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ANIMAL WELFARE SCIENCE UPDATE

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

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INCLUDED IN THIS UPDATE

COMPANION ANIMALS

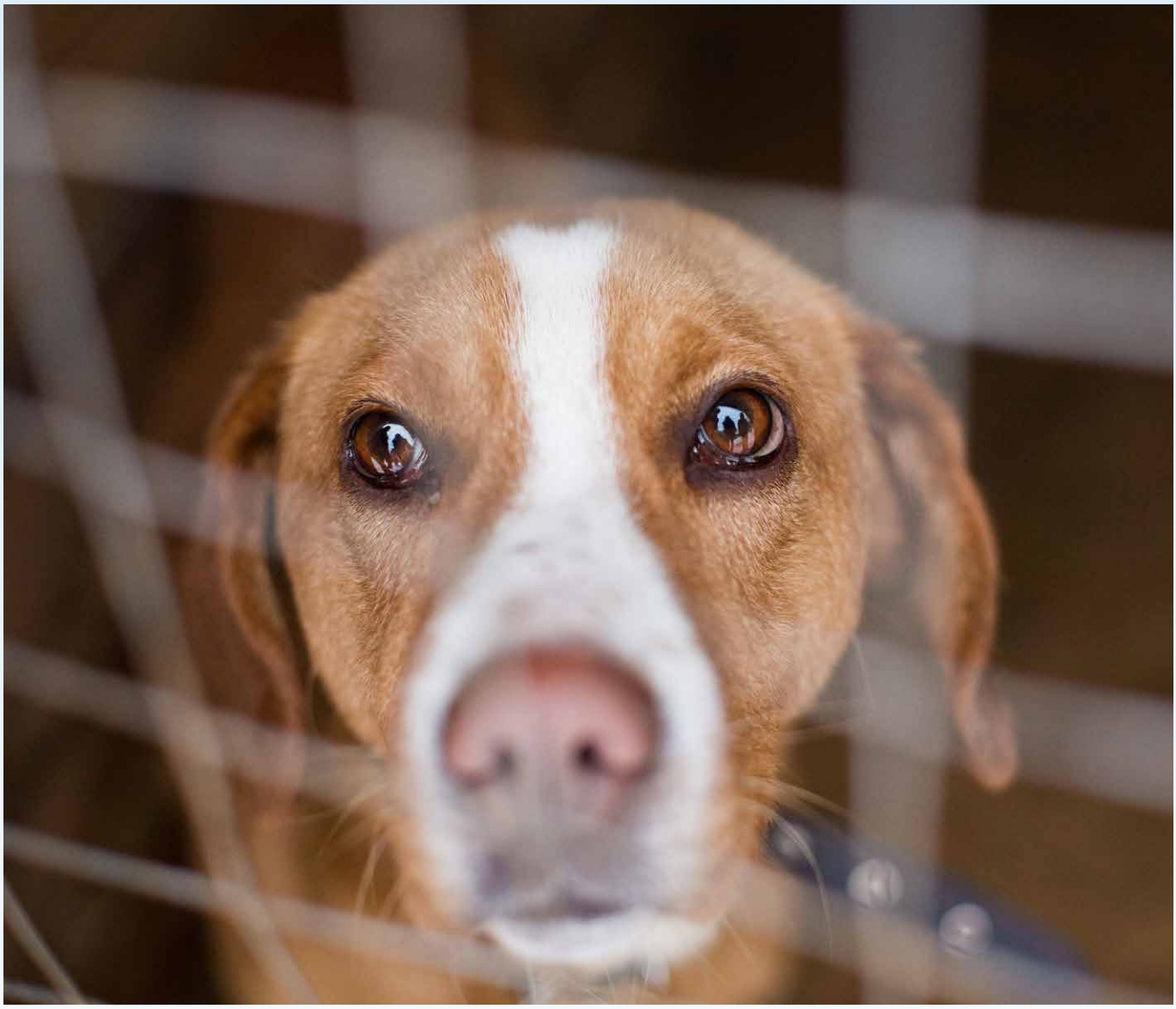
Some pet guinea pigs in New Zealand have limited access to space

Guinea pigs are popular pets. An estimated 32,000 households keep guinea pigs in New Zealand alone. Little is known about how these guinea pigs are being housed.

This study surveyed owners (n=330) to investigate how guinea pigs are being housed in New Zealand. The online survey asked respondents to provide information about their guinea pigs, such as whether they were housed alone or together, and enclosure location and size.

Survey results indicated that guinea pigs in New Zealand are mainly housed in groups of two or more individuals. Almost equal percentages are kept outdoors (29.2%) as indoors (27.1%). They are most commonly housed in hutches or cages with attached runs, or indoors with their own area of the house. On average, enclosures measure 3.3m^2, and almost 60% of owners give their guinea pigs time outside their enclosure every day. However, a third of owners provide less space per pig than recommended by the Royal New Zealand Society for the Protection of Animals (RNZSPCA). The RNZSPCA recommends providing 0.7 m^2 for one guinea pig, 1 m^2 for two guinea pigs and 1.2 m^2 for three guinea pigs. While the sample of owners may not be representative of all guinea pig owners, the authors recommend a mandatory Code of Welfare to ensure adequate housing for guinea pigs. Further investigations are required to understand how different housing characteristics affect guinea pig welfare.

Cameron KE, Holder HE, Connor RL (2022) Cross-sectional survey of housing for pet guinea pigs (Cavia porcellus) in New Zealand. New Zealand Veterinary Journal 70(4):228-232.



Behaviour modification and enrichment can help fearful dogs in rescue shelters

Dogs in rescue shelters, particularly those who have a history of abuse and neglect, can be fearful of kennelling, handling, and interacting with dogs and people. Rehabilitating fearful dogs in rescue shelters is challenging.

This study, conducted in the United States, evaluated whether standardised behaviour modification and enrichment could be used to treat fearful dogs (n=441). These dogs, most of whom had experienced cruelty or neglect, were so fearful that it was preventing placement in adoptive homes. Three main types of behaviour modification were tested, including handling, leash walking, and socialisation with people. Different types of enrichment (e.g., stuffed animals, ropes, puzzle toys, scents) were provided four times a day. Treatment outcomes were evaluated via behaviour scoring, assessment against graduation guidelines, the proportion of dogs adopted, and adopter satisfaction.

After the treatment program, the majority (99%) of dogs were adopted and 88% of adopters reported they were *"very satisfied"*. The dogs showed significant improvements in behaviour scoring and grades at graduation. Graduating dogs spent an average of 96 days in the treatment program. While it requires some investment of time and resources, behaviour modification and enrichment appear to improve outcomes for fearful dogs in rescue shelters.

Collins K, Miller K, Zverina L et al (2022) ***Behavioural rehabilitation of extremely fearful dogs: Report on the efficacy of a treatment protocol.*** *Applied Animal Behaviour Science 254, 105689.*

Play time can strengthen human-animal bonds

Humans and cats commonly interact through play. Play can facilitate healthy communication, physical and social development, and good animal welfare.

This study aimed to characterise human and cat play. Cat guardians (n=1591) from 55 countries completed an online survey. Guardians were asked 107 questions about their cat's health, activity level, total daily time spent playing with their cats, and factors that affect play sessions. An adult playfulness trait scale (APTS) was used to assess the guardians' propensity to play with their cat. A cat owner relationship scale (CORS) was calculated to measure the closeness of the relationship between guardians and their cats.

Guardians reported playing with their cats from 0 to 150 minutes daily (median 45 minutes). Factors that affected amount of play time included APTS, guardians being too tired or busy with other tasks, fear of the cat becoming too excitable or aggressive, and the health of guardians and cats. Play time tended to be longer when the guardians and cats were younger, and when cats were housed exclusively indoors. More play time increased CORS, confirming that play can be used to strengthen human-animal bonds.

Henning JSL, Nielsen T, Fernandez E et al (2022) Factors associated with play behaviour in human-cat dyads. Journal of Veterinary Behavior 52-53:21-30.

Australian veterinarians recognise behavioural problems as animal welfare issues

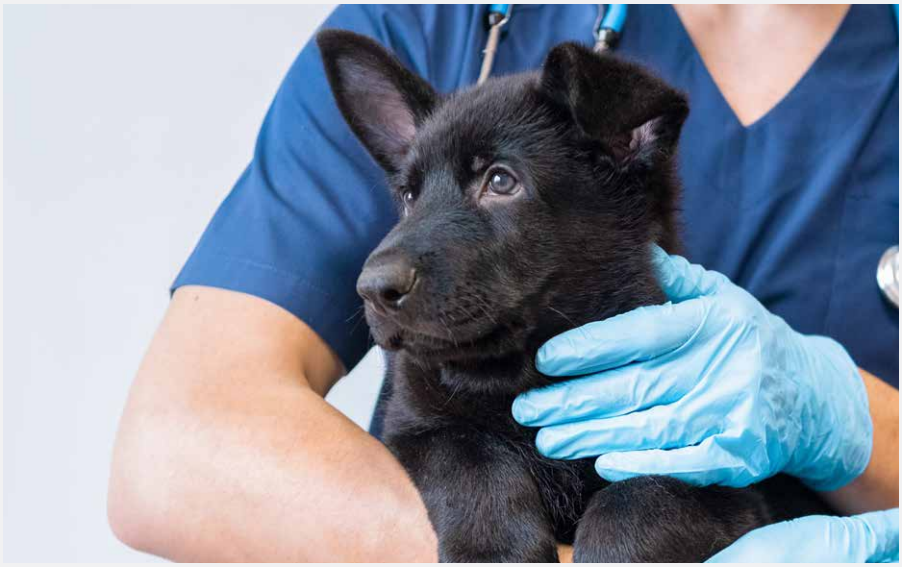
Behavioural problems, such as fear, anxiety and aggression, can negatively affect animal health and welfare. The beliefs and attitudes of consulting veterinarians can affect the way behavioural problems are managed.

This study aimed to characterise how veterinarians in Victoria view behavioural pathologies in cats and dogs. Small animal veterinarians in private practice (n=59) were surveyed to collect data on vets' demographics, how often they discuss behaviour problems with clients, and their perspective on behavioural medicine.

The majority (80%) of respondents recognised behavioural problems as an animal welfare issue and felt that veterinarians should 'absolutely' be able to identify behavioural problems. Behavioural problems were more likely to be viewed as significant animal welfare concerns by more experienced veterinarians and veterinarians with experience working in rescue shelters.

However, many respondents (>60%) felt that they do not have the time to discuss behavioural problems during a 15-minute consultation, and the majority (80%) felt that they were 'poorly' or 'extremely poorly' equipped to deal with behaviour problems. The authors recommend greater education in behavioural medicine to better equip veterinarians to address behavioural problems in cats and dogs.

Hevern ME (2022) ***Welfare worries: a preliminary, cross-sectional study of general practice, small animal veterinarians' perceptions and management of canine and feline behaviour problems.*** *Australian Veterinary Journal 100(8):377-387.*



Dogs benefit from different types of environmental enrichment

Environmental enrichment (EE), the provision of extra stimulation and activities, can help promote good animal welfare by reducing stress and improving psychological health.

This pilot study, conducted in the United Kingdom, trialled seven types of EE for 10 dogs training to be assistance dogs: (1) bonding, (2) a bubble machine, (3) play with a familiar dog, (4) an interactive toy, (5) a toy stuffed with food, (6) a playhouse with tunnels, slides and platforms, and (7) tug of war. Over a period of eight weeks, dogs were exposed to 15-minute sessions of each of the seven types of EE. Dog behaviour was evaluated before and after EE. Behavioural observations were grouped into six categories: maintenance, play, movement, relaxation, alertness and stress.

Overall, EE increased relaxation behaviours and reduced stress behaviours. Dogs had different behavioural reactions to different types of EE, suggesting that a variety of activities allowed them to express a variety of behaviours. For example, relaxation behavioural change was more significant following bonding, the bubble machine and forms of play compared to toys.

Play with a familiar dog and the playhouse appeared to have the greatest overall benefit compared to other types of EE. The authors recommend further investigations into the specific welfare benefits of different types of EE.

Hunt RL, Whiteside H, Prankel S (2022) ***Effects of environmental enrichment on dog behaviour: Pilot study.*** *Animals 12, 141.*

Previously hoarded cats can be successfully adopted

Animal hoarding, the accumulation of a number of animals and failure to care for them adequately, is a risk to animals' physical and behavioural health. Cats are a commonly hoarded species yet little information is available about the impact of hoarding on cats' behavioural health.

This study, conducted in Canada, aimed to characterise the behaviour of cats rescued from hoarding situations. Case records from the Toronto Humane Society from 2011 to 2014, were analysed. Records included behavioural assessments and post-adoption survey responses for 195 previously hoarded cats and 2662 non-hoarded cats.

At intake, over half of the previously hoarded cats were scored as 'friendly', and of the cats who had intake scores, the majority were described as 'super-social' or 'social' in the shelter. Most of the hoarded cats (174/195) were adopted. While it took cats some time to warm up to their new homes, of 43 adopters who used feelings-based language in their post-adoption surveys, 42/43 expressed positive feelings about their cat. Some cats displayed behaviours such as excessive vocalisation, needy behaviour and food anxiety, but it is unknown how much of these behaviours link to being previously hoarded. Overall, the results indicate that hoarded cats can be successfully adopted.

Jacobson LS, Ellis JJ, Janke KJ et al (2022) ***Behavior and adoptability of hoarded cats admitted to an animal shelter.*** *Journal of Feline Medicine and Surgery 24(8):e232-e243.*

Rat housing guidelines developed via expert consultation

Developing animal care guidelines is challenging when scientific information about a species is lacking. In the absence of published evidence, care guidelines can be developed by consulting multiple experts.

In this study, guidelines for pet rat housing were developed by 16 experts from the United Kingdom and United States. Experts included veterinarians, veterinary nurses, animal welfare scientists and experienced rat owners. Information was collected from experts via online surveys and discussions. Important features of rat housing were ranked and degree of agreement between experts was assessed.

Fourteen broad factors were considered essential for good rat housing including a complex environment with multiple levels, refuges, bedding, nesting material, multiple food and water bowls, and opportunities to dig and exercise. For example, compressed paper or dust-free aspen chips make ideal bedding. The experts recommended that housing should be tailored to the rats' age and mobility, and risk of injury should be minimised (e.g., sharp edges, toxic materials, objects that can be chewed and swallowed). The authors provide the guidelines as a starting point to improve rat housing in homes as well as laboratories.

Neville V, Hunter K, Benato L et al (2022) ***Developing guidelines for pet rat housing through expert consultation.*** *Vet Record doi:10.1002/vetr.1839.*

Due to extreme conformation, English bulldogs are at higher risk of skin, eye and jaw problems

English bulldogs are recognisable for their very short faces and protruding jaws. Their extreme body shape puts English bulldogs at risk of a range of serious health problems.

This cross-sectional study aimed to identify the most common health conditions in English bulldogs compared to dogs who are not English bulldogs (breed predispositions). The authors analysed a random sample of medical records of dogs presenting to veterinary clinics in the United Kingdom in 2016, including 2662 English bulldogs and 22,039 other dogs (i.e., dogs who are not English bulldogs). Data included body weight, age, specific-level diagnoses and grouped-level diagnoses (i.e., body system).

Compared to the age of other dogs (4.42 years), the median age of English bulldogs (2.65 years) was younger, suggesting that fewer English bulldogs reach an advanced age. English bulldogs had over twice the odds of being diagnosed with one or more health disorders compared to other dogs. While there were some health conditions for which English bulldogs had lower odds, compared to other dogs (e.g., fleas, fatty lumps), English bulldogs had significantly greater odds of 24/43 (55.8%) specific-level disorders, and 17/34 (50%) grouped-level disorders. At specific-level diagnosis, English bulldogs had over 38 times the odds of skin fold dermatitis, over 26 times the odds of prolapsed nictitating membrane gland (cherry eye), over 24 times the odds of mandibular prognathism (lower jaw outgrowing the upper jaw), and over 19 times the odds of brachycephalic obstructive airway syndrome. At grouped-level diagnosis, compared to other dogs, English bulldogs had over 7 times the odds of congenital disorder, over 6 times the odds of tail disorder ('screw' tail), and over 5 times the odds of lower respiratory tract disorder. These breed predispositions indicate the urgent need for changes in how English bulldogs are bred to look.

O'Neill DG, Skipper A, Packer RMA et al (2022) ***English Bulldogs in the UK: A VetCompass study of their disorder predispositions and protections.*** *Canine Medicine and Genetics 9, 5.*

FARM ANIMALS

Fewer signs of poor welfare in slower growing meat chickens

Meat chicken (broiler) breeder birds are farmed to produce the meat chickens that go on to become chicken meat. To maximise commercial production, meat chickens have been bred to grow rapidly to reach a slaughter weight at a young age (approximately 28-35 days of age). This breeding for fast growth has led to breeder birds being at risk of obesity and metabolic disorders because they are raised for a longer period than meat chickens raised for chicken meat. In an attempt to counter these issues, breeder birds' feed is restricted to control their body weight and condition. However, long-term feed restriction can lead to birds experiencing chronic animal welfare issues such as hunger, frustration and increased stress. Breeding slower growing meat chickens is one potential strategy to address the animal welfare issues associated with rapid growth and need for feed restriction in breeder birds. However, little data is available on the welfare of slower growing breeder birds.

This study, conducted in Canada, measured animal welfare and production indicators in 336 intermediate and slower-growing meat chicken breeder birds across 12 experimental pens. All birds had their feed restricted during rearing and lay. Observers recorded welfare indicators including feeding motivation, feather coverage, foot and hock condition, and a range of behaviours (e.g., scratching, preening, dust bathing, locomotion, resting, redirected oral behaviours). A post-mortem analysis was also undertaken on five birds from each pen for common health issues (e.g., fatty liver and keel bone fractures), and productive parameters (e.g., reproductive performance indicators).

Slower growing meat chicken breeder hens demonstrated good reproductive performance with fewer signs of poor welfare compared to intermediate meat chicken breeder hens. Slower growing strains had improved feather cover, better foot health, and a lower incidence of fatty liver disease. Even with feed restriction, both the intermediate and slower growing strains showed less feed motivation compared to that reported in conventional fast growing strains. Across both strains, the majority of hens had keel bone fractures at post-mortem, which the authors suggested could be associated with mating activity by overweight roosters. Overall, the results of this study suggest that some of the welfare problems in meat chicken breeder birds could be addressed by selecting slower growing strains.

Arrazola A, Widowski TM, Torrey S (2022) ***In pursuit of a better broiler: welfare and productivity of slower-growing broiler breeders during lay.*** *Poultry Science 101(8), 101917.*

Use of electric shock on animals should be reduced and replaced

Farm animals, including cattle, sheep, goats, pigs and poultry, are often subjected to electric shock. Electric shock devices represent animal welfare risks because they cause pain, injury, agitation, stress and distress.

This review details different forms of electric shock used on farm animals. Widely used forms of electric shock include fixed and portable electric fencing to keep animals contained, and electric prods that cause pain to prompt animal movement. Electric wires are used in poultry housing to limit bird location and behaviour, for example around the barn perimeter to prevent laying of eggs on the floor, or above feed/water lines to prevent perching. Cattle trainers (electric shock rods) may be installed across housed dairy cattle stalls just above the height of the cow's shoulder to force her to move back in order to defecate/urinate into a channel. In some dairies, an electrified gate shocks cows to move them up from a holding yard into the milking shed, and cows may be shocked again to move them out of the shed. Electrified wires, cattle trainers and backing gates can also contribute to 'stray voltage' in the animal's environment - another form of electric shock. Virtual fencing, where animals receive an electric shock via a collar if they do not heed a warning cue when they move outside a pre-determined boundary, is an emerging use of electric shock.

Use of electric shock on farm animals is a contentious ethical issue because it is intentionally causing animals pain. It may be argued that inflicting some pain on animals may be justified if it avoids greater harms. However, in many cases the use of electric shock has no welfare benefit and clearly causes harm. For example, in a Swedish study of 15,000 animals, use of cattle trainers was associated with higher incidence of serious health conditions. Generally, harm could be avoided by using alternatives to electric shock including humane handling, improved housing systems, and audio rather than electric shock cues. Overall, this ethical analysis discusses many reasons why the use of electric shock on animals should be reduced and replaced.

Grumett D, Butterworth A (2022) Electric shock control of farmed animals: welfare review and ethical critique. Animal Welfare 31:373-385.

Farmed turkeys suffer poorer welfare at high stocking densities

The stocking density at which poultry are housed determines the amount of space each bird has to move and perform behaviours and therefore significantly impacts their welfare. The majority of research on the impact of stocking density on poultry welfare is conducted in chickens and less attention is given to other farmed poultry species such as turkeys.

This study, conducted in Canada, investigated the impact of different stocking densities on turkey welfare. For 11 weeks, female turkeys (n=3550) were housed in one of eight open pens at different stocking densities: 30, 40, 50 and 60 kg/m^2. Observers recorded animal welfare indicators including footpad lesions, mobility, feather condition, behaviours (e.g., feeding, drinking, resting, preening, dust bathing, litter pecking, fighting, aggressive pecking), and heterophil to lymphocyte ratios (increased H/L ratios have been associated with increased stress levels).

Turkeys' health and welfare declined with increasing stocking density. Increasing stocking density was associated with less overall activity, worse average footpad scores at week 8, worse feather condition at week 8 and 11, and more birds being disturbed by other birds in the pen. While aggressive behaviour and fighting decreased with increasing stocking density, so too did behaviours such as standing, walking, and litter pecking. The heterophil to lymphocyte ratio at 11 weeks of age also increased with increasing stocking densities, suggesting increasing levels of stress. The authors concluded that further evaluation of health and welfare indicators in turkeys is needed before optimal stocking densities can be established.

Jhetam S, Buchynski K, Shynkaruk T et al (2022) ***Evaluating the effects of stocking density on the behavior, health, and welfare of turkey hens to 11 weeks of age.*** *Poultry Science 101(7), 101956.*

Australian consumers value access to pasture for dairy cows

Climate change poses a threat to animal health and welfare. In a changing climate, with an increasing number of hot days and heatwaves, animals are at higher risk of heat stress. Dairy cattle are particularly susceptible to heat stress. Traditional solutions to manage heat stress in dairy cows have largely focused on provision of shade and cooling (e.g., fans, sprinklers, soakers), and management changes (e.g., milking at cooler times of day). Moving cows indoors (zero-grazing systems) is seen as a way to address climate challenges. There is also growing interest in incorporating heat resistant genetics. Little is known about how consumers may view these proposed solutions.

This study, conducted in Australia, investigated public perceptions of proposed heat stress mitigation measures for dairy cows. Respondents (final sample of 781 participants) were asked to rate how they felt about four different scenarios on a sliding scale (1=most negative to 7=most positive). The four scenarios were: (1) Choice (indoor/outdoor access), (2) Indoor only, (3) Genetically modified heat resistant cattle with outdoor pasture, (4) Outdoor pasture with trees for shade (status quo). Participants were also asked how each system would influence their willingness to pay for one litre of milk compared to what they pay now.

Respondents had more positive perceptions of scenarios (1) and (4) that allowed cattle access to pasture for space, freedom of movement and grazing. A greater proportion of people were willing to pay more for milk produced in scenarios (1) and (4) compared to the other scenarios. There were more participants than expected who said they would purchase a plant-based alternative rather than pay a different amount for milk coming from indoor systems (scenario 2) or gene edited cattle (scenario 3). Comments included: *"Cows are not meant to live where they never see daylight or breathe fresh air. Battery cows is a backward, unacceptable step."* Broadly, attitudes towards the dairy industry and about genetic modification varied. Some respondents raised ethical concerns. For example, *"I don't agree that they should be genetically modified to cope with heat stress, they need to be kept in better conditions".* This study highlights that the Australian public appreciates the need to mitigate heat stress in dairy cows, but mitigation measures must meet consumers' animal welfare expectations, particularly access to pasture.

Hendricks J, Mills KE, Sirovica LV et al (2022) ***Public perceptions of potential adaptations for mitigating heat stress on Australian dairy farms.*** *Journal of Dairy Science 105(7):5893-5908.*

Transitioning away from intensive agriculture will require more than pro-animal welfare laws

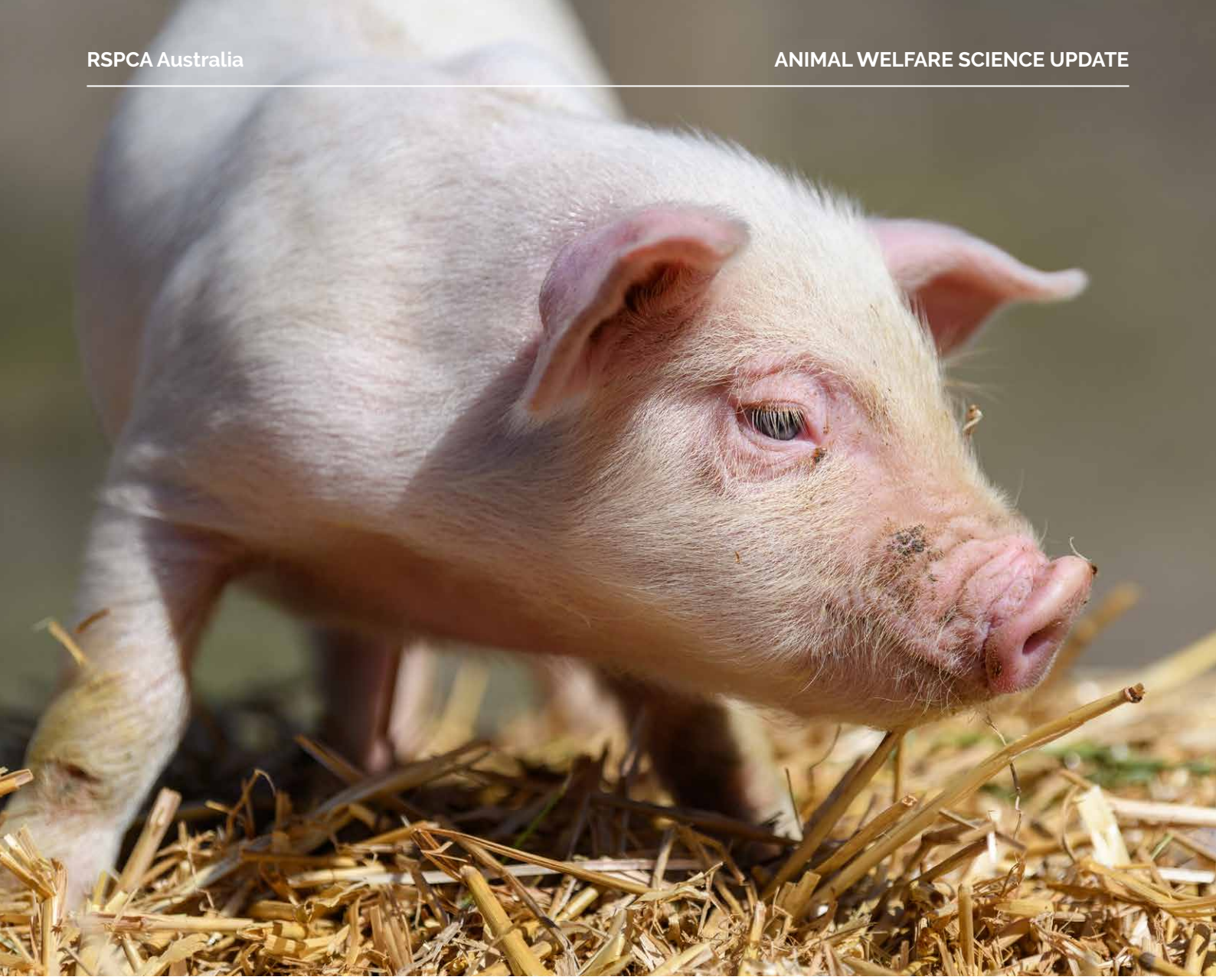
The European Union (EU) has taken a strong pro-animal welfare stance, promising to phase out large-scale caged-based farming systems by the end of 2023. However, this transformation is hindered by entrenched systems of intensive confinement. There are several barriers to transforming animal agriculture including lack of means to enforce animal welfare standards and laws, competitive pressures, technological lock-in (intensive systems suited to only one species), and features of the consolidated meat processing industry that limit producers' ability to respond quickly enough to changes.

Using pig farming in Hungary as a case study, this paper explores how animal agriculture in the EU can best be transformed to ensure good lives for farm animals, responsible use of natural resources, and biodiversity conservation. Current pig production relies largely on intensive confinement systems. The authors suggest that animal welfare would be improved if pigs were raised on smaller-scale extensive or semi-intensive farms with greater hands-on involvement by producers. Pigs would be raised over a longer period in loose group housing with indoor and outdoor access. This type of alternative farming model also relies on diversification to ensure resilience. Laws alone are insufficient for this transformation to take place because current drivers are pushing production towards cost-cutting and ever-increasing levels of confinement.

To improve animal welfare while maintaining competitiveness, producers will need assistance to break away from the drivers of intensification.

The authors argue that the EU will need to do more than simply legislating a phase out of intensive confinement systems. Laws, policies, market-based incentives, marketing strategies (e.g., labelling schemes), well-qualified personnel, improved management strategies, and alternative production systems and technologies, are needed to achieve meaningful change to farm animal welfare.

Molnár M (2022) ***Transforming intensive animal production: Challenges and opportunities for farm animal welfare in the European Union.*** *Animals 12(16), 2086.*



Piglet survival rates can be improved by providing straw to sows before birth

When provided the opportunity, sows will naturally build nests out of materials such as sticks and grass before giving birth (farrowing) to their piglets. Although sows are highly motivated to perform nesting behaviours before farrowing, most intensive indoor farming systems do not allow them to do so. In intensive indoor housing systems, sows are routinely confined in barren farrowing crates where they are unable to turn around and without any nesting material. The use of farrowing crates has been argued to improve piglet survival, however, sows, while confined and unable to perform nesting behaviours, can experience discomfort, frustration, increased stress and pain at farrowing.

This review examines the existing evidence on how the provision of different nesting materials can improve piglet survival. Studies on nesting materials mainly focus on straw with less attention given to other alternatives such as sawdust, peat and shredded paper. The results of these studies indicate that providing sows with straw improves piglet survival rates. Straw is likely beneficial because it allows the sow to nest and provides a source of dietary fibre and energy during farrowing (giving birth).

The authors recommend providing straw to sows before farrowing as one strategy to improve sow welfare and piglet survival in intensive piggeries. To encourage industry uptake and address current barriers to providing nesting material such as cost, access and availability, further research should investigate the optimal quantity, type, presentation and quality of straw and alternative nesting materials.

Plush KJ, Nowland TL (2022) Disentangling the behavioural and fibre influences of nesting enrichment for sows on piglet survival. Animal Production Science 62(10-11):957-966.

Environmental enrichment can improve the welfare of farmed Japanese quail

Japanese quail are farmed for eggs and meat. They are routinely kept in small barren cages and there is little information available about how additions to their environment (enrichment) could improve their welfare.

This study, conducted in Poland, investigated how Japanese quail respond to environmental enrichment. Japanese quail (n=280) were allocated to seven groups, each with four replications. The birds were kept in 0.5 m^2 cages with 10 birds per cage and different enrichment items were tested: a nest box, scratcher, plastic pipe, limestone cubes, sand box and feeder box. The control groups received no enrichment. After 6 weeks, behavioural tests and blood samples were collected to assess animal welfare indicators. The behavioural tests used to assess the stress levels of quail were an open field test to evaluate quails' reaction to new objects and a tonic immobility test to assess quails' recovery time after a simulated predator attack. Blood parameters measured included stress indicators (heterophil to lymphocyte ratios, and cortisol and corticosterone levels).

The colour and shape of enrichment affected the interest of quails in different enrichment items, however, overall, all quails with enrichment had improved behavioural indicators.

Quail provided with enrichment engaged in more natural behaviours, were more likely to approach new objects in the open field test, and showed reduced duration of tonic immobility. Cortisol levels were lowest in the quail provided with a sand box and highest in the control group without enrichment. Overall, providing environmental enrichment increased the opportunity for farmed quail to perform naturally motivated behaviours and improved their welfare.

Ramankevich A, Wengerska K, Rokicka K et al (2022) ***Environmental enrichment as part of the improvement of the welfare of Japanese quails.*** *Animals 12(15), 1963.*

ANIMALS IN SPORT, ENTERTAINMENT, PERFORMANCE, RECREATION AND WORK

Sleep quality and quantity may be used as animal welfare indicators in horses

Adequate and appropriate sleep is essential for all animals. Despite its restorative properties and role in memory consolidation, sleep is often overlooked in the context of animal welfare. For example, minimum animal welfare standards often neglect to mention providing adequate conditions for sleep.

This review synthesises available research on sleep in equines. Horses can sleep standing up, lying down or lying on their sides, with individual horses varying in their preferred sleep positions. Over a 24-hour period, horses have multiple periods of sleep but overall, they sleep for a shorter time compared to other domesticated animals. On average, horses sleep for just 3.85 hours per day including 0.67 hours of Rapid Eye Movement (REM) sleep, and 2.98 hours of non-REM sleep. Horse sleep patterns likely reflect ecological and biological traits including a large body mass, long gestation period, independent young, a high metabolic rate, a social species, and their adaptations as a prey species who remain vigilant against predators. Sleep quality is rarely measured in equines, but potential measures include behavioural observations, electro-encephalogram (EEG) studies, stress hormone parameters, and development of an equine sleep quality index.

Environmental factors, stress and pain can affect sleep quantity and quality, and poor sleep can be used as an animal welfare indicator. Further research is required to understand the benefits of sleep for horses and the impact of sleep deprivation on horse welfare.

Greening L, McBride S (2022) ***A review of equine sleep: Implications for equine welfare.*** *Frontiers in Veterinary Science 9, 916737.*

Improvements to welfare tools required to identify pain in ridden horses

The Ridden Horse pain Ethogram (RHpE) aims to improve horse welfare by identifying pain in horses being ridden. The ethogram is a catalogue of 24 horse behaviours including head position, ear position, exposing the whites of the eyes, mouth opening, tongue protrusion, reluctance to move, rearing, bucking, tail clamping and tail swishing. According to the RHpE, a horse is experiencing pain if they display 8 or more of the 24 behaviours.

This review details the strengths and weaknesses of the RHpE. To be robust, an ethogram for a ridden horse must be objective, clear, and minimally affected by management factors, the rider, riding surface or tack (equipment).

As the RHpE is a new approach in equine welfare, the authors of this review contend that it requires further development and testing. They argue that training, the rider's skills, faulty tack and a horse's previous experiences may affect a horse's expression of behaviours in the RHpE. Areas for improvement in the RHpE include stronger definitions, an interdisciplinary approach, and evidence-based weighting of different behaviours in the ethogram. Different behaviours should not have equal weighting and if a horse is suspected to be suffering from pain, they should be evaluated in different ways and in different situations. The authors recommend a double-blinded study to validate RHpE.

Ladewig J, McLean AN, Wilkins CL et al (2022) ***A review of the ridden horse pain ethogram and its potential to improve ridden horse welfare.*** *Journal of Veterinary Behavior 54:54-61.*

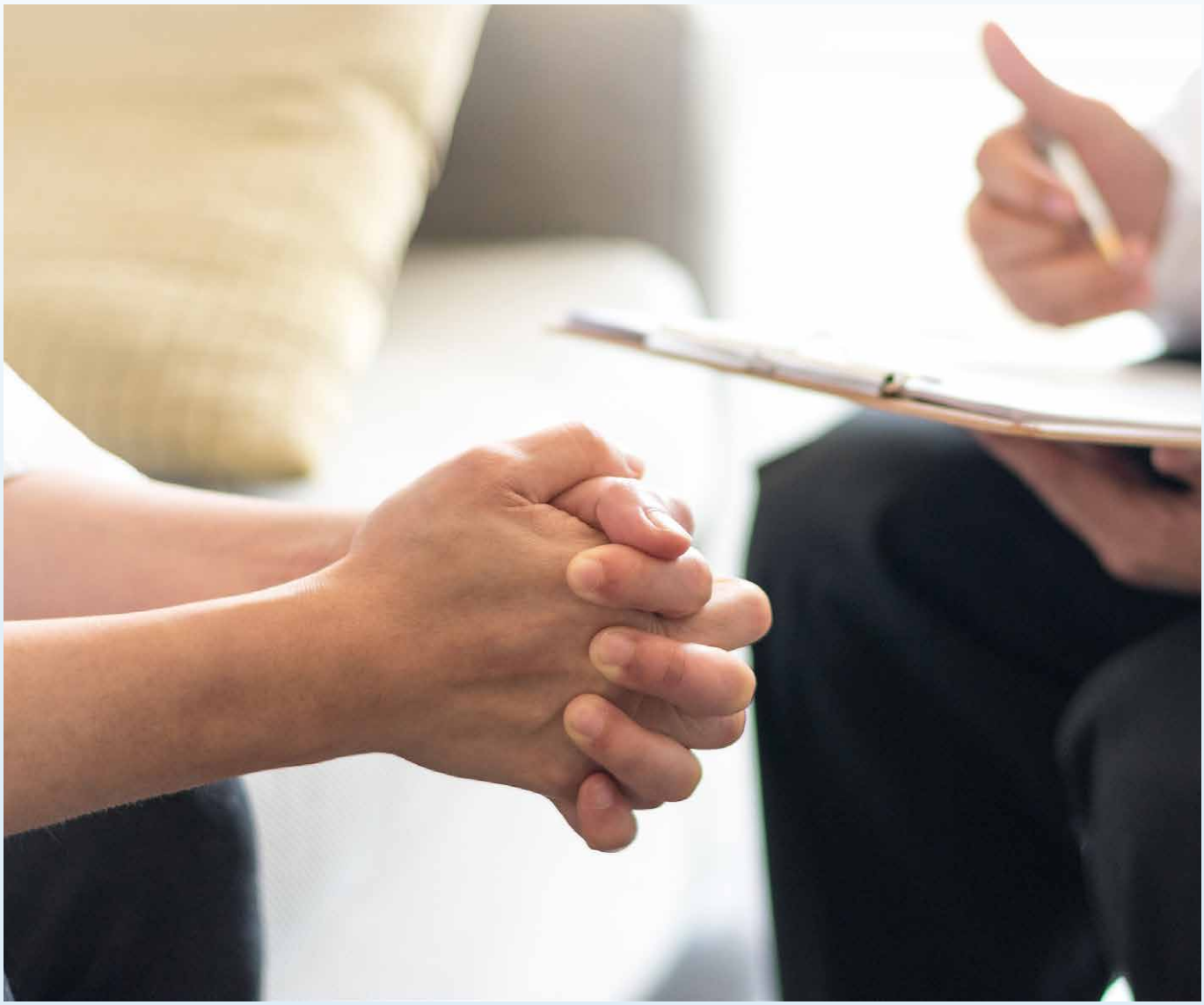
Motivational Interviewing can assist in the management of animal hoarding cases

Animal hoarding is the keeping of a large number of animals and failure to provide them with adequate care. An animal hoarder may be exploitative, or an overwhelmed care giver, a misguided rescuer, indiscriminate breeder or naïve owner. Even when actions are taken to alleviate animal hoarding situations, hoarders often continue to acquire more animals. Animal hoarding has a significant and long-term impact on animals and humans. Effective interventions are needed to assist people and animals in hoarding situations.

This study, conducted in the United Kingdom, explores how Motivational Interviewing (MI) could be used as an intervention for the hoarding of horses. MI aims to help people address entrenched behaviours by having structured conversations to develop their own motivations for change. Six Field Officers from World Horse Welfare who manage cases of horse hoarding, were trained in MI, and the outcomes evaluated.

In this study, use of MI helped in the management of horse hoarding cases. Use of MI improved Field Officers' understanding of hoarders, enhanced engagement, and facilitated a more collaborative approach. Field Officers trained in MI reported less stress, and improved outcomes for animals, people and organisations. While there is no quick fix to animal hoarding, this study suggests that training animal welfare personnel in MI can assist in the management of hoarding cases.

Williams B, Harris P, Gordon C (2022) ***What is equine hoarding and can 'motivated interviewing' training be implemented to help enable behavioural change in animal owners?*** *Journal of Equine Education 34(1):29-36.*



ANIMALS IN RESEARCH AND TEACHING

Laboratory mice should not be picked up and handled by the tail

Laboratory mice are routinely handled for procedures. Handling represents a common and often overlooked stressor. Grabbing mice by the tail is particularly stressful for them. Therefore, alternative handling techniques are needed. At the University of Bristol in the United Kingdom, a 'no tail' handling policy for laboratory mice was proposed. Consequently, the university's Animal Welfare and Ethics Review Board requested this study.

This study aimed to investigate whether different handling methods affect stress levels in laboratory mice. In the first experiment, mice were allocated to three different groups: (1) Picked up and suspended by the base of the tail (n=71), (2) Cupped using two hands to enclose the mouse (n=99), and (3) Caught and moved using a tube (n=42). In experiment 2, a modified non-tail restraint method was tested (placing the mouse onto the forearm and covering gently with the other hand). Mice were caught using cupping or a tube, and handled by pinching the loose skin on the back. Stress levels were assessed by measuring stress hormones (corticosterone), and observing behaviours including voluntary interaction with the handler, vocalisation, urination, struggling and escape behaviour. Mice were also subjected to behavioural tests including an elevated zero maze and a conditioned place preference test to assess anxiety, and a cotton bud biting test to assess aggression.

Results indicated that non-tail handling methods are beneficial for mouse welfare. While there were no differences in the behavioural tests and no differences in corticosterone, mice who were not handled by the tail showed fewer indications of stress and anxiety, including less struggling and vocalisation. The authors recommend that the 'no tail' handling policy be adopted and the modified restraint method used.

Davies JR, Purawijaya DA, Bartlett JM et al (2022) ***Impact of refinements to handling and restraint methods in mice.*** *Animals 12(17), 2173.*

People set limits on how much pain and distress should be inflicted on animals in research

The use of animals in research raises ethical questions about how much pain and distress can be justified. Public acceptance of animal testing depends on the degree to which people accept harms being inflicted on animals for research purposes.

This study investigated how acceptance of animal use in research varies with degree of pain or distress caused to the animals, and animal type. Faculty members (n=942) and undergraduate students (n=782) at the University of Wisconsin-Madison in the United States, were asked to rank the pain/distress (PD) scale they believed was justified for different types of research: animal disease, human disease, basic research, human medicine, chemical testing and cosmetic testing. Respondents were presented with scenarios involving monkeys, dogs and cats, pigs and sheep, rats and mice, and fish.

Acceptance of animal use in research varied depending on respondent demographics, the type of research and the type of animal. In both students and faculty, women justified less pain and distress being inflicted on animals in research. For most types of research and types of animals, faculty members appeared to be willing to accept greater levels of pain and distress being inflicted on animals. Students appeared to accept the highest level of pain and distress for animal disease research and lowest for cosmetic testing. Students were more likely to accept more pain being inflicted on fish and rodents. Students and faculty members who identified as vegetarian or vegan were up to three times less likely to justify pain and distress on animals. Overall, the results show that people set limits on the degree of pain or distress which they deem justifiable for research purposes. The authors recommend that guidelines for use of animals in research should mandate measurements to quantify pain and distress, and incorporate a robust harm-benefit balancing test.

Sandgren EP, Streiffer R, Dykema J et al (2022) ***Influence of animal pain and distress on judgments of animal research justifiability among university undergraduate students and faculty.*** *PLoS ONE 17(8), e0272306.*

WILD ANIMALS

Reports of wildlife entangled and trapped in pandemic-related debris

During the global COVID-19 pandemic, single-use plastic pollution has increased due to personal protective equipment (PPE) (e.g., gloves, facemasks) being discarded into the environment. Collectively, this pollution can be referred to as pandemic-related debris. Pandemic-related debris can harm wildlife including mammals, reptiles and fish.

This study collated reports of wildlife interactions with pandemic-related debris. Reports from early 2020 to late 2021 were sourced from social media, unpublished reports, and online databases.

The authors identified 114 reports of wildlife interactions with pandemic-related debris. Reports were from 23 countries, with the top five being the United States, England, Canada, Australia and the Netherlands. As many interactions go unreported, this is likely to be an underestimation of the true impact of pandemic-related debris on animals. Most reports of wildlife interactions with pandemic-related debris involved birds (83.3%). The most frequently reported type of pandemic-related debris was facemasks. Animals have been observed carrying pandemic-related debris, incorporating it into their nests, and ingesting it. Reports included animals found dead, entangled or trapped. These findings highlight the importance of improving waste management to protect wild animals from the impact of pollution from pandemic-related debris.

Ammendolia J, Saturno J, Bond AL et al (2022) ***Tracking the impacts of COVID-19 pandemic-related debris on wildlife using digital platforms.*** *Science of the Total Environment 848, 157614.*

MISCELLANEOUS

Good welfare can be preventative medicine

The new field of 'Affective Immunology' examines links between emotional well-being, immune function and human health. Likewise, in animal health, it is increasingly recognised that improving emotional well-being can have health benefits including reducing susceptibility to disease and minimising the severity of disease symptoms.

This review details the complex interactions between animal welfare, immunity and disease. The authors draw on studies in laboratory and farm animals to illustrate the health benefits of providing animals with an optimal environment and conditions. For example, pigs kept in an enriched environment show signs of improved emotional and physical well-being. On the contrary, there is evidence that animals kept in poor conditions experience stress and compromised health. For example, mice subject to experimental stressors show elevated inflammatory markers.

Evidence to date suggests that good welfare can be preventative medicine in some circumstances. However, given the complex interactions involved, the authors urge caution in generalising results. They recommend further studies in real-world conditions, for example under commercial conditions, to investigate how welfare status affects disease susceptibility, severity, and outcomes.

Düpjan S, Stamp Dawkins M (2022) ***Animal welfare and resistance to disease: Interaction of affective states and the immune system.*** *Frontiers in Veterinary Science doi:10.3389/fvets.2022.929805.*

A new framework for the design of animal management technologies

Animal-Computer Interaction (ACI) is an emerging field aiming to use technology to improve animal management. ACI includes communication systems, data gathering devices (e.g., wearable tracking devices), and equipment (e.g., digital enrichment, automated feeders, robotic gates). As these technologies develop, there is a need to ensure they are designed to optimise animal welfare.

This paper proposes a Welfare through Competence (WtC) framework for animal-centric ACI design. The WtC framework is based on the Coe Individual Competence model, which specifies that animals should be provided with: (1) Choice, (2) Control, (3) Variety, and (4) Complexity, all of which contribute to the development of (5) Competence, the capacity to address new challenges, problems, and tasks. This framework provides a guide for animal managers to design, develop, implement and evaluate ACI.

The WtC framework includes a matrix that considers choice, control, variety and complexity in the context of mental well-being, nutrition, environment, physical health and behavioural interactions. The framework takes into account the species, context, and welfare goals for the individual and the population. Application of the framework involves understanding the animals' needs and wants, and how to best provide these. The authors encourage ACI designers and practitioners to try the WtC framework in zoos, on farms, and in companion animal management.

Webber S, Cobb ML and Coe J (2022) ***Welfare through competence: A framework for animal-centric technology design.*** *Frontiers in Veterinary Science doi:10.3389/fvets.2022.885973.*

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