



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.

COMPANION ANIMALS

Cat admissions to RSPCA shelters in Queensland

Unwanted cats are commonly admitted to animal shelters in large numbers where they may be euthanased. A lack of information limits understanding of the excess cat problem and the development of effective management strategies. There is an urgent need to better understand the cat population entering shelters.

A retrospective single cohort study was conducted using all cats arriving from 1 July 2006 to 31 June 2008 at 11 RSPCA Queensland shelters in Australia. The aim was to describe characteristics of the cats entering RSPCA QLD shelters and to identify risk factors for euthanasia. The study found that the number of reclaimed cats was very low.



54% of admissions were kittens under 3 months of age and almost half of these were surrendered, indicating that reducing the number of kittens born to owned cats as a result of delayed desexing is an important strategy to reduce shelter admission numbers. Increasing the prevalence of microchipping and other forms of identification may also assist to increase reclaim rates. However, management strategies that exclusively focus on owned cats will have limited impact. Further research is required to better understand the stray cat population in the community and how cats transition between owned, semi-owned and stray populations.

Alberthsen, C., Rand, J.S., Paterson, M. *et al.* (2013) Cat admissions to RSPCA shelters in Queensland, Australia: description of cats and risk factors for euthanasia after entry. *Australian Veterinary Journal*, **91**(1–2): 35–42.

Companion recognition in donkeys

Social pair-bonding and long-lasting preferences for an individual partner have been observed in a number of different species, but research examining these bonds has largely focused on motivations such as kinship and sexual attraction. The development of 'friendships' and close bonds between two individuals of the same species for other reasons has been less frequently examined. Anecdotal evidence has suggested that donkeys form strong pair bonds with other individual donkeys and will show behavioural signs of distress when separated from their companion.

This study examined the existence of pair bonding in donkeys. Two experiments were performed, the first involving watching 55 donkeys housed in groups and recording each donkeys 'preferred nearest neighbour' over 22 days. Donkeys showing pair-bonding in the first test were then placed in a Y maze and given the option to move towards their 'preferred nearest neighbour' or another familiar or unfamiliar donkey. Over two thirds of the donkeys showed a preference for being close to one other individual donkey and chose to move close to this preferred donkey in the Y maze test. In addition, both members of each pair bond were able



to individually recognise their companion and sought to be near them. Disruption of these pair-bonds could have consequences for the welfare of the donkeys and management practices that avoid separating domestic donkeys from their companion are likely to positively influence their welfare.

Murray, L.M.A., Byrne, K. & D'Eath, R.B. (2013) Pair-bonding and companion recognition in domestic donkeys, *Equus asinus*, *Applied Animal Behaviour Science* **143**: 67–74.

FARM ANIMALS

Do hens have friends?

Our understanding of the social life of animals is important to be able to maintain their welfare and allow them to adapt to the domestic environment successfully. Animals often exist in groups in the wild to help cope with predators or minimise aggression between individuals, and good relationships between individuals may help to reduce stress and enhance positive welfare. Hens have been shown to be able to recognise other flock-mates, but it has not yet been established if they have 'preferred' flock mates.

Hens were observed over eight weeks, to see where each individual spent the majority of its time in relation to other individuals and to assess which hens associated with each other most frequently. The study showed that hens do not appear to have other 'preferred' hens and had no preferred perching place in relation to other hens. The authors suggest further research to examine if this may be specific only to the experimental set up used in this study and to ultimately ensure that the social requirements of hens are met in captivity.

Abeyesinghe, S.M., Drewe, J.A., Asher, L. *et al.* (2013) Do hens have friends? *Applied Animal Behaviour Science*, **143**: 61–66.



The effects of immunocastration on aggressive and sexual behaviours in pigs

Boar taint, an odour in pork originating from uncastrated male pigs, is undesirable in the meat industry and, in many countries, pigs are surgically castrated to prevent this tainting of the meat. Castration of pigs is often performed without anaesthetic, which causes pain and distress and, for this reason, castration of pigs is not performed in the UK and intact males are slaughtered before reaching sexual maturity at a weight lower than that of castrated pigs slaughtered in Europe. Intact males show better growth rates and leaner carcasses at slaughter than non-intact males, but this rate of growth slows in the finishing phase. This slowing of the growth is thought to be due to the increased level of aggression and sexual behaviour seen between intact pigs towards the end of the finishing phase.

This study examined the effects of immunocastration using a vaccination against gonadotrophin releasing factor (GnRF) on the behaviour of intact male pigs. Immunocastration using this vaccination blocks the effects of GnRF, temporarily preventing further growth of the testicles in male pigs and preventing the occurrence of boar taint in the meat.



Analysis of the behaviour of immunocastrated pigs showed that the immunocastration reduced the occurrence of unwanted sexual and aggressive behaviours between intact males, but did not affect the activity levels of the pigs overall. Immunocastration using GnRF may have beneficial effects in reducing unwanted behaviours in pigs, and can be used to improve the welfare of the pigs throughout the growing period.

Brewster, V. & Nevel, A. (2013) Immunocastration with Improvac™ reduces aggressive and sexual behaviours in male pigs, *Applied Animal Behaviour Science*, **145**(1): 32–36.

Comparing attitudes of farmers and meatworkers towards animals

Examination of people's attitudes towards animals have, in the past, looked at a wide range of variables that may affect their feeling towards animals including gender, age, location, education and religion. However, the effect of occupation on a person's attitude towards animals has not been investigated in depth. Past research suggests that people employed in the primary industries may have a different view of animals than the general public, due to their close interaction with animals on a day-to-day basis. Two groups of people that are of particular interest to examine in regards to their attitudes towards animals are farmers and meatworkers, who both have a high level of contact with animals, but perform very different roles within the industry.

This study used a questionnaire presented to 41 farmers and 26 meatworkers in Queensland, Australia, to obtain information about their attitudes towards animals,

when compared to each other and compared to the general population. It was found that both farmers and meatworkers had lower scores than the general public when assessing their pro-welfare attitudes towards animals, but the attitudes of the people in the two groups did not differ significantly from each other. However, it was found that meatworkers, and in particular female meatworkers, have a higher tendency for aggressive feelings and behaviours than farmers or the general public. The study suggests that females may be at particular risk for emotional and psychological harm while being employed at meatworks and more research is required to investigate this further.

Richards, E., Signal, T. & Taylor, N. (2012) A different cut? Comparing attitudes towards animals and propensity for aggression within two primary industry cohorts – farmers and meatworkers, *Society & Animals*, DOI:10.1163/15685306-12341284.

Welfare of laying hens in conventional cages and alternative systems

Conventional cages are recognised as having a detrimental effect on the welfare of laying hens, due to the behavioural restrictions they place on the birds. This has led to the banning of this type of housing system for laying hens in many countries. Conventional cages have been used extensively in the past as they are seen to provide good hygiene levels, good environmental control and small groups of hens can be housed together. Qualitative studies of laying hens in different systems have assessed and provided conclusions about the advantages and disadvantages of the different housing systems, but these studies can be open to subjectivity. The use of other quantitative numerical techniques may be able to provide objective results in complex areas such as these and provide another tool on which to base conclusions.



This study used a quantitative approach to examine the behaviour, physical condition, physiology and production levels of birds from different housing systems using information obtained from 35 studies published since 1974. It was found that although production was higher in hens housed in conventional cages, comfort behaviour was higher and feather condition better in alternative systems, including furnished cages. This quantitative study found that the chance of a mortality outbreak may be no greater in alternative systems than in conventional cages. The authors suggest that the often reported high incidence of mortality in alternative systems may indicate the magnitude of the problem once such outbreaks occur.

Freire, R. & Cowling, A. (2013) The welfare of laying hens in conventional cages and alternative systems: first steps towards a quantitative comparison, *Animal Welfare*, 22: 57–65.

Effects of open water sources on the health and production of ducks

Ducks are increasingly raised for meat due to their ability to adapt to a wide range of environmental conditions and their resistance to some common poultry diseases and ailments. One of the most common ducks used for this purpose is the Pekin duck (*Anas platyrhynchos*). These ducks are reared in different systems from traditional farms with a pond to intensive indoor commercial systems. Evidence exists that open water is beneficial to the welfare of ducks, in particular for eye and nostril condition and plumage hygiene and European countries recommend that farmed ducks be provided with water in which they can dip their heads and spread it over their wings. However, the presence of water in commercial facilities can also have a negative impact on hygiene and in turn, on the birds health, and at the present time there are no legal requirements for duck producers to provide open water facilities.



This study examined 23 commercial flocks of birds provided with either narrow (15 cm wide and 8 cm deep), intermediate (20 cm wide and 12 cm deep) or wide (50 cm wide and 8 cm deep) troughs and examined the effect that these troughs had on the health of the birds. It was found that no differences were apparent in the health of the birds except in foot condition, with intermediate troughs being better for foot condition of the birds than the wide troughs, with narrow troughs being intermediate. No effects of eye, nostril or plumage condition were found, presumably because all ducks had access to water in which they could dip their heads to maintain their health, and welfare was considered to be good in all systems overall. The study showed that the provision of water helped to maintain the health and welfare of ducks and did not affect productivity, but the importance of maintaining water quality in the troughs to ensure hygiene is also accentuated and discussed.

Liste, G., Kirkden, R.D. & Broom, D.M. (2012) A commercial trial evaluating three open water sources for farmed ducks: effects on health and production, *British Poultry Science*, 53(5): 576–584.

Robot-cow relationships in dairy farming

New technology is now available in the form of robotic milking machines with the manufacturers claim that they can significantly reduce the labour involved in dairy farming. They are designed to allow a cow to be milked whenever it chooses to be milked, providing health and welfare benefits for the cow, and taking away the responsibility from the farmer to milk his cows twice each day. Each cow in the herd wears a radio tag which can be read by the milking machine and, using this technology the automated system can store and provide a wealth of information about each individual cow, its health and productivity.

This paper examines a range of opinions towards milking machines from farmers who have installed these machines into their dairy farms, and examines the relationships between the farmers and cows in this environment. The perceived advantages and disadvantages of these machines are presented and discussed. The paper then examines the issues involved in the development of animal-technology relationships and changes in handler-animal relationships as a result of the installation of robotic equipment. Robotic equipment is likely to be increasingly installed in dairy farms in future and so, to maintain animal welfare

in these systems, it is important to understand the changing relationships between man, cow and robot in this new environment.



Holloway, L., Bear, C. & Wilkinson, K. (in press) Re-capturing bovine life: Robot-cow relationships, freedom and control in dairy farming, *Journal of Rural Studies*.

Effects of enrichment materials on the behaviour of pigs

The behavioural repertoire of domestic pigs is similar to that of wild boar. Pigs in the wild spend a large proportion of their day rooting, grazing and exploring their surroundings. In intensive housing conditions, feeding is restricted to short bouts as food is presented by the handler, and so the motivation to feed and explore continues to be strong in pigs after consuming feed in these systems. A lack of enrichment can also lead to the development of abnormal behaviour including tail- and ear-biting or belly-nosing.



This study examined the effects of adding different types of litter on the behaviour of finishing pigs either provided with food continually or fed restrictively. The addition of cut straw containing maize kernels, offered as litter in the pen, was found to increase the amount of exploratory behaviour in pigs as did the provision of a straw pellet dispenser. Pigs fed restrictively used both of these items more than twice as much as those pigs provided with food continually throughout the day. This study shows that the provision of enrichment is

beneficial for pigs in intensive housing systems. The use of straw is advantageous for this purpose as it encourages exploratory behaviour, is relatively inexpensive, is practical for the farmer to use and can have positive effects on the pigs over a long time period. The addition of enrichment materials for pigs can encourage them to perform more natural species-specific behaviours and have a beneficial effect on their welfare.

Zwicker, B., Gyga, L., Wechsler, B. *et al.* (2013) Short- and long-term effects of eight enrichment materials on the behaviour of finishing pigs fed ad libitum or restrictively, *Applied Animal Behaviour Science*, **144**: 31–38.

RESEARCH ANIMALS

Prolonged pain research in mice and application of the 3Rs

The use of animals in pain experiments is an area of welfare concern. Animals are subjected to pain-inducing procedures, for progressing medical advances for example, and pain relief is often withheld as part of the experimental design. There has been a dramatic increase in the use of mice in pain experiments over the last several decades. To maximise the welfare of mice used in these experiments it is important that the 3Rs principles are incorporated into procedures wherever possible. The 3Rs framework seeks to i) **Reduce** the use of animals in experimental procedures, ii) **Replace** the use of animals with other non-animal methods and iii) **Refine** experimental technique to minimise pain and suffering.

A global review of published papers was performed to examine the use of mice in studies in which they were subjected to prolonged pain of 14 days or more. It was found that there has been an increase in the number of mouse pain studies over the last 15 years. The use of transgenic mice has risen over the last decade, although the proportion of studies using these mice has not risen, suggesting that the increase in transgenic mouse use is not purely because of a larger number of these mice being available. The authors found no decrease in the number of mice used in each study, suggesting that one of the 3Rs, Reduction, is not being implemented. The authors also found that the 3Rs were not mentioned in a random selection of 55 papers on prolonged pain in mice. The results suggest that researchers conducting prolonged pain studies are unaware of, or are choosing not to implement, the 3Rs framework into their research. This has serious implications for the welfare of mice used in prolonged pain studies.

Balcombe, J., Ferdowsian, H. & Brise, L. (2013) Prolonged pain research in mice: Trends in reference to the 3Rs, *Journal of Applied Animal Welfare Science*, **16**: 77–95.

Playful handling as social enrichment for laboratory rats

Rats are highly social animals and housing in groups with conspecifics is recommended in the laboratory setting. However, individual housing of rats is often required during experiments due to research constraints such as monitoring of food and water intake or medical issues. This can have a detrimental effect on the welfare of the rats and individual housed rats have been shown to display an increased stress response to husbandry procedures as well as displaying abnormal social skills with conspecifics.

This study examined the effectiveness of playful handling to mimic the rough-and-tumble behaviour of rats, in order to see if this would reduce stress in laboratory rats. Rats were tickled for 2 minutes per day for 3 weeks, and compared to rats that were not tickled. It was found that the tickled rats emitted 50-kHz ultrasonic vocalisations prior to tickling, which was interpreted as the rats showing pleasure in expectation of the tickling bout. This effect lasted for 4 weeks after

the tickling bouts had ceased. In addition, the tickled rats showed a lower amount of anxiety in open maze tests. The beneficial effect of tickling was particularly strong for individually housed rats. The authors suggest that tickling could partially compensate for social interaction with cage mates during short term isolation and have beneficial effects for the welfare of the rats.



Cloutier, S., Baker, C., Wahl, K. *et al.* (2013) Playful handling as social enrichment for individually- and group-housed laboratory rats, *Applied Animal Behaviour Science*, **143**: 85–95.

Breeding performance in nude mice with and without nesting material

In laboratories, mice are housed at ambient temperatures between 20 and 24°C, which is below their lower critical temperature of 30°C, but comfortable for human workers. Therefore mice are under constant thermal stress and will expend a great amount of energy in order to keep warm. This can have an effect on the young that they produce because, if they are using energy to keep warm, a smaller amount of energy is available to produce many healthy young. In addition, mice pups are at particular risk of heat loss as their small bodies cannot yet control their internal temperature effectively. Nude mice, which don't have hair on their bodies to allow them to keep warm, may be at greater risk than furred mice in a normal laboratory setting.

Groups of nude mice were housed in two different ways; either with bedding only for six months or with bedding and nesting material. It was found that the mice provided with nesting material built nests in order to keep warm and produced more pups which were of a greater weight. The authors suggest that the energy that they usually used to maintain their body temperature in the absence of a nest was instead used to produce more and heavier young. The study suggests that the provision of nesting material in the home cage of nude mice can help to prevent thermal stress and improve their reproductive performance and welfare of the young.



Gaskill, B.N., Winnicker, C., Garner, J.P. *et al.* (2013) The naked truth: Breeding performance in nude mice with and without nesting material, *Applied Animal Behaviour Science*, **143**: 110–116.

Environmental enrichment for the captive African clawed frog

The African clawed frog (*Xenopus laevis*) has been extensively used in teaching and biomedical research. Recognition of stress and ill health in this species is important to firstly ensure the welfare of the frogs in the laboratory and that valid conclusions are obtained from research. There is a growing amount of evidence that the provision of environmental enrichment can limit fighting and cannibalism in this species as well as improve health, reproductive success and welfare.

This paper reviews the biology, behaviour and natural habitat of the African clawed frog and provides an overview of how this species detects food and predators, how it moves around its environment, how it reproduces and the defence reactions initiated in response to predators and stress. The authors suggest the formation and maintenance of stable groups to reduce fighting, injury and aggression and the provision of cover and refuge in the tanks, such as rocks or pipes, to enable frogs to hide from other frogs or perceived predators when required. The authors also suggest feeding strategies to reduce injuries resulting from competition for food. The incorporation of these techniques into the general husbandry for these frogs in a laboratory environment can reduce stress and contribute to their physical health.



Chum, H., Felt, S., Garner, J. *et al.* (2013) Biology, behaviour and environmental enrichment for the captive African clawed frog (*Xenopus spp*), *Applied Animal Behaviour Science*, **143**: 150–156.

WILD ANIMALS

Examining the effectiveness of road-crossing mitigation for squirrel gliders

Road construction can threaten wildlife populations by fragmenting habitat, reducing gene flow and increasing traffic roadkill. The construction of wildlife crossing structures, or mitigation structures, aim to reduce this impact by providing a safe passage for wildlife across the road. Mitigation structures may take the form of canopy bridges, glider poles or retaining tall trees in the road median, but the effectiveness of these structures has not been examined in many cases. It is important to examine these structures to see how effective they are in providing a safe crossing for wildlife in roadside populations to ensure that successful methods are adopted and less successful ones, not repeated.



The effectiveness of mitigation techniques for squirrel glider movement across a freeway in south-east Australia was investigated. Squirrel gliders were monitored using motion-triggered cameras and transponder scanners. It was found that squirrel gliders of both sexes and all ages used both the provided canopy bridges and glider poles to cross the freeway, while the unmitigated freeway remained a barrier to movement. However, movement was not restored to the levels observed at non-freeway sites suggesting that the noise of the traffic on the freeway created disturbance that discouraged the squirrel gliders to move across the road. Nevertheless, based on the number and frequency of individuals crossing, mitigation is likely to provide some level of functional connectivity. The rate of crossing increased over several years as animals habituated to the structure. Crossing rate can be a misleading indicator of effectiveness if the number of individuals crossing is not identified. Long term studies investigating the number of individuals using the mitigation structures are required to determine if these techniques are sufficient to restore gene flow and improve survival rates in roadside populations.

Soanes, K., Carmody Lobo, M., Vesk, P.A. *et al.* (2013) Movement re-established but not restored: Inferring the effectiveness of road-crossing mitigation for a gliding mammal by monitoring use, *Biological Conservation*, 159: 434–441.

Capture techniques to reduce capture myopathy in the Tasmanian pademelon

Currently, the world is experiencing a human-induced loss of biodiversity known as the sixth great extinction, driven primarily by habitat modification, climate change and invasive species introductions. Tasmania is one example of a place where human activities are affecting wildlife. The Tasmania pademelon (*Thylogale billardierii*), native to Tasmania, is one species that is in direct competition with humans for resources, and as a result pademelon numbers are managed using lethal and non-lethal control methods. More information about the biology of the pademelon is needed in order to best manage this species in the wild, requiring capture of the pademelon to examine its diet, physiology and habitat use. Current regulatory requirements around the capture of pademelons, however, can result in a number of individuals developing capture myopathy, a potentially fatal disorder resulting from physiological imbalances related to stress.

Nineteen wild caught pademelons were caught in Tasmania and restrained to fit GPS collars. From these, three pademelons developed capture myopathy and subsequently died. The authors suggest that the regulatory requirements for capture of pademelons are not adequate for this species and suggest that additional efforts should be made to reduce the onset of capture myopathy, such as the administration of a short-term sedative. The authors suggest further research is carried out to investigate capture techniques that will maintain the welfare of the pademelon whilst performing work to obtain more information about the biology of this species.

McMahon, C.R., Wiggins, N.L., French, V. *et al.* (2013) A report of capture myopathy in the Tasmanian pademelon (*Thylogale billardierii*), *Animal Welfare*, 22: 1–4.

TRANSPORTATION OF ANIMALS

The welfare of livestock transported by ship

Live animal export is a growing industry, with Australia being the leading exporting country, sending over 2.5 million animals overseas in 2011. Livestock are exported by ship, both as breeding animals and for slaughter, however, the long distance transport of animals by ship poses a number of animal welfare challenges. Animals are subjected to a changes in diet, high stocking densities and novel social groups, microclimates and housing facilities. These can all have significant effects on the welfare of the stock and mortality levels on board ship are higher than those which would occur should the animals be exposed to the same length of journey on land.

This paper provides an overview of the challenges associated with long distance sea transport of cattle, sheep and goats and discusses the processes of loading and unloading, stocking density, management of heat stress, exposure to elevated ammonia levels,

high noise levels, changes in photoperiod and the refusal of a number of sheep and goats to eat on board ship. The paper reviews the current scientific evidence that is available supporting a number of the current management practices used while exporting livestock on ships and indicates where there are gaps in our knowledge. The paper also highlights potential methods for monitoring animal welfare on board to reduce mortality. Although some aspects of the welfare of livestock being transported by sea can be improved by increasing our knowledge about the activities involved and implementing these in management systems used on board, the live export of animals by sea will remain a highly stressful activity which poses great risks to livestock, especially those being transported over long distances.

Phillips, C.J.C. & Santurtun, E. (in press) The welfare of livestock transported by ship, *The Veterinary Journal*.

Behavioural expression of cattle during different transport conditions

Transporting animals is known to cause stress and much research is aimed at reducing mortality and bruising in livestock destined for slaughter, which results in low quality meat. However, there remains a need to develop simple methods to assess the welfare of animals during transport in industry situations. Examining animal welfare using physiological measurements has been used while transporting animals in the past, but has limitations as it is invasive, which may make obtaining reliable measurements difficult, and it can be difficult to use under industry conditions. Examining the behaviour of animals during transport may be a cheap and flexible alternative and provide reliable data on which to make recommendations to improve the welfare of transported animals.



The method of qualitative behavioural assessment was used to assess the welfare of cattle during transport in different conditions; using grip or non-grip flooring and using either continuous driving or a start-stop driving technique. Qualitative behavioural assessment requires people to write down words indicating how they believe that the animals are feeling while watching the animal's behaviour on videotape. It was found that people who have very different backgrounds and experience came to similar conclusions when asked to describe the behaviour that the cattle displayed while being transported in each condition. The observers were also able to recognise in which treatment the cattle were being transported in by looking at their behaviour on the videotape and it was found that the behaviour also correlated with a physiological assessment of the cattle during transport. This study showed that qualitative behavioural expression is likely to be a useful method of examining the welfare of cattle during transport, and could be implemented within the transport industries for a variety of purposes.

Stockman, C.A., Collins, T., Barnes, A.L. *et al.* (2013) Flooring and driving conditions during road transport influence the behavioural expression of cattle, *Applied Animal Behaviour Science*, **143**: 18–30.

HUMANE KILLING

Multistage CO₂ gas stunning of broilers

The stunning of animals prior to slaughter remains one of the areas of focus for animal welfare improvements and is under constant scrutiny. Broiler chickens have traditionally been slaughtered using an electrical water bath, and although alternative electrical stunning methods are being developed, these still rely on the handling and shackling of live and conscious birds, which is detrimental to the bird's welfare. A practical alternative to these methods is the use of controlled-atmosphere stunning. A two-phased gas system using carbon dioxide (CO₂) firstly bring the birds to narcosis with a low concentration of CO₂ (<40%) mixed with O₂ to reduce distress in the birds. The second phase uses an increased amount of CO₂ (up to 80%) to cause unconsciousness in the birds, after which death is ensured by cutting the arteries in the neck.

This study examined the use of this phased technique for stunning birds and, using a similar gradual increase in CO₂ to stun the birds, compared the use of a 5-stage incremental CO₂ scheme lasting 6 minutes against a 4-stage incremental CO₂ scheme lasting 4 minutes.

Birds entering the multistage gas stunning system were stunned in their handling containers, and were therefore not required to be handled. It was found that stunning conditions were stable and affected all birds uniformly throughout the container. The birds still showed some signs of discomfort while unconsciousness was being induced in the chamber, although the 5-stage technique was thought to induce less distress than the 4-stage technique. However, in comparison to alternative systems requiring handling of fully conscious birds, controlled-atmosphere stunning techniques have distinct advantages for bird welfare.



Gerritzen, M.A., Reimert, H.G.M., Hindle, V.A. *et al.* (2012) Multistage carbon dioxide gas stunning of broilers, *Poultry Science*, **92**: 41–50.

MISCELLANEOUS

Public attitudes towards grief in animals

Animals in a range of management systems are separated from conspecifics or their mothers as part of their husbandry system, which may have a negative effect on them physiologically and emotionally and affect their welfare. It is not known if animals experience grief in the same way as humans do, but the physiological changes that an animal experiences when undergoing separation from those with which it has formed social bonds, could affect its ability to cope with survival situations, impair growth and reproduction and increase its risk of disease. Although these effects are recognised in modern husbandry systems, improvements in animal welfare can only occur if the general public are aware of current practices and science and choose to be the driving force behind initiating change in animal management systems.

This study used a questionnaire to examine the attitudes of 1000 members of the general public to grief in animals. The survey showed that there was a strong public belief that animals can experience grief. The animals which the public believed were most likely to experience grief were dog>chimpanzee>dolphin>elephant>cat. It was thought that these animals were placed highly in the survey due to them being popular companion animals with which people share their lives and home, or animals which the public have learned are highly intelligent as a result of this being presented in the media. Over 70% of people believed that pigs and cows can experience grief and women were more likely to believe that all animals grieve than were men. The findings that most people believe that animals can grieve which may suggest that, if education is provided to the public on management issues in which animals may undergo separation stress, there is potential for an increased demand by the public for maintaining social structures in management systems, resulting in better welfare standards.

McGrath, N., Walker, J., Nilsson, D. *et al.* (2013) Public attitudes towards grief in animals, *Animal Welfare*, **22**: 33–47.

Using visual media to investigate animal behaviour

People enjoy watching the behaviour of animals that they don't see in their day-to-day life and wildlife films remain popular viewing. The behaviour that is captured on wildlife films can be that from animals that are seen rarely and live in parts of the world that may be hard to reach and so cannot be accessed or seen readily in animals. Occasionally, behaviour is captured that has not been filmed before. Is there the opportunity to use this recorded behaviour within the discipline of animal behaviour to further analyse and understand the behaviour of a vast array of animals?

This paper discusses the advantages and disadvantages of using visual media in this way and looks at the use of this media to examine i) play behaviour in dogs interacting with other species, ii) play behaviour in horses and iii) animal responses to stimuli presented on iPads, Ipods and iPhones. The study shows that visual media, particularly that media that has not been edited or manipulated, can be used to look at animal behaviour in this way and may provide insights into animal behaviour far beyond that of more structured experimental settings.



Nelson, X.J. & Fijn, N. (2013) The use of visual media as a tool for investigating animal behaviour, *Animal Behaviour*, 525–536.

ARTICLES OF INTEREST

COMPANION ANIMALS

Bloom, T. & Friedman, H. (in press) Classifying dogs' (*Canis familiaris*) facial expressions from photographs, *Behavioural Processes*.

Farnworth, M.J., Adams, N.J., Seksel, K. *et al.* (in press) Veterinary attitudes towards pre-pubertal gonadectomy of cats: a comparison of samples from New Zealand, Australia and the United Kingdom, *New Zealand Veterinary Journal*.

Yates, D., Yeates, J. & Roberts M. (2013) Optimum age for neutering cats, *Veterinary Record*, **172**: 53–54.

FARM ANIMALS

Cattle

Andreasen, S.N., Wemelsfelder, F., Sandøe, P. *et al.* (2013) The correlation of Qualitative Behavior Assessments with Welfare Quality® protocol outcomes in on-farm welfare assessment of dairy cattle, *Applied Animal Behaviour Science*, **143**(1): 9–17.

Barrier, A.C., Haskell, M.J., Birch, S. *et al.* (2013) The impact of dystocia on dairy calf health, welfare, performance and survival, *Veterinary Journal*, **195**(1): 86–90.

Becker, J., Reist, M., Friedli, K. *et al.* (in press) Current attitudes of bovine practitioners, claw-trimmers and farmers in Switzerland to pain and painful interventions in the feet in dairy cattle, *The Veterinary Journal*.

Boyle, A.R., Ferris, C.P. & O'Connell, N.E. (2013) Does housing nulliparous dairy cows with multiparous animals prior to calving influence welfare- and production-related parameters after calving? *Applied Animal Behaviour Science*, **143**(1): 1–8.

de Vries, M., Engel, B., den Uijl, I. *et al.* (2013) Assessment time of the Welfare Quality protocol for dairy cattle, *Animal Welfare*, **22**(1): 85–93.

Sibley, R.J. (2013) Lameness in dairy cows: the developing story, *Veterinary Record*, **172**(4): 92–95.

Stehulová, I., Špinková, M., Šárová, R. *et al.* (2013) Maternal behaviour in beef cows is individually consistent and sensitive to cow body condition, calf sex and weight, *Applied Animal Behaviour Science*, **144**(3–4): 89–97.

Pigs

Aluwé, M., Langendries, K.C.M., Bekaert, K.M. *et al.* (in press) Effect of surgical castration, immunocastration and chicory-diet on the meat quality and palatability of boars, *Meat Science*.

Bekaert, K.M., Aluwé, M., Vanhaecke, L. *et al.* (2013) Evaluation of different heating methods for the detection of boar taint by means of the human nose, *Meat Science*, **94**(1): 125–132.

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