



The Five Freedoms and beyond: Improving welfare of production animals

Summary of talks – 2006 RSPCA Australia Scientific Seminar
held in Canberra on 28 February 2006

Session 1 – The biological and behavioural needs of production animals

- **Behaviour and cognition of production animals**
Professor Natalie Waran, Professor of Animal Welfare, Unitec, New Zealand
- **Biological needs of production animals**
Dr Andrew Fisher, CSIRO Armidale, NSW

Session 2 – Understanding animal behaviour to improve animal welfare

- **The secret lives of cows**
Dr Ed Charmley and Dr David Swain, CSIRO Rockhampton, Qld
- **Cognitive and learning capacity of sheep**
Dr Caroline Lee, CSIRO Armidale, NSW
- **Understanding human-animal interactions**
Professor Paul Hemsworth, Animal Welfare Science Centre, University of Melbourne, Victoria

Session 3 – Pain and stress management in production animals

- **Understanding animal pain and suffering**
Professor David Mellor, Director, Animal Welfare Science and Bioethics Centre, Massey University, New Zealand
- **Stress in livestock**
Dr Caroline Kerr, CSIRO St Lucia, Qld
- **Measuring the effects of heat stress on sheep in Southern Australia**
Dr Tony Parker, Department of Primary Industries, Victoria

Session 1 – The biological and behavioural needs of production animals

'Fish gotta swim and birds gotta fly': The challenge of providing for the behavioural needs of production animals

Professor Natalie Waran, School of Natural Sciences, Unitec, Auckland, New Zealand, email: nwaran@unitec.ac.nz

Is being free to perform natural behaviour ever likely to be possible within intensive conditions and does this matter to the animal? Have domesticated farm animals lost their need to perform natural behaviours or are there some behaviours that are so biologically relevant that the animal is unable to stop itself from performing them? What is the consequence to an animal if it is unable to perform a highly motivated behaviour? What do we know about the 'pigness of a pig, or the sheepness of the sheep' and how do animals feel if they are unable to fully express their species specific behavioural repertoire? These questions relating to farm animal welfare are globally important issues, and although animal welfare scientists have gone some way towards exploring them and in some cases have found compelling evidence in support of the 'need to perform' thesis, there is still a problem with applying this information to animals kept in large production systems. In this paper I will explore some of these issues and some of the conventional and novel approaches to exploring animal needs.

The biological needs of production animals

Andrew Fisher, CSIRO Livestock Industries, Armidale, NSW, email: andrew.fisher@csiro.au

Maslow's 'hierarchy of needs' suggests that the basic biological requirements of animals primarily include air, water, food, the ability to maintain body temperature, rest and sleep, and the avoidance of overwhelming disease. Clearly, the complete failure of any one of these requirements is not compatible with life, let alone acceptable animal welfare. However, it is more common that we seek to understand the tolerances of animals within these needs, and to identify the acceptable thresholds of, for example, hot weather, saline drinking water, or periods of reduced nutrition due to drought. More subtle biological needs include things such as physical comfort. In some situations within production systems, there may be tension between optimising the differing types of biological needs. These may be simply resolved, for example the short-lived discomfort of a vaccination needle versus the suffering caused by the disease itself; or the trade-off may be more complex, such as the reduced disease problems but increased confinement associated with some housing situations. As ever, the challenge and the opportunity are to address the biological needs of the individual animal within its thresholds in a way that aligns the productivity and profitability of the farming system with animal welfare requirements.

Session 2 – Understanding animal behaviour to improve animal welfare

The secret lives of cows

Dr Ed Charmley and Dr Dave Swain, CSIRO Livestock Industries, Rockhampton, QLD, email: ed.charmley@csiro.au

Farm animal welfare is of uppermost concern to both producers and consumers of animal products. Traditionally, we have thought of welfare issues in the context of intensive or semi-intensive farming systems where behaviour is readily monitored and welfare issues can be addressed. For extensive or pastoral production systems, domestic stock are much less closely monitored. Recent developments in electronics and telemetry now allow us to observe behaviours which were previously hidden. Observations can now be taken with greater ease and higher frequency. Technology now allows us to understand how livestock interact with their environment and identify the main drivers in the landscape that influence behaviour and can impact on welfare. This technology provides the opportunity to understand and modify management with the goals of not only enhancing productive efficiency but also animal welfare. This paper considers how technology can impact on animal welfare and reveal the secret lives of cows.

Cognitive and learning capacity of sheep

Dr Caroline Lee, CSIRO Livestock Industries, Armidale, NSW, email: caroline.lee@csiro.au

Cognition is the mental process of knowing, thinking, learning and judging. Learning involves a modification in animal behaviour that occurs as a result of experience. Sheep traditionally have had a reputation as being “dumb”. This perception of sheep has come about from the difficulties of handling sheep individually due to their strong flocking instinct. Research at CSIRO is investigating aspects of sheep cognition and learning using a maze test. The first time an animal navigates the maze indicates cognitive ability, whereas the improvement in completion time over successive testing indicates learning. Our results show that sheep have excellent spatial memory ability. This enables sheep to graze efficiently over wide areas, which is a necessary skill for their fitness and survival. The performance of sheep in the maze is related to their temperament, with calmer sheep performing better in the maze than nervous animals. There appears to be a genetic basis for learning responses in sheep with the identification of regions on chromosomes that are related to maze performance. This could enable selection of sheep that are better adapted and less stressed by our husbandry practices and result in improved animal welfare.

Understanding human-animal interactions

Professor Paul Hemsworth, Animal Welfare Science Centre, University of Melbourne, VIC, email: phh@unimelb.edu.au

While the importance of the stockperson in relation to animal welfare is generally acknowledged in industry care guidelines, codes of practice and quality assurance programs for animal welfare, it is debatable whether this sentiment has been fully accepted or adopted by the livestock industries and others.

With increasing intensification of livestock production, the dependency of livestock on the stockperson to effectively care for and manage them correspondingly increases. A key stockperson characteristic is attitudes towards livestock and working with livestock. Research has clearly shown interrelationships between the stockperson's attitudes and behaviour and fear, productivity and welfare of farm animals. Fear is widely considered as an undesirable emotional state of suffering and the implications of fear of humans on the welfare of livestock are highlighted by the substantial between-farm variation in the fear responses of commercial dairy cows, pigs and poultry to humans. An additional risk to welfare arises in situations in which the attitude of the stockperson towards the animals is negative because the stockperson's commitment to the surveillance of, and the prompt attendance to, welfare issues is most likely highly questionable. Furthermore, poor human-animal interactions may also influence the stockperson to the extent that job-related characteristics, such as job satisfaction, motivation and commitment, may be affected with implication for job performance and in turn animal welfare. High and consistent standards of animal welfare will also rely on a combination of motivation, technical knowledge and skills and clearly any deficiency in these job-related characteristics will limit animal welfare.

This paper will review the impact of the stockperson on farm animal welfare and consider the opportunities for cognitive-behavioural training of stockpeople to improve animal welfare. While both housing and stockperson factors are important determinants of animal welfare, the focus to date has been on the former. Irrespective of their relative importance, considerably more resources need to be focused on the critical role of the stockperson in protecting the welfare of farmed animals. Indeed, it is likely in the near future that both the livestock industries and the general community will place an increasing emphasis on ensuring the competency of stockpeople to manage the welfare of farm animals. Appropriate strategies to recruit, train and retain stockpeople in the livestock industries will be integral in safeguarding the welfare of commercial livestock.

Session 3 – Pain and stress management in production animals

Understanding animal pain and suffering

Professor David Mellor, Animal Welfare Science and Bioethics Centre, Massey University, New Zealand, email: D.J.Mellor@massey.ac.nz

The talk will focus on animal pain and will cover the following areas:

- What is pain?
- How do we describe pain?
- How do we think about pain?
- How can we measure pain?
- Some results
- Pets compared to farm livestock
- Can painful procedures be avoided?
- Where to now?

Stress in livestock

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It is important to manage the affects of stress factors on livestock. This is because chronic exposure to stress impacts negatively on welfare status and prolonged exposure to stress can have detrimental affects on productivity. But, first it is important to understand what stress is and gain an overview of the complex physiological response to stress. Pigs are a useful model of stress in livestock as measures of productivity can be used to demonstrate the impact of stress. As commercially reared livestock can be exposed chronically to a variety of stress factors throughout their lives, the differing impact acute and chronic stress challenges are described. The challenge is to monitor and manage and the chronic affects of stress in livestock on-farm. Gene and protein expression profiling are powerful tools for elucidating the stress response pathways and identify markers of stress. However ultimately, a multi-disciplinary approach to chronic stress quantification is required to ensure a robust approach.

Measuring the effects of heat stress on sheep in Southern Australia

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Environmental heat stress has been recognized as a significant limitation to sheep and wool production in the tropics. It is known, that where sheep in Australia experience high temperatures and solar radiation loads during pregnancy, there is a high incidence of lambs of low birth weight and high lamb mortalities. However, little research has been conducted in Southern Australia to investigate the effects of summer heat loads on sheep productivity. Heat load events in Southern Australia are similar to that experienced in northern Australia. Bureau of meteorology data for four pilot regions in southern Australia has been studied to assess the probability of a heat load event occurring in these regions. There is a trend of decreasing risk for fetal growth restriction due to heat stress with decreasing latitude.