Here's your monthly research compilation - In this roundup ‘Open Access’ papers will be indicated in the summary; open access papers are free for anyone and everyone to read and download. If you want any non-open access papers, please email research@dogstrust.org.uk as we have other avenues to access papers for you (Please don’t pay for papers, you don’t have too!). Also, please remember not all science is good science – do get in touch if you’d like help interpreting papers.

The research team’s Choosing My Dog survey is still open for responses (we’re at over 9,000 responses, so close to our goal of 10,000!) – Click the lovely Max the Spaniel below to take part (approx. 20 mins)

If you read nothing else this month . . .

Behavioural outcomes of housing for domestic dog puppies (Canis lupus familiaris) 264 puppies from 44 litters of 21 breeds were raised in either outdoor kennels (N=104) and indoor kennels (N=160). Puppy temperament was measured at age 7-8 weeks using the Puppy Aptitude Testing. Puppies raised indoors scored higher for self-confidence and lower for aggression than dogs raised outdoors. Puppies raised outdoors scored higher for aggression through fear and lower capacity for coping with novel conditions. The authors suggest that indoor raised puppies were better prepared behaviourally for life among people in a home and highlight the relationship between environment of dam and puppies for mitigating behavioural problems in adult dogs.

Does training method matter?: Evidence for the negative impact of aversive-based methods on companion dog welfare (Open Access) This pre-print (a non-yet peer reviewed article) sought to gather empirical evidence for the short and long term impacts on dog welfare of aversive-based (using primarily positive punishment and negative reinforcement) and reward-based training methods. They recorded dogs participating in aversive-based training (50 dogs) and reward-based training (42 dogs), sampled salivary cortisol (a hormone associated with the stress response) before and after training sessions, and tested the dogs cognitive bias as a measure of long-term welfare impact. The team discovered that dogs in the aversive group exhibited more stress-related behaviour (e.g. lip-licking, yawning), spent more time in tense and low behavioural states, more time panting and exhibited higher cortisol levels than dogs in the reward based training classes; they also had a more ‘pessimistic’ cognitive bias. These findings provide evidence for both short and long-term negative impacts of aversive-training methods on dog welfare.

Physical signs of canine cognitive dysfunction (Open Access) The aim of this study was to clarify the physical disturbances in canine cognitive dysfunction (CCD) by questionnaire survey. 726 owners responded to a digital questionnaire, and 103 owners to a paper questionnaire. All participants were owners of dogs aged over 10 years. Analysis of the larger cohort showed signs significantly associated with CCD included: vision impairment, smell disturbance, tremors, swaying or falling, and head ptosis (dropping). Except for head ptosis, all the findings were replicated in the 103 responses to the paper questionnaire. CCD diagnosis was most common in dogs aged over
16 years, but the physical signs associated with it increased steadily from 10 years of age, suggesting that the physical disturbances identified could be an early indicator of CCD.

The Need for Sleep in the Adolescent Brain. Sleep is a basic need for survival and mental health. This comprehensive review shows that poor sleep has detrimental impacts on numerous key developmental processes that happen during adolescence (such as emotional regulation, reward processing and social cognition). This is likely to be highly relevant to adolescent dogs brought into a shelter environment during this vital developmental period for whom sleep disruptions could worsen their mental functioning and behaviour.

Dogs Trust – Published by, funded by, or about Dogs Trust

The scent of enrichment: Exploring the effect of odour and biological salience on behaviour during enrichment of kennelled dogs. Was conducted at Dogs Trust Darlington in 2015-16: the data from this study and R analysis code are provided open access here. Provision of enrichment is an important part of managing the welfare of kennelled dogs, however the value of the enrichment provided isn’t always obvious. The authors of this study found that dogs were more likely to interact with a chew toy if it was scented with lavender or rabbit scents, compared to an unscented chew toy. Further, provision of scented chew toys also seemed to reduce the occurrence of behaviours related to stress and increase exploration of the kennel. Type of scent did not matter, meaning that it may be the novelty of the scent that is of importance. These findings suggest that providing scented toys may be a practical method for improving the welfare of kennelled dogs. Habituation to the scents could be avoided by using new scent periodically.

Brexit and Animal Welfare Impact Assessment: Analysis of the opportunities Brexit Presents for Animal Protection in the UK, EU and Internationally. Cites Dogs Trust Puppy Smuggling reports. This paper outlines the threats and opportunities to animal protection presented by Brexit in terms of 5 criteria: the political situation, regulatory changes, economic and trade factors, institutional considerations; and EU and international impacts. For dogs the focus is on the Pet Travel Scheme and the opportunity to control puppy smuggling and improve animal sentience legislation. However, pre-Brexit the Government has not demonstrated the political will and commitment to realise these opportunities.

Dog Behaviour and Welfare - Rescue centres, training incl. working/assistance, cognition

Characteristics and Adoption Success of Shelter Dogs Assessed as Resource Guarders. (Open Access) through review of 5 years of records from a New York SPCA data from 1,016 dogs were evaluated for resource guarding issues. The prevalence of resource guarding was 15% and severe resource guarders were more likely to be returned by adopters. However, 87% of these dogs were successfully rehomed.

Early Recognition of Behaviour Problems in Shelter Dogs by Monitoring them in their Kennels after Admission to a Shelter. (Open Access) This study found numerous correlations between dog behaviour when observed over the first 5 days in a shelter and that displayed in the dogs’ formal behavioural test. These results provide evidence that the behaviour test is a valid reflection of the dogs’ behaviour in the shelter, even if it doesn’t predict future behaviour outside of the shelter. It also suggests that early signs of problems may be detected from observing in kennel behaviour from day 1.

Hunger for words. (Not published research, but popular in the media this month) The blog is run by a speech therapist popularised by her dog Stella who has been taught to press buttons on a board – by pressing the buttons it plays a word such as ‘play’ or ‘eat’. This builds on examples like dogs able to ring a bell to ‘ask’ to go outside. It is difficult to show that Stella truly understands the ‘words’ or ‘sentences’ she is using rather than getting stimuli=outcome (as in the bell example above); in some videos when Stella constructs ‘sentences’ it may be that she has
not received the desired outcome and is trying different buttons until she succeeds. Allowing animals to express choices is however a great way to boost their welfare and a button board can be an awesome enrichment option!

The effect of oxytocin on yawning by dogs (Canis familiaris) exposed to human yawns. This study definitively shows that dogs do not yawn in response to a human yawn as an emotional contagion. Instead, apparent contagious yawning in dogs is a response to situational stress, rather than an empathy mediated reaction.

Balancing skill against difficulty - behavior, heart rate and heart rate variability of shelter dogs during two different introductions of an interactive game (Open Access) in this pre-print, the authors sought to test whether the speed of introduction to interactive games impacts success rate and frustration-related behaviour of 28 shelter dogs. Recordings were made of the dogs behaviour, heart rate and heart-rate variability with half the dogs introduced to a moderately difficult game gradually (dogs were presented with a smaller version of the game first and a human demonstrated the mechanism) and half the dogs were introduced hastily (given a complete version of the game with no demonstration). Dogs introduced to the game gradually had higher success rates, displayed less stress-related behaviours and different heart rate responses. The authors conclude that gradual introduction (including demonstration) to interactive games promotes a more enjoyable experience for the dog.

Quantitative translation of dog-to-human aging by conserved remodelling of epigenetic networks (Pre-print) Is a dog year really equivalent to 7 human years? We always knew that wasn’t quite accurate, but this new study explains why - Throughout life our genes experience a change called methylation, with a set of these changes called methylomes. You can compare methylomes between species to investigate rates of aging. By comparing human and dog methylomes the researchers now suggest that a 7-week old puppy is equivalent to a 9-month-old baby, a 12-year-old Labrador would be equivalent to a 70-year-old human. Dog aging appears to occur quickly in the first two years of the dog’s life before slowing down. The new rough equation is 16x ln(dog age) +31. Or you can use the handy calculator here

Evaluating Cognitive and Behavioral Outcomes in Conjunction with the Secure Base Effect for Dogs in Shelter and Foster Environments (Open Access) Understanding how dog-human attachment relationships correspond with other measures of behaviour and well-being may be of interest within shelter and foster populations. This study provides the first empirical evidence looking at the association between how a dog is attached to its shelter caretakers or foster carer and determining whether their attachment style corresponds to a variety of behavioural, personality and cognitive problem-solving measures. Amongst numerous findings: foster dogs were scored as showing higher levels of attachment-attention seeking behaviour than shelter dogs; both types of dog that appeared to be securely attached had lower scores for ‘neuroticism’; and secure attachment in the foster home was associated with improved performance on a cognitive task. These results show that attachment styles with temporary caregivers may have implications for behaviour and welfare in dogs in shelter or foster care.

Evaluation of the usefulness of the temperament tests in utility dog breeding on the example of a Boxer breed (Open Access) Some countries use temperament tests as part of qualifying Boxer dogs for breeding, which is considered by some to be justified in preserving the breed’s
character. This study aimed to evaluate the usefulness of such tests using results from international dogs sports competitions (organised by the Association Technique Internationale du Boxer), with data from 30 breeders clubs around the world, for the years 2002-2015 (with a mean of 33 dogs per year taking part in Guard Dogs Championships and 32 dogs in Tracking Dogs Championships). The use of temperament tests in breeding qualifications appeared to have little effect on competition results. However, temperament tests varied across countries and breeders clubs with little mention in the study of the actual content of these tests.

**Exploring the utility of traditional breed group classification as an explanation of problem-solving behavior of the domestic dog (Canis familiaris)** The results of this study urge for caution is using breed group as a way to understand problem-solving behaviour of dogs. Contrary to common perceptions, dogs in breed-groups do not differ in their problem-solving ability.

**Humans and Dogs - Education, human-animal bond, handler/owner/vet perceptions**

**There for You: Attending Pet Euthanasia and Whether this Relates to Complicated Grief and Post-Traumatic Stress Disorder** This study sought to investigate the influence of pet euthanasia on the bereavement process. Pet owners in Hawaii (n= 236, 70% dog owners) who had experienced a pet euthanasia, completed a 37-item questionnaire, the Inventory of Complicated Grief Revised Short Form (CG) and the Post-Traumatic Stress Disorder Checklist (PTSD). 79 attended the euthanasia of their pet, 119 did not and 38 did not answer the attendance question. 3.4% of respondents met criteria for CG and 4.7% for PTSD; physically attending a pet’s euthanasia was not correlated with CG or PTSD.

**A systematic scoping review: What is the risk from child-dog interactions to dog’s quality of life?** Child-dog interactions are important to consider in relation to dog quality of life. However, this review found very limited published attention has been paid to the role of children play in influencing the quality of life of dogs, despite growing attention being paid to the value of dogs as service dogs or therapy dogs for children. The authors identified some specific risk-factors in child-dog interactions including: unprovoked child attention; interaction predictability; and the dog being used in child initiated games.

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**Figure 2.** Links between child-dog interactions and effect to dog’s well-being.
**Monetizing Bowser: A Contingent Valuation of the Statistical Value of Dog Life**

Value of statistical life is a method for used to calculate the value of a typical human life (i.e. similar to life insurance). This paper used statistical value of dog life to calculate the value of a dog. 5000 dog owners were asked about their willingness to pay for resources which would change the mortality risk for their dog. Specifically, owners were asked about willingness to pay for a hypothetical vaccine, which was calculated to reduce risk of mortality by about 10% per year. Owners were on average willing to pay between $500-$900. By averaging this over a dog’s life-time, adjusting for multi-dog households and adding in known biases in human risk assessment the authors suggest a dog’s life is worth $10,000. Summary – *Washington Post* (We have this as a word doc if you would like it)

**Is Dog Ownership Associated with Mental Health? A Population Study of 68,362 Adults Living in England**

15,856 of participants in this study had a dog in their household. Whilst dog owners were less likely to report long-standing mental illness than non-owners this was found to interact with the respondents’ marital status; dog owners who were single had an increased chance of experiencing short-term psychological stress. This provides additional evidence that whilst dog ownership is sometimes correlated with mental health outcomes, there are usually additional complex factors at play.

**Companion dog acquisition and mental well-being: a community-based three-arm controlled study**

(Open access) 77 people took part in an 8-month long study to measure loneliness, positive and negative affect and psychological distress in relation to dog acquisition. 17 acquired a dog within 1 month of the study, 29 delayed getting a dog until after the study and 25 had no intention of acquiring a dog. For the 17 people who did get a dog there was a significant reduction in loneliness by month 3, and a smaller reduction across the full 8 months. It is unclear which, if any, elements of dog ownership specifically contributed to this change in this small sample.

**Dog Days of Final Exams: Using Canine-Assisted Therapy to Reduce Stress and Improve Mood Among Community College Students**

530 students at a College in Texas completed surveys pre-and post-interaction with therapy dogs and their handlers during a week of final exams. A significant number of participants reported an improvement of mood and decreased stress levels following the dog therapy sessions and rated the animal-assisted therapy experience as beneficial. The length of sessions spent with the therapy dogs was not recorded and no controls were in place to check if the same results might have been achieved with a different type of intervention.

**The impact of dog therapy on nursing students’ heart rates and ability to pay attention in class**

Dog walking mediates the relationship between dog ownership and neighborhood social interaction

421 US pet owners were surveyed about neighbourhood social interactions and the dog owners amongst them also completed a dog walking questionnaire. Of participants aged 55+ the probability of meeting neighbours was 2.4x higher for dog owners than cat owners, differences in age and neighborhood type (rural, suburban/urban) between groups were controlled for during statistical analyses. Amongst dog owners, the odds of meeting a neighbour increased the more they walked their dog. These findings suggest that supporting dog ownership and dog walking among older adults may help reduce social isolation.

**Bodies of knowledge, Kinetic Melodies, Rhythms of Relating and Affect Attunement in Vital Spaces for Multi-Species Well-Being: Finding Common Ground in Intimate Human-Canine and Human-Equine Encounters**

A two study paper investigating the child-animal relationship between primary school children (7-11) and a school dog and young people (16-19) and horses. The focus is on children’s bodies and senses, describing interactions beyond attainment, language and cognitive perception. The children in this study voted to get a school dog (Ted) during a mock election and he is cared for by the class teacher. A visual and sensory ethnography was used to materialise the
children's experience with Ted (drawings/comics) and demonstrate Ted's presence in the classroom as an extension of the children’s bodies.

**Barks & Rec: A Dog Park Socio-Technical System** (Conference Abstract, Open Access) A computer sciences view of designing an optimal dog park. Through observing dogs and owners plus conducting focus groups ‘Bark & Rec’ park was designed to encourage community connections, contributing to community goals and encouraging pet awareness. The presented idea includes an app through which owners could monitor which other dogs are attending the park to coordinate with their dog’s perceived ‘friends’ or avoid problematic owners.

**The ability to recognize dog emotions depends on the cultural milieu in which we grow up** (Open Access) A study of the human-ability to recognise facial expressions in dogs. Participants (adults and children with varying dog experience) were shown pictures of dogs, humans and chimpanzees showing angry, fearful, happy, neutral and sad emotions. Dog emotions of happy and angry were readily recognised independent of age and experience with dogs. The probability of adults successfully recognising dog emotions was higher for participants who had grown up in a culture which highly valued dogs and integrated them into human life.

**Back to the Future: A Glance Over Wolf Social Behavior to Understand Dog–Human Relationship** (Open Access) This review article looks at the social behaviours wolves use to cooperate and compared them to analogous data on dogs to better understand how domestication has influence dog-human communication and cooperation.

**Figure 1.** Reciprocal muzzle licking during a post-conflict triadic affiliation (“consolation”) between an adult (the consoler) (a) and an immature subject (the victim) (b) Photos by Elisabetta Palagi.

**Who let the dogs out? A Plea for Official Guidelines on Service Animals in the Teaching Laboratory**

**People’s perception of brachycephalic breeds and breed-related welfare problems in Germany**

**International - Rabies/other zoonotic diseases, parasites, spay/neuter, population control**

**The Effectiveness of Dog Population Management: A Systematic Review** (Open Access) This systematic review considers 39 papers on the effectiveness of dog population management. 15 countries are represented in the literature. The strategies reviewed were neutering/immuonocontraceptives (13 papers), culling (7 papers), sheltering (2 papers) and taxation (1 paper). Fertility control was the most investigated and had the greatest reported effect on dog population size. Reporting quality was found to be low for power calculations (11%), sample size calculations (11%) and the use of control populations (17%).
A study of Human Behaviour and Rabies Spread in West Kalimantan, Indonesia Rabies is present in 13 out of 14 districts in West Kalimantan, Indonesia and since 2017 it has been threatened by a rabies outbreak in Sarawak, Malaysia on their border. A field study was conducted to identify risk pathways for rabies. The estimated dog population is 200,000, with 90% free roaming, predominantly in areas where Christian and Dayak indigenous populations live. Most houses have 2-5 dogs, used for hunting, guarding homes/crops, ‘special’ house dogs and for consumption. Hunting with packs of 5-15 dog is a traditional activity necessary for food security. Gifting of puppies is also a tradition. Despite identifying these traditional routes of dog movement, the authors suggest this is inadequate for explaining how rabies spread so rapidly in these areas. Instead the authors suggest the new palm oil plantations and highways increased the ease of rabies distribution.

Rabies spread modelling within wild dog populations in northern Australia (Event abstract) Whilst Australia is currently rabies free there is a threat of the disease entering the country through the Indonesian Archipelago (Closest case was 300km from northern Australia). Disease control in this region would be challenging as it is populated by remote Indigenous communities, Australia itself has a large wild dog population (dingoes, feral dogs, dingo-dog hybrids) but dog/dingo density data is lacking in northern Australia. This abstract generates data on wild dog ecology and uses it to predict the spread of rabies in northern Australia.

The ripple-effects of free-roaming community dogs (Conference abstract) Five remote communities in Australia were studied through semi-structured and informal interviews to investigate dog value, impacts and the influence of management strategies. Constraints associated with remote-living (intermittent veterinary services, expensive food), limited governance (unrestricted dog ownership, lack of dog control), and local norms (free-roaming dogs, low expectations of dog health) collectively underpinned dog problems such as scavenging, aggression and poor dog health. This increased resentments to dogs, reducing human and dog wellbeing, as residents had to avoid dogs or actively harmed dogs. The authors suggest a carrying capacity population level for dogs within these communities with a multi-level stakeholder approach; this will support cultural norms of dog ownership but minimise dog problems.

Wellcome Trust - Leishmaniasis (Video 3mins 19secs) The Wellcome trust explains the impact of Leishmaniasis in Kenya and their work developing a new oral treatment for humans.

Canine parvovirus prevention and prevalence: veterinarian perceptions and behaviors The aim of this study was to document vets’ perceptions around canine parvovirus (CPV) occurrence and mortality rate, explore the preventative strategies used by vets, and determine if practitioner recommendations differed from vaccine labels and guidelines. 534 Australian veterinary hospitals were surveyed (23.5% of all Australian small animal clinics). Vets overestimated CPV mortality rates by 2.74 times, but underestimated disease rates nationally by a factor of ten. Vets that don’t see CPV cases underestimated CPV occurrence by a factor of 20. The perception of mortality risk being significantly higher than it is might lead to an overestimation of cost to treat, and over-recommendation of euthanasia. 48.7% of vets stopped vaccinating earlier than recommended, which might put patients at risk.

Socioeconomic, geographic and climatic risk factors for canine parvovirus infection and euthanasia in Australia (Open Access) this study used the same sample of vets described in the above research to evaluate the risk factors for canine parvovirus in Australia in 2016. 11% of Australian vet hospitals reported severe caseloads (>40%) of CPV per year. Caseload and euthanasia without treatment were both significantly associated with socio-economic disadvantages, confirming that socioeconomic disadvantage is a risk factor for CPV infection and negative outcome. Increasing regional temperature and lower annual rainfall were also identified as climate-related risk factors for CVP infection.
Evidence-based veterinary medicine matters  
RCVS and Sense about Science have joined together to make a commitment to evidence-based veterinary medicine. 15 organisations have made a commitment to evidence-based veterinary medicine. To launch their initiative, they have collated 14 case studies showcasing the impact of standout veterinary research and evidence. 3 of these case studies relate to dogs (Ciclosporin for anal furunculosis, BOAS grading, epilepsy management)

Efficacy of fluoxetine for canine behavioral disorders  
The results of this study support continued use of fluoxetine when used in conjunction with a comprehensive behavioural modification plan for the treatment of behavioural disorders.

Posters have limited utility in conveying a message of antimicrobial stewardship to pet owners  
(Open access) Whilst posters and leaflets are popular in health promotion campaigns, their effectiveness in veterinary medicine is unknown. This study investigated whether or not pet owners noticed and retained the message of a post on antimicrobial stewardship in veterinary clinic exam rooms. 111 pet owners at 5 veterinary clinics in Philadelphia took part. Only 51 (46%) of owners noticed the poster and only 11 (10%) could partially or completely remember the message. No demographic or clinic factors were associated with noticing the poster or remembering the message. Antibiotic knowledge scores were related to baseline knowledge and were not affected by viewing the poster. Veterinarians were also sceptical of the impact of the posters and found it did not increase the frequency with which antibiotic resistance was discussed with owners. Posters alone therefore had a limited impact on conveying the message of antibiotic resistance to owners.

Veterinary nurses must be conscious of recent research indicating early neutering of bitches increases incontinence risk

Development and evaluation of a health-related quality-of-life tool for dogs with Cushing’s syndrome  
(Open access) 210 dogs with Cushing’s syndrome and 617 without Cushing’s syndrome were used to develop and define a health-related quality of life tool. The tool was refined from 32 questions to 19, showing good internal consistency. Dogs currently on trilostane had a statistically higher health related quality of life compared to those not receiving trilostane.

True Colors: Commercially acquired morphological genotypes reveal hidden allele variation among dog breeds, informing both trait ancestry and breed potential  
11,790 dogs (212 breeds, 4 wild canine species) from the Mars Wisdom Panel data base were evaluated for 7 coat trait genes and 5 physical characteristics. The study documents the frequency of alleles for these 12 genes thereby demonstrating both anticipated genotypic variations within breeds but also highlighting rare and unexpected alleles not previously reported for these breeds. Despite the relatively closed nature of dog breed mating/selection practices since the late 19th century this study evidences that almost all breeds still had rare trait-causing genes. The authors suggest either unifying breed standards across registering bodies to increase selection pressure against these genes or to expand breed standards to allow these phenotypes.

A complete cross-over design evaluating canine acceptance of Carprieve® and Rimadyl® carprofen chewable tablets in healthy dogs  
(Open access) 37 cross-bred beagles at the US Veterinary and Biomedical Research Center, Inc. (VBRC, Inc.; Manhattan, Kansas) were offered a carprofen chewable tablet (either Rimadyl® or Carprieve® in a cross-over design) and given the opportunity to voluntarily eat the tablet. 73.0% (27/37) and 70.3% (26/37) of dogs voluntarily accepted Rimadyl® and Carprieve®, respectively, and there was no significant difference in acceptability between the two carprofen chewable tablets.
Analysis of combined resistance to oxazolidinones and phenicols among bacteria from dogs fed with raw meat/vegetables and the respective food items (Open access)

Improving the Health of Teeth in Cats and Dogs with Live Probiotic Bacteria 9 cats and 13 dogs were given a combination of selected bacteria Streptococcus thermophilus SP4, Lactobacillus plantarum 14D and Lactobacillus rhamnosus SP1 (Petguide powder) in powder form daily for four weeks on top of the dry feed. This was to investigate impact on oral health. Microbiological samples were taken before and after the intervention. After 4 weeks this intervention was shown to prevent the growth of infectious bacteria, with Petguide probiotic powder reducing the relative abundance of infectious microbes significantly.

Hair arsenic level in rice-based diet-fed Staffordshire bull terriers (Open Access) The aim of this study was to assess the risk of chronic exposure to inorganic arsenic (iAs) from rice-based dog diets. iAs level was evaluated from hair samples of seven SBT’s fed rice-based diets and nine SBT’s fed a rice-free diet. The hair iAs level was significantly higher ($P=0.005$) in dogs fed a rice-based diet (mean $0.143 \mu g/g$). The results suggest that eating a rice-based diet for long periods of time represents a risk for chronic iAs exposure in dogs.

Facial changes related to brachycephaly in Cavalier King Charles Spaniels with Chiari-like malformation associated pain and secondary syringomyelia Summary: Science Daily

Development of a real-time PCR assay for detection of Cryptosporidium canis in dog fecal samples

Do prevalence rates and severity of acquired urinary incontinence differ between dogs spayed by laparoscopy or laparotomy? Comparing apples with apples with a matched-pair cohort study

Estimation of dog population in Nasarawa state Nigeria: a pilot study (Open access) using questionnaires and interviews it was estimated that 97.7% of owned dogs in Nasarawa state, Nigeria were local breed types, and 77% were considered as guard dogs, with 23% used for hunting. The majority (79%) were unvaccinated, and the estimated total dogs in the state was 462,586. The authors recommend education of dog owners and laws to promote rabies vaccinations and postexposure prophylaxis for humans.

Ethics, Culture and Law – incl. history, domestication, dingo/wolf-human conflict, dogs in society

Commons Select Committee – MPs express concern over scale of ‘cruel’ puppy smuggling trade The EFRA committee has written to the Secretary of State for DEFRA to express their concern over the Government’s commitment to halting the illegal puppy smuggling trade. Dogs Trust facts and figures used throughout as compelling evidence. Amazing work and coverage as always from the efforts of our Public Affairs team.

Perspectives from the Science-Policy Interface in Animal Health and Welfare This paper explores the factors critical to scientific effectiveness when trying to influence policy making. In animal health and welfare these are suggested to be connected to public interest research, scientific independence, a commitment to research quality and openness, opportunities for partnership and collaboration plus an interest in strategic and systematic change. Areas of improvement are
outlined as including policy relevance in research from the outset, engagement with policy makers and other stakeholders, better usage of platforms to facilitate science-policy dialogue and appropriate dissemination of research findings.

**Geographic hot spots of dingo genetic ancestry in south eastern Australia despite hybridisation with domestic dogs** Hybridisation with domestic dogs is a major cause for concern in dingo conservation. 783 wild-caught canids in eastern New South Wales were analysed for levels of hybridisation using a 23-microsatellite test. Only 0.6% of canids sampled had no dingo ancestry with between 9% and 23% were pure or ‘likely to be’ pure dingo. [Summary in the Guardian](#)

**Evaluating conservation dogs in the search for rare species** A review of the literature on conservation scent dogs. Five measures are identified as important in evaluating success: precision, sensitivity, effort, cost and comparison with other techniques. Of 61 studies investigated only 4 reported all 5 measures. Significant cost variations were found in the studies, notably due to sourcing and employing the dog-handler pairs.

**Reported livestock guarding dog-wildlife interactions: Implications for conservation and animal welfare** 225 Livestock Guardian Dogs (LGDs) in South Africa were used to determine prevalence of farmer-reported LGD-wildlife interactions. 71 dogs (32%) had interactions with wildlife. Non-lethal herbivore interactions were significantly lower than non-lethal predator interactions (17%) but no difference was found in lethal interactions (9% of herbivore interactions, 10% of predator interactions). All predator interactions were reported as defensive compared to 25% of reported herbivore interactions. LGDs were shown to be highly targeted and discriminatory towards predators attempting to predate on livestock, although interactions with non-target species

**From ‘no dogs here!’ to ‘beware of the dog!’: restricting dog signs as a reflection of social norms** These authors looked at how warning signs can reflect differing dog-human relationships norms. They compared dog-based warning signs in a Finnish town to those in two Romanian villages. In the Finnish town, which has a more ‘Western’ view of dogs as pets/family members, the signs were all aimed at dog owners as instructions to restrict the ‘being’ of dogs. However, the signs in the Romanian villages, where dogs are seen more as workers or guards, the signs used dog images to restrict the ‘being’ of the humans.

**Dog-walking in dense compact areas: The role of neighbourhood built environment** (Open Access)

**Other Species – Behaviour, welfare, research methods**

**Cognitive Kin, Moral Strangers?** (Book) Judith Benz-Schwarzbürg presents a range of studies on culture, language and theory of mind in animals and getting is to ask why these complex cognitive abilities matter. The author focuses on both ethical theory and the practical ways we use animals, suggesting that the knowledge we have about their capabilities is already enough to inform the ways we treat animals in our care in captivity and in the wild.

**Potential Impact of Construction Noise on Selected Zoo Animals** (Open access) Although captive animals can habituate to sounds that they hear on a regular basis, construction noise can be intense and unpredictable. The behaviour of elephants, giraffes, emus and alligators were recorded during 90min exposures to different sound environments including ambient noise and four construction noise treatments. All animals responded to the recorded noise, with giraffes, emus and elephants showing behavioural changes indicative of stress.

**What’s new from the zoo? An analysis of ten years of zoo-themed research output** (Open access) By searching the Web of Science data base for zoo-based research this paper evaluates trends in zoo publications. More birds and fish are kept in zoological collections compared to other animal groups, but mammals are the most studied. Birds are seeing a steady increase in publications.
Husbandry evaluation is a major research topic, but pure biology, cognition and health are also seen. The main findings are 1) trends in species holding are unrelated to trends in publications; 2) zoo-themed research makes meaningful contributions to science 3) zoo researchers should diversify their aims/output categories and chosen study species to help close persisting research gaps.

Comparative analyses of longevity and senescence reveal variable survival benefits of living in zoos across mammals. 50 mammal species were compared for four survival metrics (longevity, baseline mortality, onset of senescence and rate of senescence) in both wild and zoo populations. For 84% of species, mammals in zoo populations living longer than wild counterparts. This effect was most notable for smaller species with short life spans including tree shrews, weasels and white-tailed deer. All 15 carnivore species studied had greater longevity in zoos. Summary: Science Daily

 Owners’ Attitudes, Knowledge, and Care Practices: Exploring the Implications for Domestic Cat Behavior and Welfare in the Home (Open access) Much of the research available regarding the link between domestic cats’ environments and their welfare has been done in animal shelters or research facilities. This study therefore aimed to assess this in cats living in homes within the US. A cross-sectional survey of 547 cat owners showed that owner knowledge and understanding of cat behaviour and their reported strength of the human-animal bond were significant predictors of the number of reported behaviour problems. Certain misconceptions about cats and a reported weaker bond correlated with the use of punishment based methods in response to misbehaviour. The authors suggest there is a need for better education for cat owners covering topics such as normal cat behaviour, resource and enrichment needs and welfare implications of certain practices.
Miscellaneous Research - Citizen science projects, books, tech, everything else

**Dog Aging Project** A citizen science project looking to identify factors which are key to improving a healthy lifespan in dogs. So far, they have 70,000 dogs signed up!

**Inside the world of Guide Dog dropouts** (Online magazine article NOT peer reviewed) A couple of case studies about Guide dogs in the US who didn’t quite make the cut.

**Mental Health and Well-being in Animals** (Book) The second edition of the most current knowledge on the array of mental health issues seen in animals.

**Scientists’ opinions and attitudes towards citizens’ understanding of science and their role in public engagement activities** (Open access) Research in Spain interviewing 1022 scientists to discover their views on the public. 75% of respondents thought that the public had a serious lack of knowledge and understanding of scientific reasoning. However, 73% of respondents also recognised that science is of interest to the public. Responding scientists also rated the value of their work at 4.22/5 whereas the general public values scientific professions at 3.12/5. Narrowing this gap in perceptions can make future public engagement activities more effective.