator:	Grahame Coleman
Investigator(s)	Linda Lobao, Jeff Sharp, Paul Hemsworth, Normand St-Pierre, Maurice Eastridge
Lead organisation:	Monash University
Collaborating organisation(s):	
1. The Ohio State University	
2. The University of Melbourne	
Funding	Ohio Ag Research & Dev Center
Status	Current
Summary (including aims and objectives)	

The welfare of farm animals has increasingly concerned researchers, the livestock industry, and public at large. Animal scientists, traditionally interested in welfare of animals in delivering quality and safe products, have developed recent interest in understanding public acceptance of production and processing practices. The European Union now has strict new accreditation rules establishing minimum standards for animal welfare to be adhered to during production (Bindon and Jones, 2001), and there are ongoing moves to place animal welfare on the World Trade Organization (WTO) agenda. Producers in the US as well as other nations with large livestock sectors, such as Australia, are on the cusp of a massive wave of changes brought about by global public concerns with animal welfare and the new regulatory environment ushered in by these concerns. The United States Department of Agriculture (USDA) is already anticipating dramatic changes, hosting a September 2005 workshop with the Scientists Center for Animal Welfare in Research Triangle Park, North Carolina. on the future status of farm animal welfare.

Despite wide recognition, the animal industry is facing new public pressures, but little is known about the US population's views and behavior regarding the welfare of farm animals. A few opinion surveys (can we cite references?) have been used to collect information on animal welfare concerns, but questions about perceived treatment of food animals are even more rare. In the food animal industry, decisions tend to be driven by special interest groups that put pressure on different segments (e.g. quick service restaurants, grocer's organizations, national restaurant consortia, food animal commodity groups, etc.) without true understanding of public concerns. 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. In the past decade, U.S. Congress has passed more than 15 laws to protect animals (Pacelle, 2005). State laws specifically to protect welfare of farm animals were recently pasted in California to ban future production of foie gras and in Florida to ban gestation crates.

Objectives Part I: Public Attitudes and Behavior Regarding Farm Animal Welfare: 1) Identify the range of attitudes about farm animal welfare that exist in the population and among key stakeholders, 2) Identify the social, economic, and demographic determinants of these attitudes, and 3) Investigate the degree to which attitudes affect consumption behaviors and community behaviours, such as political action for/against livestock farming.

Objectives Part II: Animal Welfare Concerns and the Animal Industry: 1) Determine the extent to which public and organizational pressures are affecting industry practices concerning animal welfare, particularly use of animal welfare audits (i.e. protocols for animal treatment), with a focus on poultry, dairy, and swine, and 2) Determine the extent to which producers in these industries will adopt new protocols for animal treatment.

Outcomes:
The first detailed information on public attitudes and behavior regarding animal welfare and industry response within the U.S. population.
Highlights:
Part I has been completed and preliminary analyses have been carried out.

Project title: 3.5	Human-animal interactions in the turkey industry: Behavioral responses of turkeys to humans, and relationship to bird welfare and productivity
Chief investigator:	Naomi Botheras
Investigator(s)	Paul Hemsworth, John Barnett
Lead organisation:	The Ohio State University
Collaborating organisation(s):	
1. University of Melbourne	
2. Cooper Farms	
Funding	Midwest Poultry Research Program
Status	Current
Summary (including aims and objectives)	

The long-term goals of the proposed 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.

Outcomes:	
Highlights:	

Project title: 3.6	Welfare of working dogs on sheep properties in Western Victoria
Chief investigator:	Sarah Chaplin
Investigator(s)	*Lisa Virgona (3rd yr student)*
Lead organisation:	The University of Melbourne
Collaborating organisation(s):	
Funding	The University of Melbourne
Status	Completed
Summary (including aims and objectives)	

There is a complete dearth of information on the welfare of working dogs on farms. The aim of this project was to establish the current status of the welfare of working dogs. Fifty dog-owning sheep farmers were selected from an existing client base and interviewed about their management of their dogs with questions on the general background of the dog, its housing, feeding, transport and health routines. A physical examination of the dog was also carried out and finally farmers were questioned about their attitudes towards working dogs. Responses were scored to generate a score for each area of welfare and an overall welfare score. More positive scores reflected better welfare.

Outcomes:

Most dogs surveyed were sourced from unplanned litters (46%) and the median cost was $60 (range $0-3000). In general the survey results were very encouraging: the dogs' welfare was good with all dogs being in good health and most dogs fed daily (80%) and in good condition (54%). Nearly half of all dogs (48%) were not allowed in the house or yard and 70% had dirty water. Some discipline methods were cause for concern but electric collars were only used by 14% of owners. Possibly the biggest concern was the high rate of lethal accidents (28%) befalling the owners' previous dogs in the course of their work. Notwithstanding these concerns, 92% of owners had positive attitudes towards working dogs. In fact 54% considered that a good working dog was worth three men and 92% thought of their dog as their mate.

Highlights:

- The project was featured in "The Age" educational supplement and a further media release is planned.

Current and recently completed AWSC projects: Written summaries

PROGRAM 4

TERTIARY AND POST-GRADUATE EDUCATION AND TRAINING

Project title: 4.1	"Animals in Society" as part of the "Human and animal interactions" cluster at The Ohio State University
Chief investigator:	Pauleen Bennett
Investigator(s)	Mariko Lauber, Samia Toukhsati, Paul Hemsworth
Lead organisation:	Monash University
Collaborating organisation(s):	
1. The University of Melbourne	
Funding	OSU
Status	Current
Summary (including aims and objectives)	
"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.	
Outcomes:	
An increased understanding amongst students of the role of animals in society.	
Highlights:	
• Centre staff have delivered the course at OSU in 2007 and 2008.	

Project title: 4.2	The subjects Animals in Society, Applied Animal Behaviour and Animal Welfare in the new science degree B.Sci. (Animal Science)
Chief investigator:	Mariko Lauber
Investigator(s)	Mariko Lauber, Paul Hemsworth
Lead organisation:	The University of Melbourne
Status	Current
Summary (including aims and objectives)	

Animals in Society 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. We examine in detail some key relationships between humans and animals, including animals as pets, in agriculture, as research subjects, in educational roles and as pests. We discuss the changing attitudes of humans towards animals throughout time and talk about humankind's moral and ethical obligation to animal wellbeing. Within this discussion we introduce animal welfare science and discuss some of the current animal welfare issues in livestock industries around the world. Finally, we look to the future and where the relationship between humans and animals may be headed.

Applied Animal Behaviour allows students to examine the behaviour of farm, companion and laboratory animals and highlights the processes and factors involved in cause and effect manipulating behavioural functionality. The subject will train students to describe, record and measure behaviour, examine the development of behaviour in a range of species; examine the effects of stimuli and communications; motivation, decision making, learning and memory; genetic and hormonal basis of behaviour; organisation, social, sexual, maternal, and dam-neonate interactions.

Topics covered include:

- describing, recording and measuring behaviour; development of behaviour;
- stimuli and communication;
- motivation and decision making;
- learning and memory;
- genetic influences on behaviour;
- hormonal influences on behaviour;
- organisation of behaviour;
- social behaviour; sexual behaviour; and
- maternal behaviour and dam-neonate interactions; and behavioural problems

Animal Welfare develops knowledge and understanding of systems for regulating body function, and physiological and behavioural processes that are utilised by animals in response to environmental challenge. This basis will allow students to evaluate and assess animal welfare and ethical issues that confront livestock production and amenity use of animals in society. The subject will also develop knowledge in adaptation, preference testing, cognition, and short/long-term biological response.

Specific topics covered include:

- the current debate about animal usage and animal welfare;
- systems regulating the body (homeostasis, motivation and control systems, and development of regulatory systems);
- limits to adaptation (stimulation, tolerance and coping, variation in adaptation);
- stress and welfare (Selye's concept of stress and refinements to the concept, coping and fitness, definition of welfare and its assessment);
- assessing welfare using short- and long-term biological responses;
- assessing welfare using preference testing;
- assessing welfare by studying cognitive skills;
- ethical problems concerning welfare;
- welfare issues in agriculture and the general community; and codes of practice for the welfare of livestock and welfare solutions.

Project title: 4.3	Animal welfare education package
Chief investigator:	Mariko Lauber
Investigator(s)	Mariko Lauber, Paul Hemsworth, Grahame Coleman, John Barnett
Lead organisation:	The University of Melbourne
Collaborating organisation(s):	
1. Monash University	
Department of Primary Industries, Vic	
Funding	Animal Welfare Science Centre
Status	Current
Summary (including aims and objectives)	

The aim of the package is to introduce key concepts and animal welfare considerations and provide field tools, for staff who work directly with animal owners and carers, to identify certain animal welfare problems in a range of species.

The package will provide comprehensive training in animal welfare and welfare assessment to underpin the assessments in existing further education certificates; such as the Animal Management and Control Certificate IV and the Animal Welfare Inspector Certificate IV.

The package will provide participants with a series of modules/units that can be configured to suit the demands of the group being trained.

Outcomes:

Highlights:

- Focus groups have been established.

Project title: 4.4	"Minimising Handling Stress" - Prototype stockperson training packages for dairy, cattle, pigs and laying hens
Chief investigator:	Grahame Coleman
Investigator(s)	Paul Hemsworth
Lead organisation:	Monash University
Collaborating organisation(s):	
1. The University of Melbourne	
Funding	EU 6th Framework
Status	Current
Summary (including aims and objectives)	

Multimedia-based cognitive behavioural approaches to stockperson training have been shown to produce a high level of behaviour change, to be appropriate for people with limited formal education and to be the preferred method of learning for stockpeople. Such training has been shown to improve stockperson animal handling, improve farm animal production and improve farm animal welfare.

This is a collaborative project within the EU 6th Framework Welfare quality program (Sub-project 3, Minimizing handling stress) will develop integrated, knowledge-based, practicable species-specific strategies to improve farm animal welfare. This prototype training package will be based on existing knowledge mainly coming from Australian and French research and development as well as information obtained from research in the EU.

Outcomes:

This project will deliver a set of cognitive behavioural training programs relevant to the European pork, egg, dairy and beef cattle industries.. These programs will be raeadily adaotable into different languages and different production systems because of the generic structure adopted. Speech, video and graphic material is in files that are separate from the core programs and there can be easily alterd to suit local conditions.

Highlights:

Development of the prototypes has been completed and the final versions will be available in the first quarter of 2009.

Project title: 4.5	Implementation of Animal Welfare Standards into the meat chicken industry's company QA programs
Chief investigator:	John Barnett
Investigator(s)	Michelle Edge
Lead organisation:	Department of Primary Industries, Vic
Collaborating organisation(s):	
Funding	Poultry CRC
Status	Completed
Summary (including aims and objectives)	

This project had its origins when the 'Welfare Audit for the Chicken Meat Industry' (Barnett *et al.*, 2001) was published with funding from the then Rural Industries Research and Development Corporation (chicken meat industry program). Since its publication, the Audit documentation was incorporated into a state-based industry program for growers, the QA programs for one major national company, a company in Victoria and, in part, another Victorian company; the two Victorian companies have since been taken over by other national companies. It was estimated following the initial implementation since 2001, that the 'welfare audit' covered about 50% of the national flock.

This project, under the auspices of a small steering committee of industry representatives, CRC representatives and the researchers, was to increase industry implementation by revising the industry standards and conduct training of key industry personnel.

Outcomes:

The documentation was revised into a format more familiar to the industry and was based on that developed for biosecurity at grower farms.

A training program was conducted as 'train the trainer' sessions that met the requirements of 3 competency units within the National Competency Framework. Participants were assessed and provided with certificates of competency in animal welfare.

Training was delivered to 43 company personnel and growers. The company personnel were QA and technical representative participants from 12 first and second tier companies, representing the majority of the industry. Arrangements have been made for certificates of competency in animal welfare to be issued to the participants.

Highlights:

- The project achieved its objective in that 85% of companies now have the ability to train their own staff in the implementation of and record keeping associated with the animal welfare standards; these companies represent by far the majority of birds in the national flock.

Project title: 4.6	Revision of Pig ProHand
Chief investigator:	Grahame Coleman
Investigator(s)	Paul Hemsworth
Lead organisation:	Monash University
Collaborating organisation(s):	
1. The University of Melbourne	
Funding	Australian Pork Ltd
Status	Completed
Summary (including aims and objectives)	

Training of stockpeople as professional managers of pigs has, in the past, been largely ignored. In recognition of the vital role that stockpeople play in the overall productivity, welfare, and health of the livestock under their care, the Animal Welfare Science Centre (AWSC) developed a stockperson professional handling training program - ProHand pigs.

This program was developed over 10 years ago and is being revised to take into account some of the major technological changes which have occurred in the pork industry.

Outcomes:

To integrate OH&S considerations into the ProHand Pigs program which will be revised to take into account both developments within the pig industry and improved software availability.

Highlights:

- The final report has been delivered to APL in October 2008.

Proposed AWSC projects for consideration

PROGRAM 1: WELFARE METHODOLOGY

Project title: 1.1P	Refining assessment of fear responses of farm animals to humans
Chief investigator(s):	Paul Hemsworth, Xavier Boivin
Investigator(s)	
Lead organisation(s):	University of Melbourne and INRA (France)
Collaborating organisation(s):	
Funding source(s)	
Status	For consideration
Summary (including aims and objectives)	

Fear of humans by farm animal can have profound effects on animal welfare and productivity. Behavioural tests, involving initial isolation followed by exposure to humans have been extensively used by the AWSC to study these fear responses to humans in farm animals in both commercial and experimental conditions in order to examine factors regulating these fear responses. These tests have been shown to be effective in detecting moderate to large differences in fear responses in animals, but the tests may be less useful in differentiating smaller differences. Furthermore, the tests require highly standardised conditions (eg effects of other motivations (curiosity, hunger, etc), context (testing setting, individual person and stimulus properties eg posture, clothing, etc.), location (relative to routine handling location), to reliably assess fear responses to humans. Recent research in France has identified opportunities to extend these tests to detect small differences in fear responses in animals. For example, the addition of an isolation period following exposure to humans in the AWSC tests may allow moderate differences between animals in fear to be detected particularly in animals of low fear.

There are increasing international and local pressures for farm animal welfare monitoring schemes. While the housing of farm animals is a contentious issue, the importance of stockmanship is receiving increasing attention. Stockpeople have a major impact on the welfare of their livestock and thus monitoring fear of humans in a standard manner is an important component of monitoring animal welfare and the competency of stockpeople.

Objectives:

1. This collaborative project with French scientists will examine opportunities to fine tune current behavioural tests to assess fear of humans in farm animals.

Outcomes:

Better tools to assess fear of humans in farm animals both in research and in the field.

PROGRAM 2: HOUSING AND HUSBANDRY EFFECTS ON ANIMAL WELFARE

Project title: 2.1P	Importance of space and nests for laying hens in cages
Chief investigator:	John Barnett
Investigator(s)	Paul Hemsworth
Lead organisation:	University of Melbourne
Collaborating organisation(s):	
1. University of Sydney	
2. University of Guelph	
3. Davis University	
Funding source(s)	Australian Egg Corp Ltd
Status	Submitted
Summary (including aims and objectives)	

With issues of food security, production and safety, indoor housing will remain an important option for the egg industry for the foreseeable future. Furthermore, the issue of housing hens in cages is likely to remain on the political agenda, with ongoing pressures for change by industry. Thus, issues of nest boxes (and perhaps to a lesser extent dustbaths) and space will remain fundamental issues that need to be addressed by industry. Furthermore, industry will need to counter the likely perception that furnished cages are more attractive to the public compared to conventional cages. A separate issue that impacts on housing systems and husbandry practices across species is the methodology used to assess animal welfare as shown by the LayWel (2006) report that uses the 5-freedoms approach and concludes that all hen production systems, except for conventional cages, can meet the welfare requirements for hens. Using the functional approach to welfare assessment on the same data would result in a different conclusion.

This project will address both issues of cages and welfare methodology in factorial experiments that will focus on the issues of space and nests.

Objectives:

1. Examine the welfare implications of space allowance in cages for laying hens.

2. Examine the welfare implications of nests in cages for laying hens.

3. Further examine the relationship between two current approaches to welfare assessment, the biological functioning and animal preference approaches.

Project title: 2.2P	Welfare implications of tail docking in pigs at different ages
Chief investigator:	John Barnett
Investigator(s)	Paul Hemsworth, Craig Johnson, Christine Lunan
Lead organisation:	University of Melbourne
Collaborating organisation(s):	
1. Massey University	
2. University of Adelaide	
Funding source(s)	Australian Pork Ltd / industry
Date completed or date likely to be completed	Start July 2009; End June 2012
Summary (including aims and objectives)	

Surgical procedures conducted on farm animals are of welfare concern because they are mostly done without anaesthesia or analgesia. Hence they are targeted by animal welfare groups and it is likely that the general community would find alternative and less painful procedures more acceptable. In pigs, one procedure that is routinely undertaken without any pain relief is tail-docking. Tail-docking is routinely conducted to prevent an outbreak of tail-biting, a behaviour that can be learned by other pigs and that can cause considerable damage, even death, to pigs that are bitten. The cuases of tail-biting are unknown and there is no alternative procedure to prevent tail-biting. There is some limited evidence that this procedure can result in on-going (chronic) pain, based on the presence of neuromas in the tail-stumps of tail-docked pigs.

There is some evidence in mammals that pain mechanisms are dependent on the animal's stage of development of EEG responses at birth and the timing of a noxious stimulus before or after the development of the EEG response affecting subsequent hyperalgesia (increased response to painful stimuli). For example lambs (a precocial species – well developed at birth) show little EEG response to castration until about 3 days of age. However, if castrated at one day of age they show more pain related behaviour to tail docking at 1 month of age than their peers castrated at 10 days of age. In altricial species (relatively undeveloped and fully dependent at birth eg. rats) there is little EEG response to noxious stimulation until about 12 days of age. Pigs are considered intermediate on the continuum from altricial to precocial and therefore one aspect to pursue is the balance in timing of development of EEG responses and hyperalgesia for when tail-docking is best undertaken. This project will utilise behavioural, endocrinological, neurophysiological (EEG) and neuroanatomical (presence/absence of neuromas) methodologies to test the hypothesis that there is a time after birth for tail-docking piglets in which there is both reduced perception of pain and no subsequent hyperalgesia.

Objectives:

1. To determine the age of development of a full EEG response to a painful stimulus, initially electric shock,.

2. To determine if responsiveness to painful stimuli and subsequent hyperalgesia is age dependent in piglets.

Highlights:	

- A collaborative project between AWSC / UofM and Massey University

Project title: 2.3P	Effect of age and handling during transport on the welfare of bobby calves
Chief investigator:	Ellen Jongman
Investigator(s)	Mariko Lauber, Paul Hemsworth, John Barnett
Lead organisation:	Department of Primary Industries Vic
Collaborating organisation(s):	
1. The University of Melbourne	
Funding source(s)	Department of Primary Industries Vic
Status	For consideration
Summary (including aims and objectives)	

1. Transport of bobby calves has recently been highlighted is a major welfare issue for the dairy industry in Victoria; specifically age at transport, transport duration and transport conditions. Currently, few recommendations exist for the transport of bobby calves in Victoria, for either short or long duration journeys. The literature suggests that while young calves exhibit fewer physiological indices of stress associated with transport, they suffer from post-transport morbidity and mortality that is directly correlated with age at time of transport (Knowles, et al., 1999; Eicher, 2001). Continuing on from the pilot project examining the influence of age on the responses of young calves to transport under ideal transport conditions; this study would begin to examine the impact of group size/stocking density on the immediate and longer-term welfare of calves transported, for the maximum 10 hours allowed under the Australian Transport Standards, at 3, 5 and 10 days of age.

Objectives:

1. Examine the welfare implications of group transport and transport conditions on calves at 3, 5 and 10 days of age

2. Examine the long-term outcomes (morbidity and mortality) on calves transported at 3, 5 and 10 days of age under standard commercial transport conditions.

2. A recent workshop investigating the welfare issues surrounding bobby calves in the dairy industry highlighted the need for specialised training and equipment for handling young calves. Young calves (calves under 3 weeks to 1 month of age) are less capable of following another animal to move from point to point. The literature suggests that these calves are still in their "hider" phase of life, where, in the wild, they would spend most of their time lying protected from predators by long grass or other environmental obstacles; standing only to feed when their dam returns to them periodically throughout the day (Thompson, 1998). There appears to be a lack of information and formal training available to stockpeople and transport drivers working with young calves. This project would follow on from part 1. and will aim to determine the most appropriate handling techniques for moving young calves; in particular, examining low stress stock handling techniques and facility design for maximising efficiency in moving young calves, while minimising stress to the calves and stockpeople.

Project title: 2.4P	Welfare of lambs in feedlots
Chief investigator:	Ellen Jongman
Investigator(s)	
Lead organisation:	DPI
Collaborating organisation(s):	
1.	
2.	
Funding source(s)	MLA
Status	For condiseration
Summary (including aims and objectives)	

Two of the main welfare problems for lambs in intensive finishing systems are the number of shy feeders and stocking density. Little is known about the social interactions within groups of lambs and how these social interactions influence adaptation by lambs to intensive housing systems such as feedlots. Group size and stocking density will most likely affect these interactions, and will impact on a wide range of aspects, including shy feeders, use of shade, use of feeders, impacts of hot, cold and wet weather, etc. Stocking density and resultant overcrowding may result in competition for resources including preferred areas of the pen and may result in lambs not being confident to visit the feeder or drinker or even to lie down to rest. Research on other livestock species has found that overcrowding may result in a chronic stress response with potential negative impacts on growth rate, food conversion efficiency and health. There appears to be differences between breeds in adaptation to a feedlot environment, suggesting there may be some genetic basis for adaptation. Temperament of the individual animal may well be predictive of its ability to adapt to different environments.

Optimal stocking densities both for indoor and outdoor systems will be determined using measurements of behaviour, physiology, immunology and growth. The effects of the use of feeders and drinkers and the effect of different shaded areas will be included. It is proposed that the temperament of all lambs in the study will be tested through a range of short behaviour tests prior to entering a feedlot. The results of the behaviour tests can then be correlated to the individual responses upon introduction into a feedlot. These data may help predict what characteristics are important for successful feedlotting and may also help identify unsuitable animals before problems such as shy feeders arise.

Objectives:

1) To decrease the number of shy feeders in intensive finishing systems.

2) To determine optimal stocking density and develop recommendations on shaded area, feeder space, number of feeders and watering points.

3) To assess some of the predictive indicators that may be correlated to successful adaptation to a feedlot environment.

Project title: 2.5P	Effect of early handling treatment on ease of movement in bobby calves
Chief investigator:	Mariko Lauber
Investigator(s)	John Bodey, Paul Hemsworth, John Barnett
Lead organisation:	The University of Melbourne
Collaborating organisation(s):	
1. Department of Primary Industries, Victoria	
Funding source(s)	DPI/AWSC???
Status	For consideration
Summary (including aims and objectives)	

A recent workshop investigating the welfare issues surrounding bobby calves in the dairy industry highlighted the need for specialised training and equipment for handling young calves. Young calves (calves under 3 weeks to 1 month of age) are less capable of following another animal to move from point to point. The literature suggests that these calves are still in their "hider" phase of life, where, in the wild, they would spend most of their time lying protected from predators by long grass or other environmental obstacles; standing only to feed when their dam returns to them periodically throughout the day/

Anecdotally, the problem of moving calves has two phases. The first phase involves waking sleeping calves and getting calves to stand up from a lying or sitting position. Current industry practice sees stockpeople use a variety of techniques to wake sleeping calves, including noise (voice or tin rattle), running a foot down the base of the spine, tickling the calves on the shoulder or hips, and using a sheep dog to bark to wake the calves.

The second phase is moving the awake calves. Current industry practice for this phase includes the use of voice, tine rattle, sheep dog, electric prodders (although this is illegal) flappers, a "tiger claw" technique which involves dragging the fingers over the back of the calf and lifting the had as soon as the calf moves forward, and pressure and release in the push zones of the eye of the calf. It is clear that some of these techniques would result in stress and pain for some calves and others would be largely ineffective in you calves that have difficulty 'following' and have low environmental awareness due to their 'hider behaviour'.

Studies in beef cattle have shown, however, that young calves can be taught to move using low stress stock handling by handling their mothers using the appropriate pressure and release technique (Cattle expressions, low stress stock handling). Yet, there also appears to be a lack of information and formal training available to stockpeople and transport drivers working with young calves. While dairy calves are often separated from their mother within 24 hours, it may be possible to impose handling treatments during the first 4 days of life, prior to transport, that improve the effectiveness of low stress stock handling and create an effective means for handling dairy calves.

Objectives:
1. Determine the most appropriate handling techniques for moving young calves.
2. Examining low stress stock handling techniques and the impact of rearing conditions on handling.
3. Determine facility design factors which optimise the efficiency of moving young calves.

PROGRAM 3: ATTITUDES TO ANIMALS AND ANIMAL WELFARE, AND FARMER, CONSUMER AND COMMUNITY BEHAVIOUR

Project title: 3.1P	Human-animal relationships: Preliminary examination of fear responses and ease of handling of ewes.
Chief investigator:	Paul Hemsworth
Investigator(s)	Grahame Coleman, Ellen Jongman, Greg Cronin, Bob Kilgour.
Lead organisation:	University of Melbourne
Collaborating organisation(s):	
1. Monash University	
2. Department of Primary Industries Vic	
3. The University of Sydney	
4. NSW Agriculture	
Funding source(s)	Australian Wool Innovation / Meat and Livestock Australia / Department of Primary Industries Vic
Status	For consideration
Summary (including aims and objectives)	

Over the last two decades, members of this research team have made considerable progress in understanding human-animal interactions in agriculture. This research on dairy cattle, pigs and poultry has been multidisciplinary in nature, has led the international developments and has revealed the profound effects that farmers and stockpeople have on their livestock.

While research has demonstrated the impact of the stockperson in intensive animal management systems, less research has been conducted in more extensive situations. Nevertheless, human-animal interactions can affect ease of handling as well as animal productivity and welfare via animal stress, while other important human characteristics such as technical skills and knowledge, job motivation, commitment and job satisfaction can affect animal welfare and productivity by affecting the standard of animal inspection and care provided by the stockperson.

This preliminary study will study stockpeople in commercial settings with the aims of:

o Identifying individual animal variation in fear responses (avoidance behaviour and cortisol response to humans) and ease of handling

o Examining relationships between stockperson behaviour and subsequent fear responses to humans (avoidance behaviour and cortisol response).

Outcomes:

The outcome will be an understanding of the relationships between stockperson behaviour and the behavioural and physiological responses of ewes.

An understanding of the stockperson behaviours related to these fear and stress responses provides an appreciation of the implications of human-animal interactions on the animal and the potential opportunities to improve ease of handling and reduce handling stress in commercial settings, but these specific opportunities would need to be determined via further R&D.

Project title: 3.2P	Welfare audits in the pig industry - stockperson attitudes and behaviour
Chief investigator:	Grahame Coleman
Investigator(s)	Paul Hemsworth
Lead organisation:	Monash University
Collaborating organisation(s):	
1. Monash University	
2. University of Melbourne	
Funding source(s)	Australian Pork Ltd
Status	For consideration
Summary (including aims and objectives)	

Given the extensive research to show that stockperson attitudes are good predictors of their interactions with pigs and that these interactions have a substantial effect on pig welfare and productivity, it is proposed to develop a tool for measuring those stockperson attitudes that can be used to audit stockpeople. In part this will entail validation of some of the measures that have previously been developed and in part will entail some broader measures that assess motivation and willingness to learn new skills.

The aim will be to validate these tools by tracking stockpeople over time to show that changes brought about by training (eg ProHand), feedback provided from the audit and experience in the industry are reflected in changes in the attitudes measured by the audit tool.

Outcomes:

The outcome will be the development of a set of tools that can be used throughout the pig industry to audit welfare-relevant stockperson attitudes and behaviour and a set of normative data that can be analysed over time to indicate industry-wide changes.

Project title: 3.3P	The development of a multimedia training program for livestock transporters
Chief investigator:	Grahame Coleman
Investigator(s)	Paul Hemsworth, Michelle Edge
Lead organisation:	Monash University
Collaborating organisation(s):	
1. Department of Primary Industries Vic	
2. Meat and Livestock Australia	
3. Australian Pork Limited	
Funding	Meat & Livestock Australia / Australian Pork Ltd / Australian Livestock Transporters Assoc
Status	For consideration
Summary (including aims and objectives)	

Recent developments overseas and recent trends in Australia indicate that Governments and/or food retailers in the near future will require the incorporation of welfare into industry quality assurance program for the pre-slaughter handling and management of farm animals at Australian abattoirs.

The results of studies by the research group both in commercial farms and at abattoirs indicate that cognitive-behavioural interventions that successfully target the key attitudes and behaviour of animal handlers that regulate the animal's fear of humans, offer the industry good opportunities to improve the welfare of their animals. Such improvements may also reduce injury and limitations on meat quality, such as bruising, arising from poor handling.

The success of the cognitive-behavioural technique in improving the attitudes and behaviour of stockpeople in the pig and dairy industry and at abattoirs clearly demonstrates that training programs should be developed based on this intervention procedure and that such a program for pig transporters would be effective in improving animal welfare by improving animal handling in situations where poor handling reduces animal welfare.

Until the limitations imposed by handling on ease of handling, injury and meat quality are quantified, the financial benefits are unknown. This project has two components: 1. Assessing the attitudes and behaviours of animal handlers/transporters involved in the loading and unloading of animals and the effects of handling on ease of handling and fear responses in the animals; 2. Using this information to develop of cognitive-behavioural training program for livestock transporters.

Outcomes:	

The specific outcomes of this project will be:

1. The development of a cognitive-behavioural training program for livestock transport drivers.

2. An improvement of the key attitudes and behaviour of livestock transport drivers which in turn will reduce the animal's fear of humans and improve the animal's welfare post-farm gate.

3. A reduction in injury and limitations on meat quality, such as bruising, arising from poor handling.

4. A response to increasing pressure from Governments, processors/wholesalers/retailers, consumers and/or the general public to safeguard the welfare of farm animals post-farm gate.

5. A contribution to industry profitability and sustainability which will be supported by such training programs that address animal welfare issues.

Project title: 3.4P	Consumer willingness to pay for animal products from different production systems.
Chief investigator:	Grahame Coleman
Investigator(s)	Paul Hemsworth, John Barnett
Lead organisation:	Monash University
Collaborating organisation(s):	
1. Melbourne University	
2. Department of Primary Industries Vic	
3. Australian Egg Corp Ltd	
4. Australian Pork Limited	
Funding	Department of Primary Industries Vic / Australian Egg Corp Ltd / Australian Pork Limited
Status	For consideration
Summary (including aims and objectives)	
The price-welfare tradeoffs for eggs and pork produced using different housing systems is not fully understood. This study will directly assess the price-welfare tradeoff by manipulation of the price differences between intensively housed and free-range housing systems and will assess attitudes to animal welfare and other relevant variables in supermarkets that may provide some insights into the reasons why consumers choose to buy free range products and how this relationship is moderated by price differentials. In this way, we will be able to determine price-welfare tradeoffs.	
Outcomes:	
This research will lead to the development of a questionnaire that will be used to identify both welfare-specific and generic attitudes relevant to the poultry and pork industries and production methods. This questionnaire will be used to identify those attitudes that are associated with consumer choice in distinguishing between animal products from different production systems. The results may be used to inform marketing strategies and, if the questionnaire is used on a routine basis, it will assist in identifying trends both in purchasing behaviour and in the attitudes that underlie such behaviour.	

PROGRAM 4. TERTIARY AND POST-GRADUATE EDUCATION AND TRAINING

Project title: 4.1P	Review of the National Animal Welfare Standards at Livestock Processing Establishments
Chief investigator:	John Barnett
Investigator(s)	Michelle Edge
Lead organisation:	University of Melbourne
Collaborating organisation(s):	
1. Department of Primary Industries	
Funding source(s)	Meat & Livestock Australia
Status	Negotiation
Summary (including aims and objectives)	

In 2005, the Australian Meat Industry Council, in collaboration with the Animal Welfare Science Centre (AWSC) developed and launched National Animal Welfare Standards for Livestock Processing Establishments (Edge et al, 2005). These standards were designed to reflect: 1) the key requirements of the Code of Practice for the Welfare of Livestock at Slaughtering Establishments, 2) the Australian Standards for the Production and Transportation of Meat and Meat Products for Human Consumption, 3) scientific literature, 4) commercial customer requirements and 5) current practice in the meat industry. This project will review these Standards and address new industry practices and requirements, changes in national and international commercial and legislative requirements, changes in community expectations and new research and development relating to animal welfare standards.

Objectives:

1.   Review and revise as necessary, the National Animal Welfare Standards for Livestock Processing Establishments in collaboration with the Standards Management Group (utilised to develop the standards in 2005).

2.   Identify gaps in current knowledge and provide recommendations to address these gaps for i) future revisions of the existing Codes of Practice and other legislative requirements and ii) the review of existing training materials and other extension materials which were developed as part of the original project.

3.   Assess current uptake of the standards and improve uptake as required, including initiating appropriate linkages across the supply chain.

Project title: 4.2P	Consolidation of animal welfare and food safety audits to increase industry adoption of animal welfare audits
Chief investigator:	John Barnett
Investigator(s)	Michelle Edge
Lead organisation:	University of Melbourne
Collaborating organisation(s):	
1. Department of Primary Industries	
Funding source(s)	Australian Egg Corp Ltd
Status	Submitted
Summary (including aims and objectives)	

There are a number of commercial and licensing requirements in relation to quality assurance that must be met by egg suppliers to demonstrate the supply of wholesome and ethically produced products. In addition to the regulatory framework, enterprises may supply a number of customers, each with specific requirements, standards and audit processes. As the number of customers and their associated 'proprietary QA programs and standards' relating to egg products continues to increase, so to are multiple audits, by multiple certification bodies, in order to demonstrate different standards for different customers. Many egg production enterprises report up to 15 audit days per year and inputs range from the development and continual management of multiple QA programs, time/labour preparation both pre- and post audit, costs relating to audit and corrective actions and so on.

There is a need for improved and consolidated development of quality assurance and audit practices exists in the egg industry and this will become an increasing imperative as new customers enter the market and consider developing standards. Thus, the purpose of this project is to identify and scope options towards a single framework that may encompass the requirements of the commercial entities and reduce multiple audits.

Objectives:

1. Examine the number of commercial and regulatory audits, their content (similarities and differences across the various regulatory and commercial requirements) and the number of verification bodies and customers in the egg industry.

2. Examine opportunities for consolidation, in terms of i) gaining equivalence between programs and/or audit mechanisms, ii) consolidating activities across customers and certification bodies and iii) consolidating standards or audits, where these are generic and non-proprietary and subsequently reduce costs/inputs from industry in demonstrating standards multiple times.

An electronic version of this publication is available from:

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