



RSPCA AUSTRALIA

Animal welfare science update

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The Animal Welfare Science Update aims to keep you informed of developments in animal welfare science that relate to the work of the RSPCA. The update provides summaries of some of the most relevant scientific papers and a bibliography of other articles that have been received by the RSPCA Australia office in the past few months.

Companion Animals

1. Human contact can reduce stress in shelter dogs

The experience of being in a shelter can be stressful for many dogs. The unfamiliar and sometimes threatening environment of the shelter, in combination with the social isolation that dogs experience is often very traumatic. Cortisol levels in the blood or saliva of a dog can provide a useful indicator of the animal's stress response to this experience.

Previous studies have shown that the stress response of dogs increases dramatically within the first three days of entering a shelter. In the present study, Coppola et al. investigate whether contact and interaction with humans during this initial period in the shelter can reduce the intensity of the dogs' stress response. To measure the stress response of the dogs in the study, the authors measured the level of cortisol present in the saliva. Cortisol is a hormone whose activity is closely linked to the stress response in many animals. The dogs in the study were randomly assigned to one of two treatment groups, contact or no-contact. The dogs in the contact group were taken into an outdoor enclosure on their second day in the shelter and engaged in a human interaction session. The dogs in the no-contact group did not experience the human interaction session. The cortisol levels of the dogs in each treatment group were measured on the second, third, fourth and ninth days in the shelter. The results showed that the cortisol levels of dogs in the contact treatment group were significantly reduced in comparison to the cortisol levels of dogs in the no-contact group, suggesting that the human interaction session was effective in reducing the stress response of dogs on their third day in the shelter. On the other days there was no difference between the cortisol levels of dogs in either treatment group.

Although the findings of this study were limited to the effect of human contact sessions on the second day in a shelter, they do suggest that human contact sessions given shortly after a dog's arrival at a shelter may help to alleviate stress and help the dog to adjust more quickly to the shelter environment.

Coppola, C., Grandin, T. and Enns, R. (2006). Human interaction and cortisol: Can human contact reduce stress for shelter dogs? *Physiology and Behaviour* 87, 537-541.

Farm Animals

2. Assessment of pain and welfare in sheep

Freedom from pain, injury or disease is one of the five fundamental tenets of animal welfare guidelines and research. Behavioural responses to pain, injury or disease can differ significantly between species; it is therefore important to develop methods of assessing pain that are relevant to these responses to uphold an acceptable standard of welfare.

Fitzpatrick et al. discuss the importance of understanding the behavioural responses of sheep to pain, injury and disease with a view to developing an accurate and reliable measurement of welfare. Sheep are highly susceptible to numerous infectious and non-infectious diseases, making disease control one of the most important areas of focus when addressing sheep welfare. Pain caused by disease is highlighted by the authors as an area of particular concern because sheep, as a prey animal, do not often exhibit overt signs of pain as this would make them more likely targets for predators. The authors argue that, as a result, any form of pain assessment in sheep is insufficient if it relies only on subjective measures (such as behavioural assessments). Instead, accurate measurements of pain in sheep require a combination of subjective and objective measures. In particular, the authors discuss the use of hyperalgesia as an informative and species appropriate method of objective pain assessment. Hyperalgesia is a condition in which an animal becomes highly sensitive to painful stimuli and is often related to disease. Fitzpatrick et al. argue that testing for hyperalgesia should be more widely used to assess pain in sheep. Other objective measurements such as acute phase protein concentration could also be employed as indicators of stress and/or pain in sheep. The authors also argue that non-steroidal anti-inflammatory drugs should be more widely used to provide relief for the pain caused by both acute and chronic disease conditions. The authors conclude that more attention should be paid to the manifestations of disease and pain in sheep. These could be assessed through the development of composite indices that include both subjective and objective species-relevant pain indicators.

Fitzpatrick, J., Scott, M. and Nolan, A. (2006). Assessment of pain and welfare in sheep. *Small Ruminant Research* 62, 55-61.

3. Environmental enrichment for pigs

Animal welfare issues have become increasingly important to policy makers in developed nations. As the importance of animal welfare is acknowledged, the need for enhanced regulation and protection grows. In the European Union, legislation that was initially implemented to provide some rudimentary protection to animals is being updated and revised as knowledge and understanding of the requirements of different species increases. Policy is often directed by the opinion of animal welfare experts. As a consequence, it is important to gauge what expert opinion is on certain issues so that areas of disagreement can be identified and addressed.

The 2001 European Commission Directive for the protection of pigs specifies that pigs should be provided with enrichment materials such as straw, compost, sawdust, wood or a similar material. To satisfy this, many farms have provided pigs with chains as this is believed to satisfy the requirement for a 'similar' material. In this paper, Bracke aims to identify what pig welfare experts believe are sufficient environmental enrichment materials for pigs and whether materials that are commonly used, such as chains, satisfy pig welfare needs. To do this, the author sent a questionnaire to pig welfare scientists in many different countries asking various questions about environmental

enrichment for pigs. 89% of respondents to the questionnaire believed that a chain is not a sufficient enrichment material. The results of the questionnaire also indicated that current scientific opinion identifies rooting behaviour as important for pig welfare suggesting that, at a minimum, pigs should be provided with rootable materials such as straw. This study also highlighted some discrepancies between the opinions of different experts. Bracke argues that this indicates the need for a better understanding and use of the knowledge that already exists about suitable material for pig enrichment. This approach could then be used to influence policy makers and to improve the legal requirements for environmental enrichment materials for pigs.

Bracke, M. B. M. (2006). Expert opinion regarding environmental enrichment for pigs. *Animal Welfare* 15, 67-70.

4. The importance of the human-animal relationship for the welfare of farmed animals

Some of the most stressful events that are experienced by a farm animal are associated with the presence of humans. When considering the welfare of farm animals it is therefore important to understand how the presence and activities of humans affects animals and how this interaction can be modified to limit the negative effects and potentially enhance the welfare state of animals.

Waiblinger et al. present a critical review of the welfare issues that are associated with the human-animal relationship in farmed animal species. In this article, the authors highlight several issues that are important when considering the association between human-animal interactions and animal welfare. The first section discusses the link between human-animal interactions and animal welfare. The authors argue that any consideration of farm animal welfare must necessarily address the relationship between animals and stockpersons and how the interactions between animals and humans have the potential to enhance welfare. The second section of the review highlights some of the internal and external factors that are likely to influence the relationship between stockpersons and animals and the importance of considering this relationship from the perspective of both the animal and the human. The third section of the review looks at the methods that have previously been employed to assess and quantify the human-animal relationship and highlights the need for an increased understanding and a clarification of definition of the concepts such as 'fearfulness' that are commonly employed in these analyses. In the final section of the paper, the authors discuss some of the limitations of the current methods that are being used to assess human-animal interactions and highlight some aspects that need to be addressed in future research. In particular, the authors suggest that future research should focus on clarifying animals' perception of humans, illuminating the animals' emotional and cognitive capacities in respect to human contact, determining the existence, nature and intensity of positive human-animal relationships, and assessing the scope for and the acceptability of genetic and/or ontogenetic modification of animals' responsiveness to humans. The authors especially emphasise the importance for all research concerning the human-animal interaction to evaluate the animals' perception of humans and the test situation.

Waiblinger, S., Boivin, X., Pedersen, V., Tosi, M., Janczak, A., Visser, E. and Jones, R. (2006). Assessing the human-animal relationship in farmed species: a critical review. *Applied Animal Behaviour Science* article in press.

Animals in Sport and Entertainment

5. A review of environmental enrichment and aggression in primates

Captive animals develop psychological and physiological problems if the environment in which they are kept does not allow them to satisfy their natural behavioural repertoire. In recent years, environmental enrichment (modification of the physical, social and temporal environment) has been used to improve the negative impact of the captive situation on various species and to help satisfy, in part, their natural behavioural requirements. However, any form of environmental enrichment needs to be suitable for the behavioural requirements of the species and the individual if it is to minimise the limitations of the captive environment and have a positive effect on the welfare of confined animals.

Non-human primates have complex physical and psychological requirements in captivity and can often become highly aggressive towards others and themselves if kept in conditions that limit natural behaviours. Honess and Marin review the literature on the relationship between environmental enrichment with a particular focus on how such enrichment can be used to control aggressive behaviour in captive primates. In this review, the authors address several aspects of the captive environment that have been shown to reduce aggression and abnormal behaviour in primates. These include housing, feeding, physical objects as well as the sensory and social environment. Although, in many cases, attempts to enrich the environment of primates have resulted in a reduction in undesirable behaviour, the effects of enrichment on individual behaviour can be quite variable. Whilst a barren environment will increase the incidence of aggressive and abnormal behaviour in primates, enrichment that is poor or inadequate can also be detrimental to primate welfare. The authors conclude that attempts to enrich the captive environment of primates must be thorough and must take into account the requirements of the individuals that are confined in order to encourage species-typical behaviour and to protect the welfare of the animals.

Honess, P. E. and Marin, C. M. (2006). Enrichment and aggression in primates. *Neuroscience and Biobehavioral Reviews* 30, 413-436.

Wildlife

6. Estimate of marine mammal bycatch in U.S. and global fisheries

Many species of marine mammal are becoming endangered as a result of modern commercial fishing methods. Marine mammals that are captured during commercial fishing operations are often discarded as 'bycatch'. Because many of the animals that constitute the bycatch are killed or injured, it poses a drastic threat to the population of many marine species. Unfortunately, very little is known about the number of marine mammals that are caught as bycatch in the world's fisheries.

Read et al. attempt to estimate, for the first time, the number of marine mammals that are caught as bycatch in both U.S. and global fisheries. To do this, independent observers were placed on a selection of fishing vessels in a number of U.S. fisheries. These observers recorded and categorised any marine mammals that were caught on the vessels. The authors then used these figures to get an estimate of the number of marine mammals that were caught in each fishery and then extrapolated the data to obtain estimates of bycatch in both the U.S and the world. The data were collected annually between 1990 and 1999. The results of the study showed that an average of 6215 marine

mammals were caught in U.S. fisheries each year between 1990 and 1999: around 50% of these were cetaceans (whales, dolphins and porpoises) and the remaining 50% were pinnipeds (seals, sea lions and walruses). The authors estimate that the global marine bycatch between 1990 and 1999 was 653,365. The results of the study also revealed that, in the U.S at least, gill net fisheries take more marine mammal bycatch than other types of fishing method. Although the estimates in this study can only be used as a rough indicator, they reveal the huge impact that fishing operations have on the population of marine mammals. The results highlight the need for more accurate recording and detailed studies of bycatch in order to be able to identify the true impact of fishing operations on marine mammals so that future conservation efforts can be maximised.

Read, A., Drinker, P. and Northbridge, S. (2006). Bycatch of marine mammals in U.S. and global fisheries. *Conservation Biology* **20**, 163.

General Welfare

7. Animal welfare science – Working at the interface between the natural and social sciences

Animal welfare research often concentrates on the behavioural, physiological and psychological status of animals in order to understand and improve their well-being. However, animal welfare issues are often inextricably entwined in the social, philosophical, political and economic framework within which they occur.

Lund et al. discuss the current cooperation between disciplines in the natural sciences in animal welfare research and examine the contribution that the social sciences could make to advancing our understanding of animal welfare issues. It has long been acknowledged that animal welfare research requires the combined expertise of scientists from a variety of disciplines within the natural sciences such as physiology, veterinary science and ethology. This approach places emphasis on improving the lives of animals but largely ignores the role that humans play in the issues that are being addressed. The authors provide examples of research in which disciplines from the social sciences have made valuable contributions to animal welfare research in order to highlight the importance of combining the natural and social sciences in this area. Lund et al. also acknowledge the difficulties that can be encountered by combining such vastly different fields of knowledge and argue that it needs more support and acceptance from the broader academic community including research and educational institutions.

Broom, D. M. (2006). Behaviour and welfare in relation to pathology. *Applied Animal Behaviour Science* **97**, 73-83.

8. Exploring the inter-relationship between health, welfare and behaviour

Poor health can affect many aspects of an animal's behaviour. Pain and discomfort can affect both the physiological and emotional state of animals. For example, pain can affect an animal's posture and gait as well as causing an animal to be more aggressive or withdrawn.

In this paper, Broom discusses the relationship between health and behaviour and examines how this is linked to welfare. Broom argues that any kind of pathology involves some degree of poor welfare. Poor health, such as that caused by disease, infection or injury, can result in negative physiological and emotional states and, as a consequence, can affect the ability of an animal to cope

with its environment. Similarly, negative emotional states such as those which can arise in animals that are kept in intensive production systems, can lead to a suppression of the immune system, making an animal more susceptible to disease and infection. Good welfare, in contrast, can help to protect an animal against poor health as positive emotional states are known to boost an animal's immunity to infectious agents. As a consequence, Broom argues that knowledge of disease pathology and its behavioural, physiological and emotional effects on animals can help enhance our understanding of animal welfare issues. In addition, an understanding of animal behaviour and brain function can help our understanding of disease transmission and through it important aspects of animal welfare.

Lund, V., Coleman, G., Gunnarsson, S., Appleby, M. and Karkinen, K. (2006). Animal welfare science - Working at the interface between the natural and the social sciences. *Applied Animal Behaviour Science* 97, 37-49.

Other Articles

- Andersen, I. L., Naevdal, E., Boe, K. E. and Bakken, M. (2006). The significance of theories in behavioural ecology for solving problems in applied ethology - Possibilities and limitations. *Applied Animal Behaviour Science* 97, 85-104.
- Chilton, S., Burgess, D. and Hutchinson, W. (2006). The relative value of farm animal welfare. *Ecological Economics* article in press.
- Diederich, C. and Giffroy, J. M. (2006). Behavioural testing in dogs: A review of methodology in search for standardisation. *Applied Animal Behaviour Science* 97, 51-72.
- Goddard, P., Waterhouse, T., Dwyer, C. and Stott, A. (2006). The perception of the welfare of sheep in extensive systems. *Small Ruminant Research* 62, 215-225.
- Gupta, S., Earley, B. and Crowe, M. A. (2006). Effect of 12-hour road transportation on physiological, immunological and haematological parameters in bulls housed at different space allowances. *The Veterinary Journal* article in press.
- Nicol, C. J., Brown, S. N., Pope, S. J., Short, F. J., Warriss, P. D., Zimmerman, P. H. and Wilkins, L. J. (2006). Effects of stocking density, flock size and management on the welfare of laying hens in single-tier aviaries. *British Poultry Science* 47, 135-146.
- Plant, J. W. (2006). Sheep ectoparasite control and animal welfare. *Small Ruminant Research* 62, 109-112.
- Wells, D., Coleman, D. and Challis, M. (2006). A note on the effect of auditory stimulation on the behaviour and welfare of zoo-housed gorillas. *Applied Animal Behaviour Science* article in press.