



RURAL INDUSTRIES RESEARCH
& DEVELOPMENT CORPORATION

Support for the Establishment of the Animal Welfare Centre

**A report for the Rural Industries Research
and Development Corporation**

By Professor Paul H. Hemsworth

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Foreword

The joint Animal Welfare Centre was established on the 24th March 1997 by the University of Melbourne, Monash University and the Department of Natural Resources and Environment. The Centre focuses and coordinates the research and academic resources of the three collaborating organisations, providing the farming community with an internationally competitive research, teaching and training resource in animal welfare.

In 1997 a 5-year plan was developed for the Centre's research, training and teaching activities and this plan consists of key programmes and their goals with identified key performance indicators. The plan was developed in consultation with the three partner organisations (through the Centre's Board of Management), the Centre's Advisory Committee, clients such as the rural industry research corporations and interested parties such as animal industry bodies and community groups representing the general public's interest in animal welfare (such as the RSPCA and Animals Australia).

The major programs of the Centre are basic research to develop welfare methodology, research examining the effects of human-animal interactions, housing and husbandry practices on animal welfare, the development and provision of undergraduate, postgraduate and industry training programs in animal welfare and the provision of scientific, objective information on animal welfare to the general public.

Local and international consumer and public concerns about farm animal welfare are likely to place increasing pressure, either directly or indirectly, on practices in the livestock industries. RIRDC recognises the important role of the Animal Welfare Centre in improving our understanding on farm animal welfare and the factors that affect it. Sound knowledge is required on the welfare implications of contentious issues in order to sensibly direct changes in livestock production that reflect both the concern of the general public and the consumer, the risks to the welfare of farm animals and the sustainability of the livestock industries. Consequently RIRDC has supported the establishment of the Centre and a number of its research programs on laying hens and meat chickens.

This project was funded from industry revenue which is matched by funds provided by the Australian Government.

This report, an addition to RIRDC's diverse range of over 900 research publications, forms part of our Chicken Meat R&D program, which aims to support increased sustainability and profitability in the chicken meat industry by focusing research and development on those areas that will enable the industry to become more efficient and globally competitive and that will assist in the development of good industry and product images.

Most of our publications are available for viewing, downloading or purchasing online through our website:

- downloads at www.rirdc.gov.au/reports/Index.htm
- purchases at www.rirdc.gov.au/eshop

Simon Hearn
Managing Director
Rural Industries Research and Development Corporation

Contents

Foreword.....	iii
Titles of Research Projects	1
External Project Funding.....	2
Summary of Research Projects	3
Post-Graduate Students and Post-Doctoral Fellows	9
Communications	10

Titles of Research Projects in the Animal Welfare Centre in 1999 and 2000

Dairy Research & Development Corporation

Commercialising a training programme targeting stockperson attitudes and behaviour.
Designing components of milking sheds using aversion learning techniques.

Pig Research & Development Corporation

Selection of experienced and inexperienced stockpersons for the pig industry.
Effect of handling and housing on pig welfare.
Increasing piglet growth and survival by stimulating sucking bouts welfare.
Training programs for abattoir workers to improve pig welfare and meat quality welfare.
A review of the influence of housing systems for pregnant, farrowing and lactating sows on pig welfare.
Multi-media computerised training.
Evaluation of sow stall dimensions.

Nation Pork Industry Development Program

Deep-litter housing systems for pigs.

Rural Industry Research & Development Corporation

Welfare QA programs for broiler chickens.
Reducing cannibalism in laying hens.

Environment Australia

Humane control of foxes.

Department of Natural Resources & Environment Initiative Funding

Human control of cockatoos.
Welfare Audits (pigs and dairy cows).
Welfare Audits (layer hens).

National Health and Medical Research Council

Sex differences in the mechanisms by which stress inhibits the secretion and actions of GnRH.

Australian Research Council (SPIRT)

Behaviour and welfare of suburban dogs.

Institute of National Agriculture (France)

Stress during pregnancy and the behaviour of offspring.

Commercial funding

Anti-barking muzzle for dogs.
Rotary dairies.

External Project Funding

Annual external funding for the Animal Welfare Centre since 1996/97

YEAR	RESEARCH PROJECT FUNDING	CAPITAL FUNDING
1996/97	\$657,699	-
1997/98	\$792,577	\$163,000
1998/99	\$533,932	-
1999/00	\$703,071	-
2000/01	\$738,939	-

Summary of Research Projects in the Animal Welfare Centre in 1999 and 2000

1. Dairy Research and Development Corporation

Commercialising a training programme targeting stockperson attitudes and behaviour

The results of recent DRDC projects (DAV219, DAV370 and DAV419) have shown significant relationships between the attitudes and behaviour of farmers/stockpeople towards their cows and the fear and productivity of their cows. The recent results indicate that practical and inexpensive opportunities exist, in the form of a training programme targeting the key characteristics of farmers, to manipulate these human-animal interactions to improve the amount of milk, protein and fat produced by dairy cows. DRDC and industry examining opportunities to offer this training programme, based on the intervention procedure, to industry.

The effect of fear of humans on the behaviour, physiology and productivity of dairy heifers and cows

A series of experiments was conducted in this PhD programme to examine the influence of handling on the behaviour, stress physiology and production of dairy cows. Handling was found to markedly affect the subsequent behavioural response of the cow to humans. Negative handling increased fear responses in dairy heifers while positive handling decreased fear responses in dairy heifers. Increased fear of humans, through negative handling, produced both an acute stress response and a chronic stress response. In one of two experiments negative handling resulted in reduced milk yield and lameness in heifers. These experiments provide evidence that negative handling by humans can affect the subsequent fear and stress responses of dairy cows to humans. These fear and stress responses have implications for the productivity and welfare of commercial dairy cows.

Designing components of milking sheds

This PhD project is examining the behavioural and physiological responses of cows to common components or features of a milking system. A thorough understanding of the aversiveness of common features of a milking system for the animal will enable dairy facilities to be designed or modified that facilitate movement of cows in and out of the dairy shed. In addition to benefits on animal movement, improvements in animal productivity and welfare and job satisfaction for the farmer may also occur.

2. Pig Research and Development Corporation

Selection of experienced and inexperienced stockpersons for the pig industry

This 3-year project examined the factors predict good performance by stockpeople in the pig industry. Computerised questionnaires were used at the start of employment of stockpeople to evaluate the value of measures of personality, motivation, turnover and performance potentials, and attitudes and empathy toward pigs to predict the subsequent performance of stockpeople. The results indicated that there are several variables which can be assessed in inexperienced stockpeople and which predict future performance. Potentially, these tests can be assembled into a kit for use in selection in the pig industry. However, there are several cautionary points that should be made. First, as with all selection tools, care should be taken to use such findings as a guide in selection and not a prescription. Second, because this was an exploratory study where many variables were investigated, the levels of variance in stockperson performance accounted for will tend to be inflated as a result of the stepwise strategy employed. It is essential that a validation study be carried out before the findings of this study are implemented widely.

Effect of handling and housing on pig welfare

This 3-year project examined the relative effects of housing and human factors on the welfare of pigs. An understanding of the importance of human factors to animal welfare and productivity is a

fundamental issue for pig production. The results of the project, in conjunction with previous industry and experimental studies, highlight the importance of human factors on pig welfare and indeed suggest that in the experimental situation, human factors may be relatively more important to animal welfare and productivity than the housing system *per se*. While most discussions on animal welfare centre on the impact of housing systems, effective dissemination of findings such as these should result in a more appropriate focus on human factors that affect welfare in housing systems for pigs, which in turn should result in improvements in pig welfare. For example, an improved appreciation of the role of the stockperson should assist industry in providing an increased focus on attracting and retaining desirable and providing appropriate training.

Training programs for abattoir workers to improve pig welfare and meat quality welfare

This 2-year project is examining the relationships between the attitudes and behaviour of pig handlers at abattoirs and the level of fear, the magnitude of the acute stress responses and meat quality in pigs. Results to date indicate that there are some important relationships between stockperson attitudes and behaviour and stockperson behaviour and meat quality in pigs. The next step in this project is to examine the effects on meat quality of a cognitive-behavioural intervention programme targeting these key stockperson characteristics.

A review of the influence of housing systems for pregnant, farrowing and lactating sows on pig welfare

This short-term project reviewed sow housing and relevant issues of behaviour and welfare. This project also assessed the Australian research regarding fit with current industry practices. A report has been submitted to the PRDC and the review has been published in a scientific journal.

Multi-media computerised training

Multimedia training programmes offer instructional consistency, good retention and high motivation amongst participants. They also reduce learning time, training costs and operational costs in the long run. Despite the fact that there is substantial evidence to demonstrate the critical role that the stockperson plays in productivity and welfare of pigs, comprehensive training of stockpeople has barely begun. The best way to disseminate this skills and knowledge to the pig industry has not been investigated. This 1-year project evaluated the effects of multimedia techniques on learning, retention and satisfaction in trainees in comparison with a conventional teaching approach. Results to date provide limited support for the hypothesis that participants in the multimedia group would perform and retain content better than did participants in the manual group. There was support for the hypothesis that participants in the multimedia group would be more satisfied with their media than the manual group.

Increasing piglet growth and survival by stimulating sucking bouts welfare

The main objective of this project was to measure the efficacy of broadcasting tape-recorded sow suckling grunts to increase piglet growth during lactation. The secondary aim was to measure effects of the auditory treatment on sow body condition. Trials were conducted on a number of commercial pig farms. An improvement in piglet growth in the order of 8% compared to untreated controls was recorded at 2 farms. This technique may also have practical application for improving feed intake by weaner pigs.

Evaluation of sow stall dimensions

The housing of dry sows, particularly individual housing, is one of the most controversial issues of conventional pig production. While precise figures are not known, industry opinion indicates that in Australia about 40-60+% of pregnant sows are individually housed in stalls at some stage during pregnancy, with the remainder being group-housed. The implications of gestation stall dimensions for sow welfare are not known, with the dimensions of stalls largely based on both the size of pigs and the requirement that they not be able to turn around. This aspect of stall dimensions will be one focus of this new project. The consequences of housing in stalls for shorter or longer periods of time and

the advantages/disadvantages for overall welfare remain to be determined and is the second aspect of this project.

3. Rural Industries Research and Development Corporation Welfare QA programs for broiler chickens

The development of welfare audits with their incorporation into industry quality assurance programmes is likely to be one of the most effective measures introduced in the livestock industries to improve animal welfare. Such a measure will also assist in reassuring the public's confidence in the livestock industries. This 3-year project will develop practical but comprehensive audit documentation for the broiler industry. This welfare audit will be utilised either independently or within a quality assurance programme for use in welfare assessment.

Travel report on alternative egg laying production systems in Europe

This project reported on a 2-week trip to The Netherlands, Germany, Sweden and the UK by a small delegation including a journalist, 2 farmers and a poultry scientist (Dr. John Barnett). The latest alternative housing systems were seen and the future alternatives following the EU directive proposing a ban on conventional cages in 2012 were discussed.

Reducing cannibalism in laying hens

Pecking causes considerable economic and animal welfare problems in laying hens. It may cause feather damage, injuries or even death. Feather pecking is not only observed in caged birds but also in alternative housing systems. The measure commonly used to control feather pecking is beak trimming, however this treatment may affect animal welfare since it may cause significant behavioural change perhaps indicative of chronic pain and neuromas are commonly seen. This project will examine the effects of management practices during rearing, such as low lighting and access to litter, on pecking in laying hens.

4. Environmental Australia Humane control of foxes

Baiting of foxes with 1080 is a common practice, however there are some concerns about the pain involved during the latter stages of the dying process. Animals die after a period of convulsions, which is not only very unpleasant to watch but also raises concern about possible suffering by the animal. Adding an effective analgesic to 1080 bait will reduce suffering from pain during dying. Not much is known about analgesics in foxes and only cheap non-steroidal anti-inflammatory analgesics can be used. The best available method to establish whether an analgesic is effective is by measuring brain activity (Evoked Response Potentials) in response to a painful stimulus. The Evoked Response Potentials are indicative of the brain receiving painful stimuli and this project will use this methodology to examine the effectiveness of analgesics in baits.

5. National Pork Industry Development Program The behaviour, performance and welfare of growing pigs in a deep-litter group-housing system

Housing growing pigs in large sheds using a floor base of deep litter has been developed as an alternative housing system. These systems are cheaper to establish and are perceived as being more "welfare-friendly" for pigs, compared to conventional intensive systems. Recent industry records have shown that pigs grown out in deep-litter systems are ten percent less efficient in converting feed to live weight gain and are 15-20 percent fatter. This PhD project is studying the social and feeding behaviour of pigs in order to identify behavioural limitations to pig performance and welfare.

6. DNRE Initiative Humane control of cockatoos

4-Amino-pyridine (4-AP) (registered as Avitrol® in the US and Scatterbird® in Australia) is one of the most commonly used chemicals to manage bird damage to crops and world-wide it has been used

with considerable success. However, the extent of pain and distress experienced by intoxicated birds is uncertain. Little information has been gathered concerning potential crop hygiene issues, primary and secondary off-target poisoning, bait palatability and environmental contamination and these issues should be addressed before widespread baiting is adopted. A recently proposed approach to address the humaneness of poisons is to use an analgesic incorporated into a bait to prevent pain during toxicosis; this approach may have a potential application with 4-AP. This project will assess the palatability of analgesic compounds and bait mixtures for cockatoos in laboratory trials, the effect of analgesics and analgesic/avicide combinations upon Evoked Response Potentials in birds and the lethal efficacy of analgesic/avicide combinations in captive cockatoos.

Part development of a welfare audit for the egg industry

One of the recommendations of the August 2000 ARMCANZ meeting was for industry to develop a QA programme incorporating food safety, biosecurity and welfare and report on its progress in March 2001. Because of a lack of welfare information to incorporate into such a programme and based on some similar work conducted for the chicken meat industry, NRE provided funds to undertake this development. Two draft booklets have been produced, on a welfare audit for 2 sectors of the industry, i) chicks and pullets and ii) layers (cage, barn and free range). The project was completed with considerable inputs from a management group comprising, industry, welfare groups, educators and researchers. In the meantime industry is developing its own QA programme, with the welfare component largely based on the Model Code of Practice for Welfare. Thus the development of a comprehensive welfare audit that covers all sectors of the egg industry is currently uncertain.

Welfare QA programs for the livestock industries

A large number of the issues that farmers deal with on a daily basis, such as animal health, production and human hygiene, also relate to animal welfare, although up to this point in time the information has not been formalised into one document. The object of welfare audits is to set best practice targets for production and animal welfare. The aim of this new 3-year project is to develop, with industry and other stakeholders, welfare audit documentation for the pig and dairy industries to incorporate into industry quality assurance (QA) programmes. The standards in the audit documentation will fulfil both industry's and the community's expectations of high levels of welfare associated with the production of a particular product (eg milk or meat).

7. Commercial funding

Anti-barking muzzle for dogs

An anti-barking muzzle for dogs was tested in this commercial project during winter on Australian Kelpies at a commercial breeding kennel, to examine the effects of the device on dog welfare. The trial involved 8 pairs of dogs (paired on sex and age); one dog per pair was allocated at random to the Muzzle Treatment and the other to the Control Treatment (not muzzled). Muzzle Treatment dogs wore the anti-barking device for about 43 hours. The behavioural responses of dogs were recorded over 4 days, from before application of muzzles to 2 days after removal of the muzzles. Saliva samples were collected post-muzzling to measure salivary concentrations of the stress hormone cortisol.

Report on cow behaviour at a problem rotary dairy

The commercial research project examined the behaviour of cows around the time of milking at a problem farm with that of cows from three other farms which had a similar proprietary rotary platform.

8. Australian Research Council (ARC SPIRT)

Behaviour and welfare of suburban dogs

Many dogs are restricted to suburban backyards. This project will involve the collaboration of scientists and industry partners with practical and regulatory responsibilities in improving behaviour and welfare. The incidence of behavioural problems, that are indicative of maladaptation, will be quantified and together with some physiological and health indices of welfare, will be used to assess

the risks to the welfare of suburban dogs. The relationships between this assessment and environmental factors (e.g. social and human contact, space and environmental stimulation) will be examined to identify those factors that need to be targeted to improve dog behaviour and welfare. A PhD student Amanda Kobelt has been appointed in 2000 to this project.

9. Institut National Agronomique, Paris-Grignon Stress during pregnancy and the behaviour of offspring

Part of this PhD programme (Ms. Sabine Roussel) will be undertaken at the AWC and this collaborative project with INA will examine the effects of prenatal stress in sheep. In particular the effects on the behavioural and physiological responses of lambs to common stressors and their learning ability will be studied. Research on laboratory species has shown adverse effects of stress during foetal development on young animals. Therefore this project will examine the effects of prenatal stress on the behavioural and physiological responses of sheep to novel, startling and social stimuli. The relationship between the behavioural and physiological response (or “reactivity”) of the pregnant animal and the effect of prenatal stress on the offspring will be also studied.

10. State Government and AWC Funding Neophobia in dogs

This honours project will develop the methodology to objectively measure fear of novelty in dogs. With such methodology, the role of neophobia in the causation of behavioural problems in dogs can be studied.

Human-pet (dog) interactions in divorced/separated single-parent families

This honours project will examine the role that pets play for the adult and children in terms of companionship, support, etc. In particular, the level of attachment to pets will be studied and the independent variables investigated will include number/age/sex of children, time since separation, and presence/absence of a pet.

Human-pet (dog) interactions in situations involving children with behavioural disorders

This honours project will examine the treatment of animals by children with behavioural disorders.

Confinement of dogs and cats: attitudes and problems for the general community and pet owners

This Master’s programme in collaboration with the Bureau of Animal Welfare will examine the attitudes of both the general public and pet owners to pet confinement. Furthermore, the main issues or barriers confronting owners in confining their pets will be identified. For example, problems such as ethical issues, economical issues, disinterest and ignorance will be examined. Such information is necessary to assist in the development of public education programmes and legislation that meets the needs of human safety and animal welfare.

Survey of reported welfare abuses to horses

This Master’s programme in collaboration with the Bureau of Animal Welfare will examine the circumstances surrounding reported cases of welfare abuses in horses in Victoria. Over 1000 cases of horse welfare abuse are reported to the RSPCA and the Department of natural Resources and Environment each year in Victoria and data on issues, results of investigations, situational and demographic factors associated with the cases, etc. will be collected in order to identify the major factors associated with such cases. With such information, avenues for education may be developed and situations where policy development would be beneficial may be identified.

The mental evolution of the horse and its consequences for training

The aim of this PhD programme is to identify, as far as possible, from the viewpoints of evolutionary biology and experimental psychology, the mental capabilities of the horse. The project commenced

with a review of mental abilities in mammals and birds, discussed from an evolutionary perspective. Experimental trials investigating the mental abilities (particularly insightful abilities) of the horse are underway. Areas of conflict and mental stress in horse training will also be identified. Finally, a training scheme for ground handling and training under saddle will be proposed based on the demonstrated mental capabilities of the horse, and a modern application of conditioning principles. This project aims to reduce welfare problems associated with the training of horses by designing training methodologies appropriate to the mental abilities of this species.

11. National Health and Medical Research Council Funding

Sex differences in the mechanisms by which stress inhibits the secretion and actions of GnRH

It is well known that stress can impair reproduction in humans and animals but it is not understood how this occurs. Consequently there are no therapies available to overcome the detrimental effects of stress on reproduction. Stress can take many forms, such as psychological stress, surgical trauma, strenuous exercise, under-nutrition, all of which may inhibit reproduction. We now know that males and females respond differently to stress and we have shown that stress is also likely to have different effects on reproduction in males and females. In this project we aim to determine how stress impairs reproduction in males and females.

A major effect of stress appears to be to inhibit the secretion of a substance produced by the brain that is necessary for the regulation of reproduction. This substance is called gonadotrophin releasing hormone (GnRH) and it acts on a small gland at the base of the brain to cause the release of hormones that are essential for reproduction in both males and females. It is also possible that stress may inhibit the actions of GnRH. Our research suggests that there may be differences between males and females in the extent to which stress inhibits the secretion of GnRH from the brain and its actions to cause the release of other reproductive hormones. In this project we will determine how stress acts in the brain to affect the secretion and actions of GnRH in males and females.

Post-Graduate Students and Post-Doctoral Fellows Associated with the Animal Welfare Centre

Post-graduate Students:

- Anne Turner - PhD, Awarded in 1998, Monash.
- Kate Breuer - PhD, Awarded in 2000, Monash.
- Carole Axton - PhD, Monash.
- Rebecca Sargent - PhD, Melbourne.
- Andrew McLean - PhD, Melbourne.
- Peter Cransberg - Masters. Awarded 1997 La Trobe.
- Andrew Feher – Proposed PhD, Melbourne.
- Amanda Kobelt – PhD, Melbourne.
- Cecily Maller – PhD, Melbourne.
- Sabine Roussel – PhD, INA, Paris.
- Neva Van de Kuyt – Masters, Melbourne.
- Naomi Pearson – Masters, Melbourne.
- Fleur Dwyer – PhD, Monash.
- Catherine Stackpole – PhD, Monash.

Postdoctoral Fellows:

- Dr. Laura Beveridge - University of Melbourne.

Honours students:

- Tammie King – University of Melbourne.
- Wendy Bodsworth – Monash University.
- Helen McSweeney – Monash University.

Communications in the Animal Welfare Centre in 2000

1. Books

- Hemsworth, P.H. and Barnett, J.L. (2000). Human-animal interactions and animal stress. In "Biology of Animal Stress", edited by M. Mench and G.O. Moberg, CAB International, Oxon UK, pp. 309-335.
- Hemsworth, P.H. (2000). Behavioural Principles in Pig Handling. In "Livestock Handling and Transport", edited by T. Grandin, 2nd Edition, CAB International, Oxon, UK, pp. 255-274.

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3. Conferences publications

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