

animal welfare science update

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.

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review

Long Distance Transport and Welfare of Farm Animals

The release of this comprehensive volume: *Long Distance Transport and Welfare of Farm Animals*, coincides with the WSPA Handle With Care campaign against the long distance transport of animals for slaughter. More than one billion animals are transported every week and with growing public concern for their welfare this book presents a timely review of the effects of long distance transport on the welfare of farm animals.

The book commences with a discussion of the scientific aspects of animal welfare including the development of animal welfare science, how scientific research has contributed to our understanding of animal welfare and influenced husbandry practices, and the physical, mental and environmental aspects of animal welfare science. Despite the vast scope of animal welfare science, its lessons are not always applied. Chapter two delves into the economic factors that drive the animal transport industry, often at the expense of the welfare of the animals being transported. Chapters three and four discuss the animal welfare issues that are economically beneficial for producers and processors to uphold, namely disease and injury prevention. Both chapters discuss the practical aspects of animal transport that influence losses from infectious disease and negatively impact meat quality. The book then examines legislation designed to set minimum standards for the treatment of animals and the difficulties associated with enforcing such legislation, using the EU as a case study. The next two chapters broadly review the road and sea transport of animals, discussing the main welfare issues associated with both systems before steering the focus of the book towards a global survey of transport practices. Authorities from 18 countries have contributed their knowledge and experience from various regions of the world, including a chapter on Australia and New Zealand co-authored by Dr Bidda Jones, chief scientist of RSPCA Australia.

Long Distance Transport and Welfare of Farm Animals provides readers with a thorough background to the animal transport industry, summarising the scientific basis, economic pressures, legislative difficulties and practical aspects of road and sea transport. The reports on regional practices give an overview of the animal welfare problems associated with long distance transport on a global scale. Factors that differ between developed and developing nations include the quality of infrastructure and facilities, legislation and enforcement, and the education and skill of animal handlers. The authors and editors present a convincing argument for replacement of the live transport industry with a trade in carcasses and meat. To achieve this, producers, processors and retailers require education in welfare issues and the international community needs to make the required developments in infrastructure and legislation a priority.

Edited by Appleby, M.C., Cussen, V., Garcés, L. (all WSPA), Lambert, L.A. (CIWF) and Turner, J. (Independent researcher) (2008) *Long Distance Transport and Welfare of Farm Animals*. CAB International, Oxfordshire, UK.

companion animals

Legislation concerning “aggressive” dog breeds

Following the fatal attack of a six-year-old child in Hamburg by a pit-bull-type dog, local government authorities passed a Dangerous Animal Regulations order in July 2000. Accordingly, certain breeds of dog were deemed ‘dangerous’, and grouped into two categories. Category 1 dogs included American Staffordshire, bull and pit bull terriers, while Category 2 included Rottweilers and Dobermans, among others. A critical point was that Category 1 dogs needed to pass a standardised temperament test in order to be permitted to remain with their owners. Even after passing the test, the dog needed to be kept on a leash and

muzzled, when outside private property, for the remainder of its life. Category 2 dogs, on the other hand, could be exempted from these regulations on passing the test.

The authors of the following two papers first observed the testing of over 400 Category 1 and 2 dogs by trained professionals. Dogs were subjected to a variety of everyday situations, such as approach by (and contact from) strangers, exposure to other strange dogs, loud noises and threatening gestures from strangers. Each dog was given a score ranging from 1 (non-aggressive) to 7 (very aggressive) for each situation, and the scores were averaged for each breed. The researchers found that only 5% of the dogs tested displayed excessive aggressive displays or aggressive behaviour in inappropriate situations. These displays were associated with unusual movements from the human testers and the dogs' apparent anxiety. Moreover, high levels of aggression were not detected in any particular breed; in fact, bull terriers were the breed most likely to display no aggressive behaviour at all (63% of individuals attained a score of 1, compared to an overall proportion of 38% across all breeds).

In a follow-up study, the researchers subjected 70 golden retrievers to the same temperament test, and obtained a very similar result: only 1.5% displayed aggressive behaviour in inappropriate situations. 58.57% of the dogs did not show aggressive behaviour (a score of 1). The authors concluded that there was no scientific basis for breed-specific legislation – this has led to a change in legislation, and the breed lists have been withdrawn.

Schalke *et al.*, (2008) Is breed-specific legislation justified? Study of the results of the temperament test of Lower Saxony, *Journal of Veterinary Behavior*, 3:97-103.

Ott *et al.*, (2008) Is there a difference? Comparison of golden retrievers and dogs affected by breed-specific legislation regarding aggressive behaviour, *Journal of Veterinary Behavior*, 3:134-140.

The behavioural rehabilitation of shelter dogs

Aggression towards other dogs is a common problem among shelter dogs, and often leads to the adopted pets being returned to the shelter. This study subjected a group of shelter dogs (who were only aggressive towards other dogs) to a behavioural training regime, and measured their level of aggressiveness before and after training. A control group of dogs was given no training. Training involved ten days of mixed desensitisation (exposure to 'friendly' and 'confident' dogs of either gender), counter-conditioning (being commanded to sit or make eye contact with the handler at the onset of bad behaviour) and positive reinforcement (rewarding with treats) interventions.

This procedure was found to significantly reduce aggression scores in treated dogs on day 11 of the trial. The control dogs, on the other hand, attained increased or unchanged aggression scores over the same period. The rehabilitated dogs also displayed lowered frequencies of body postures that are associated with challenge or aggression ('facing the stimulus dog' and 'stiff posture'), and increased frequencies of 'lowered neck' and 'ears back', postures which commonly represent a dog that is less 'actively assertive'. Unfortunately, the reduction in aggression was temporary, as the rehabilitated dogs had reverted to pre-training levels one week after the intervention. However, certain postural improvements were preserved, suggesting that the behavioural rehabilitation was beneficial, and that it needed to be continued over a longer period of time to have a more lasting effect.

Orihel, J. and Fraser, D. (2008) A note on the effectiveness of behavioural rehabilitation for reducing inter-dog aggression in shelter dogs, *Applied Animal Behaviour Science*, 112:400-405.

Owner compliance in cat behavioural therapy

Normal cat behaviours such as scratching, urine spraying and aggression, if allowed to become a problem behaviour, can impinge negatively on the lifestyle of the owner, and lead to the surrender of the pet to an animal shelter. While behavioural therapies exist for such conditions, their effectiveness depends heavily on the compliance of the owner; namely, whether the owner's behaviour coincides with the professional advice given by the therapist. Owner compliance is affected by many factors – for example, a short-term course of medication is likely to be accompanied by high compliance, while treatment requiring drastic changes to normal lifestyle (such as diet or exercise habits) is not.

This study examined the compliance of almost 100 cat owners with a range of behavioural problems. The owners were visited twice at their home by a therapist, and given verbal and written advice regarding treatment on the first visit. On the second visit, the therapist reassessed the cat's behaviour, and also asked the owner objective questions regarding his/her compliance with the therapist's advice. The researchers found a strong positive association between compliance score and improvement in the cat's behaviour.

However, no relationship was found between compliance and the severity of the cat's condition, as determined on Visit 1. Hence, the degree to which owners adhered to the treatment program seemed to be independent of how severe they considered the problem to be. Owners also consistently rated certain types of conditions as more severe: urine spraying, defecation, and urination in the house. The therapist, on the other hand, considered cases of excessive grooming, avoidance behaviour and pica to be severe more often than the owner. Female owners were generally more compliant than males, but there was no effect of owner age. Finally, the type of behavioural problem significantly affected compliance: the greatest compliance occurred in cases of aggression toward family members or visitors to the house, and the lowest in cases of pica, over-grooming, and conflict with other cats outside the household. These differences in compliance may be related to the extent to which these behaviours impact on owner lifestyle.

Casey, R. *et al.*, (2008) Owner compliance and clinical outcome measures for domestic cats undergoing clinical behavior therapy, *Journal of Veterinary Science*, **3**:114-124.

farm animals

Animal welfare during transport and slaughter

The rough handling of farm animals prior to slaughter can have negative effects not only on their welfare, but also on the quality of the final product – the meat. Improper treatment of animals (as well as suboptimal processing facilities) can lead to stress at all stages of the pre-slaughter process, including loading, transport, unloading and ID verification. For instance, slippery concrete floors can cause calves to slip and fall, while confinement in a crush for ID verification can lead to bruising and other injuries. The transport of live animals can also cause injuries and even death, due to inadequate food/water supplies or ventilation. Such stresses can cause animals to lose weight, become contaminated with pathogens such as bacteria, as well as undergo physiological changes which lead to tough, or otherwise poor quality, meat. Finally, all of the many slaughter techniques currently available have the potential to cause unnecessary distress to the animal, if used inappropriately, or by untrained personnel. More research is required to understand the relationships between slaughter technique and welfare benefit to the animal.

Gregory, N. (2008) Animal welfare at markets and during transport and slaughter, *Meat Science*, **80**:2-11.

Pre-slaughter stress and meat quality

This review article further explores the issue of stress in cattle prior to slaughter, and focuses on the physiological mechanisms that might adversely impact on the quality of the resulting meat. A common complaint regarding the meat from stressed cattle is 'dark cutting', where the meat is of a dark colour due to the depletion of glycogen from muscle tissue (glycogen is a sugar-like compound used by muscle fibres for energy). However, the connection between individual stressors and this phenomenon remains unclear, and requires further research.

An animal's general response to stressful or fearful situations involves the release of chemicals that can lead to the breakdown of glycogen, and affects several key meat quality attributes such as ultimate pH, tenderness and ageing potential, colour and water-holding capacity. Dehydration and hunger *en route* to an abattoir, coupled with physical activity and fatigue can also have similar effects. Direct physical injury and prolonged transport to, or lairage in, the abattoir can result in a reduced meat yield, while also causing a greater incidence of dark cutting.

In other farm animals, the administration of supplements such as magnesium, tryptophan and electrolytes can sometimes mitigate the effects of stress on meat quality. The evidence on the utility of similar supplements for cattle, however, remains ambiguous. Finally, the authors explore the possibility of breeding cattle for a more suitable temperament (*e.g.* with reduced escape/avoidance behaviour) in order to reduce stress and bruising, and ultimately enhance meat quality.

Ferguson, D. and Warner, R. (2008) Have we underestimated the impact of pre-slaughter stress on meat quality in ruminants? *Meat Science* **80**:12-19.

Improving the welfare of lambs after mulesing

Mulesing is a commonly used method of fly strike prevention in Australian sheep. The procedure involves the surgical removal of loose skin folds from the breech area of sheep. Subsequent wound contraction during healing leaves a smooth area of skin which is less prone to fly strike and therefore reduces morbidity and mortality. Mulesing and associated husbandry procedures such as tail docking and castration are routinely performed without pain relief despite the acute pain and stress they cause. There is growing concern that mulesing is an unnecessarily cruel procedure and more recently some companies have campaigned against mulesing by boycotting Australian wool. This article investigates the use of Tri-Solfen® as a method of pain management in lambs during mulesing and marking. Tri-solfen® is a topical local anaesthetic containing lignocaine, bupivacaine and adrenalin, available as a spray-on formula or gel. It is applied directly to the wound to achieve local anaesthesia. Pre-procedural use is limited by the poor skin penetrability of local anaesthetic agents.

This article discusses the results of three Tri-Solfen® trials performed on mixed sex flocks of 6 to 12 week old lambs. In the first trial 60 lambs were tested for sensitivity to light touch and painful sensation as well as their pain related behaviour after mulesing. Trial two measured wound sensitivity and pain related behaviour in 80 lambs that were mulesed and marked (tail docked, castrated, ear-tagged and vaccinated) and trial three examined wound sensitivity, wound healing and weight change in a mob of 263 lambs undergoing mulesing and marking. In all trials post-mulesing Tri-Solfen® treatment was compared with a placebo control. The authors elected to measure pain responses via a combination of wound sensitivity testing and behavioural observations to avoid the confounding affects of handling-related stress on physiological parameters such as cortisol levels.

The authors found that wound sensitivity was increased for untreated lambs in all trials. Post-procedural application of Tri-Solfen® reduced or prevented the escalating pain response that was shown to occur in untreated lambs. Treated lambs exhibited reduced pain related behaviour compared with untreated or placebo treated lambs. Wound contraction was faster in Tri-Solfen® treated lambs compared to untreated lambs in all sheep tested, providing further incentives for producers to use Tri-Solfen® post-mulesing. The lambs receiving placebo treatment (Tri-Solfen® gel without the local anaesthetic agents) also demonstrated faster wound contraction than untreated animals suggesting another ingredient in the gel aids wound healing.

All group three lambs exhibited slightly longer wound healing, likely due to environmental conditions. This group suffered a higher mortality rate (3.8%) than the other groups, also thought to be due to environmental conditions at the time of mulesing but may have also been associated with slower wound healing. No significant difference in weight gain was observed between treated and untreated lambs in the four weeks post-mulesing.

This study demonstrates Tri-Solfen® to be a safe, effective method of alleviating pain after mulesing in lambs. The ease of use should not impact the speed of the procedure and the positive effects of the anaesthetic on wound healing suggests that morbidity and mortality may be reduced by Tri-Solfen® use. Tri-Solfen® offers a promising means of improving the welfare of Australian lambs until such a time that a non-invasive method of fly-strike prevention is available.

Lomax, S., Shell, M. and Windsor, P.A. (2008) Impact of topical anaesthesia on pain alleviation and wound healing in lambs after mulesing, *Australian Veterinary Journal*, **86** (5):159-168.

research animals

Mirrors for laboratory birds

Animals raised in isolation often develop stereotypical behaviours, which are regarded as detrimental to their welfare. The European starling is widely used in laboratory experiments that involve rearing the captive birds in isolation, despite wild populations living in female-female pairs or groups of males. This study investigated the benefits of providing a mirror to captive starlings reared in a variety of conditions. It was hoped that like other species, starlings would also reduce stereotypic behaviours on seeing their reflection.

Starlings were initially raised in a variety of conditions: singly, in pairs, or in social groups. When two years old, the birds were transferred into individual cages for ten days, where they could hear, but not see other birds. A mirror was then presented to each bird in one corner of its cage. The researchers found that the reactions of the birds to the mirror differed according to sex and social experience. While all birds paid

attention to the mirror while it was present, the mirror appeared to induce more attention focusing and movement in single and socially raised males, while the pair-raised males and the females seemed calmer. The authors conclude that a mirror might be a good way to reduce isolation-related stress in laboratory birds, but that sex and social experience at least have to be taken into account, as these factors can reverse the response of some individuals.

Henry, L. *et al.*, (2008) The use of a mirror as a 'social substitute' in laboratory birds, *C.R. Biologies* doi:10.1016/j.crvh.2008.04.005.

other articles of interest

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Huber-Eicher, B., and Spring, P., (2008) Attitudes of Swiss consumers towards meat from entire or immunocastrated boars: A representative survey. *Research in Veterinary Science* In Press.

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Jones, D., (2008) Crimes without consequences: The enforcement of humane slaughter laws in the United States, *Animal Welfare Institute*, Washington, DC, U.S.A.

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doi:10.1016/j.anbehav.2007.12.019

Pedersen, L.J., (2008) Better beginnings for pigs in new type of pen, Department of Animal Health, Welfare and Nutrition, Faculty of Agricultural Sciences, University of Aarhus.

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Vas, J. *et al.*, (2008) Consistency of dogs' reactions to threatening cues of an unfamiliar person *Applied Animal Behaviour Science* **112**:331–344

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