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ANIMAL WELFARE SCIENCE UPDATE

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The aim of the animal welfare science update is to showcase recent animal welfare science publications that are relevant to the work of the RSPCA. The update provides summaries of some of the scientific papers and reports viewed by the RSPCA Australia office in the past quarter.

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INCLUDED IN THIS UPDATE

COMPANION ANIMALS

A One-health approach to free-roaming dogs in Australia

Free-roaming dogs can pose a risk to public health and safety, contribute to the spread of zoonotic diseases, threaten native wildlife and livestock, and are at increased risk of injury, illness and poor welfare. Efforts to reduce the negative impacts of free-roaming dogs have been hindered by conflicting legislation across state borders and difficulty differentiating free-roaming dog types, which can include uncontained pets, feral dogs, wild dingoes, and crossbreeds of each. Management decisions are further complicated by the deep social bonds between humans and dogs, and the cultural significance of dingoes.

This paper reviews the negative impacts of free-roaming dogs in Australia and identifies key gaps in current management strategies. To reduce confusion, the paper provides a five-type classification system for free-roaming dogs in Australia on a spectrum from partly restrained to completely wild-living. Due to the complexities of free-roaming dog management, the authors propose and evaluate a One-Health based solution. One-Health is a concept that recognises the connections between human health and the health of domestic and wild animals, plants and the wider environment.

The review asserts a need to define free-roaming dog management from the viewpoint of human behaviour and highlights the importance of educating stakeholders about the interconnected nature of the issue.

The suggested measures include undertaking research into current stakeholder and public perspectives and barriers, increasing education and awareness around One-Health and the need for long-term collaborative management, investments to foster commitment and collaboration between the involved stakeholders, and ongoing monitoring of management impacts to assess effectiveness.

Fleming PJS, Allen BL, Ballard G, Behrendorff L, Claridge AW, Gentle MN, Harriott L, Hine DW, Jenkins DJ, Kennedy BPA, McLeod LJ, Meek PD, Proudfoot G, Schembri N, Smith D, Sparkes J (2025) ***Diverse human dimensions affect the management of public and animal health impacts of free-roaming dogs in Australia: a One Health solution****. Front Vet Sci 12:1666111*

Outdoor-cat owners respond best to positive, practical containment messaging

Keeping cats indoors has been promoted as a way to safeguard cat welfare, protect native wildlife, and reduce community conflict in Australia. However, uptake of cat containment remains limited, with owners often reluctant to contain cats with established outdoor access. Cat containment can be an emotionally charged, contentious subject. Whether a cat is kept indoors often depends on owner values, beliefs about cat wellbeing, practical constraints such as financial and rental limitations, and perceived social norms. Understanding these factors is essential for creating successful interventions that motivate and support sustained behaviour change in owners.

22 Australian owners of cats who had current outdoor access were recruited to participate in online focus groups. Owners discussed their cats' needs, safety, and overall wellbeing, and responded to two messaging concepts about keeping cats indoors. Concepts were produced by a professional advertising agency and presented to the groups in three formats: radio, video, and still imagery. The order in which concepts were presented was alternated between groups.

Participants frequently expressed a belief that their cats could look after themselves, and downplayed outdoor risks such as injury, disease or going missing. Participant perceptions of containment were often influenced by the cat's life history, how long outdoor access had been available, and owner beliefs about cat independence and happiness. Participants showed a preference for messaging focused on clear, practical solutions for keeping cats safe, active and happy at home, rather than messaging focused on blame, fear or moral judgement. The findings of this study highlight the challenge of changing husbandry choices once routines have been established and point to the importance of early intervention, particularly around adoption, when habits are yet to form and owners may be most open to guidance.

Ma GC, Speedy KL, David P, Gates MC, Littlewood KE, Zito S (2026) ***Understanding Australian cat caregiver motivations and reactions to behaviour-change messaging on cat containment: Insights for campaign design****. Animals 16(5):784 [Authors Ma GC and Zito S are from RSPCA NSW and RSPCA Australia respectively]*

Aging cats need interaction and enrichment, but is it accessible to them?

Cats are living increasingly longer lives. However, limited research has been conducted on how aging impacts cat behaviour or welfare. As cats age, they are more likely to become 'frail', a term that describes a combination of decreased physical and cognitive ability that makes an individual more vulnerable to negative health outcomes such as disease, disability and death. Because of this, aging cats require specific care to support their changing needs.

A questionnaire, completed by 441 cat owners in France, looked at the behaviour, health and living conditions of older cats. Questions included owner and cat demographics, validated measures for pain and frailty, and questions about the cat's behaviour and home environment. Comparisons were made between cats across three age categories: mature (8-10 years), senior (10-14 years) and super senior (15 years and above).

Results showed frailty (51%) and high pain levels (47%) were most common in super senior cats and least common in mature cats (3% and 6% respectively). A higher proportion of super senior cats struggled to groom themselves, eliminated outside of the litter tray and were less likely to display social behaviours toward their owner such as head-butting or initiating play. Older cats were less likely to have access to key resources such as olfactive and interactive enrichment or elevated resting areas. The study highlights the need for owner education around maintaining cognitive and physical stimulation for aging cats

and the interactive or environmental alterations that can be made for them, such as providing ramps to access elevated rest areas and adapting play patterns to accommodate a cat's physical capabilities.

Hoummady S, Rameau O, Besegher A, Bedossa T, Jeannin S, Anton P-M, Stephan Y, Rebout N, Robles M (2025) ***A day in the life of an aged cat – Environment of old domestic cats and welfare implications****. J Vet Behav 83:20-25*

Changing human behaviour to keep cats safe at home

Domestic cats with outdoor access are at heightened risk of negative welfare outcomes such as illness and injury, contribute to community conflict and present a challenge for biodiversity protection. To try and reduce these impacts, cat containment is being increasingly promoted within Australia. However, not all cat owners are equally able, or motivated, to contain their cats. For containment to be achieved, strategies that address the practical and behavioural barriers of owners are needed.

The Keeping Cats Safe at Home (KCSAH) project, led by RSPCA NSW in partnership with 11 councils, took place from 2021-2024. Following initial stakeholder consultation and using a Capability-Opportunity-Motivation Behaviour (COM-B) framework, the project implemented a series of approaches to encourage owner behaviour change, including social marketing campaigns, school programs, community events, and subsidised desexing and microchipping. Digital analytics, camera traps, distance sampling transect drives, council data and statewide pre- and post- project surveys were used to track project reach and impact.

The initiative achieved high levels of public engagement, reaching millions online, and engaging thousands in subsidised desexing initiatives, community events and school programs. Project monitoring revealed decreases in the density of roaming cats in multiple areas, and reduced nuisance complaints and impoundments in many councils. Cat owners who encountered campaign messaging reported increased motivation and confidence in their ability to keep cats contained. However, results between councils differed and the project's surveys were limited in their ability to assess genuine behaviour change. Several challenges were encountered during the project, including veterinarian shortages, regulatory ambiguities and difficulty sustaining programs beyond their initial funding. For future interventions to have long-term success, ongoing policy reform, expanded veterinary capacity and sustained investment is needed. The KCSAH project informs future strategies and demonstrates the potential of large-scale, multi-channel, community-driven campaigns to drive change.

Ma GC, Gates MC, Littlewood KE, Zito S, Kennedy BPA (2025) ***Keeping Cats Safe at Home (KCSAH): Lessons learned from a human behaviour change campaign to reduce the impacts of free-roaming domestic cats****. Animals 15(24):3554*
[Authors Ma GC and Zito S are from RSPCA NSW and RSPCA Australia respectively]

Humans struggle to recognise signs of discomfort and stress in cats during play

Human preferences for human-cat interactions, such as play, are not always aligned with cat preferences. When a person fails to notice cat discomfort during an interaction, it can negatively impact cat welfare and lead to human injury. Cat stress is associated with increased risk of illness and development of behaviours that may be problematic for owners. Stressed cats may also try to end an interaction by biting or scratching. These injuries are high-risk for infection, disease transmission, and can lead to complications, including sepsis. It is therefore important that people are able to recognise when a cat does not want to interact.

This paper assessed the human ability to recognise cat communication cues during play. 368 Australian participants watched videos of play interactions. However, only half of the videos showed cats who were 'playing' and the other half showed cats displaying signs they didn't want to play or were feeling stressed. After each video, participants were asked about the interaction they had just watched including if it was overall positive or negative for the cat, based only on the cat's behaviour, and how they would have interacted with the cat in the video.

Results showed participants struggled to recognise cat discomfort or stress. For videos that included subtle stress behaviours such as body tension or avoiding touch, participant recognition was lower than chance (48.7%). When behaviours were overt, such as hissing or attempting escape, participant's still incorrectly categorised interactions as positive 25% of the time. Of further concern, even when participants successfully recognised stress signals, they often still chose to interact with the cat. The results of this study highlight a need to increase public awareness of early signs of stress in cats and to educate people on responding appropriately to these signs by ending interactions and giving cats space.

Henning JSL, Nielsen T, Hazel S, Atkinson PJ (2025) ***Do you speak cat? Assessing the impact of a training video on human recognition of cat emotions and behaviours during play interactions****. Front Ethol 4:1675587*

Dog reactive dogs: Tailoring management strategies to dog behaviour profiles

Dog reactive dogs (DRDs) are dogs who display rapid, intense behaviours such as barking, snapping or lunging in response to other dogs. The intensity of these responses suggests a negative welfare state in the DRD, and the potential for escalation poses a risk to other dogs and people nearby. While previous studies have explored owner experiences and perceptions of reactivity, fundamental questions about reactive behaviour and its biological underpinnings remain unanswered.

This study aimed to investigate whether distinct behavioural subtypes exist within the DRDs population. A UK based questionnaire was completed by 1959 DRD owners. The questionnaire included dog demographics, contextual factors and questions about the frequency and type of reactive behaviours observed. Reactive behaviours were then analysed using principal components and cluster analysis to identify behavioural subtypes.

Analysis revealed three core reactive behavioural dimensions. *Posturing*: threat signalling behaviours such as growling and raised hackles, *frustration*: behaviours associated with restraint such as barking, lunging and whining and *oral attack*: behaviours involving physical or attempted physical mouth contact such as biting. Further analysis identified four distinct dog profiles, each with different implications for management strategies. 'Low Risk Signallers' displayed moderate posturing and frustration but very low oral attack. 'Frustrated Escalators' showed very high levels of frustration, high posturing and low-moderate oral attack, 'Impulsive Escalators' showed a concerning readiness to make physical contact even without particularly high levels of frustration, suggesting their escalation may be more impulsive in nature, and 'Risky Rapid Escalators' displayed high levels of all behaviours and represented the highest risk for escalation. Based on these findings, an owner-friendly screening tool was developed to estimate a dog's profile type and tailor management strategies. For instance, lower-risk dogs may benefit from training alternative communication behaviours while stricter risk management and methods to reduce 'frustration' may be more relevant for higher-risk dogs.

Van Haevermaet H, Soulsbury CD, Mills DS (2026). ***Reactive and risky: The behavioural structuring of 'dog reactive dogs'****. Appl Anim Beh Sci 299:106961*

Outdoor cats adapt to indoor life, but their owners struggle with the transition

For cat safety and to protect native wildlife, an increasing number of owners are choosing to keep their cat indoors. For others, the move indoors is a result of local by-law changes that require cats be contained. While some research has looked at the general welfare of indoor cats, no previous studies have investigated how cats with established outdoor access, and their owners, adapt to cat containment.

This study followed 16 outdoor cats and their owners as they moved their cats indoors. After an initial week in which cats maintained their usual level of outdoor access, owners were asked to keep their cat indoors for three weeks. Owners filled out daily diaries on cat behaviour changes, weekly surveys and a six-month follow up survey. Cats were fitted with HeyRex2 activity monitors to assess cat activity levels.

Results showed cat activity levels remained relatively stable throughout the transition, suggesting that most cats adapted well. However, owner reports varied, with some cats showing behavioural indicators of stress. Analysis of owner reports indicated that most cats had adjusted by day 21. While most cats adapted well, their owners found the transition challenging, expressing feelings of guilt and reporting practical challenges such as escape attempts, difficulty ensuring children and guests kept cats inside, and struggling to balance their own need for comfort with keeping doors and windows closed. At the end of the study only 40% of owners thought they would keep their cat indoors and, at the six-month follow up, only three cats remained contained. While limited by a small sample size, this study suggests cats may adapt readily to indoor living; however, owner perceptions and practical factors may create barriers to sustained containment.

Railton R, Henning J, Hannaford R, Zobel G, Waran N, Hazel S (2025) ***Who let the cats in? Evaluation of the transitioning of cats to indoor life****. Vet J 314:106465*

FARMED ANIMALS

High stocking density negatively impacts pigs' night time rest

High stocking density, where large numbers of animals are housed within limited space, is a common practice in conventional pig farming systems. This can affect pig welfare in multiple ways, increasing tail biting and pen fouling, impacting growth and restricting pig ability to express highly motivated behaviours. Night rest is an especially important behavioural component of animal welfare. However, high stocking density may disrupt this behaviour. In mammals, sleep deprivation has been linked to immunosuppression, increased sensitivity to pain, hormonal changes and increased risk of death.

This study, conducted in Denmark, focused on pig night rest during an 11-week fattening period and investigated how different stocking densities affected where pigs rested. 197 pigs were assigned to three different stocking density treatments: 0.7m^2/pig (18 pigs per pen), 1.4m^2/pig (9 pigs per pen) or 2.1m^2/pig (6 pigs per pen). On weeks 2, 5 and 10, overnight videos were collected and scanned every 10 minutes to record the proportion of pigs resting on different floor types (solid, drained, slatted) and the proximity to other pigs (alone, close contact, full contact).

Findings showed significant differences in night rest between groups. While all groups spent around 95% of the time lying down, pigs in the lowest density treatment (2.1m^2/pig), and therefore with the highest agency to choose where to sleep, were more likely to rest alone on the preferred solid floor with a scattering of straw, while pigs in the highest density treatment (0.7m^2/pig) were more likely to rest in full body contact on the least preferred slatted floor. These results suggest high stocking densities (low space allowances) may negatively impact pig rest quality by reducing the availability of preferred, clean/dry resting areas and forcing pigs into closer proximity than preferred when space allows. These findings add to existing evidence that legal space minimums for pigs require reconsideration to better support pig welfare.

Coutant M, Michel J, Pedersen LJ, Larsen ML (2026) ***Space density affects resting location and proximity of fattening pigs at night****. Livest Sci 305:105913*

Chicken perceptions of humans matter for their welfare

Domestic chickens are often thought to have limited cognitive abilities, a misconception that contributes to low levels of concern for chicken welfare by society. However, research shows chickens have the capacity for complex cognitions including episodic-like memory, social learning, and behaviours indicative of empathy. Historically, limited attention has been paid to how chickens perceive and are impacted by the humans around them. Considering the prominent role that humans play in chicken husbandry and farming, understanding the human-chicken relationship may provide valuable avenues for improving chicken welfare.

This article reviewed decades of research on how chickens interpret and respond to human behaviour. The paper examines the socio-cognitive abilities of chickens towards humans, and discusses how human-chicken interactions influence husbandry and production outcomes, as well as the direct consequences of these interactions for chicken welfare, with a particular focus on fear responses, physiological markers of stress, and the potential for positive interactions.

The authors conclude that chickens have more complex perceptions of humans than previously assumed. Chickens show sensitivity to human attentional states, can discriminate between individual human faces and voices, and can demonstrate social learning about humans by observing flockmates. Regular positive human contact reduces chicken stress and fearfulness, improving immune function and boosting fertility, growth and egg production. Because chickens are capable of social learning, farmers who interact in a calm and positive manner with individual chickens may also improve welfare across the entire flock. These findings have considerable practical and ethical implications and provide promising avenues for future research to improve animal welfare practices and broaden our understanding of interspecies social cognition.

Ferreira VHB, Lansade L, Calandreau L (2026) ***How do domestic chickens perceive humans—and why does it matter?*** *Worlds Poult Sci J 82(1):3–24*

Watching another calf feed may worsen the experience of feed restriction in dairy calves

Dairy calves are routinely fed around half the milk required to satisfy hunger; a restriction designed to reduce costs and stimulate earlier solid food intake. However, insufficient milk supply can negatively impact calf welfare by restricting growth, suppressing immune responses, and leading to negative emotional states such as hunger and frustration, which can in turn contribute to abnormal behaviours such as sucking on other calves.

This UK study ran three conditioned place avoidance experiments, in which calves were conditioned to associate experiences with locations. Experiment one compared a room where calves were fed versus a room with an empty milk bucket. Experiment two compared a room where calves were fed while an adjacent calf received nothing versus a room where the calf received nothing while watching an adjacent calf be fed. Experiment three also included an adjacent calf feeding, but compared a room where calves were placed after being fed, versus one where they were hungry. After four days, calves were allowed to roam freely between the two rooms. Data was collected on which room the calves first entered, time spent in each and behaviours observed.

Calves only demonstrated avoidance behaviours in experiment two, avoiding rooms where they had been hungry while another calf fed. The authors suggest this may reflect either a negative emotional response to inequity, or intensified frustration from watching another calf eating. However, the visible presence of food is a potential confounder. Because the study did not include a condition of visible food without another calf present, and due to the differing satiation states of calves across positive conditions, the study is limited in its ability to determine which factors contributed to avoidance behaviours. Despite limitations, this study adds to existing literature indicating that feed restriction negatively impacts dairy calf welfare and suggests that negative mental states may be intensified by social context.

Hendricks J, Mendl MT, Lecorps B (2025) ***Watching makes it worse: Dairy calves are averse to watching another calf feed while hungry****. Anim Behav 232:123380*

Assessment of piglet mortality within a new farrowing system: the Maternity Ring

Accidental crushing by the mother is a common cause of liveborn piglet mortality. Farrowing crates reduce crushing by restricting sow movement in terms of how quickly and frequently she can change position. However, this close confinement (the sow is unable to turn around within the crate) negatively impacts sow welfare, causing pain, sores and an inability to express normal and highly motivated behaviours including nesting, maternal behaviour and piglet contact. Alternative systems, such as farrowing pens, improve sow welfare but are generally associated with higher piglet mortality, and require greater space. The Maternity Ring is a recently developed Australian farrowing system with a similar footprint to a farrowing crate that still allows sows greater freedom of movement. However, the performance of this system, especially in relation to piglet mortality, had not yet been assessed.

This study compared piglet mortality rates and first-parity sow performance between pigs in farrowing crates and Maternity Rings. 389 first-parity sows in New Zealand were randomly allocated to either a farrowing crate (n=184) or Maternity Ring (n=205). Litter size, cause and timing of piglet deaths, medical interventions and piglet removal or relocation for cross-fostering, a standard procedure that redistributes piglets for uniformity and teat access, were recorded.

In the first 24 hours post-farrowing (i.e., prior to fostering), 0.3 more deaths per litter occurred in Maternity Ring litters and, across the entire study length, 0.6 more piglets per litter were crushed compared to piglets in farrowing crates. However, after piglets were cross fostered, at approximately 24 hours, no significant differences were found between treatments in piglet mortality rates. Total pigs born, pigs born alive, and the number of pigs weaned between the two treatments did not differ. Results also showed fewer medical interventions for both sows and piglets, and 0.3 pigs per litter lower removal rates due to loss of body condition in Maternity Ring litters than in farrowing crate litters. These findings suggest Maternity Rings may achieve comparable piglet survival to farrowing crates, while offering improved sow mobility. Future studies, including with multi-parous sows, are needed to determine whether these results are repeatable.

Note: Authors Plush, Young, D'Souza and van Barneveld declared a conflict of interest as employees of SunPork Group, whose subsidiary company CHM Alliance, holds the patent for the Maternity Ring. Chidgey declared she is an employee of NZ Pork.

Plush KJ, Chidgey KL, Young N, D'Souza DN, van Barneveld RJ (2026) ***First lactation performance of sows in Maternity Ring housing is comparable to that in farrowing crates****. Front Vet Sci 12:1717512*

Farmer investment is needed to ensure global food system reform, but interventions are overlooking farmer experience

Global food systems are under increasing pressure to improve sustainability, adopt positive animal welfare practices and ensure global food security. While research has identified promising avenues for improving these factors, meaningful change depends on shifts in livestock farmer practice. Previous interventions aimed at encouraging farmers to adopt new practices have frequently fallen short and, because of this, farmers have often been stereotyped as reluctant to change. However, this hesitation may instead reflect a failure of interventions to consider the barriers experienced by farmers. Human behaviour change (HBC) science identifies key factors determining whether behaviour shifts or persists. Applying this method to farming contexts may better empower interventions to stimulate change.

Researchers from The University of Edinburgh undertook a scoping review of 21 publications to assess how HBC science has been used in interventions related to the One Welfare framework, a concept that recognises the interconnected nature of human well-being, animal welfare and the health of the environment, and emphasises the need to address them as a whole.

Most of the studies reviewed focused on farmers' behavioural intentions rather than their actions and, while some studies used HBC science to assess interventions, most interventions had not been designed using HBC science. Theoretical frameworks were often poorly matched to intervention goals, and demographic diversity was lacking across the research. The authors suggest these findings highlight a missed opportunity and recommend that researchers and policymakers embed behavioural science from the outset of intervention design. Global reform of food systems demands timely and effective action. Informed solutions that support, rather than pressure, farmers may better stimulate and sustain meaningful change.

Naydani CJ, Jessiman L, Doyle R, Jarvis S (2026) ***(How) have human behaviour change interventions influenced livestock farmers' behaviours in relation to One Welfare components? A scoping review****. Agric Hum Values 43(1):10*

Associations between farmer well-being and animal welfare

Farmers play an essential role in animal husbandry decision making, implementation and subsequent animal welfare outcomes. The well-being of farmers may therefore have direct implications for the welfare of the animals they keep. High rates of physical and mental health problems including pain, stress, depression and burnout are reported in farming populations. Farmers experiencing negative well-being may be physically, mentally or emotionally unable to implement or maintain welfare measures for their animals. Conversely, improving farmer well-being may enable farmers to improve management practices, and therefore animal welfare outcomes. This concept falls under the "One Welfare" framework, an extension of the One-Health model, that recognises that deep interconnections exist between human well-being, animal welfare and environmental health.

This scoping review examined the relationship between farmer well-being and animal welfare and aimed to systematically map the methods used to describe, and compile evidence of, this relationship. 22 articles were included in the review. These articles covered multiple countries and cultures and encompassed more than 4,600 farmers and around 280,000 animals including cattle, sheep, pigs, goats and poultry.

In some cases, cross-study comparisons were difficult to achieve due to differences in methods used to describe relationships, highlighting a need to standardise methods and improve comparability. Despite this, 93 out of 94 identified pieces of evidence showed that improved farmer well-being was associated with improved welfare in their animals, and vice versa. The most frequent associations were between farmer mental health and animal physical health. Poorer mental health in farmers and lower work satisfaction was associated with higher herd mortality rates and higher rates of culling, while higher work satisfaction was associated with positive, calm and patient animal handling. The findings of this review indicate that farmer and animal welfare are inextricably linked and suggest that strategies aimed at improving the welfare of farmed animals should also consider farmer well-being.

Levallois P, Buczinski S, Desmarchelier M, Lupien S, Robichaud MV (2026) ***Relationships between farmer well-being and the welfare of their animals: A One Welfare scoping review****. Anim Welf 35:e3*

ANIMALS IN SPORT, ENTERTAINMENT, PERFORMANCE, RECREATION AND WORK

Rodeo calves experience negative welfare prior to entering the arena

Calf rope-and-tie (also known as calf-roping) involves chasing a calf on horseback, lassoing a rope around their neck, abruptly halting, forcing the calf to the ground and tying their legs together. This type of handling does not occur on farms in Australia but occurs at many rodeos. Research provides evidence that calf rope-and-tie can have negative welfare outcomes for calves including fear and stress. Prior to their release into the area, calves are held in narrow holding crates called chutes. Confinement to these chutes, within the context of a noisy rodeo environment, may further contribute to negative welfare states in calves.

31 videos from two rodeo events in Queensland were used to investigate calf welfare within the chute prior to roping. Based on how long the calf spent in the chute, 17 videos were classified as short duration (SD: up to 51 seconds) and 14 as long duration (LD: 52-166 seconds). To compare between these groups, the final 28 seconds of each video were scored by two researchers using a 17-behaviour ethogram, including six "red flag" behaviours strongly associated with negative welfare states such as fear and stress, including eye white exposure, rearing, tail swishing and attempts to escape.

While all calves displayed at least one behaviour associated with negative welfare, "red flag" behaviours were significantly more frequent in LD videos. The authors suggest this may reflect prolonged confinement escalating fear and stress accumulating from failed escape attempts, or increased exposure to aversive handler interactions. Within this study, some calves were observed to be pulled by the ears, slapped, and, in one instance, a calf's face was stood on for 21 seconds following an escape attempt. The authors recommend minimising chute confinement time, eliminating aversive handling practices, and consideration of legislative reform to prevent unnecessary harm to calves used in roping events.

Dave A, Evans D, Vindevoghel T, Ward MP, Quain A (2026) ***An exploratory study of behaviours expressed by rodeo calves restrained in the chute prior to release in calf-roping events in Australia****. Ruminants 6(1):15 [Author Evans D is from RSPCA Australia]*

Concerns raised over inaccurate testing for noseband tightness in horses

A noseband can be tightened to prevent horses opening their mouths in an attempt to relieve bit pressure, a force applied to the bit by a rider through the reins to communicate commands. Tight nosebands are often used to increase rider control and gain competitive advantage. However, tight nosebands are known to contribute to negative horse welfare, preventing horses from expressing normal comfort behaviours such as yawning and coughing, and causing pain, oral lesions and long-term facial damage. To reduce these impacts, the International Society for Equitation Science (ISES) developed a taper gauge to reliably test noseband tightness at the dorsal midline (the middle of the horse's nose).

A study funded by the Fédération Équestre Internationale (FEI), citing concern over anatomical variation at the dorsal midline, tested whether three alternative sites could be suitable replacements, concluding the lateral maxilla was an appropriate substitute. Methodological and ethical issues within this study prompted a published response from Henshall et al., that raised concerns about the findings and their potential to negatively impact horse welfare.

Henshall et al. highlight the unsuitability of the lateral maxilla for reliable measurement due to inherent issues with the location and a failure of the study to provide adequate, repeatable methodology. The cheek area, where the lateral maxilla is located, has considerable soft tissues that may become compressed during measurements, making nosebands appear looser than they are, and allowing tight nosebands to pass welfare checks undetected. Location descriptions are also vague and inadequately described, making them unusable for valid, repeatable measurement. The authors point out that the lateral maxilla is also subject to anatomical variability, bringing into question the initial justification for the study. Of further concern, the study chose to test tightness at levels known to cause harm, without adequate justification. Finally, the authors point out that research that focusses on the biomechanics of equipment while failing to assess welfare indicators, cannot be used to infer the impact on horse welfare. Henshall et al. warn that adoption of the lateral maxilla in welfare checks may have serious consequences for horse welfare globally.

Henshall C, McGreevy P, Shea G, Doherty O, Christensen JW, Fenner K, Warren-Smith A, McLean A (2026) ***Commentary on MacKechnie-Guire et al. Measuring noseband tightness on the lateral aspect of the horse's face****. Animals 16(3):412*

Humans recognise negative, but not positive, emotion in horses

Emotional states can be broadly categorised as positive or negative, a concept called valence, and as low or high arousal, referring to how intense or activating the emotion is. Recognition of emotional states in horses is an important element of horse welfare assessments. Horses are a highly expressive species who communicate through a wide repertoire of facial movements. Previous research has assessed human recognition of horse emotional states based on body language, but none had assessed recognition of isolated facial expressions.

Horses were photographed in eight situations associated with positive or negative emotions within previous research. A total of 930 French participants engaged in an online task involving the use of 47 cropped photographs of the face and neck of horses in eight contexts associated with positive or negative emotions.

While negative contexts were accurately categorised by over 90% of participants, positive contexts showed variable results, ranging from 42% accuracy (grooming) to 84% (going to the pasture). When asked to categorise arousal, 93% of participants accurately recognised a low arousal context, while high arousal contexts varied in accuracy from 55% for a positive, high arousal context (going to a food bucket) to 96% for a negative, high arousal context (a sudden stimulus).

Experience with horses improved accuracy for negative contexts but did not consistently improve recognition of positive expressions. The authors suggest that negative facial expressions may be more visually obvious, and that humans may have an attention-bias towards threat-related cues. The authors recommend targeted training and increased awareness of positive expressions to enable more comprehensive welfare assessments.

Phelipon R, Lefort G, Galland O, Piegu B, Hennes N, Briefer E, Lansade L (2026) ***Humans can accurately categorise negative but not positive emotional facial expressions in horses****. Appl Anim Behav Sci 296:106901*

Defining separation anxiety in horses

Horses are herd animals that form strong social bonds. Separation from companions can therefore cause significant distress, commonly referred to as 'separation anxiety'. Despite general recognition of this state, little scientific research has been conducted on separation anxiety in horses, partly due to a lack of agreement on how it should be defined, the contexts in which it occurs, and the behaviours associated with it. Without consensus on these factors, identifying risk factors and developing effective interventions for separation anxiety in horses remains difficult.

To address this issue, an online questionnaire completed by 88 horse owners and caregivers was analysed, capturing their perceptions and definitions of separation anxiety and the behaviours associated with it. Thematic content analysis identified distinct definitions, contexts and common signs of separation anxiety in horses. These findings were reviewed by a panel of seven international equine behavioural experts through a structured consensus exercise, which was repeated until at least 85% agreement was reached.

Based on expert consensus, separation anxiety was defined as a behavioural state involving negative emotional responses that occur when a horse is separated from another horse, horses or bonded companion of any species. These emotional responses are indicative of distress and may occur during anticipation of separation, the process of separating, or after the horse has been separated, and can be experienced whether the horse is alone or with others. Eight distinct, but not mutually exclusive, contexts for separation anxiety were identified and defined along two axes: whether the horse was leaving or being left behind, and the stage of the separation process, from preparation through to complete loss of contact. Behaviours associated with separation anxiety included hypervigilance and vocalisation as well as depressive responses such as apathy and inhibition of maintenance behaviours. The authors recommend future research consider all eight contexts of separation anxiety to ensure accurate clinical assessment and management.

Ricci-Bonot C, Della Costa E, Houpt E, Jones M, Koch VW, Pearson G, Randle H, van Dierendonck M, Mills DS (2026) ***Development of a consensus definition of "separation anxiety" in horses****. Appl Anim Behav Sci 298:106937*

ANIMALS IN RESEARCH AND TEACHING

A call for consistent terminology in animal-free science

In the last two decades, efforts to replace animals within research and testing have led to a rapid increase in new terminology intended to describe animal-free methods and approaches. However, the meaning of these new terms is not always clear or consistent across regulatory, research and industry contexts. Adding to the confusion are differing definitions of the term 'animal' across various legislations and regions. Together, these factors create ambiguity around what is meant by 'animal-free science', hindering collaboration between stakeholders and preventing valid research comparisons.

To address this, the authors mapped current definitions of key terms including 'NAM', 'animal' and 'animal-free' using a structured search of regulatory, academic, institutional and legislative resources from across Australia, North America, Europe, Asia and Latin America. Data was collated into a structured table comprising term, definition and the reference.

The review found considerable variation in definitions across countries, regions and within organisations over time. For example, the acronym NAM was most commonly used to mean 'new approach methodology' but was also occasionally used to mean 'non-animal method', and definitions often varied based on the primary goals of the stakeholder. Additional ambiguity was identified around whether invertebrates, non-human embryonic vertebrates, and ex vivo methods qualify as NAMs. Stakeholders focused on reducing animal use considered them valid transitional steps, while those who strictly defined NAMs as non-animal methods did not, as they still involve animal-derived materials or living organisms.

To drive alignment, the authors put forward the **definition** agreed by members of the International Collaboration on Cosmetics Safety as a model for broader adoption, and recommend that standardised definitions be integrated into education, training and publications across all stakeholder groups.

MacMillan D, Holcomb P, Sullivan KM (2026) ***Lost in NAMs-lation: A review of animal-free science definitions****. ALTEX https://doi.org/10.14573/altex.2512221*

COMPASS: A framework for conducting welfare-focused animal behaviour-modification research

Evidence based studies that aim to improve animal welfare must be rigorously designed, conducted and interpreted to a high standard, with full consideration of potential limitations. For this purpose, frameworks, such as the **ARRIVE guidelines**, have been created to guide researchers in the planning, execution and reporting of animal studies. However, there is a growing need for additional specific guidelines for the design of studies focused on practices such as training, handling or restraint that alter animal behaviour. This is especially relevant now, as increasing numbers of studies are focused on determining and correcting the negative welfare consequences of animal husbandry practices due to increased public scrutiny of animal-related industries.

To address this gap, a team of researchers with collective expertise across multiple disciplines including veterinary medicine, welfare science and regulatory oversight, utilised an expert consensus process to develop guidelines for animal behaviour modification research. This was informed by the authors' combined experience in designing, conducting and reviewing behaviour modification research proposals and manuscripts across a wide range of species. The resulting guidelines are designed to complement existing frameworks for animal research and are applicable to a broad range of contexts and species including terrestrial mammals and some aquatic species.

The guidelines comprise 124 points that are organised under seven thematic areas corresponding to the acronym COMPASS: Controls and Calibration; Objectivity and Open Data; Motivation and Methods; Precautions and Protocols; Animal-centred Assessment; Study Ethics and Standards; and Species-relevance and Scientific Rigour. These guidelines aim to ensure that behaviour modification research provides reliable, ethical, and welfare-focused knowledge that is beneficial to both animals and the humans who care for them. The authors intend for the framework to be collaboratively refined and updated through further research and in line with the emergence of new methodologies, tools and perspectives, providing valuable guidance for researchers, animal ethics committees, regulators and trainers.

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WILD ANIMALS

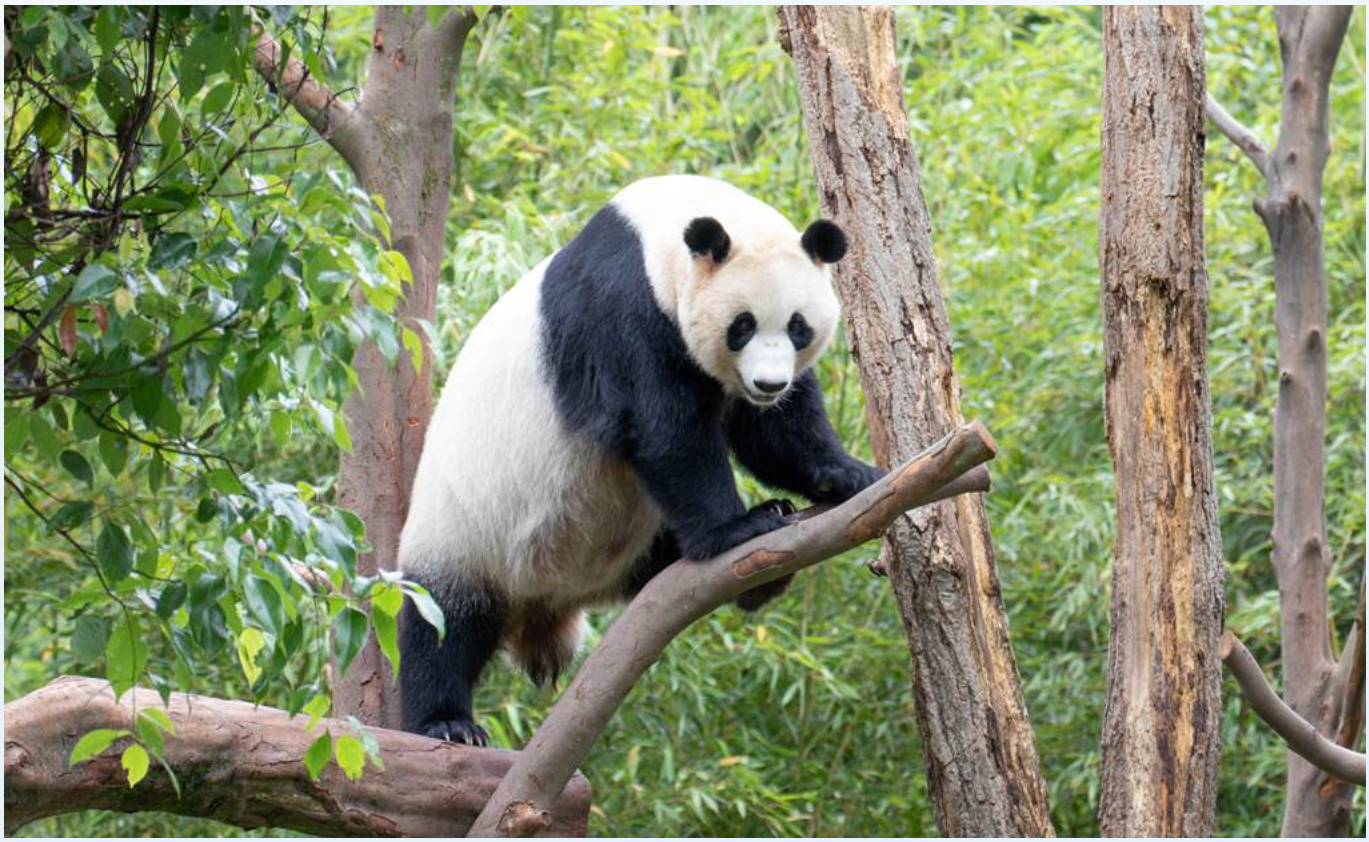
Tourist perceptions of wildlife-based tourism

Public interest in wildlife-based tourism is rapidly growing. By 2032, activities involving animals are estimated to generate over US $300 billion globally. However, many wildlife-based tourism attractions have been found to have negative animal welfare and conservation impacts, which tourists are often unaware of. Frameworks have been developed to help assess the welfare, conservation and governance (how a facility is managed and regulated) standards of animal-based attractions and, from these, efforts have been made to inform tourists to make more informed, ethical choices. However, these frameworks had not been tested in specific settings, involving a particular species in the view of tourists.

Using the **Fennell et al. (2022)** prototype framework, this study investigated tourist perceptions and the factors that influence these perceptions of visitors to the Chengdu Research Base of Giant Panda Breeding (Panda Base). 1,092 visitors were asked to evaluate the facility across 25 indicators of governance, conservation, and welfare standards. Participants could select from four response options ranging from best to worst practice or could select that they were unaware of evidence for a particular indicator. Responses were analysed using descriptive statistics and variance analyses to examine how perceptions varied across demographic groups and visitor characteristics.

Findings indicated that, overall, visitors evaluated the facility positively across all three dimensions, with policies restricting the contact between visitors and animals, and the conservation benefits of captivity rated particularly high. Conversely, the facilities' transparency around how income was allocated to conservation efforts was rated the lowest. While most demographic characteristics such as age, gender and education had limited influence on visitor evaluations, visitors with prior exposure to Giant Panda-related social media content were more likely to give positive evaluations. The authors recommend engaging tourists through education, participatory evaluation and digital platforms to enhance public awareness of conservation and initiatives around wildlife tourism.

Fennel D, Guo Y, Butler R (2026) ***Understanding tourist's perceptions of animal welfare, governance, and conservation: Evidence from the Panda Base****. Animals 15(24):3548*



TRANSPORTATION OF ANIMALS

Practical strategies for reducing pre-slaughter deaths in broiler chickens

Before slaughter, broiler chickens are caught, crated, transported, placed in lairage (a waiting area for processing), and then stunned. Throughout this process, broiler chickens face significant welfare challenges including poor health, distress, physical trauma and thermal stress, which in some cases can result in death prior to slaughter, a phenomenon referred to as dead-on-arrival (DOA). High rates of DOA can cause considerable financial losses for farmers and are a significant animal welfare issue that requires intervention.

Researchers at Virginia Tech reviewed the rates and risk factors for DOA based on research from over the last decade. 24 peer-reviewed studies, published between 2014-2024 across multiple countries including the UK, Canada, Thailand and Turkey, were included in the review.

A review of data from previous necropsy research identified four major causes of death: poor bird health, distress, exposure to extreme temperatures, and physical injury. In alignment with these, the most common DOA risk factors identified through the scoping review were longer journey duration and distance, high ambient temperatures, season (the most high-risk season differed geographically), extended time in lairage and heavier body weight. The mean DOA rate, reflecting typical conditions across thousands of transports, was relatively low across studies, ranging from 0-0.85%. However, rates as high as 27.56% were seen for a single transport, underscoring the importance of understanding and addressing risk factors. These findings provide valuable insights into how rates of DOA might be reduced. For example, pre-slaughter decision making should consider flock characteristics, transport should be scheduled for the mildest parts of the day, with crate densities aligned to temperature conditions, and care should be taken to limit the amount of time birds spend in transport or lairage. Together, these interventions represent practical opportunities for improving broiler welfare during the pre-slaughter process and may help reduce economic losses for the industry.

Vitek S, Jacobs L (2026) ***A decade of evidence on broiler chicken dead-on-arrival rates and risk factors: a scoping review****. Animals 16(5):805*

HUMANE KILLING

Assessment of low atmospheric pressure stunning (LAPS) as a method for stunning poultry

Prior to commercial slaughter, EU law requires all poultry be rendered unconscious by stunning. Approved methods for stunning include submersion in electrical water baths and Controlled Atmospheric Stunning (CAS) using carbon dioxide. However, these methods can negatively impact animal welfare. Electrical water baths require shackling and inversion, which can cause stress and bone fractures, while the carbon dioxide used in CAS systems can trigger aversive reactions such as headshaking and gasping. Low atmospheric pressure stunning (LAPS), a stunning method where oxygen levels are gradually reduced to achieve loss of consciousness through hypoxia, has been suggested as an alternative. However further research is needed to assess its effectiveness and implications for welfare.

The LAPS method was tested on 35 Ross 308 broiler chickens in Germany and their behavioural response to the decompression was recorded. Behaviours were coded as being suggestive of consciousness (e.g., standing or vocalising), unconsciousness (e.g., motionlessness or loss of posture), or aversion (e.g., convulsions, headshaking or wing flapping). Variables that may influence the procedure were also recorded including temperature, humidity, and individual bird characteristics such as age, sex and weight.

Results showed that birds remained conscious for the first 43 seconds of the procedure, and clear signs of unconsciousness were not observed until after four minutes of exposure. Prior to losing consciousness, the birds experienced an intermediate phase during which it was not possible to distinguish between conscious and unconscious states for over three minutes. During this intermediate phase, researchers observed frequent aversive behaviours associated with negative welfare including convulsions, headshaking and wing flapping. The findings of this paper indicate that while the LAPS method may have practical and welfare advantages over other methods, it has its own, potentially equal, welfare drawbacks and did not consistently ensure a rapid, sustained onset of unconsciousness.

Kuck FJ, Heck JE, Bergmann S, Schmidt P, Rauch E, Louton H, & Schwarzer A (2026) Low atmospheric pressure stunning as a new method for stunning broilers in Germany under ethological aspects. Poultry Sci 105(2):106224

MISCELLANEOUS

What is the teleonome? A new framework for animal welfare assessment

The field of animal welfare science spans multiple disciplines, with biologists, animal behaviourists, neuroscientists and numerous other specialities all contributing to the body of research that informs animal welfare recommendations. However, these specialities often act in isolation, using different methods, terminologies and interpreting findings through their own discipline's perspectives. This fragmentation means the field lacks a shared foundation, making it difficult to connect findings or gain a complete picture of animal welfare, understand why certain experiences matter to animals, or weigh one welfare concern against another.

To address this, the authors introduce a new framework called the teleonome. The name combines the Greek words for "purpose" and "system" and reflects its meaning as the organised, purpose-driven biological system through which an animal pursues survival and reproduction. This teleonome is made up of subsets of physical, behavioural, physiological and emotional systems and traits that are teleonomic (their purpose is directed toward staying alive and reproducing). These systems and traits operate together as an interconnected network that continuously responds to the environment the animal is in. An animal's teleonome is what an animal uses to detect, process and respond to environmental change in ways that keep them alive and enable them to reproduce.

Within animal-welfare science, the teleonome offers a biological reference point, grounded in the animal's own perspective. Beyond the partial answers offered by current fragmented approaches, such as recording when a stress hormone is raised or a behaviour is present, the teleonome enables researchers to ask what the measurement actually means for the animal's ability to function based on evolutionary capacity and imperatives. Within this framework, an animal's welfare is not a fixed state, but an ongoing process, shaped by their species, life stage, history and the environment they find themselves in. The authors argue that building species-specific teleonome profiles could help researchers prioritise welfare concerns more reliably, improve assessments and make decisions for animals with greater reference to what genuinely matters to the animals themselves.

Wilkins CL, Henshall C, Lykins AD, Mellor DJ, Fillios M and McGreevy PD (2026) ***The teleonome: a framework for understanding animal welfare integrating adaptive capabilities, affective regulation, agency, and environmental affordances****. Front Anim Sci 7:1768519*

Veterinary care is geographically inaccessible for 250,000 Australians

Lack of accessibility to veterinary services can pose a serious risk to animal health and welfare. For many conditions, timely treatment directly impacts health outcomes, especially in emergency situations such as after a snake bite. Greater distance to care facilities is also associated with decreased care seeking behaviour in humans and negative health outcomes. While veterinarian shortages have been identified as a potential contributing factor to veterinary 'care deserts', limited information is known about the distribution of the veterinary workforce across Australia.

This study aimed to model the spatial distribution of the Australian population beyond a one-hour drive from a Veterinary Service Location (VSL), and to estimate how many people are affected by veterinary inaccessibility. A one-hour drive was selected for measuring accessibility because the first 60 minutes following an emergency are considered most critical for survivability and preventing long-term complications. VSL's were collected from Overture Maps and Google Places to model accessibility to veterinary services across Australia. Travel-time estimation maps were generated, and population exposure to veterinary inaccessibility was analysed.

Findings showed that veterinary services were geographically inaccessible to more than 250,000 Australians, with veterinary care deserts most commonly found in rural and regional suburbs. Inaccessibility was worst in the Northern Territory, where over 20% of the population did not have access to a veterinary clinic. Inability to access veterinary services represents a significant animal welfare concern, as well as a human equity issue. Inaccessibility of veterinary care leads to otherwise preventable diseases and deaths in animals and increases the risk of disease outbreaks. This paper identifies opportunities for improving veterinary accessibility through government subsidies to support rural veterinary clinics, legislative reform such as altering the in-person requirement for establishing a Veterinary-Client-Patient-Relationship, currently required by all Australian regulatory boards, and research into the factors affecting supply and demand of veterinary services in Australia. Considering the continued decrease in some rural populations, the number of Australians without access to veterinary care will likely increase over time if innovative changes are not made.

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