

# animal welfare science update



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The aim of the animal welfare science update is to keep you informed of developments in animal welfare science relating to the work of the RSPCA. The update provides summaries of the most relevant scientific papers and reports received by the RSPCA Australia office in the past quarter.

## NEW SECTION!

## Reports and reviews

### Problems with pedigree dogs

In this new report, Advocates for Animals (an animal welfare organisation based in Scotland) provide an overview of the scientific evidence indicating that pedigree breeding practices pose serious health and welfare risks to pedigree dogs. The report discusses the prevalence of breed-related disease and includes sections on the principle hereditary diseases and physical problems of pedigree dog breeds. The authors argue that the inherited health problems that are exhibited by pedigree dogs arise from two related practices. Firstly, some of the physical characteristics that are required by the breed standard cause health problems as they are close to physical abnormalities. For example, the excessively short noses that are desired by breeders of pugs and bulldogs can lead to serious and sometimes life-threatening breathing difficulties. Secondly, in order to select for and enhance certain characteristics, pedigree animals are often inbred which limits the gene pool and increases the prevalence of inherited diseases. The report concludes that the current practice of breeding pedigree dogs for their appearance with little regard for their health creates serious problems for the welfare of pedigree animals.

Advocates for animals (2006). [www.advocatesforanimals.org.uk/pdf/Thepriceofapedigree.pdf](http://www.advocatesforanimals.org.uk/pdf/Thepriceofapedigree.pdf)

### Are shock collars humane?

Most animal training techniques rely on a form of learning known as operant conditioning, where the animal learns an association between an action and the consequence of performing that action. Unfortunately, many training methods rely on negative reinforcement where the animal is trained to associate undesired behaviours with an aversive stimulus or associate desired behaviours with the alleviation of an aversive stimulus. Because it generates a pain or fear response in the animal, training through negative reinforcement is often unsuccessful or has unpredictable results.

In this review, Blackwell investigates the use of shock collars for dog training and assesses the welfare implications of their use. Shock collars are devices that can be used to deliver an aversive stimulus to a dog in the form of an electric shock. Blackwell begins the review with a discussion of the types of shock collars that are available to the public, including collars that allow a shock to be administered by a remote control transmitter, collars that operate automatically in response to a dog barking and collars that administer a shock when a dog moves beyond a defined boundary. The review then discusses the effectiveness of using electric shocks to train animals. Many laboratory studies rely on the effectiveness of electric shock punishment as a training method. However, there is evidence that, when removed from the controlled conditions of the laboratory, the effects of administering electric shocks to promote learning become much more unpredictable and ineffective. Investigations have shown that, in the complex environment of a training ground or a back yard it becomes difficult for dogs to associate the shock with the behaviour that they are being punished for. In some cases, dogs can learn to associate shocks with the general context of their training and, in some cases, becoming fearful of their handler. The third section of the review examines whether the application of electric shocks is stressful to a dog. There is a great deal of evidence to suggest that dogs who have experienced electric shocks display signs of increased stress and anxiety and that long-term use of electric shocks can severely impair the welfare of individuals. The review concludes with a discussion about the effectiveness of shock collars as training devices. Although few studies have investigated the effectiveness of shock

collar training in dogs, the author concludes that current scientific evidence suggests that the only context in which shock collars may be considered humane or effective is when they are used by highly skilled handlers. Thus, the availability of such devices to unskilled persons should be restricted on humane grounds.

Blackwell, E. and Casey, R. (2006). [www.rspca.org.uk/servlet/Satellite?pagename=RSPCA/RSPCARedirect&pg=CADReportsandresources](http://www.rspca.org.uk/servlet/Satellite?pagename=RSPCA/RSPCARedirect&pg=CADReportsandresources)

## Research papers

### COMPANION ANIMALS

#### Noise in the animal shelter environment

Animals housed in shelters are often exposed to stressful amounts of noise due to poor building design. In their article, Coppola et al. evaluate the levels of noise that dogs in an adoption shelter are exposed to on a daily basis. The authors also discuss the importance of effective building design and building materials in reducing the noise levels within them. Noise levels within a shelter for dogs were recorded in various enclosures within the building for a continuous 84-hour period. The results showed that the noise levels in all of the dog enclosures regularly exceeded 70dB and would frequently exceed the limit of the measuring instrument (118.9 dB). The results indicate that the noise in animal shelters can often exceed levels that are known to cause both physical and psychological stress in animals (including humans). The discussion highlights the importance of considering noise levels in animal shelters, not only for the welfare of the animals, but also for the staff and members of the public that work in or visit the shelter. This study also demonstrates the importance of considering ways to minimise noise through material use and building design in both existing and future shelters.

Coppola, C., Mark Enns, R. and Grandin, T. (2006). Noise in the animal shelter environment: Building design and the effects of daily noise exposure. *Journal of Applied Animal Welfare Science* 9, 1-7.

### WILDLIFE

#### Stereotypic behaviour in captive wombats

Behavioural stereotypies, or movements that are repeated with no apparent goal, are commonly expressed by animals that are kept in captivity due to a lack of control over their environment and an inability to express natural behaviours. As a result, behavioural stereotypies are often used as indicators of a poor welfare state.

In their study, Hogan and Tribe investigate both the prevalence and the cause of stereotypic behaviours displayed by wombats in Australian zoos. The first part of the study comprised a telephone survey which was aimed at developing a profile of the husbandry techniques, wombat enclosures, food and food presentation techniques and the type and occurrence of stereotypic behaviours of the captive wombat population in Australia. In the second part of this investigation, the authors observed and categorised the behaviour of wombats at three Australian zoos in order to examine more closely the expression and causes of behavioural stereotypies.

One of the most significant findings of this study is that stereotypic behaviours occurred in 44% of the captive wombat population (in zoos that responded to the survey) and that these behaviours can occupy between 20% - 55% of the animals' time, indicating that the welfare of wombats is severely compromised in the captive environment. The results also suggest that behavioural stereotypies in captive wombats are most likely related to the frustration of natural foraging behaviours which, in the wild occur at night (in captive environments feeding occurs at predictable times during the day) and occupy a large amount of time (in captivity wombats are fed on small quantities of concentrated food). Although many investigations have shown that the disruption of natural feeding behaviours is closely related to the expression of stereotypic behaviours, this study reinforces the need for managers of captive animals to understand and reflect their natural foraging behaviours.

Hogan, L. A. and Tribe, A. Prevalence and cause of stereotypic behaviour in common wombats (*Vombatus ursinus*) residing in Australian zoos. *Applied Animal Behaviour Science* In Press, Corrected Proof.

#### Group housing of mammals in captivity

In this review, Price and Stoinski discuss how group size and structure influence the behaviour, and thus the welfare, of captive mammals. Although the review focuses primarily on research from primates, the authors highlight several issues that must be considered in order to protect the well-being of mammals in captivity. One of the most important points that the authors make is that, in order to successfully manage a group of mammals in captivity (i.e. to minimise stress and to enhance reproductive success), it is necessary to understand the functional

basis of group structure and composition in the wild. This understanding is crucial as many of the factors that influence group formation in the wild, such as predation threats and food availability, are absent in the captive environment and may therefore greatly influence successful group composition in captivity. The constraints of the captive environment may change the social requirements of individuals and, as a result, it may not be sufficient to simply replicate the group situation as it occurs in the wild. This review also emphasises the importance of understanding the natural social dynamics of mammals as the absence of functional inter-relationships, such as dominance hierarchies, in captivity can generate tension within the group and lead to individual suffering. Social dynamics can be affected by factors such as the number of individuals within the group as well as the gender and age composition of the group.

Overall, this work provides a timely reminder that understanding the structure and function of group composition in the wild is essential for successful group compositions of mammals in captivity.

Price, E. E. and Stoinski, T. S. (2006). Group size: Determinants in the wild and implications for the captive housing of wild mammals in zoos. *Applied Animal Behaviour Science* In Press, Corrected Proof.

## FARM ANIMALS

### Malnutrition and sheep mortality during drought

In Australia there is little accurate information on the causes of sheep mortality, especially during drought. In areas where Ovine Johne's disease (OJD) is prevalent, the majority of sheep deaths are recorded by producers as being caused by this disease. However, it is probable that many of the sheep deaths that are attributed to OJD during drought are actually caused by other factors such as malnutrition.

This study aims to identify the actual causes of sheep deaths during drought conditions. To do this, the authors performed pathological studies on dead Merino sheep from 12 OJD-infected flocks from southern NSW in 2002. A questionnaire that was sent to the flock managers was also used to obtain information on flock management and history. Of the 362 sheep that were examined, OJD was found to be the likely cause for 69% deaths. Of the remaining sheep, malnutrition was found to be a contributing factor in 63% of cases, with the remaining mortalities being primarily related to husbandry practices. Overall, the average mortality rate for the 12 flocks in one year was 8.6% with malnutrition contributing to an average of 1.3% of deaths and costing producers an estimated loss of \$16,882. The authors argue that many of the deaths that were caused by malnutrition could have been prevented by better management techniques and a better understanding of the nutritional requirements of sheep in drought conditions. The results of this study emphasise the need for better farmer education to encourage regular flock surveillance and the implementation of appropriate management techniques in order to reduce the number of preventable sheep deaths, especially in drought conditions.

Bush, R. D., Toribo, J. and Windsor, P.A. (2006). The impact of malnutrition and other causes of losses of sheep in 2 flocks during drought. *Australian Veterinary Journal* 84, 254-260.

### Welfare of non-traditional farm animals

This review by Bornett-Gauci et al. explores what is known about the welfare of non-traditional farm animals such as deer, buffalo, bison and ostrich. In particular, the authors focus on the specific welfare needs of these animals during transport and slaughter in order to identify priorities for future research. The review first discusses the current animal transport legislation in the UK, which the authors consider fails to address or even recognise the welfare needs of non-traditional farm animals. The review includes a broad assessment of the literature relating to the welfare implications of transport and slaughter in a variety of farmed animal species. Although most of the literature discussed relates to commonly farmed species, these investigations reveal that each species has very different and specific needs during transport and slaughter and that welfare can be severely compromised if these needs are not addressed. Based on this conclusion, the next five sections of the review discuss the existing legislation relating to deer, ostriches, wild boar, buffalo and bison as well as what is known about the behaviour and management requirements of these species during transport and slaughter. From this discussion it is clear that whilst there is quite detailed research on the welfare of farmed deer and ostriches, very few studies have focussed on the welfare of farmed wild boar, buffalo and bison. The authors conclude by making recommendations for areas of research and training that need to be addressed for each species in order to facilitate the development of species-appropriate codes of practice and legislation.

Bornett-Gauci, H. L. I., Martin, J. E. and Arney, D. R. (2006). The welfare of low-volume farm animals during transport and at slaughter: a review of current knowledge and recommendations for future research. *Animal Welfare* 15, 299-308.

## Caged layer hens prefer Astroturf to wire for dustbathing

In 1999, a European Directive was issued banning the use of conventional battery cages for laying hens by 2012. Under these regulations, hens must be kept in 'furnished' cages which contain a perch, a nest box and a pecking and scratching area.

Whilst the importance of dustbathing for hen welfare is well recognised in the scientific literature, it is not specifically recognised in the European directive. In spite of this, Merrill et al. suggest that many furnished cage designs do attempt to provide areas for dustbathing within the pecking and scratching area. Although there is a general consensus in the literature that hens prefer loose litter substrates to wire floors for dustbathing, the authors of this study argue that loose litter is unlikely to be used by producers as it must be replaced regularly and eggs laid in it tend to be of poorer quality. As such, the authors investigated the potential of Astroturf as a dustbathing substrate in furnished cages. Astroturf was used in this study because it is a material that is likely to be used by producers as it is durable and easy to maintain.

In the experiment, hens were housed in adjoining furnished cages, one cage with a conventional wire floor and one with a wire floor covered with perforated Astroturf. The behaviour of the hens was recorded over a 10-day period. Dustbathing was observed more often on the Astroturf substrate whilst other behaviours appeared to be uninfluenced by floor type. Although the results of this study indicate that Astroturf substrates are preferred by hens for dustbathing, it does not reveal how attenuated these behaviours are when compared to dustbathing on loose litter. This would have been an informative comparison as it would indicate how Astroturf affects natural dustbathing behaviour and, in turn, hen welfare.

Merrill, R. J. N., Cooper, J. J., Albetosa, M. J. and Nicol, C. J. (2006). The preferences of laying hens for perforated Astroturf over conventional wire as a dustbathing substrate in furnished cages. *Animal Welfare*, vol. 15, pp. 173-178.

## Castration in piglets: is surgery more painful than non-surgical treatments?

In many countries, male piglets that are destined for human consumption are routinely castrated as meat from entire male pigs is considered to have an unpleasant odour and taste. Surgical castration, where the scrotum is incised and the testes removed with a knife, is usually performed by the producer within the first few days of the piglet's birth without the use of anaesthesia or post-operative analgesia. Alternatives to surgical methods of castration such as the chemical destruction of testicular tissue and immuno-castration do exist but are not commonly practiced on pigs.

In this review, Prunier et al. aim to identify the advantages and disadvantages of surgical versus non-surgical methods of piglet castration and to evaluate the physiological, behavioural and health consequences of each method. The authors begin by reviewing current methods of surgical castration. This is followed by a discussion of the welfare consequences of surgical castration without analgesia focussing on three areas: (1) the effects of surgical castration on the behaviour, physiology and health of piglets; (2) the effects of the restraint method and castration method on the stress responses observed in piglets; and (3) the effect of age on the welfare of castrated piglets.

Evidence from the literature suggests that, whilst some methods may improve blood loss and heal better, the pain and stress experienced by piglets during and after surgical castration is not affected by the method used or the age of the piglet. The next section of the review looks at the effectiveness of anaesthesia and analgesia for relieving the pain of surgical castration. The authors find that, although the use of anaesthetic and analgesics can reduce the amount of suffering that piglets experience due to surgical castration, few are suitable for intensive production as they either require professional administration or cannot be legally used on animals for human consumption. The final part of the review looks at the feasibility and welfare consequences of non-surgical castration methods such as immuno-castration (interfering with hormone secretion) or chemical destruction of testicular tissue. However, these methods require further scrutiny in order to determine how they affect the welfare of the animals and whether they are safe for human consumers.

Overall, this review serves to highlight the welfare problems associated with routine surgical procedures that are conducted on-farm and demonstrates the importance of developing methods that minimise the harm caused to the animals.

Prunier, A., Bonneau, M., von Borell, E. H., et al. (2006). A review of the animal welfare consequences of surgical castration in piglets and evaluation of non-surgical methods. *Animal Welfare* 15, 277-289.

## Does tooth grinding cause less stress in piglets than tooth clipping?

Newborn piglets often compete with litter-mates to establish a 'teat order' which determines the order in which each piglet is allowed access to the sow's teats. If the piglets' teeth are left intact, this competition can result in severe facial injuries. In order to prevent facial lesions caused by teat competition and to minimise the damage that the piglet's teeth cause to the sow's udder, producers routinely reduce the length piglet's teeth (a process known as a resection). Two methods are currently used by producers to reduce damage caused by piglet teeth; clipping - the practice of using pliers to clip the teeth of piglets to the gum line - and grinding which involves using electric grinders to reduce tooth length. Both methods can compromise the welfare of piglets. Teeth clipping is associated with increased mouth lesions as the stumps of the clipped teeth often splinter. The process of grinding teeth takes longer than clipping and involves more handling which can be stressful for the piglets.

In this study, Llamas Moya et al. examined the effects of clipping and grinding on a series of physiological indicators of stress such as skin temperature, cortisol and a series of acute phase proteins whose concentrations are associated with inflammation and infection. In the first experiment, piglets either had their teeth clipped, ground or left intact. The results indicated that there was a significant difference between the piglets that had been subjected to the resection procedures, and the piglets whose teeth had been left intact. A second experiment was also conducted in order to determine whether the change in skin temperature observed in the first experiment was actually related to a stress reaction. The results of the second experiment indicated that the difference in skin temperature that was observed in the first experiment was not related to cold stress; supporting their first finding that teeth resection caused an increase in piglet stress.

Based on their findings, the authors concluded that both methods of teeth resection (clipping and grinding) constitute an acute stressor and cause piglets to suffer more than piglets whose teeth are left intact. The authors also conclude that clipping has more negative welfare implications than grinding.

Llamas Moya, S., Boyle, L. A., Lynch, P. B. and Arkins, S. (2006). Influence of teeth resection on the skin temperature and acute phase response in newborn piglets. *Animal Welfare* 15, 291-297.

## Other articles of interest

Agenas, S., Heath, M. F., Nixon, R. M., Wilkinson, J. M. and Phillips, C. J. C. (2006). Indicators of undernutrition in cattle. In *Animal Welfare*, vol. 15, pp. 149-160.

Bjone, S. J., Price, I. R. and McGreevy, P. D. (2006). Food distribution effects on the behaviour of captive common marmosets, *Callithrix jacchus*. In *Animal Welfare*, vol. 15, pp. 131-140.

Delezie, E., Lips, D., Lips, R. and Decuyper, E. (2006). Is the mechanisation of catching broilers a welfare improvement? In *Animal Welfare*, vol. 15, pp. 141-147.

Fraser, D. (2006) Animal welfare assurance programs in food production: a framework for assessing the options. In *Animal Welfare*, vol. 15, pp. 93-104.

Knowles, T. G. and Butterworth, A. (2006). Immediate immobilisation of a Minke whale using a grenade harpoon requires striking a restricted target area. In *Animal Welfare*, vol. 15, pp. 55-57.

Olsson, I. A. S. and Westlund, K. (2006) More than numbers matter: The effect of social factors on behaviour and welfare of laboratory rodents and non-human primates. *Applied Animal Behaviour Science* In Press, Corrected Proof.

Puppe, B., Ernst, K., Schon, P. C. and Manteuffel, G. (2006). Cognitive enrichment affects behavioural reactivity in domestic pigs. *Applied Animal Behaviour Science* In Press, Corrected Proof.