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. Email science@rspca.org.au to subscribe.
The economic value of Australian stock herding dogs

Australia has approximately 91,000 livestock producers, each of which use an average of 3 working dogs to assist with stock handling. Herding dog ownership has financial costs, but the contribution that the dogs make on-farm is considerable. To maximise profitability on farm, producers must weigh up the benefits of spending money against the financial gains that they will receive as a result of expenditure. Costs associated with the care and upkeep of working dogs should be informed by knowledge of the value of their dogs and the work they perform and in this way, the welfare of the farm dog is linked with its perceived value. This study aimed to assess the economic value of the working dog and, additionally, obtain some insight into the way that farmers currently perceive the worth of their stock dogs. To assess this, a questionnaire was developed that contained a number of questions devised to solicit information from stock herding dog users in Australia in relation to the cost of acquiring and maintaining their working dogs, the dog’s workload and longevity and the time invested in training.

812 responses were received from farmers providing information about their working dogs. It was found that the average cost of owning a herding dog in Australia was $7,763 over the period of its working life. The work performed by the dog throughout its lifetime was estimated to have a value of approximately $40,000, indicating that herding dogs typically provide a 5.2 fold return on the money spent on them. However, on average respondents indicated that the maximum one-off veterinary expenditure they would consider for their dog was $1,001–2,000, which did not match up with the worth of the dog over its lifetime. The result of this survey suggest that while the costs of acquiring and maintaining these dogs are minimal, these costs should not be considered to be indicative of the dog’s worth. These findings should be taken into account when farmers are making financially appropriate decisions in relation to their working dogs, leading to increased profitability for farmers and improved welfare for their dogs.

Responses of horses to shade or unshaded pens in hot weather

The provision of shade for horses in hot weather is often recommended, but to date, the benefits of providing shade have not been scientifically studied. Horses will use both natural and artificial shelter in extreme weather events, but a hypothesis also exists that horses tend not to use shelter in hot weather due to the increased insect density in shade where vegetation is present. This study aimed to investigate the use of shade by horses in hot sunny weather by examining their physiological, behavioural and serological responses to exposure to hot weather with or without the provision of shade.

Five mares and seven geldings were placed in one of two treatments in a randomised crossover design. One treatment was completely shaded (SH) and the other treatment was completely unshaded (SUN). The horses were subjected to 2 days acclimation period to adjust to the environment in which they were housed, followed by a 10 day collection period (5 days per treatment group in the crossover design).

It was found that the horses that were housed in SUN activated their thermoregulatory mechanisms (increased respiration rate and higher skin temperature) earlier in the day than those housed in the SH. Skin temperature, respiration rate and rectal temperature were also greater in horses housed in the SUN treatment than those in SH at all points measured from 12.30 to 17.30 during the day. Observation of the horse's behaviour from 12.00 to 16.00 hrs in both treatments showed that those in SUN also consumed 30% more water than the horses in the SH treatment and stood within 1m of the water source 1.7 times as often as those in the SH treatment. It was also found that although there were more flying insects in SUN than in SH, the horses showed no difference in insect avoidance behaviour between the two treatments. The horse's cortisol levels were greater in SUN than SH, but remained within the normal range for resting horses, suggesting that horses are able to take measures to thermoregulate under the hot sunny conditions used in this study. The results indicate that horses benefit from the provision of shade in hot sunny weather and this should be considered when developing management practices for the care of horses.

COMPANION ANIMALS

Thiamine deficiency in a cat fed on pet meat containing sulphur dioxide preservatives

Thiamine (vitamin B1) is critical for the normal functioning of the central nervous system. A deficiency in thiamine leads to progressive brain malfunctioning and neurologic symptoms. Thiamine deficiency is a typically reversible neurologic disorder seen in companion animals fed a thiamine-deficient diet. This paper reports on a cat that was presented at a veterinary surgery in Australia with probable dietary-induced thiamine deficiency after being fed pet meat containing high levels of sulfur dioxide preservative. Sulfur dioxide preservatives destroy thiamine in food. The cat presented with acute onset of neurological abnormalities including muscle twitching, inability to stand and ventroflexion of the neck. The cat was fed exclusively on a single brand of commercial kangaroo meat pet food purchased from a supermarket. The cat improved clinically with thiamine supplementation and a presumptive diagnosis of thiamine deficiency was made. The kangaroo ‘pet meat’ product was tested and demonstrated high concentrations of sulfur dioxide, a known cause of thiamine deficiency in cats.

Animal hoarding involves the collection of a large number of animals that are not kept at a standard that meets the minimum requirements for responsible pet ownership and results in negative consequences on the animal’s health and/or behaviour. Because of the welfare impacts that animal hoarding has on the animals, it has been described as a form of animal cruelty which also has deleterious effects on the hoarders themselves and their communities. When the cases are discovered and the animals seized, many of the animals require veterinary care or euthanasia, which represents a high economic cost for shelters and administrations, especially if the animals are required to be kept in shelters for extended periods prior to rehoming as a result of behavioural problems they may have developed as a result of the hoarding.

This study aimed to examine the characteristics of 24 animal hoarding cases in Spain. Data was obtained from animal shelters and humane societies that had been involved in attending animal hoarding cases. The circulated questionnaire requested information in relation to 1) the general characteristics of animal hoarding cases; 2) the hoarders profile; 3) the condition of the animals; and 4) the characteristics of the physical environment in which the animals had been hoarded. 24 separate cases were analysed, which involved 1,218 dogs and cats and 27 hoarders.

The hoarders kept between 12 and 159 animals per case, with an average of 50 animals. Hoarders were generally middle-aged or older, who in most cases lived alone and also showed signs of object hoarding. In most cases, hoarders tended to hoard just one species (cats or dogs) with men hoarding dogs more commonly than cats and women showing no species preference. In 75% of cases the animals showed indicators of poor health and welfare and behaviourally, aggression and fear were the most reported problems, reflecting a lack of socialisation and chronic stress. This study supported claims that animal hoarding is a significant problem that requires significant financial support to remove and care for the animals and more research is required in order to further understand this problem to reduce the number of cases of animal hoarding.

Sulfur dioxide preservatives are of increasing concern because no regulations exist for the addition of these in pet meat despite the potential to cause thiamine deficiency in dogs and cats (which can be fatal). Despite awareness of the problem in Australia for over twenty years, sulfur dioxide preservatives continue to be found in commercial pet foods at harmful concentrations. One of the key problems is the lack of regulation of fresh meat products sold for pet consumption. Although the pet food industry is self-regulated under the Pet Food Industry Association of Australia (PFIAA) Code of Practice, which mandates adherence to Australian Standards (AS5812:2011), including requirements for minimum thiamine concentrations in pet ‘food’, pet ‘meat’ producers do not generally operate under the same standards.

There are numerous strategies to prevent thiamine deficiency in companion animals. The simplest option is to avoid feeding pet meat high in sulfides and recommend feeding a commercial complete cat or dog food. Varying the brands of pet foods may reduce the overall dose of sulfur preservatives. Pet owners who prefer to feed a more ‘natural’ diet should be advised to purchase meat sold for human consumption, for which appropriate legislation precludes the addition of preservatives that cause thiamine deficiency. The diet should also be supplemented with natural sources of thiamine such as pork, organ meats such as liver, heart, brain and kidney, yeast, oatmeal and whole wheat. It is common for cats and dogs to be fed on one food exclusively for days to weeks on end, which means that they cannot obtain sufficient thiamine from other food sources if the one they are being fed is deficient. Foods must be evaluated for their suitability as a sole or primary diet.


The effects of environmental enrichment on the behaviour of shelter dogs

The behaviour of each individual dog that is housed in an animal shelter will have a large influence on whether the dog will be adopted into a new home. Many animal shelters choose to house their dogs singly which can have a detrimental effect on their welfare and result in the performance of stereotypic behaviour, an indicator of chronic stress, as well as cause physiological stress responses in the dogs. Most shelters aim to ensure that their dogs show calm friendly behaviour wherever possible, in order to increase their chances of adoption and their welfare. Although previous studies have examined the effect of different enrichment procedures on behaviour, no studies to date have examined the effects of a complex enrichment programme involving both animate and inanimate enrichment. This study aimed to examine the effect of a complex enrichment programme on the behaviour of shelter housed dogs, and whether this, in turn, increased the number of dogs that were adopted.

107 dogs were randomly placed into either an experimental (48) or control (59) group of dogs as they entered the shelter facility. For three days the experimental group were exposed to twice daily cage-behaviour training, where desired behaviours (approaching front of cage, sitting or lying and remaining quiet when approached) were rewarded with a treat. In addition, they were also provided daily with a food-filled toy. The control dogs were not provided with this enrichment programme for the 3 days.

After the three days it was found that dogs that were provided with the enrichment programme had calmer body postures, were quieter when people approached their cages and were less likely to jump up in greeting. It was also found that the control group of dogs increased their unwanted behaviours, whereas the experimental group didn’t, also suggesting that the enrichment programme had a preventative effect. The number of dogs adopted from the shelter was not affected by the enrichment programme in this study, however, the behavioural health and welfare of the dogs exposed to the programme was increased, suggesting that similar programmes could increase the welfare of dogs in other shelters.


Use of accelerometers to measure stress in shelter dogs

Dogs experience significant stress when housed in shelters as a result of the new environment, the loud noises and social isolation. This can impact their welfare and health, and they can develop anxiety-based behaviour problems such as fear or aggression. Physiological measurements, such as cortisol, have been used in the past to determine a dog’s stress levels. In addition, a number of behaviours have been identified as indicating that dogs are experiencing poor welfare. It has previously been shown that in many situations, dogs that are stressed will increase the level of activity that they perform and will display different types of hyperactive and attention-seeking behaviour.

This study examined 13 individually housed dogs that had just been admitted to a dog shelter and monitored their behaviour, physiological attributes of stress (salivary and urinary cortisol levels) and the levels of activity that they were displaying and attempted to determine the relationship between these facets. Activity was measured using an accelerometer which was fastened to the collar of the dogs.

Cortisol levels were found to be elevated in the dogs, supporting the belief that dogs were stressed in a shelter environment. The study also showed that the use of the accelerometer was a feasible tool to monitor activity levels in dogs, but the relationship between activity and physiological measurements of stress was complex in that stressed dogs did not simply show higher levels of activity. The authors discuss the findings and the potential factors that may have influenced the results that they obtained. However, the results do suggest that activity level of dogs in shelters should be monitored and those dogs that are unusually active or inactive flagged for further examination and possible behavioural intervention.

prepubescent animals than for older animals. Anaesthetic risks in young animals can now be controlled, so there appear to be no significant welfare arguments against desexing before puberty. This supports the view that desexing of prepubescent female cats (<4 months old) could make a significant difference to cat welfare by reducing the numbers of kittens surrendered to shelters. It could also reduce supplementation of feral cat populations with abandoned kittens. The authors concluded that if these results are reflected nationally, desexing of prepubescent cats up to 4 months old could significantly reduce the numbers of unwanted kittens born to pet cats.


**Potentially preventable factors in dog bite related fatalities**

Human injury sustained as a result of dog bites has been viewed as a preventable public health problem. Although rare, dog bites to humans attract a large amount of public interest, especially if the bites and attacks prove to be fatal. To date, there has been a large emphasis on the tendency of different breeds to bite and attack, with less emphasis placed on other potentially contributing factors such as ownership and husbandry factors, which combine with genetic factors to influence a dog’s reactions in a particular situation. There is now agreement by experts that the causation for dog bites cannot be attributed to one single factor, such as breed.

This study aimed to assess this by examining in detail the different situations in which dog bite related fatalities have occurred in the United States. Information was obtained from media reports of dog bite related fatality cases, from homicide detectives, animal control reports and interviews with persons who had been involved with the cases. 256 dog bite related fatalities over a 10 year period were analysed and information about the dogs and victims were obtained as well as information about husbandry factors and situational factors associated with the incidents.

The major co-occurent factors for the fatal dog bites were found to be the absence of an able-bodied person to intervene (87%), little or no familial relationship of the victims with the dogs (85%), dogs not neutered (84%), victim interacting inappropriately with the dog (77%), dogs isolated from regular positive interactions with family (76%), owners prior mismanagement of dogs (38%) and owners history of neglect or abuse of dogs (21%). Four or more of these factors occurred in 81% of deaths. Dog breed differed in 31% of media accounts and 40% where media and animal control breed reports were available. The study showed that most dog bite related fatalities were characterised by coincident preventable factors, but dog breed was not one of these factors. Future approaches to reducing dog bite fatalities should use a multi-factorial approach, rather than looking at single factors, such as breed of dog, to reduce dog bite fatalities.


**Survey on pet predation behaviour**

The University of Queensland is conducting an online survey of pet owners to better determine what factors affect the likelihood of pet cats and dogs hunting, the proportion of native vs introduced prey captured, hunting behaviours, and public attitudes to predation by pets. The findings of this survey will hopefully help better determine the impact domestic cats and dogs have on wildlife, and what action may help to both protect wildlife and pet welfare. To complete the survey go to: https://www.surveymonkey.com/s/petpredation
Administration of post-surgical pain relief following caesarean section in beef cows

Caesarean sections in beef and dairy cattle are performed in approximately 1–2% of calvings and usually follow difficulties birthing (dystocia), although elective caesareans are performed in some breeds of domestic cattle. Following a caesarean section, cows are likely to experience pain as a result of both the surgery itself and the failed attempts at vaginal delivery. Dystocia and caesarean sections have been rated at seven and nine on a ten point scale for pain by veterinarians in the UK, suggesting that the pain associated with this procedure is a significant welfare concern. Pain relief is usually provided for cattle that are given a caesarean section, but post-surgical analgesia is less common, despite evidence from human medicine that inadequate treatment of pain post-surgery increases recovery times. This study examined the use of meloxicam, a non-steroidal anti-inflammatory drug, in reducing pain following caesarean section. Meloxicam has a half-life of approximately 26 hours and so it is considered suitable for alleviating the most severe pain following caesarean section, which is believed to occur within the first 24 hours following delivery. The study aimed to determine if the administration of this drug would alter the behaviour of beef cattle, in particular lying behaviour, following caesarean section.

One hundred and ten beef cows were treated with either meloxicam or a placebo and the activity of each cow measured by use of a pedometer which was attached to the cow’s leg. The time that each cow spent lying, the number of lying bouts and the number of steps each cow took was calculated using this equipment.

It was found that the cattle that had received the meloxicam spent more time lying in the first 16 hours following surgery and had a greater number of lying bouts in the first 24 hours. This suggests that the cattle treated with meloxicam were experiencing reduced pain following caesarean section and that the use of this drug allowed the cows to better change their posture from standing to lying following the surgery and thus fulfil their need for rest by enabling them to lie down more comfortably. The study suggests that the use of meloxicam when performing caesarean sections on cows has positive implications for their welfare.


Reactions of stressed sheep to positive events

Farm animals are known to be exposed to events that may impact on their wellbeing including social separation and mixing, transport and changes in their environment or food. These types of events can cause chronic stress which may have an effect on the animal’s cognitive functions, increase the amount of fear they show in different situations and also decrease the quality of their social behaviours and interactions. In contrast, a long-lasting experience of enrichment produces positive effects on cognitive functions and positive judgement bias, learning and memory.

This study aimed to assess if repeated exposure of sheep to positive events could alleviate the effects of being chronically stressed by using recognised behaviour tests for fearfulness (novel object and suddenness tests), judgement and the quality of relationship with a human (when approached). It was predicted that the repeated exposure to positive events will reduce the fear-related reactions to novelty and suddenness in chronically stressed sheep and contribute to a better human-animal relationship than in those that have been exposed to repeated stressful events alone.
Fifteen lambs were exposed to treatments known to induce chronic stress for seven weeks, and 15 other lambs were exposed to the same seven week treatment, but then in the last four weeks, were also exposed to positive events (being brushed, positive contact with humans and anticipation of food by a light indicating when food was to be presented). At the end of the seven week treatment, lambs were tested in a judgement test in which they had been pre-trained prior to the experiment and exposed to two standard tests of fearfulness (novelty and suddenness) and a human approach test.

It was found that the exposure of lambs to positive effects for the final four weeks induced an optimistic judgement and reduced the reluctance of the negatively stimulated lambs to approach humans when compared to the control lambs. However, the positively exposed lambs were also found to express a higher emotional reactivity to suddenness and novelty than those exposed to negative events only. The authors suggest that further research be performed before recommending positive treatment to negate the negative effects of chronic stress, but suggest that this study supports the use of judgement tests to assess an animal’s affective state.


Use of outdoor ranges by laying hens

The use of intensive housing systems for animals is attracting concern from the general public about the welfare of the animals housed in these systems. Perceived ideas of good animal welfare for production animals lean towards animals being housed in ‘natural’ environments. Laying hens that are provided with the facilities to allow them to range outside the hen house fits into this concept and there is a general tendency for society to perceive that the welfare of laying hens in a free-range system is better than those kept in barn or cage systems. However, practically, most laying hens are kept in large flocks and only a small percentage of the birds venture outside the house at any one time. In addition, factors such as stocking density and rearing conditions can also affect the bird’s tendency to use the outdoor area. To date, research that has examined the use of outdoor areas by laying hens has not determined whether it is the same birds, or different birds, that use the outdoor area each day.

This study aimed to examine the use of outdoor areas by individual birds in flocks of different sizes. The study used a radio frequency identification system to monitor the number of times a bird passed through the pop holes to a covered veranda and to an uncovered outdoor area and measured the amount of time that the individual bird spent in each of the areas. Five to ten percent of birds in commercial laying hen flocks of different sizes (four small (2-2,500 hens), four medium (5,000-6,000) and four large (≥ 9,000)) were fitted with an identification tag and their ranging behaviour monitored for three weeks.

It was found that between 79 and 99% of birds were registered on the veranda at least once in all flocks and between 47 and 90% registered on the free range at least once. There was no association between the percentage of hens outside the house (free range and veranda) and the flock size, but it was found that individual hens in the small and medium-sized flocks visited the outdoor areas more frequently and for more time than those from the large flocks. This study showed that, even if individual hens do not access the outdoor areas every day, most birds will use outdoor areas if provided.

Animal welfare and society concerns

This paper questions if young adults are being raised in a manner that distances them from agriculture. This may be a concern as these are the very people that the livestock industries need to educate about animal welfare so that they can choose to make changes to improve the welfare of the animals in these industries in future. In addition, with the growth in social communication tools in today’s society, much of the information that young people are likely to be provided with, unless they do their own research into the practices used in the livestock industries, are pictures or video footage of animal abuse. In addition, research has shown a startling lack of understanding in young people about where their food actually originates.

This paper aims to provide an overview of the major problems that the author considers are of the most importance in the different animal production industries. Some issues can be corrected by changes in management systems or upgrading and installing new and better designed equipment, or by providing better training and an increased understanding of the animal industries for staff and management. Other issues, such as the modern society’s tendency for the production industries to maximise their output, potentially compromising the welfare of the animals involved, need to be considered on an ethical level.

The author also discusses the role of retailers in determining welfare standards, the positive effect that retailers can have by requiring higher standards from producers, and the influence that the consumer has in shaping the future of the livestock industries. The author believes so-called ag-gag laws send the wrong message to consumers and strongly suggests that livestock industries be more transparent about their production practices to allow people to better understand where their food comes from.


Best practice framework for animal welfare certification schemes

Certification schemes have been developed in a number of countries in order to provide assurance to customers about how animals are treated when being farmed for food, suggesting that animal welfare is a legitimate concern that is valued by consumers. However, the schemes are likely to vary between countries, depending on the level of societal interest in animal welfare in each country and the schemes often operate to different inspection, certification or accreditation standards, resulting in different information being provided to consumers, leading to consumer confusion. At the present time, the lack of an international framework for defining the welfare standards underpinning livestock products means that it is difficult for the food industry to trade products with a definable welfare status. The different societal interest in animal welfare in different countries also means that schemes developed in one county may not transfer easily to other countries. Therefore an important step is to define a best practice framework for animal welfare certification schemes that could apply in any country and that is based on a continuous improvement approach.

This paper discusses the development of such a framework and the principles that need to be incorporated into a scheme such as this so that it would be able to deliver a genuine assurance of animal welfare across countries. The authors suggest that the principles outlined in this paper could be used to inform the future development of animal welfare accreditation and certification schemes or could be used by policy makers wishing to review the credibility of existing schemes and animal welfare claims. In addition, if the principles were incorporated into future labelling, the authors suggest that the framework could facilitate trade in products with specified levels of welfare. The authors hope that the information presented in this paper can be used to promote the sharing of ideas around the development of this framework which is ultimately designed to stimulate animal welfare improvement.

Welfare outcomes for weaner and mature bulls undergoing different castration techniques

Castration is a commonly performed procedure on beef cattle, with USA data indicating between 7–15 million procedures each year. In Australia, there is no legal requirement for administering pain relief when castrating cattle, and the code of practice recommends that those over 6 months of age should be castrated by a veterinarian. In the USA, there is also no legal requirement that pain relief be provided in animals of any age. In both Australia and the USA, the most common castration method is surgical castration. In the last 15–20 years, however, there has been an increase in the use of banding as a castration method. There is a perception that banding is less painful than surgical castration, which is promoted by the manufacturers of these products. In addition, manufacturers also encourage their customers to delay castration to exploit the faster growth rate of the intact male prior to castration.

This study aimed to assess the welfare outcomes of Bos indicus bulls in a tropical environment castrated by tension banding compared to those castrated using surgical castration. The effects of providing pain relief (administration of the non-steroidal anti-inflammatory drug ketoprofen immediately prior to castration) compared to controls (intramuscular saline injection) were also examined under commercial type conditions using weaners (7–10 months) and mature bulls (22–25 months). Welfare outcomes were assessed using a range of measures.

Behavioural observations were performed directly by an observer and obtained by use of data loggers which were attached to the hind leg of the bulls for four weeks following castration. The behavioural observations within the crush/chute in which the castration was performed indicated that, during the performance of the procedure, tension banding was less painful than surgical castration in bulls of all ages (determined from the higher frequency of movement in surgically castrated bulls) but both procedures were acutely painful for the bulls. One and a half hours post-castration, tension banded bulls performed more time walking forwards and backwards, and making tail and leg movements, indicative of restlessness. Surgical castrated bulls were found to perform more immobile behaviours than banded bulls during this time period. It was found that the administration of ketoprofen relieved some behavioural indicators of pain from 1.5 to 3 hours following castration, and was more effective in mature bulls than the weaners.

Physiological, stress, morbidity and productivity-related responses were also examined to compliment the behavioural observations above. It was found that cortisol levels were higher in the cattle that had been castrated using the banding technique compared with those that had been surgically castrated at two hours post-castration, indicating that banding was more painful for the bulls. Ketoprofen was found to reduce the cortisol levels following castration in the mature surgically castrated bulls, but had no effect on the cortisol levels of the banded bulls. In addition, cortisol levels were found to be higher in the banded bulls compared to the surgical mature bulls at 2–4 weeks post-castration. There was also evidence that the banded bulls had poor wound healing compared with the surgically castrated cattle. Liveweight gains were not affected by castration method.

The findings of acute pain, inflammation and poor wound healing in the banded bulls support the behavioural findings of this study and indicate that tension banding produces inferior welfare outcomes for weaners and mature bulls when compared with surgical castration. Administration of ketoprofen can help to reduce pain following surgical castration in mature bulls.


Tail biting behaviour and the relationship with general behaviour in pigs

Tail biting is a problem in pig production and has both economic and welfare costs. Tail biting between pigs can cause mild to severe damage to the tail and in severe case, can cause death from infection or paralysis. Tail biting is known to have a multifactorial background with aspects of the environment in which the pig is placed and its biological make up both having an effect on whether any individual will develop tail biting behaviour. Although many risk factors for tail biting are known, it is an unpredictable behaviour with some, but not all, pigs developing the behaviour if kept under the same circumstances. This suggests that different pigs may have different motivations for developing tail biting and in addition, tail biting may be associated with the performance of other behaviours too.

This study aimed to determine if individual differences in tail biting are consistent over time and if tail biting behaviour had a relationship with the general behaviour at pig or pen level. As pigs have different motivations for performing tail biting, the pigs were housed in either barren or enriched (bedding material of straw and wood shavings was added) enclosures. 480 pigs were reared from pre-weaning to slaughter (23 weeks). Following weaning at four weeks of age, the piglets were placed into either barren or enriched pens. The behaviour displayed by the pigs was monitored throughout the 23 weeks.

It was found that tail biting started early in life and was noted to occur in the piglets pre-weaning. Tail biting behaviour was more likely to occur in barren pens than enriched ones and those pigs that had high levels of tail biting within the litter as piglets, also went on to perform higher levels of tail biting as adults, suggesting that the pre-weaning environment may have an effect on the development of this behaviour. In the post-weaning stage, the presence of the bedding greatly reduced tail biting behaviour, but it did still occur. Individual tail biters were not consistent over time, but the victims of tail biting were. Tail biting and damage were best predicted by the behaviours of the pigs at pen level, rather than individually, and more pig and pen-directed manipulative behaviours were observed in pens with high levels of tail biting. The authors suggest that high levels of chewing or eating objects in pens could be used as an indicator of tail biting outbreaks.


Positive affective states in sheep and the role of the opioid system

Evidence is growing which shows that animals experience feelings, or affective states, which affect their welfare. Affective states, however, cannot be directly seen, and so behavioural measurements can be used to examine how an animal feels. Cognitive judgement bias tests have been developed to examine affective states in animals and have been adapted for use in a range of species. These tests work on the basis that if an animal has been exposed to positive events in the recent past, it will feel more positive about the future and so will have an increased expectation of reward in any situation. Conversely, if it has been exposed to negative events in the recent past, it will have a negative expectation of an event that occurs in its future.

It has been suggested that the opioid system may influence the formation of affective states and administration of morphine, an opioid agonist, is thought to increase pleasure in some animals (e.g. in response to being given a favoured food item). In contrast, the administration of naloxone, an
Effects of housing conditions on body weight and cortisol in cavies

Rodents are commonly used in medical research in order to understand the causes, diagnoses and treatment of animal and human diseases. In recent times, evidence has been mounting of the importance of providing enrichment for animals held in captivity and the effect that housing conditions have on the variety of behaviours that animals show, and their morphological, physiological and neuronal characteristics. Providing cage enrichment for rodents held in laboratories has been shown to influence their behaviour and improve cognitive skills, emotional ability and memory. However, one important aspect has largely been ignored, the fact that these animals naturally live outside. Data that are gathered in laboratories are thought to reflect the animal’s natural physiology or behaviour, but when an animal is taken out of its natural environment, it can be suggested that the data obtained may not be reflective of the animal’s natural responses. Body weight is influenced by stress and as stress increases, the body weight may reduce due to reduced food intake. This study investigated the effects of indoor versus outdoor housing on body weight and blood cortisol levels using a range of experimental tests and examination of archived data on the weight of wild socially housed cavies. The experimental tests involved examining the weight and cortisol levels of cavies kept indoors, outdoors and those that were changed to different conditions during the experiments.

The studies showed that both body weight and cortisol levels were strongly influenced by the environment in which the cavies were housed. The body weight of cavies remained stable over months under stable housing conditions, but changed considerably when the animals were transferred into another housing condition. The transfer from outdoor to indoor enclosures resulted in a body weight loss of approximately 8% and indoor to outdoor transfer in a gain of approximately 12%. Cortisol levels were also significantly lower in those animals kept outdoors. Both of these results suggest that the cavies are less stressed in an outdoor environment. This study has implications for the use of indoor housed rodents in research and the validity of the data that is obtained from using rodents held solely in an indoor environment, compromising scientific and ethical justifications for the use of animals in research.

WILD ANIMALS

Animal-welfare outcomes in helicopter shooting of camels

Helicopter shooting has been used for the management of large invasive mammals for several decades. The technique is generally used to control animals in remote or inaccessible situations in which other control methods have proved ineffective. An unfavourable public perception of helicopter shooting of animals for population management has made this technique increasingly contentious. To date, no studies have been published providing quantitative animal welfare data for any species during helicopter shooting. It is recognised that the two most important determinants of how much suffering any given killing method causes an animal are the duration between the application of the method and death and the intensity of suffering experienced by the animal. Feral camels are an invasive species found in arid areas of Australia, and the remoteness of the areas in which they live and the ruggedness of the landscape has meant that helicopter shooting is the management technique most commonly used for this area. A model national standard exists in Australia, which shooters are required to comply with, and an ongoing process of verification and compliance is in place to assess compliance with this standard.

The aim of this study was to provide an assessment of the humaneness of camel shooting from helicopters using a combination of ante-mortem (n=192) and post-mortem (n=715) observations. Measurements of the time to death, the instantaneous death rate, the wounding rate and location of the bullet wound were all noted. It was found that during the cull of the camels, the wounding rate was 0.4% and the killing efficacy of the technique was 99.6%. The mean time to death was 4 seconds and the mean instantaneous death rate was 83%. The most important factors determining the effectiveness and hence humaneness of the kill were the nature of the vegetation (high canopied vegetation reduces visibility and hence accuracy of the shot) and shooter identity (dependant on the shooters selection for the role, their prior training, experience and skill). The wounding rate of 0.4% that was obtained in this study is considerably lower than that reported for other hunting methods and helicopter shooting is associated with a shorter average duration of suffering than most other means of lethal population control.

ARTICLES OF INTEREST

ANIMALS USED FOR SPORT, ENTERTAINMENT, RECREATION AND WORK


COMPANION ANIMALS


FARM ANIMALS

Aquaculture


Cattle


**Pigs**


Rabbits


Sheep/goats


General


HUMANE KILLING


