



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](mailto:science@rspca.org.au) to subscribe.

## COMPANION ANIMALS

### The effects of facial conformation on canine eye problems

Concern has arisen in recent years that the selection for extreme facial features in dogs may be leading to an increased frequency of eye disorders. Corneal ulcers are a common and painful eye problem in dogs that can lead to blindness. Exaggerated facial structures like large eye openings and protruding eyes have been suspected risk factors for corneal ulceration. Some breeds, such as the Pug and the Pekingese, are more prone to developing corneal ulcers as a result of their facial features. The 'breed standard' (the official description of how a breed should look) of some breeds such as the Pug and Pekingese encourage extreme eye conformations and are a potential driver of this problem.

This study, aimed to investigate the potential relationship between facial conformation and corneal ulceration and determine how wide eye openings and prominent eyes (which can lead to inadequate tear film protection), a brachycephalic muzzle (a very short flat muzzle), nasal folds (skin folds on the nose which, on dogs with a short muzzle, can cause the hairs on the nose to rub against the eye) and the presence of visible sclera (the white of the eye is exposed) influence the development of corneal ulceration. 700 dogs entering a small animal veterinary hospital over 14 months were examined, and dogs were assessed to see if they had a corneal ulcer or if they had any previous diagnosis of corneal ulcer(s) in their historic veterinary records.

It was found that 31 of the dogs were affected by corneal ulcers. Thirty of these cases were pure bred dogs, representing 10 different breeds, the most common being the Pug, then the Shih Tzu, the Bulldog and the Cavalier King Charles Spaniel. Brachycephalic dogs were twenty times more likely to be affected than those with longer muzzles. Dogs with nasal folds were almost 5 times more likely to be affected by corneal ulcers than those without. A 10% increase in the width of the eye opening more than tripled the risk of corneal ulcers. Exposed eye-white was associated with nearly three times increased risk. The results demonstrate that artificially selecting for these facial characteristics greatly heightens the risk of corneal ulcers, and such selection should be discouraged to improve canine welfare. To reduce ulcer risk, dogs exhibiting any of the four high risk conformations, especially in combination, should be avoided in breeding programmes, should not be awarded in the show-ring by judges, and should not be encouraged in breed standards. Dogs with more moderate eye sizes, relatively longer muzzles, and less pronounced or preferably no nasal folds, should be selected to reduce the risk of this painful condition.

Packer RMA, Hendricks A, Burn CC (2015) Impact of facial conformation on canine health: corneal ulceration. Plos One DOI: 10.1371/journal.pone.0123827





## Adopting cats or kittens from an Australian animal shelter

Thousands of cats are surrendered to animal shelters each year and many of these cats are euthanased, raising serious ethical issues, which also has financial costs to the community and is associated with mental health issues for the workers involved with performing euthanasia. The numbers of adult cats and kittens admitted to shelters are similar, but adult cats are less likely to be adopted than are kittens. To attempt to increase the number of adult cats adopted from shelters, strategies such as lowering or waiving the adoption fee have been used to attract buyers, but the use of these techniques have also been met with concern that the low adoption prices could be associated with impulse buying and unsuitable people adopting these cats and poor outcomes for the cat. This study attempts to examine if this is the case.

382 people adopting cats (> 4 months of age) or kittens ( $\leq$  4 months of age) at a RSPCA shelter in Queensland, Australia were surveyed upon adopting the cat or kitten and in a follow up survey 6-12 months after adopting the animal, and the price that the people adopting the adult cat paid was recorded.

The results of the surveys showed that most people had put considerable thought into buying a cat or kitten prior to purchasing one from the shelter, and that the majority of people purchasing an animal from the shelter were doing so because they thought it was the right thing to do, they trusted the shelter and wanted to help. It was found that the adoption



outcomes were generally good for all animals, including adult cats adopted for low prices from this shelter, alleviating concerns about 'low cost outcomes' for cats. The results gained from this study can be used to guide strategies for increasing adoptions, and provide evidence that creative strategies can be successful at increasing the rate of adoption of adult cats, without affecting the health and welfare outcome for the cat.

Zito S, Paterson M, Vankan D *et al* (2015) Determinants of cat choice and outcomes for adult cats and kittens adopted from an Australian animal shelter. *Animals* 5:276-314.

## Problems associated with microchip data of stray dogs and cats entering an animal shelter

Microchip identification has become an important tool to reunite stray dogs and cats with their owners. Improvement of the microchipping system in Australia is limited by a lack of published Australian data documenting the problems experienced by shelter staff when using microchip data to contact the owner of a stray animal.

This retrospective study analysed admission data for stray, adult dogs (n = 7258) and cats (n = 6950) entering the RSPCA in Queensland between January 2012 and December 2013 was undertaken to determine the character and frequency of microchip data problems and their impact on the outcome for the animal.

Only 28% of dogs and 9% of cats were microchipped, and a substantial proportion (37%) had problems with their data, including being registered to a previous owner or organisation (47%), all phone numbers incorrect/disconnected (29%), and the microchip not registered (14%). A higher proportion of owners could be contacted when the microchip had no problems, compared to those with problems (dogs, 93% vs. 70%; cats, 75% vs. 41%). The proportion of animals reclaimed declined significantly between microchipped animals with no data problems, microchipped animals with data problems and non-microchipped animals - 87%, 69%, and 37%, respectively, for dogs and 61%, 33%, and 5%, respectively, for cats. Strategies are needed to increase the accuracy of microchip data to facilitate the reclaiming of stray dogs and cats.

Lancaster E, Rand J, Collecott S *et al* (2015) Problems associated with the microchip data of stray dogs and cats entering RSPCA Queensland shelters. *Animals* 5:332-348.

## Current perspective on the optimal age to desex dogs and cats

Surgical desexing of pet dogs and cats is a commonly performed procedure, and is thought to prevent many health problems for both of these species. It is also used as a method of contraception to help with pet-overpopulation in many countries, including the United States. In the past, animals as young as 6-8 weeks of age have been desexed, but recently, the health benefits of desexing cats and dogs, as well as the young age at which it is performed, is being scrutinised. This review examines the available literature regarding the risks and benefits of desexing cats and dogs and attempts to determine the optimal age for desexing in both species. The review examines the literature around the effects of desexing on a number of key health problems as well as behaviour and shows that there may not be a single optimal age for desexing cats and dogs, but the optimal age may be dependent on a number of factors including species, breed, body size, the context and breed-specific diseases.

The authors state that with cats, the overwhelming evidence would suggest that desexing is safe at any age over 6 weeks. In dogs, the optimal age is less clear and in general, for many breeds, the literature suggests it is safe to castrate male dogs at any age above 6-8 weeks of age. The authors recommend that if possible, female dogs should not be desexed until 3-4 months of age, to avoid an increased risk of urinary incontinence, recognising that in sheltering situations this may not always be possible. The authors do however note that there may be some exceptions

to this rule with breeds such as the Rottweiler, Golden retriever, Labrador retriever and the Vizsla standing out as having particular requirements when considering optimal age of desexing. The authors state that while the benefits of desexing likely heavily outweigh the risks for most cats and dogs, the considerations outlined in this paper should be borne in mind when determining the best age to desex pet dogs of certain breeds. It is important for the veterinarian to weigh these risks against the benefits gained for each patient that presents for spaying or castrating.

Howe LM (2015) Current perspectives on the optimal age to spay/castrate dogs and cats. *Veterinary Medicine: Research and Reports* **6**:171-180.



## Prevalence of and risk factors for degenerative mitral valve disease in dogs

Degenerative mitral valve disease (DMVD) is the most common cardiovascular disorder in dogs. Published estimates of the prevalence of this disease are currently limited to populations of high-risk breeds. It would be useful to obtain information about the incidence of DMVD in the general dog population to improve understanding of risk factors.

This study, performed in southeast England, examined 111,967 electronic patient records for dogs attending 93 veterinary practices between January 2010 and December 2011. Diagnosed DMVD cases (those patients with confirmed DMVD in their notes) and possible DMVD cases (dogs over 1 year old with a documented heart murmur, consistent with DMVD but without a specified diagnosis) were recorded.

The study found a high prevalence of heart murmurs consistent with DMVD and concluded that DMVD

was a common disorder in practice attending dogs. In a multivariable analysis, male dogs had higher odds of diagnosed DMVD than did female dogs and dogs  $\geq 20$ kg had approximately half the odds of DMVD diagnosis compared with smaller dogs. The study also showed that some breeds were more predisposed to developing these conditions than others with Cavalier King Charles Spaniel and the King Charles Spaniel being most susceptible to developing both DMVD and heart murmurs. These results can be used by veterinarians to provide insight into factors influencing DMVD diagnosis.

Mattin MJ, Boswood A, Church DB *et al* (2015) Prevalence of and risk factors for degenerative mitral valve disease in dogs attending primary-care veterinary practices in England. *Journal of Veterinary Internal Medicine* **29**:847-854.

## The challenges of pedigree dog health: inherited diseases



Humans and dogs have coexisted for thousands of years, and during this time, dogs have been selectively bred for certain physical and/or behavioural characteristics which have been maintained by inbreeding within familial lines. As a result, genetic bottlenecks have been created, for example, with repeated use of a common sire dog with the aim of obtaining certain traits in the offspring. Although this may result in particular traits being maintained, it can also increase the occurrence and severity of unwanted disease-causing traits within particular dog breeds which in many cases, have significant effects on the health and welfare of the dogs. Concerns regarding inherited disorders in dogs have been voiced as far back as the 1960s and continue today. Some breeds of dogs have been bred for particular extreme characteristics, for example brachycephalic dogs (such as the pug) which have a very short muzzle and exhibit significant breathing problems as a result. In addition, in the English Bulldog, due to the very large size of the head of the puppies, the mother, in most cases, cannot give birth unaided via the pelvis and a caesarean section is needed. Other dog breeds are predisposed to other types of inherited diseases.

The authors of this review, which focuses on pedigree dogs in the United Kingdom, examine the use of different breeding strategies to reduce inherited diseases in dogs and screening schemes to identify the presence or absence of harmful genes in individual dogs, with an attempt to reduce disease frequency, whilst maintaining genetic diversity within each breed. The authors discuss the challenges to be overcome using the different methodologies that they have described and the potential future for the pedigree dog and suggested ways forward such as ceasing to produce breeds with the poorest health record and most inherited disorders, crossing 'at risk' breeds with other breeds to reintroduce genetic variation and amending 'breed standards'.

The authors state that recognition of the benefits of crossbreeding and offspring limits imposed on stud dogs would improve breed health. They also emphasise the importance of public awareness and education of inherited disorders in dogs and the importance of the support of breeders in making these changes successful and common practice.

Farrell LJ, Schoenebeck JJ, Wiener P *et al* (2015) The challenges of pedigree dog health: approaches to combating inherited disease. *Canine Genetics and Epidemiology* **2**:3.



## FARM ANIMALS

### Welfare and performance in layer hens on introduction to the layer facility

Layer hens are often raised at a specialised rearing facility and then transferred, at 15-18 weeks of age, to the laying facility. Some laying facilities temporarily exclude pullets from the litter area for a few weeks to help them find food and water and to minimise the number of floor-layed eggs later on. However, in Sweden, this management strategy is not permitted as it involves reducing drastically the amount of space that the bird is provided with, and its access to litter, which it is thought may have negative effects on bird welfare.

The aim of this Swedish study was to examine how the restriction of space and litter affected the welfare and performance of 600 non-beak-trimmed birds entering a laying facility. Birds entered the laying facility at 16 weeks of age and for the next two weeks, were provided with 1) full access to the litter area, or 2) were excluded from the litter area (and hence were kept at a higher bird stocking density). Following the 2 weeks in either treatment, the birds were then housed during 18–72 weeks of age, with full access to the litter area.

It was found that birds that were initially excluded from the litter area had better feather cover (reduced incidence of feather pecking behaviour), reduced fearfulness and also produced eggs with a lower amount of shell irregularities. There was no difference between the two treatments on the number of floor-layed eggs, or in faecal corticosterone (stress) levels

measured in the birds. The results of the study suggest that the welfare of the birds is not compromised by excluding them from the litter area for two weeks upon entry to the laying facility, and there were suggestions that in fact, some aspects of bird welfare had improved.

Alm M, Wall H, Holm L *et al* (2015) Welfare and performance in layers following temporary exclusion from the litter area on introduction to the layer facility. *Poultry Science* **94**:565-573.



### Effect of analgesia and anti-inflammatory treatment on production indicators in dairy calves after disbudding

In New Zealand, disbudding (removal of the horn buds) is carried out when dairy calves' horn buds are 5-10 cm long and can be removed with a heated disbudding iron. The procedure is usually carried out without analgesic, although it is painful for the calves. There is mounting evidence that providing analgesia during the performance of this procedure has benefits such as weight gain in the calves, and this could be useful in encouraging farmers to provide pain relief when performing disbudding. The aim of this study was to assess the effect of administering the non-steroidal anti-inflammatory drug (NSAID), meloxicam, when disbudding 202 calves aged between 3-6 weeks old: 1) by the farmer using no sedation or analgesia (n=50), 2) by the farmer using meloxicam (n=51), 3) by veterinary staff using sedation and local analgesia

(n=50) and 4) by veterinary staff using sedation, local analgesia and meloxicam (n=51).

It was found that from Day 0 (day of disbudding) to Day 15 the calves that had been given meloxicam during disbudding grew faster (0.65 kg/day) than those that did not receive this NSAID (0.55 kg/day), but due to an interaction between operator and meloxicam treatment ( $P=0.056$  kg/day), the veterinarian-disbudded calves did not grow faster than the farmer disbudded calves. From Day 16 to 30 there was no significant effect of meloxicam on growth rate, but the veterinarian-disbudded calves grew faster (0.76 kg/day) than the farmer-disbudded calves (0.66 kg/day). Therefore, for the first 30 days, if meloxicam was not used, veterinarian-disbudded calves grew

faster than farmer-disbudded calves ( $P=0.002$ ), but if meloxicam was used, there was no difference in the growth rate between veterinarian- and farmer-disbudded calves ( $P=0.878$ ). Milk consumption was greater for calves disbudded by veterinary staff than by farm staff ( $p<0.001$ ) but meloxicam had no effect on milk intake ( $P=0.618$ ).

This study supports the conclusion that the use of meloxicam is a simple way of reducing the impact of disbudding on growth, without the need for veterinary treatment, and can help reduce the negative impact that disbudding has on growth rates, which is beneficial for farm productivity, as well as reducing pain. The combination of sedation, local anaesthetic and NSAID remains the optimal method of reducing pain during disbudding.

Bates AJ, Eder P, Laven RA (2015) Effect of analgesia and anti-inflammatory treatment on weight gain and milk intake of dairy calves after disbudding. *New Zealand Veterinary Journal* **63**(3):153-157.



## Effect of providing straw on usage, behaviour and growth of pigs

Directive 2001/93/EC states that all pigs in the European Union should have permanent access to a sufficient amount of material that enables manipulation activities. However, in many countries, pigs are kept without litter, which may lead to them redirecting their attention toward other pen mates in the form of tail and ear biting. There are a number of different enrichment materials which can satisfy the pigs exploratory and manipulation needs, but to what extent these materials satisfy these needs is not clear. The provision of straw to pigs has been shown to increase the feed intake and growth of pigs and straw meets the pig's behavioural needs for manipulation and exploration. However, straw is not used on many farms as it falls through the slats in the floor and blocks the slurry system below. In addition, replenishing this amount of straw on a regular basis is costly and time consuming. It has been considered that a daily provision of a smaller amount of straw, or presenting it in a box or rack may offer an alternative, and this study, performed in Belgium, aims to assess this by examining the behavioural effects, straw use and effects on growth of four straw applications of pigs housed on slatted floors.

The pigs ( $n=96$ ) were given continuous access to one of four applications: 1) a straw dispenser (Funbar) with

fully chopped straw, 2) a MIK toy (rolls of pressed, chopped straw, 3) a rack (long-stemmed straw) and a straw feeder (long-stemmed straw), and the pigs behaviour was monitored over two weeks.

It was found that the rack and straw feeder were manipulated the most ( $P=0.02$ ) and for longer ( $P=0.0009$ ) than the other applications, which may be due to the length of the straw used in these applications. Straw use in the feeder was found to be very high with an average straw use of 2kg (for 6 pigs) per week. The amount of contact that pigs showed with all applications was lower in the second week compared with the first, but this was smallest in the pen with the MIK toy. Growth did not differ between all applications. The study suggests that the use of the straw feeder or rack may be most useful for providing pigs with straw where it is not able to be used for bedding. The Funbar straw dispenser was the least preferred application for providing these behavioural needs.

Bulens A, Beirendonck SV, van Thielen J *et al* (in press) Straw applications in growing pigs: Effects on behaviour, straw use and growth. *Applied Animal Behavior Science*.

## Red and processed meat consumption and purchasing attitudes

Many both high- and low-income countries have adopted meat as the basis around which meals are prepared and the purchase of meat has become widely available and financially accessible. The complexity of the issues around meat consumption is extensive, with consumer purchase and consumption of meat being influenced by a range of factors. Understanding people's attitudes towards meat consumption is important as they can provide an indication of consumer behaviour and, as such, what strategies are likely to be most effective to inform consumers about the effects of their food choices and enhance population health and sustainability of food consumption. This study, performed in Nottinghamshire, England, used survey techniques to investigate consumers' red and processed meat consumption and perceived impacts on animal welfare, human health and environmental sustainability.

842 adults (497 females and 345 males) between 18-91 years of age were surveyed from a random population of 2500 residents (representing a 35.6% response rate). All respondents were asked questions regarding their red and processed meat purchasing and consuming habits, as well as socio-demographic information about themselves. When the collected data was analysed, it was found that women were more likely ( $P < 0.01$ ) than men to consume  $\leq 1$  portion of meat per day. Females and older respondents ( $> 60$  years) were more likely to have positive attitudes towards animal welfare ( $P < 0.01$ ) and positive attitudes towards animal welfare were associated with consuming less meat and a greater frequency of 'higher welfare' meat purchases. Less than one fifth (18.4%) of the sample agreed that the impact of climate change could be reduced by consuming less meat, dairy products and eggs.

Human health and animal welfare are more common motivators to avoid eating red and processed meat than is environmental sustainability. Low red and processed meat purchasing behaviour is associated with concerns about animal welfare suggesting that animal welfare might therefore be an important motivator of behaviour and could be used in future campaigns to reduce meat consumption and promote health. Achieving environmental and nutritional sustainability will require coordinated action from a range of stakeholders, but understanding public attitudes is vital to help guide and adopt a more sustainable food supply.

Clonan A, Wilson P, Swift JA *et al* (2015) Red and processed meat consumption and purchasing behaviours and attitudes: impacts for human health, animal welfare and environmental sustainability. *Public Health Nutrition* doi: 10.1017/S1368980015000567.

## The effects of environmental enrichment and beak-trimming on feather pecking in laying hens



Feather pecking continues to present a problem in the egg industry and, as well as having an economical impact on the farmer, presents concerns for the welfare of the birds. Severe feather pecking involves forceful pecking at others, and the pulling out of feathers, which is likely to cause pain and injury and may turn to cannibalism and death of the target bird. This type of pecking is distinct from aggressive feather pecking, which is associated with dominance and the creation of social hierarchies. Gentle feather pecking involves the birds pecking at others without much force and resulting in no damage to the target bird, but it has not yet been determined if gentle feather pecking may act as a precursor to more extreme and severe feather pecking. Beak trimming has been used to reduce the damage caused by feather pecking between birds, but some countries have now either moved away from beak trimming birds or are indicating that this will be proposed in the near future. There is therefore a need to investigate the incidence



of severe feather pecking in laying hen flocks with or without beak trimming. In addition, it is important to assess if the provision of environmental enrichment in the form of foraging material may have an effect on the amount of feather pecking exhibited between birds.

This Australian study aimed to investigate whether beak trimming and environmental enrichment during the rearing period affects plumage damage in the laying period and to investigate the relationship between behaviour of the birds in the rearing period and plumage damage in the laying period. Treatments were applied in a 2 x 2 factorial arrangement and, during the rearing period, half of the birds obtained from a commercial hatchery were subjected to a beak trim at 1 day of age (with a follow up light trim at 11 weeks of age). Enrichment was provided to the treatment group of birds from 12 days of age in the form of pecking strings, whole oats sprinkled into the litter and a greater litter depth provided.

It was found that beak-trimmed birds performed less ground pecking ( $P=0.003$ ), less severe feather pecking ( $P=0.021$ ) and more gentle feather pecking ( $P=0.018$ ) than the non-beak-trimmed birds, and also had less feather damage in week 43 ( $P<0.001$ ). This indicates that gentle feather pecking when rearing is not related to the onset of severe feather pecking during the laying period. Higher rates of ground-pecking and severe feather pecking may be indicative of severe feather pecking later in life. This study showed no effect of enrichment on plumage damage. The results of this study support that beak trimming during the rearing period may be effective in reducing severe feather pecking later in life.

Hartcher KM, Tran KTN, Wilkinson SJ *et al* (2015) The effects of environmental enrichment and beak-trimming during the rearing period on subsequent feather damage due to feather-pecking in laying hens. *Poultry Science* **94**:852-859.

## Effect of an anti-gonadotrophin-releasing factor vaccine on sexual and aggressive behaviour in male pigs

Increasing the weight of entire male pigs at slaughter has been associated with frequent downgrading of carcasses due to the development of 'boar taint' (an unpleasant taste in the meat) and bruising and damage to the pig due to sexual and aggressive behaviour between male pigs. Surgical castration of pigs is not commonly performed in Australia. Current techniques to manage boar taint and the welfare implications of sexual maturity in pigs are limited to the use of immunocastration procedures.

This study examined the effectiveness of an anti-gonadotrophin-releasing factor (GnRF) vaccine, which acts to create an immune response against GnRF in male pigs, inhibiting testicular function, and consequently the testosterone-driven aggressive and sexual behaviours that they exhibit, under standard Australian conditions. Male pigs from four consecutive batches were randomly assigned to either a control untreated group ( $n=434$ ) or a treatment group ( $n=433$ ) at weaning and assigned to separate pens within an ecoshelter housing system typically used in Australia, where they remained until slaughter at 20-22 weeks of age. The treatment group received doses of the GnRF vaccine at 10 and 16 weeks of age.

It was found that the sexual and aggressive behaviours associated with testosterone production decreased significantly after the second vaccination, and the immunocastrated pigs showed significantly lower levels of sexual activity. The results support the

suggestion that the use of an anti-GnRF vaccination can be used as a management tool to improve the welfare of male pigs as they reach sexual maturity. The use of immunocastration tools allow Australian farmers to produce larger animals that remain free of boar taint while resolving the behavioural issues associated with keeping heavier male pigs until slaughter, improving their welfare.

Karaconji B, Lloyd B, Campbell N *et al* (2015) Effect of an anti-gonadotropin-releasing factor vaccine on sexual and aggressive behaviour in male pigs during the finishing period under Australian field conditions. *Australian Veterinary Journal* **93**(4):121-123.



## To be or not to be horned

In cattle, both male and female horned breeds have permanent horns which start to form during the first two months of life, and at around 6 months of age will become completely attached to the frontal sinuses and continue to grow throughout their life. To date, a large proportion of cattle is disbudded or dehorned, in many cases, without appropriate pain relief, raising a welfare issue. This review takes one step back and aims to examine the potential consequences of cattle having or not having horns; the consequences for the cattle themselves, but also for the farmer.

The review describes the function of horns and how they affect the quality and quantity of social relationships and interactions within a herd, and how cattle use their horns for reasons such as self grooming body regions that would otherwise be out of reach. The authors discuss how horns may have either negative or positive welfare effects, depending on the environmental conditions in which the cattle are housed. The authors then examine the current literature around pain and stress caused to the animal

when performing disbudding or dehorning, and the gaps in this literature that require further research. In relation to the impact that keeping different types of cattle have on the farmer, the authors discuss the different consequences to the farmer of owning horned and non-horned cattle. Farmers may choose to keep horned cattle for ethical reasons, but this does come with increased risk during handling of these animals. The farmer may be able to reduce the risk of injury by improving housing and management conditions and by maintaining a positive human-animal relationship, although keeping hornless cattle may prove to be advantageous economically.

The review concludes that it is an open question whether the removal of horns alters the social behaviour of animals, or whether the cattle adjust to the husbandry conditions that are insufficiently adapted to their species-specific needs.

Knierim U, Irrgang N, Roth BA (in press) To be or not to be horned – Consequences in cattle. *Livestock Science*.



## Risk factors affecting the development of vent pecking and cannibalism in hens

Vent pecking and cannibalism are both problematic behaviours that occur in the laying hen industry which affect animal welfare and have an economic cost to the farmer. They are particularly problematic in loose-housing systems where hens have access to a large number of other hens. Vent pecking is defined as a peck to the vent of a conspecific, whereas cannibalism is defined as pecking at the skin in areas other than the vent. With the ban on conventional cages in the UK in 2012, loose-housing systems are becoming more common, with 44% of eggs produced in the UK coming from free-range systems. With a ban on beak trimming scheduled for 2016, it is important to understand the causes of vent pecking and cannibalism, so as to better manage this problem.

This study investigated the development of vent pecking and cannibalism on 62 free-range, barn and organic farms (119 flocks of hens) in the UK. Flocks were visited when the hens were 25 and 40 weeks of age, the amount of vent pecking was recorded and the farmer was asked if they had observed cannibalism within their flocks. Management and environmental factors were also examined and analysed against the collected data.

It was found that vent pecking was apparent in 19.5% of flocks at 25 weeks and 29.9% of flocks at 40 weeks of age, and cannibalism was observed on 22.6% visits. Vent pecking was more likely to be observed in laying houses with more and/or longer pop holes and where feed was scattered on the floor. Providing more aerial perch length, or perches >0.5m in height was associated with increased risk of vent pecking. These results indicate that both vent pecking and cannibalism continue to be a problem for loose-housed laying hen systems in the UK, but by identifying several risk factors associated with vent pecking, this study contributes information towards finding practical management strategies that can be used on-farm to protect against these behaviours.

Lambton SL, Knowles TG, Yorke C *et al* (2015) The risk factors affecting the development of vent pecking and cannibalism in free-range and organic laying hens. *Animal Welfare* **24**:101-111.

## The impact of alternative light technology and broiler chicken stress

Light technology is of interest to the livestock industry due to the recent availability of high-efficiency alternative lamps and the potential to save on the energy costs associated with raising livestock. Incandescent lamps have been the industry standard (a glass globe with a glowing filament), however, these types of lamps are only able to convert 5% of the energy that they draw into light, and the remaining energy is wasted as heat. Alternative light technologies include light-emitting diodes (LEDs) and fluorescent lamps. LEDs have multiple individual light-emitting elements, and have difficulty in producing light in the green-yellow range at which chickens and humans have a peak in spectral sensitivity, and have been marketed as being more environmentally sustainable than other light sources as they do not contain mercury. Cold cathode fluorescent lamps (CCFLs) emit ultra-violet (UV) light, which is converted to visible light. They are more efficient and have a longer working life than incandescent lamps, but are less efficient and have a shorter life than LEDs.

It is not currently known how the emission of light from incandescent lamps, LEDs and CCFLs interact with the visual system on the broiler chicken, and how the bird's perception of this light affects stress, behaviour or growth. This study, performed in Delaware, aimed to assess this by using 672 broiler chickens raised to 6 weeks of age (42 days) under incandescent lamps (control), CCFL lamps or one of two different types of LED lamps. Birds were removed from each treatment group at days 7, 14, 35 and 42 to be weighed and analysed for H:L ratios (to measure stress levels).

It was found that birds raised under CCFLs had lower body weights than the control birds at day 42, and



higher H:L ratios indicating that these birds may have been chronically stressed. Birds raised under the two LED technologies had similar body weights to each other and to the incandescent lamps, although the levels of stress that the birds showed between the two LED lamps differed. Unfortunately, the paper fails to mention what the different LED treatments entailed. The study suggests that the use of CCFLs, while more energy efficient, may not be an ideal replacement for incandescent lamps, and attention to the type of lighting used in broiler housing can improve production performance, flock health and economic gain.

Rogers AG, Pritchett EM, Alphin RL *et al* (2015) II. Evaluation of the impact of alternative light technology on male broiler chicken stress. *Poultry Science* **94**:331-337.



## Australian Journal of Emergency Management Volume 30, Issue 2

Natural disasters such as fire or flood are not uncommon in the Australian landscape. This special edition of the AJEM is dedicated to the importance of including animals in all aspects of emergency planning, response and recovery.

Access the journal here.

<https://ajem.infoservices.com.au/items/AJEM-30-02>



## Dairy calves' preference for rearing substrate

Good management of dairy calves prior to weaning is essential to reduce stress and the risk of disease. The substrate on which they are reared is important as it can affect the behaviour, physiology and health of the calves. Straw, sawdust and wood shavings are commonly used as rearing substrates for calves, but there is a recent move away from these types of materials due to concerns about hygiene during use, lack of availability and labour and transportation costs, which affect the price of using these materials and the labour involved using them on farm. Therefore, there is a need to assess alternative substrates for rearing calves, which are economically viable for farmers, are readily available and provide an acceptable level of welfare.

This study, performed in Hamilton, New Zealand, used 24 calves aged between 3-8 days of age and aimed to 1) assess the preference of dairy calves for rubber chips, sand, sawdust or river stones as a substrate; and 2) investigate the effects that these different substrates had on the behaviour and physiology of the calves.

The authors tested 4 calves together and repeated the following consecutive testing periods six times to test the 24 calves: 1) an initial free choice for the calf

(access to all substrates); 2) restriction (access to only one substrate at a time for 2 days each); 3) pair-wise choice (access to two substrates at a time for 2 days); and 4) a final free choice (free access to all substrates for 2 days).

It was found that the calves spent more time on the sawdust when given free choice of substrates and they spent more time playing when on preferred substrates (calves will tend to spend more time playing when experiencing positive emotions). Their preference ranking for the different substrates was for sawdust, followed by rubber chip, sand and lastly river stones. When the calves were restricted to one surface at a time, they spent more time lying and running on sawdust and rubber in comparison to sand and stones. It is thought that the preference for sawdust may be due to its relatively soft physical structure and its ability to hold heat compared to the other offered substrates, and the results presented in this study indicate that it is the preferred substrate for calves during rearing.

Worth GM, Schütz KE, Stewart M *et al* (2015) Dairy calves' preference for rearing substrate. *Applied Animal Behaviour Science* **168**:1-9.



## WILD ANIMALS

### The effectiveness of the Birdsbesafe® anti-predation collar in reducing wildlife predation by pet cats

Many pet cats hunt wildlife. In some countries, steps have been taken to reduce predation of wildlife such as birds for example by keeping cats within the boundaries of the owner's property. However in Australia, many owners do not contain their cats. A new device, named the Birdsbesafe® cat collar (BBS) is a colourful ruff type collar around 50cm long and 5cm wide which slips over a standard cat collar to fit around the cat's neck. The BBS attempts to work on the basis that birds have very good colour vision and will more easily notice the cat approaching when it is wearing the colourful collar. Many reptiles and amphibians (but not mammals) also have good colour vision and may be warned of the cat's approach. This study aimed to assess the effectiveness of the BBS collar in reducing the amount of prey that cats brought back to their owner's homes.

Three different prints of BBS were trialled (yellow, red and rainbow) on 114 pet cats in suburban Australia and the owners surveyed about their experience using the BBS collar. In the first year, it was found that the capture of prey was reduced by 54% when wearing a BBS of any colour, with the rainbow and red BBS

being more effective in this regard than the yellow when the birds were prey (but not mammals). The second year focused on the use of the rainbow BBS alone and when the data from the rainbow BBS from both years was combined it was shown that there was a significant reduction (47%) in prey with good colour vision captured. 79% of owners reported that their cats had no problems with the BBS and another 17% reported that their cats adjusted within 2 days. 64% of owners using the red collar, 48% using the rainbow and 46% using the yellow believed it worked and 77% of all owners were planning to continue using the collar after the study had finished. The authors conclude that BBS therefore is an option for cat owners wishing to reduce the amount of predation of birds and lizards, but not mammals or large invertebrates.

Hall CM, Fontaine JB, Bryant KA *et al* (in press) Assessing the effectiveness of the Birdbesafe® anti-predation collar cover in reducing predation on wildlife by pet cats in Western Australia. *Applied Animal Behaviour Science*.

## TRANSPORTATION OF ANIMALS

### Loading and unloading pigs: Effects of bedding types, ramp angle and bedding moisture

Loading and unloading pigs for transport can cause stress, which, apart from the effects that this has on their welfare, if the pigs are being transported to slaughter, this can also affect pork quality and yield. Slipping and falling pigs on the ramp causes injuries and stress and pigs that fall and are unable to stand again, or die while loading or unloading, have a negative economic and animal welfare effect. Steep loading ramps can compromise well-being and guidelines in the United States suggest using ramps below 20 degrees to load and unload pigs, but do not provide guidance on material to be used on the ramp to encourage pigs to move on the ramp and to reduce slipping.

This study, performed in Texas, examined the effects of pigs (70-120kg) being loaded onto a truck using a ramp at three different angles (0, 10 or 20 degrees), with five different bedding types (nothing, sand, feed,

wood shavings or wheat straw hay), at two different moistures (dry or wet bedding) over two seasons (>23.9 °C summer, <23.9 °C winter). The pigs were observed during loading and unloading and all slips, falls and vocalisations recorded.

It was found that the use of bedding, moisture levels, season, and slope interacted to determine the total time to load and unload pigs. Heart rate and the total time to load and unload increased as the slope of the ramp increased. The study suggests that a number of factors should be taken into consideration when deciding on the most appropriate bedding to use for any loading or unloading process.

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## ANIMAL WELFARE SCIENCE UPDATE

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