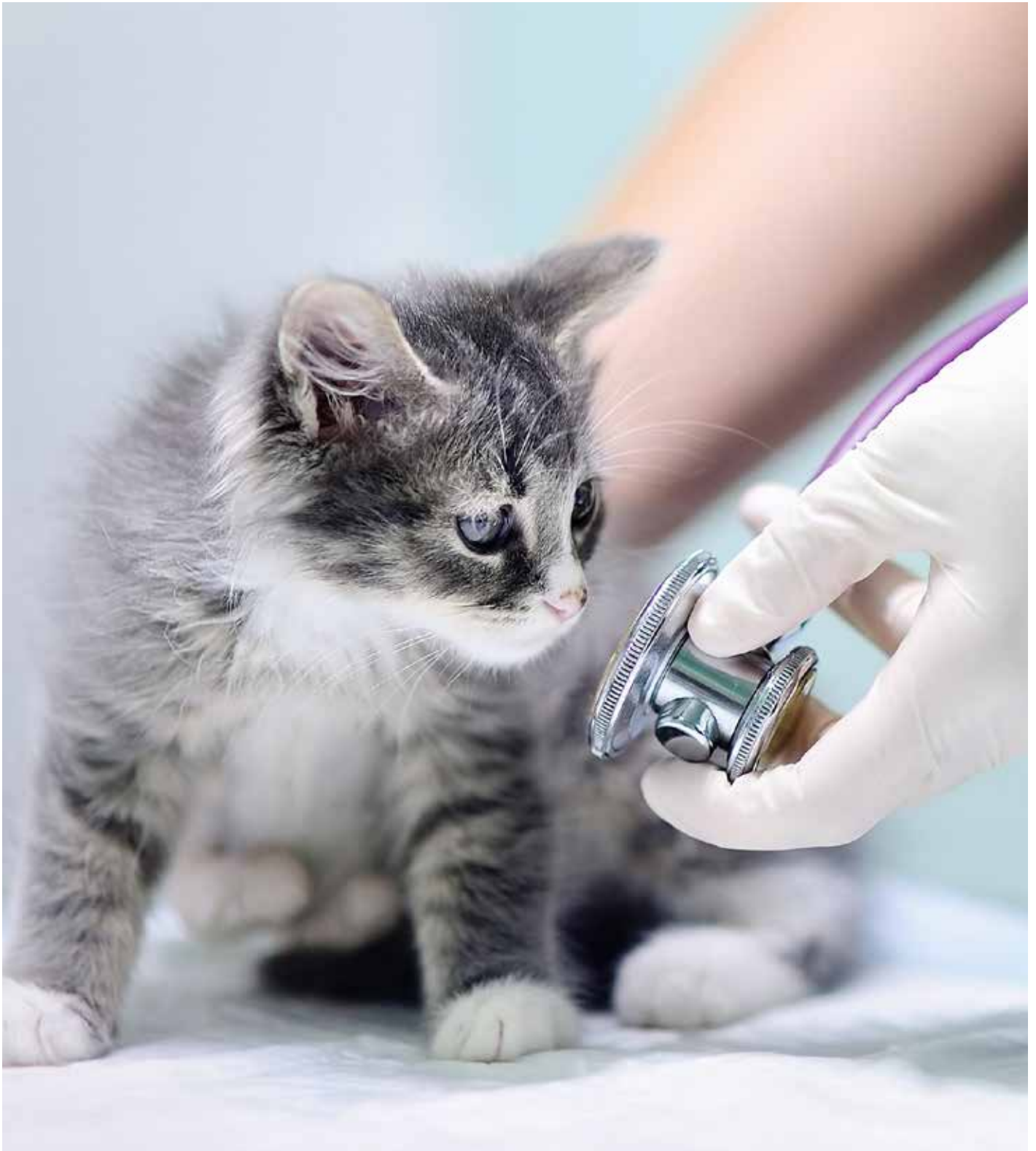


THE  
AUSTRALIAN  
**VETERINARIAN** MAGAZINE

Horses blink less,  
twitch eyelids more  
when stressed

**Reading dogs' facial  
expressions is learned,  
not innate**

The ABC's of veterinary  
dentistry: A is for  
Anaesthesia Monitoring,  
Attrition and Abrasion



# CONTENTS

4CYTE  
FULL PAGE  
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**READING DOGS' FACIAL EXPRESSIONS IS LEARNED, NOT INNATE**



**THE ABC'S OF VETERINARY DENTISTRY: A IS FOR ANAESTHESIA MONITORING, ATTRITION AND ABRASION**



**HORSES BLINK LESS, TWITCH EYELIDS MORE WHEN STRESSED**

- 6** Oestrogen's opposing effects on mammary tumours in dogs
- 8** Dog owners often inaccurately measure out dry dog food
- 9** Furry friends ease depression, loneliness after spousal loss
- 10** Microbes make chemicals for scent marking in a cat
- 11** Cats are securely bonded to their people, too
- 14** Feeding pets raw food is not considered by pet owners as a significant source of infections
- 15** Overweight owners are more likely to have overweight dogs
- 16** Chicks born with ability to distinguish and avoid different dangers
- 17** The problem with promoting 'responsible dog ownership'
- 22** Be aware of the spread of rabies, vaccinate to eliminate
- 23** AMRRIC recognised with National award
- 24** Online Pet Supplies Business Celebrates 20 Years
- 25** WSAVA's Global Pain Council Aims to Raise Standards of Pain Management by 'Teaching the Teachers'
- 26** Jaw-some wombats may be great survivors
- 26** Planning will save pets in bushfires
- 27** Horse nutrition: Probiotics may do more harm than good
- 28** Lop-eared rabbits more likely to have tooth/ear problems than erect eared cousins
- 29** Genetic risk factor for laryngeal paralysis in miniature bull terriers identified
- 29** Better managing animal disease threats
- 30** Vets crash Improve International website at release of new AES Accelerated Emergency Program
- 30** Vet association says national horse register is a no brainer
- 31** Horses blink less, twitch eyelids more when stressed
- 32** Jetpets Companion Animal Rescue Awards Winners revealed
- 34** Bats don't rely on gut bacteria the way humans do
- 35** Genetic history of endangered Australian songbird could inspire an encore
- 36** Genes play a role in dog breed differences in behaviour
- 37** Body language key to zoo animal welfare
- 38** Identifying a gene for canine night blindness

## THE AUSTRALIAN VETERINARIAN

PO BOX 812 Strathfieldsaye VIC Australia 3551 P: 03 5441 8166 E: info@regionalreachpublishing.com  
W: www.theaustralianveterinarian.com

**Design & Advertising**  
Emma Hampton  
Email: info@regionalreachpublishing.com  
Phone: 03 5441 8166

**Publisher**  
Paul Banks  
Email: paul@regionalreachpublishing.com  
Phone: 03 5441 8166



# READING DOGS' FACIAL EXPRESSIONS IS LEARNED, NOT INNATE

**DOGS WERE THE FIRST DOMESTICATED ANIMAL, WITH HUMANS AND DOGS SHARING MORE THAN 40,000 YEARS OF SOCIAL INTERACTIONS AND LIFE TOGETHER. ACCORDING TO THE CO-DOMESTICATION HYPOTHESIS, THIS PROCESS ALLOWED HUMANS AND DOGS TO EVOLVE SPECIAL EMOTIONAL SIGNALS AND COGNITIVE SKILLS THAT FAVOUR MUTUAL UNDERSTANDING.**

We know, for example, that over the millennia, dogs have evolved the ability to understand human words, iconic signs, and other gestures, and research has shown that dogs can even use tone of voice and facial expressions to recognize human emotions. Beyond personal testimony from dog lovers, however, little attention has been paid to how well humans can understand their canine counterparts.

In the current study, led by Federica Amici of the Max Planck Institute for Evolutionary Anthropology and Juliane Bräuer of the Max Planck Institute for the Science of Human History, the researchers set out to understand how well humans can understand the emotional displays of dogs, and where that understanding comes from.

## How well do we understand our species' best friend?

In order to test how well humans can understand the emotions behind dog facial expressions, researchers collected photographs of dogs, chimpanzees, and humans displaying either happy, sad, angry, neutral, or fearful emotions as substantiated by the photographers. They then recruited 89 adult participants and 77 child participants and categorized them according to their age, the dog-positivity of their cultural context, and the participants' personal history of dog ownership.

Each participant was presented with photographs of dogs, chimps, and humans, and asked to rate how much the individual in the picture displayed happiness, sadness, anger, or fear. Adults were also asked to determine the context in which the picture had been taken (e.g., playing with a trusted conspecific partner; directly before attacking a conspecific). The results of the study showed that, while some dog emotions can be recognised from early on, the ability to reliably recognize dog emotions is mainly acquired through age and experience. In adults, the probability of recognizing dog emotions was higher for participants who grew up in a cultural context with a positive attitude towards dogs, regardless of whether they owned a dog themselves.

## Without a dog-positive context, we could be barking up the wrong tree

A dog-positive cultural background, one in which dogs are closely integrated into human life and considered highly important, may result in a higher level of passive exposure and increased inclination and interest in dogs, making humans better at recognizing dogs' emotions even without a history of personal dog ownership. "These results are noteworthy," says Amici, "because they suggest that it is not necessarily direct experience with dogs that affects humans' ability to recognize their emotions, but rather the cultural milieu in which humans develop."

The researchers also found that regardless of age or experience with dogs, all participants were able to identify anger and happiness reliably. While these results may suggest an innate ability favoured by the co-domestication hypothesis, it is also possible that humans learn to recognize these emotions quickly, even with limited exposure. Other than anger and happiness, the children in the study were not good at identifying dog emotions. They recognised anger and happiness more reliably in dogs than in chimps, but otherwise identified dog emotions as poorly as they did chimpanzee emotions, suggesting that the ability to understand how dogs are feeling is not innate.

"We think it would be valuable to conduct future studies that seek to determine exactly which cultural aspects affect one's ability to read dog emotions, and to include real-life stimuli and body expressions in addition to instructed stimuli and facial expressions," states Bräuer. "In this way, we could develop a better understanding of inter-cultural variation in emotion recognition. Hopefully this information could be used to reduce the occurrence of negative incidents between humans and dogs that are caused by humans' inability to read dog signals."

## Journal References:

Federica Amici, James Waterman, Christina Maria Kellermann, Karimullah Karimullah, Juliane Bräuer. The ability to recognize dog emotions depends on the cultural milieu in which we grow up. *Scientific Reports*, 2019; 9 (1) DOI: 10.1038/s41598-019-52938-4

"These results are noteworthy, because they suggest that it is not necessarily direct experience with dogs that affects humans' ability to recognize their emotions, but rather the cultural milieu in which humans develop." Federica Amici





## OESTROGEN'S OPPOSING EFFECTS ON MAMMARY TUMOURS IN DOGS



Dogs that are spayed at a young age have a reduced risk of developing mammary tumours, the canine equivalent of breast cancer. Early spaying reduces levels of oestrogen production, leading many veterinarians and scientists to cast oestrogen in a negative light when it comes to mammary cancer. Dogs that are spayed at a young age have a reduced risk of developing mammary tumours, the canine equivalent of breast cancer. Early spaying reduces levels of oestrogen production, leading many veterinarians and scientists to cast oestrogen in a negative light when it comes to mammary cancer.

But the effects of oestrogen on cancer risk in dogs aren't straightforward, according to a new study led by researchers from Penn's School of Veterinary Medicine. While it's clear that spaying dogs greatly minimises their risk of developing mammary cancer, the findings suggest that the practice may increase the risk of more aggressive cancers. And in spayed animals with mammary tumours, the team found that higher serum oestrogen levels were actually protective, associated with longer times to metastasis and improved survival times.

**“Dogs that remain intact and have their ovaries develop many more mammary tumours than dogs that were spayed, so removing that source of oestrogen does have a protective effect,” says Karin U. Sorenmo, a veterinary oncologist at Penn Vet and senior author on the study, published in PLOS ONE. “Oestrogen does seem to drive mammary cancer development. But what it does for progression to metastasis - that I think is more complicated.”**

Sorenmo and colleagues have been studying mammary tumours in dogs as a way of improving care and treatment for pets but also to make insights into human breast cancer biology.

“Much of the research we do in veterinary medicine looks at what is done in people and then adapts it,” she says. “But dogs are such a great, comprehensive model for cancer. Yes, there are differences in biology between dogs and people, but here those differences may allow us to ask very probing questions about what oestrogen is doing in both dogs with mammary cancer and women with breast cancer.”

The research used data from two prospective studies, including one involving dogs in the Penn Vet Shelter Canine Mammary Tumour Program, through which shelter dogs with mammary tumours receive treatment, are studied by researchers like Sorenmo, and then find foster or permanent homes.

The team evaluated 159 dogs with mammary cancer, 130 that were spayed as part of the study and 29 that remain intact. In addition to surgically removing the dogs' measurable tumours, the team collected information on serum oestrogen levels, tumour type, disease grade and stage, time to metastasis, and survival time.

Despite oestrogen's link with an increased risk of developing mammary tumours, the researchers found that higher serum oestrogen levels also seemed to help dogs avoid some of the riskiest aspects of their disease. Unexpectedly, when dogs were spayed at the same time their tumours were removed, those with oestrogen receptor-positive tumours that had higher serum oestrogen took longer to develop metastatic disease and survived longer than dogs with lower oestrogen levels, confirming that these tumours depended on oestrogen for progression.

Sorenmo speculates that, in these cases, oestrogen's action may be nuanced. “It drives the cancer, but it also seems to control or modulate it, reining it in,” she says, because most dogs with high serum oestrogen levels had lower-grade and oestrogen receptor-positive tumours, rendering them susceptible to hormonal deprivation by spaying.

The protective role of oestrogen was also surprisingly pronounced in dogs with oestrogen-receptor negative mammary tumours. In these higher-risk cancers, high serum oestrogen was associated with delayed or absent metastasis. Complementing these findings and supporting a potential broader, tumour receptor-independent anti-cancer effect driven by oestrogen, dogs with low serum oestrogen had a significantly increased risk for developing other non-mammary aggressive fatal tumours, such as hemangiosarcoma, during their follow-up after mammary tumour surgery.

Some of the findings contradict what has been found in women with breast cancer. For example, higher serum oestrogen levels in women following breast cancer therapy have been associated with higher rates of recurrence. But Sorenmo also notes that many cases of breast cancer in women arise just after menopause, when oestrogen levels tumble. So there may be a more complex role for oestrogen in people's cancer risk as well.

The work points to new possibilities for examining the role of oestrogen in cancer initiation and progression. Already, Sorenmo and colleagues, including Penn Vet's Susan Volk and Ellen Puré, are pursuing investigations of how the hormone affects the tumour microenvironment, cells that aren't themselves cancerous but may either stem or encourage a tumour's growth and spread.

“I think this study opens some really complicated questions,” Sorenmo says. “If we start dissecting exactly what oestrogen is doing, what genes or immune cells it's interacting with, maybe we could harness the power of oestrogen to be more clever in our treatment strategies.”

### Journal References:

Karin U. Sorenmo, Amy C. Durham, Enrico Radaelli, Veronica Kristiansen, Laura Peña, Michael H. Goldschmidt, Darko Stefanovski. The oestrogen effect; clinical and histopathological evidence of dichotomous influences in dogs with spontaneous mammary carcinomas. PLOS ONE, 2019; 14 (10): e0224504 DOI: 10.1371/journal.pone.0224504

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## DOG OWNERS OFTEN INACCURATELY MEASURE OUT DRY DOG FOOD

A cup might seem like the most obvious way to measure out dry dog food, but new University of Guelph research finds that when it comes to getting portions right, dog owners often get it wrong.

The study, designed to test dog owners' measuring skills, found owners were often inaccurate, ranging from a 48 percent underestimation to a 152 percent overestimation, depending on the device they used and the amount they tried to portion out.

The occasional measurement mistake may not seem like much, but errors made day after day could lead to under-nourishment, weight gain or obesity, said lead author Prof. Jason Coe from U of G's Ontario Veterinary College.

"We found it particularly concerning to see how often participants over-measured the assigned portions, particularly given that there is an ongoing problem with pet obesity. Dog owners can easily overfeed their animals if they don't measure out portions correctly, putting their animals at risk of several obesity-related diseases," he said.

The solution, Coe said, is for dog owners to change their approach to measuring their dog's dry food. The gold standard would be to use a kitchen scale to weigh out portions. Scales are precise and leave little room for error to ensure that dogs are neither over- nor underfed.

The study, published in the BMJ journal *Veterinary Record* and funded by Royal Canin, recruited 100 dog owners and asked them to use one of three common measuring devices to measure out kibble: a standard 2-cup scoop with graduated markings, sold at a local pet store; a 2-cup liquid measuring cup typically used for baking; and a 1-cup plastic dry-food measuring cup.

Each participant was asked to take their assigned measuring device and measure out three volumes of dry dog food: ¼ cup, ½ cup and 1 cup. The volume of dog food measured by participants was then compared to the correct weights respectively.

The participants' portions varied considerably, particularly when they were asked to portion out the smallest volume which participants often got significantly wrong.

"That finding has important implications for small dogs, since they typically receive smaller volumes of food. Even a small amount of over measuring for a small dog can be a considerable increase in their daily caloric intake putting them at risk of weight gain from too much food," said Coe, who is a researcher with the Department of Population Medicine.

Those using the 2-cup liquid measuring cup were most likely to inaccurately measure all three portions.

**"The problem with trying to eyeball 1 cup or ½ cup in a 2-cup device is that there is lots of room for error in deciding where the measurement line is, depending on how you're holding the cup," said Coe.**

Study participants were most accurate when they used a 1-cup dry-food measuring device to portion out 1 cup of kibble. Another

option for improving accuracy is to use a dry-food measuring device matched to the amount needed, said Coe.

"The closer the measuring cup is to the portion you want to measure, the more accurate you'll be," said Coe.

But the best method of all, say the researchers, is the kitchen scale, which ensures each portion size is precise.

When the participants in this study were shown how off their usual measurement methods were, most indicated a high likelihood that they would start using a kitchen scale for measuring their dog's kibble.

"I now use a scale in my own home for accurately measuring my own dog's kibble. I first found it strange to use. But now that I'm in the routine of using it, it seems weird not to use a scale," Coe said.

Coe says even dog owners who have pets that are at a healthy weight, ensuring correct food portions now is key to preventing weight gain and weight-related problems down the road.

"Most people want their pets to be happy and healthy and this is a way to keep their pets' weights in control from Day 1, improving their chances of living long and full lives."



### Journal References:

Jason B Coe, Alexandra Rankovic, Tara R Edwards, Jacqueline M Parr. Dog owner's accuracy measuring different volumes of dry dog food using three different measuring devices. *Veterinary Record*, 2019; vetrec-2018-105319 DOI: 10.1136/vr.105319

## FURRY FRIENDS EASE DEPRESSION, LONELINESS AFTER SPOUSAL LOSS

Researchers have found the companionship of a pet after the loss of a spouse can help reduce feelings of depression and loneliness in older adults.

The study, funded by The Gerontological Society of America and the WALTHAM Centre for Pet Nutrition and published in *The Gerontologist*, examined depressive symptoms and loneliness among people age 50 and older who experienced the loss of a spouse through death or divorce.

"Increasingly, there's evidence that our social support networks are really beneficial for maintaining our mental health following stressful events, despite the devastation we experience in later life when we experience major social losses," said Dawn Carr, lead author and FSU associate professor of sociology. "I was interested in understanding alternatives to human networks for buffering the psychological consequences of spousal loss."

Carr and her team compared individuals who experienced the loss of a spouse to those who stayed continuously married. Then they explored whether the effects of spousal loss differed for those who had a pet at the time of the death or divorce.

They found all individuals who lost their spouse experienced higher levels of depression. However, people without a pet experienced more significant increases in depressive symptoms and higher loneliness than those who had pets. In fact, those who had a pet and experienced the death or divorce of their spouse were no lonelier than older adults who didn't experience one of those events.

"That's an important and impressive finding," Carr said. "Experiencing some depression after a loss is normal, but we usually are able to adjust over time to these losses. Persistent loneliness, on the other hand, is associated with greater incidents of mortality and faster onset of disability, which means it's especially bad for your health. Our findings suggest that pets could help individuals avoid the negative consequences of loneliness after a loss."

Carr's team used data from a sample of older adults who participated in an experimental survey about human animal interaction as part of the University of Michigan's Health and

Retirement Study in 2012, and linked the data with additional data collected between 2008 and 2014. They identified pet owners as those participants who either had a cat or a dog.

**"In everyday life, having a cat or dog may not make you healthier," Carr said. "But when facing a stressful event, we might lean on a pet for support. You can talk to your dog. They're not going to tell you you're a bad person, they're just going to love you. Or you can pet your cat, and it's calming."**

The researchers noted that additional studies should be conducted to explain why having pets helps maintain mental health better. However, Carr suggested part of it may relate to whether you feel like you matter to someone.

"Often times, the relationship we have with our spouse is our most intimate, where our sense of self is really embedded in that relationship," Carr said. "So, losing that sense of purpose and meaning in our lives that comes from that relationship can be really devastating. A pet might help offset some of those feelings. It makes sense to think, 'Well at least this pet still needs me. I can take care of it. I can love it and it appreciates me.' That ability to give back and give love is really pretty powerful."

The findings have potential consequences for social policies. For instance, it may be beneficial to include companion animals in the treatment of people residing in senior-living facilities, or reducing barriers to pet ownership in such settings.

### Journal References:

Dawn C Carr, Miles G Taylor, Nancy R Gee, Natalie Sachs-Ericsson. Psychological Health Benefits of Companion Animals Following a Social Loss. *The Gerontologist*, 2019; DOI: 10.1093/geront/gnz109





## MICROBES MAKE CHEMICALS FOR SCENT MARKING IN A CAT



Domestic cats, like many other mammals, use smelly secretions from anal sacs to mark territory and communicate with other animals. A new study from the Genome Centre at the University of California, Davis shows that many odoriferous compounds from a male cat are actually made not by the cat, but by a community of bacteria living in the anal sacs. The work was published in September in PLOS ONE.

**“Cats use a lot of volatile chemicals for signalling, and they probably don’t make them all,” said David Coil, project scientist at the Genome Centre and an author on the paper.**

Many species - including cats, dogs, bears, pandas, skunks and hyenas - use anal sac secretions as a chemical language. Skunks, of course, also use them as a means of defence.

The experiment grew out of the KittyBiome Project started at the Genome Centre by Holly Ganz, a postdoctoral researcher working with Coil and Jonathan Eisen, professor of evolution and ecology in the UC Davis College of Biological Sciences. The KittyBiome Project has since been spun off as AnimalBiome, a company with Ganz as CEO.

The researchers obtained anal sac secretions from a single male Bengal cat volunteered to participate by its owner. They extracted DNA for sequencing to identify types of bacteria, and also took samples for chemical odour analysis in Professor Cristina Davis’ laboratory in the UC Davis Department of Mechanical and Aerospace Engineering.

Sequencing showed that the microbial community was not very diverse and dominated by a small number of bacterial genera.

“There are not a lot of players there,” Coil said.

### Analysing volatile organics

The most abundant bacteria from the screen were grown in culture. Mei Yamaguchi, a postdoctoral researcher in Davis’ lab, analysed the volatile chemicals given off by the bacteria.

Davis’ lab focuses on technology for detecting and characterising low levels of volatile organic compounds that can be markers of health and disease, from influenza in humans to citrus greening in fruit trees.

Yamaguchi and Davis were able to detect 67 volatile compounds released by the bacterial cultures. Fifty-two of these compounds were also found directly in the anal sac secretions.

The results support the idea that the bacterial community, not the cat itself, produces many of the scents used by the cat to communicate.

Coil and colleagues want to follow up by looking at more cats. If these scents are made by bacteria, why do cats smell different to each other? How do cats acquire the bacteria and do they change over life? Understanding how microbes influence their scent could have wide implications for understanding scent communication in animals.

Additional authors on the paper are Adrienne Cho, Thant Zaw and Guillaume Jospin at the UC Davis Genome Centre and Mitchell McCartney at the Department of Mechanical and Aerospace Engineering. The work was partly supported by the KittyBiome Project and grants from the National Institutes of Health.



### Journal References:

Mei S. Yamaguchi, Holly H. Ganz, Adrienne W. Cho, Thant H. Zaw, Guillaume Jospin, Mitchell M. McCartney, Cristina E. Davis, Jonathan A. Eisen, David A. Coil. Bacteria isolated from Bengal cat (*Felis catus* × *Prionailurus bengalensis*) anal sac secretions produce volatile compounds potentially associated with animal signalling. PLOS ONE, 2019; 14 (9): e0216846 DOI: 10.1371/journal.pone.0216846

## CATS ARE SECURELY BONDED TO THEIR PEOPLE, TOO

Cats have a reputation for being aloof and independent. But a study of the way domestic cats respond to their caregivers suggests that their socio-cognitive abilities and the depth of their human attachments have been underestimated.

The findings reported in the journal *Current Biology* on September 23 show that, much like children and dogs, pet cats form secure and insecure bonds with their human caretakers. The findings suggest that this bonding ability across species must be explained by traits that aren’t specific to canines, the researchers say.

**“Like dogs, cats display social flexibility in regard to their attachments with humans,” said Kristyn Vitale of Oregon State University. “The majority of cats are securely attached to their owner and use them as a source of security in a novel environment.”**

One revealing way to study human attachment behaviour is to observe an infant’s response to a reunion with their caregiver following a brief absence in a novel environment. When a caregiver returns, secure infants quickly return to relaxed exploration while insecure individuals engage in excessive clinging or avoidance behaviour.

Similar tests had been run before with primates and dogs, so Vitale and her colleagues decided to run the same test, only this time with cats.

During the test, an adult cat or kitten spent two minutes in a novel room with their caregiver followed by two minutes alone. Then, they had a two-minute reunion. The cats’ responses to seeing their owners again were classified into attachment styles.

The results show that cats bond in a way that’s surprisingly similar to infants. In humans, 65 percent of infants are securely attached to their caregiver.

“Domestic cats mirrored this very closely,” Vitale says. In fact, they classified about 65 percent of both cats and kittens as securely bonded to their people.

The findings show that cats’ human attachments are stable and present in adulthood. This social flexibility may have helped facilitate the success of the species in human homes, Vitale says.

The researchers are now exploring the importance of this work in relation to the thousands of kittens and cats that wind up in animal shelters. “We’re currently looking at several aspects of cat attachment behaviour, including whether socialisation and fostering opportunities impact attachment security in shelter cats,” Vitale said.

This work was supported through a Nestlé Purina sponsorship for studies in cat and dog emotional well-being and by the National Science Foundation.

### Journal Reference:

Kristyn R. Vitale, Alexandra C. Behnke, Monique A.R. Udell. Attachment bonds between domestic cats and humans. *Current Biology*, 2019; 29 (18): R864 DOI: 10.1016/j.cub.2019.08.036







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## FEEDING PETS RAW FOOD IS NOT CONSIDERED BY PET OWNERS AS A SIGNIFICANT SOURCE OF INFECTIONS



An extensive international survey conducted at the University of Helsinki indicates that pet owners do not consider raw food to considerably increase infection risk in their household. In the survey, targeted at pet owners, raw food was reliably determined to be a contaminant only in three households.

The safety of feeding raw food to pets has become a topic of debate on a range of forums, but so far, no outbreaks of contamination among humans caused by raw pet food have been reported. Raw food denotes any meat, internal organs, bones and cartilage fed to pets uncooked.

Now, a survey conducted at the Faculty of Veterinary Medicine investigated perceptions on food-transmitted pathogens among pet owners who feed their pets raw food.

A total of 16,475 households from 81 countries responded to the survey. Out of these, only 39 households (0.24%) reported having been contaminated by pet food, and were also able to name the pathogen. The most common pathogens reported were *Campylobacter* followed by *Salmonella*, in addition to which there were occurrences of *Escherichia coli*, *Clostridium*, *Toxoplasma* and a single *Yersinia* infection.

However, the meat fed to pets had been analysed in only three households (0.02%), identifying the same pathogen as found in the samples taken from the infected individuals. As well as the 39 households above, 24 households (0.15%) reported a contamination from pet food without being able to name the pathogen causing the symptoms.

In total, 99.6% of households feeding their pets raw food did not report any pathogens being transmitted from the raw food to humans. The time the responding households had been feeding raw food to their pets ranged from several weeks to 65 years, with 5.5 years as the mean value. The reported cases of illness covered whole time frame that raw food was consumed in the household.

The median age among the infected individuals was 40.1 years. From among the 39 households with infections, in four the infected

individuals were children between two and six years of age, while in two households the infected were immunocompromised individuals (cancer and Crohn's disease). However, a quarter of these households had children between two and six years of age, while 15% had immunocompromised individuals.

**"It was surprising to find that statistical analyses identified fewer infections in the households with more than 50% of the pet diet consisting of raw food. Furthermore, feeding pets raw salmon or turkey was associated with a smaller number of infections," says researcher Johanna Anturaniemi from the Faculty of Veterinary Medicine.**

A positive correlation with infection was only found in relation to children between two and six years of age living in the household, even though most of the infected individuals (90%) were adults.

"This raises the question of whether the pathogens could have been transmitted by children from outdoors, daycare centres or other public spaces, even if pet food had been assumed to be the source of infection," Anturaniemi says.

According to the researchers, the role of other factors in infections cannot be assessed in more detail within the confines of this study; rather, further research is needed. In contrast, reports of outbreaks of pathogens linked to pet treats and dry food can be found from around the world. In fact, the Dogrisk research group is planning to conduct a comparative follow-up study where infections transmitted from pet food are to be investigated in households that use both raw food and dry food.

The survey was translated into five languages and made available to all dog and cat owners across the globe feeding their cats and dogs raw food.

### Journal References:

Johanna Anturaniemi, Stella Maria Barrouin-Melo, Sara Zaldivar-López, Hanna Sinkko, Anna Hielm-Björkman. Owners' perception of acquiring infections through raw pet food: a comprehensive internet-based survey. *Veterinary Record*, 2019; vetrec-2018-105122 DOI: 10.1136/vr.105122

## OVERWEIGHT OWNERS ARE MORE LIKELY TO HAVE OVERWEIGHT DOGS



A new study from the University of Copenhagen reports that the prevalence of overweight dogs is markedly larger among overweight owners than among normal weight owners. Part of the explanation lies in whether treats are used as training tools or "hygge-snacks." It is the first major study on canine obesity in Denmark.

There's a bit of truth to the saying "like owner, like dog." This has now been confirmed by researchers. For the first time in Denmark, researchers have systematically investigated the factors related to our four-legged friends being overweight or obese. One of the results demonstrates an unambiguous correlation between the weight status of a dog and its owner.

The study, conducted by researchers at the University of Copenhagen, shows that the prevalence of heavy or obese dogs is more than twice as large among overweight or obese owners than among owners who are slim or of a normal weight.

Part of the explanation rests upon how owners manage dog treats. The research results show a correlation between overweight dog owners and the use of dog treats as "hygge-candy" (cosy-candy).

**"Whereas normal weight owners tend to use treats for training purposes, overweight owners prefer to provide treats for the sake of hygge. For example, when a person is relaxing on the couch and shares the last bites of a sandwich or a cookie with their dog," says Charlotte R. Bjørnvad of the University of Copenhagen's Department of Veterinary Clinical Sciences.**

Bjørnvad, a veterinarian and professor, is the main author of the research article, now published in the journal *Preventive Veterinary Medicine*.

The researchers studied 268 adult dogs recruited at animal clinics around Zealand and the Capital Region of Denmark. Of the pets recruited, 20% were either heavy or obese.

"Oftentimes, people don't consider their dog's weight status to be a problem. And this might contribute to a dog's being overweight. But being heavy or obese does have a great impact on dog health - which on average results in a shortened lifespan," according to bioethics professor and article co-author, Peter Sandøe, of the University of Copenhagen's Department of Food and Resource Economics.

Previous studies have shown that on average, heavy dogs live 1.3 years less than dogs on restrictive diets and that part of the explanation may be an earlier development of osteoarthritis with the heavier weight.

### Castration triples the risk of being heavy or obese

The researchers also looked into how castration and sterilization can be risk factors in relation to dog weight. The study shows that castrated male dogs have three times as high a risk of being

heavy or obese compared to intact dogs. On the other hand, the study demonstrated that sterilization has no impact on weight in female dogs. Whether they are intact or not, female dogs, have an increased risk of being heavy compared with intact males.

"When males are castrated, they face just as high of a risk of becoming overweight as females. Castration seems to decrease the ability to regulate the appetite in male dogs and at the same time, it might also decrease the incentive to exercise which results in an increased risk of becoming overweight. Therefore, an owner should be careful about how they feed their dog after it has been castrated," says Bjørnvad.

"They might even want to consider not neutering. As long as there are no runaway females in the area, there are in most cases no reason to neuter." Sandøe added.

The researchers hope that this new knowledge raises awareness about canine weight among veterinarians and dog owners, and that it contributes to better obesity prevention and treatment strategies by identifying focus areas for intervention.



### Journal References:

C.R. Bjørnvad, S. Gloor, S.S. Johansen, P. Sandøe, T.B. Lund. Neutering increases the risk of obesity in male dogs but not in bitches - A cross-sectional study of dog- and owner-related risk factors for obesity in Danish companion dogs. *Preventive Veterinary Medicine*, 2019; 170: 104730 DOI: 10.1016/j.pvetmed.2019.104730



## CHICKS BORN WITH ABILITY TO DISTINGUISH AND AVOID DIFFERENT DANGERS

Chicks are born with the knowledge to flee from predators rather than learning it from experience, according to a study by University of Trento and Queen Mary University of London.

The researchers also found that new-born chicks know to slow down or stop moving to avoid being noticed when a predator is far away.

The study, published in the journal PNAS, shows that these responses do not require learning but are known by the chick before it is born.

Appropriate reactions to predators are fundamental for survival and in the case of prey-predator interactions, learning the best strategy by trial and error is very dangerous and might result in death.

For this reason, it has been assumed that these responses of fleeing and freezing do not require learning but the evidence was sparse and contradictory.

Dr Elisabetta Versace, co-author of the study from Queen Mary University of London, said "Our results show that at the beginning of life animals are well equipped to cope with threats present in their environment, they possess some predispositions that help them to survive."

Professor Vallortigara, leading the University of Trento team, said "Together with our previous studies about the social predispositions that help young chicks and humans to interact with their social partners these findings clarify we are not born as blank slates, but with sophisticated mechanisms that enable us to use specific strategies in front of particular stimuli. Dr Hébert, who is the first author of the paper, conducted the experiments looking at newborn animals and was thus able to show how differential anti-predatory responses are in place already at birth."

The researchers ran an experiment where the chicks did not have a chance to interact with any moving objects once they hatched.

They showed that at the first encounter with approaching threats (a looming stimulus overhead, like an approaching raptor) or distant moving threats (a small object sweeping overhead, like a raptor exploring territory for prey), the chicks responded appropriately. They fled away from the approaching threats and reduced their speed in the presence of far sweeping stimuli.

This experiment can be conducted with chicks because they are able to move around and feed by themselves from birth unlike other animals that require parental care. Chicks also have a relatively mature sensory and motor system soon after hatching.

Relatively little is known about the predisposed behaviour available at the beginning of life and the neural mechanisms underlying responses to a visual threat. Responses to looming stimuli can be observed in human infants while freezing responses can also be observed in humans, in situations of extreme danger such as a fire or a sexual assault.

**Dr Marie Hébert, first author of the study from University of Trento, said "I am now investigating which parts of the chick's brain are activated by these visual threats in naive animals, with a special focus on structures such as the amygdala and the optic tectum, that are thought to play a crucial role in threat detection and in the triggering of defensive behaviours. To do so, I will couple behavioural experiments with markers of neuronal activation in the brain."**

The use of animal models may open the door to the investigation of molecular mechanisms as well as individual differences, which are striking in the responses of both human and non-human species, and their genetic and environmental bases.



### Journal References:

Marie Hébert, Elisabetta Versace, Giorgio Vallortigara. Inexperienced preys know when to flee or to freeze in front of a threat. PNAS, 2019

## THE PROBLEM WITH PROMOTING 'RESPONSIBLE DOG OWNERSHIP'



Dog welfare campaigns that tell people to be 'responsible owners' don't help to promote behaviour change, a new University of Liverpool report suggests.

Dog owners interviewed for a study published in Anthrozoös all considered themselves to be responsible owners, despite there being great variation in key aspects of their dog-owning behaviour.

"Policy and campaigning messages related to dog ownership and welfare tend to focus on the concept of being a responsible owner. However, while 'responsible dog ownership' has considerable appeal as a concept, how it is perceived and interpreted has not been studied in-depth," explains lead researcher Dr Carri Westgarth, a dog behaviour expert at the University of Liverpool.

In order to better understand beliefs and views about responsibility in dog ownership, the researchers carried out in-depth interviews with dog-owning households and shorter interviews with dog owners while walking their dogs or representing their breed at a dog show. The interviews focused on dog walking, an issue perceived to be a component of responsible dog ownership, as well as other aspects of campaign messages, such as dog fouling, aggression and neutering.

Dr Westgarth also reflected on her own experiences of walking her three dogs, and on her many conversations with other owners over the two-year study period.

Dr Westgarth said "It's clear from our research that responsible dog ownership means different things to different people at different times. It emerges from a blurred intersection of the needs of dogs, owners, and others, where often the dog comes first."

"Dog owners do what they perceive to be best for their individual dog, even if this goes against general advice given such as how often dogs need walking or neutering campaigns."

"Yet this perception may be different from what others feel is best for that dog, or how people who are impacted by the dog want the dog and their owner to behave."


"Therefore, simply telling owners that they should 'be responsible' is of limited use as a message to promote behaviour change because they already believe that they are. Any educational messages for dog owners need to be specific what they want owners to do and explain why that is in the best interest of the dog that they love so much."

The report authors say that further research is now required in order to understand the implications for wider aspects of responsible dog ownership practices.

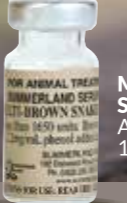
### Journal Reference:

Carri Westgarth, Robert M Christley, Garry Marvin, Elizabeth Perkins. The Responsible Dog Owner: The Construction of Responsibility. Anthrozoös, 2019; 32 (5): 631 DOI: 10.1080/08927936.2019.1645506


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# THE ABC'S OF VETERINARY DENTISTRY: A IS FOR ANAESTHESIA MONITORING, ATTRITION AND ABRASION

DR DAVID E CLARKE REGISTERED SPECIALIST, VETERINARY DENTISTRY AND ORAL SURGERY

**THE START OF AN ALPHABETIC JOURNEY THROUGH THE MANAGEMENT OF OUR VETERINARY PATIENTS' ORAL PROBLEMS BEGINS WITH AN 'A'. OUR ALPHABET CONSISTS OF 26 LETTERS, FROM A TO Z, AND FORMS THE FOUNDATION FOR MILLIONS OF WORDS. I'VE NARROWED THE LIST DOWN TO 26 THAT RELATE TO DENTAL CARE IN PETS. IN THIS SERIES OF ARTICLES, WE BEGIN WITH 'A' FOR ANAESTHESIA MONITORING, ATTRITION AND ABRASION AND FINISH WITH 'Z' FOR DENTAL ZEBRAS. I INVITE YOU ON THE JOURNEY THROUGH THE ALPHABET ON OUR QUEST TO DO THE BEST DENTISTRY FOR OUR VETERINARY PATIENTS.**

Last week, I was fortunate enough to visit the dentist and have my teeth cleaned. Like most people, I reclined in the dental chair, chatted to the dental hygienist, opened my mouth as wide as I could and stared vacantly at the posters on the roof, almost falling asleep; except she tried to engage in conversation whilst probing my sulci, charting my mouth, scaling and polishing my teeth, and suctioning under my tongue. Not to mention pushing a digital sensor into my delicate vestibule and asking to stay still and motionless while they zapped a radiograph on a previous restoration. Phew - no cavities. I was free to escape. On my way back to the veterinary clinic to see my afternoon patients, I pondered anaesthesia-free dentistry and thought 'How could I implement this technique into my daily routine?' If only my patients didn't need general anaesthesia. Well that thought was brief, as my first referral consult for the afternoon was a cat that came with teeth and claws, ready for a fight. I didn't get to chat, probe, take a radiograph or even have a look in the mouth. So I recommended a COHA (Comprehensive Oral Health Assessment) under general anaesthesia, as it wasn't worth the fight. General anaesthesia in

our patients is needed to thoroughly clean, polish and examine the teeth and oral cavities in our patients.

Unfortunately, this is a common scenario in our daily practices, and even if the pet is compliant, who wants to battle a moving target, especially one that can damage your equipment and fingers in a second. A second issue is that many of our clients are so worried about anaesthetising their pets that proper care is often declined. How can we allay our clients' fears? Well, the best way is to share with them the efforts you take to make anaesthesia as safe as possible. This is done by choosing the right patient for anaesthesia through a complete physical examination, taking a complete history, performing preoperative blood/urine testing, using intravenous fluids at the correct rate, tailoring the anaesthetic protocol to the individual patient and using the appropriate anaesthetic agents along with monitoring the anaesthesia before, during and after the procedure.

## ANAESTHETIC MONITORING

Consistent and close patient monitoring is paramount during and after anaesthesia.

The American College of Veterinary Anesthesiologists (ACVA) recommends monitoring for:

- Circulation - Ensure that blood flow to tissues is adequate; measured via blood pressure.
- Oxygenation - Ensure adequate oxygen concentration in the patient's arterial blood; measured via pulse oximetry.
- Ventilation - Ensure that the patient's ventilation is adequately maintained; measured via capnography.
- Temperature - Ensure avoidance of hyper- and hypothermia, which is common in anaesthetised dental patients and a source of trouble for perfusion and ventilation.

The ACVA recommends hiring a trained veterinary technician to be constantly at the patient's side. The technician monitors the physiological parameters from the patient, as well as, reading and recording the data from the electronic monitors, including significant events and trends as they occur, and their clinical expertise to manage the patient's proper anaesthetic depth. In our dental procedures, the technician records the patient's data and records its condition at least every five minutes throughout the procedure (Figure 1).



Figure 1. A dental technician monitoring and recording anaesthesia monitor findings whilst the dental COHA is performed.

## How to monitor

Monitoring is accomplished using subjective (e.g. clinical appearance - lack of jaw tone, pink gum colour and <2 sec perfusion time, regular femoral pulse, even and regular breathing, no eye palpebral reflex) and objective methods (e.g. electronic systems).

Electronic monitors detect non-invasive blood pressure measurement, capnography, pulse oximetry, electrocardiography and temperature. They may also detect anaesthetic complications before being recognised by a trained technician. Often, the advanced warning systems can head off problems before they become critical but as importantly they give data when recorded, which can alert the technician to changes on trends and avoid complications. Electronic monitoring systems help to provide positive patient outcomes and reduce stress during the procedure. A monitor is affordable and available through many distributors (Figure 2).



Figure 2. An example of our electronic monitor used during dental anaesthesia.

## ATTRITION AND ABRASION.

The mechanism of tooth development, whereby enamel formation is completed before tooth eruption, and following death of the ameloblast, ensures that there is no ability for post-eruption repair of worn or damaged enamel. In contrast, dentine production continues in vital teeth throughout the pet's life and the odontoblast has the ability to respond to external trauma, thereby providing some protection to the underlying pulpal tissues. The wear of teeth is an inevitable consequence of their evolutionary designated purpose of food acquisition, prehension and mastication, highlighted in wild animals that consume harsh and fibrous foods. Wear is also observed in domestic pets that chew inappropriate hard objects including bones, sticks, hooves and antlers, as well as, pets with behavioural or dermatologic problems that eat dirt, sand or chew their own hair and feet. Wear is also common in many domesticated breeds, when malocclusions are evident and there is tooth to tooth contact.

Dental attrition is the progressive loss of the hard structures of the teeth (enamel and dentine) caused by tooth to tooth contact between opposing teeth. The extent of the attrition depends on the type of contact and the position in the mouth (e.g. maxillary incisors contacting mandibular incisors; and the distal edge of the maxillary 3rd incisor tooth against the mesial aspect of the mandibular canine tooth) (Figures 3 - 10).



Figure 3. Attrition of the maxillary and mandibular incisor and canine teeth.



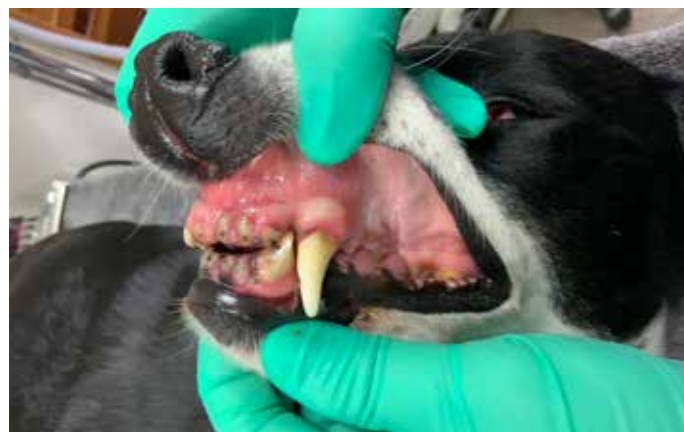


Figure 4. Attrition of the maxillary left 3rd incisor tooth and mandibular left canine tooth.



Figure 5. Attrition of the maxillary right 3rd incisor tooth and mesial surface of the mandibular right canine tooth.

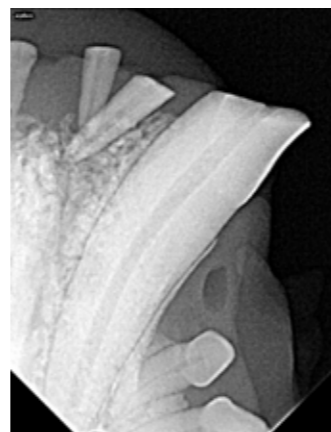


Figure 6. Radiograph demonstrating advanced attrition of 302, 303 and 304. Note open pulp canals and loss of alveolar bone height.

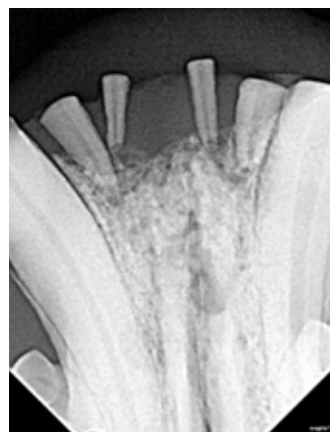


Figure 7. Radiograph demonstrating advanced attrition of 303, 302, 402 and 403 with resulting periodontal disease and loss of alveolar bone height.

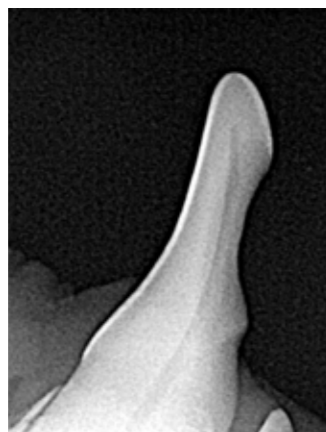


Figure 8. Radiograph demonstrating attrition of 404.



Figure 9. Radiograph demonstrating attrition of 101, 201, 202 and 203 with resulting periodontal disease and loss of alveolar bone height.



Figure 10. Radiograph demonstrating attrition of 101, 102, 103 and 201.

Dental abrasion is the progressive loss of the hard structures of the teeth (enamel and dentine) caused by mechanical actions of food and foreign body contact (e.g., tooth brushing, bones, sticks, chew toys, antlers and cow hooves) (Figures 11 - 12). An analysis of the cause and history of damaged enamel needs to be undertaken in identifying its initial origin.

As previously discussed, enamel does not have the capacity to repair itself once the tooth has erupted, in contrast to the dentine, which is produced continuously during the life of a vital tooth. Dentine production provides the tooth with the ability to respond to wear, and as such, when the tooth is under wear, additional

dentine is produced to protect the underlying pulp tissues and prevent pulp exposure. Unfortunately, if the wear occurs quickly, adequate dentine cannot be produced, and the pulp becomes exposed. In this case, pulpitis occurs and eventually a periapical infection, osteomyelitis and tooth loss may result.

Treatment of pets' teeth with tooth wear is directly related to the cause of the attrition or abrasion and the condition of the pulp tissue.

Attrition should be treated as it relates to the degree of wear. When the teeth are significantly worn and there is no further



Figure 11. Abrasion of the left mandibular 1st and 2nd molar teeth. Note a crown-root (slab) fracture is also present on the buccal surface of the 1st molar.

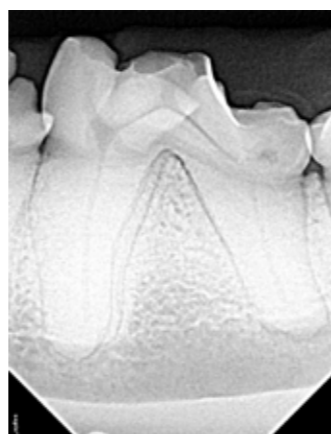


Figure 12. Radiograph demonstrating abrasion of 309.

contact, the tooth should be radiographed and can be monitored if no dentine is exposed and the tooth is radiographically healthy. Repeat radiographs will ensure the pulp remains vital over the long term. When there is dentine or pulp exposure, radiographs are recommended to determine the condition of the tooth root and surrounding tissues followed by dentine bonding, a root canal procedure (Figure 13) or extraction (Figures 14 - 16). A malocclusion found in the early stages of wear or prior to dental trauma should be treated by orthodontics or extraction of the teeth.

Abrasion should initially be treated by diagnosis of the cause, a complete oral health assessment including radiographs, followed by behavioural modification or dental treatment. Dental treatment primarily depends on whether the pulp canal is exposed and the radiographic health of the root and surrounding tissues. Treatment may include dentinal bonding or restoration, when no pulp exposure is present and the tooth root has no pathology associated with it; or root canal therapy and extraction, when there is pulp exposure and periapical pathology present.



Figure 13. Radiograph demonstrating the obturation of a root canal procedure on 404 due to severe attrition and pulp canal exposure, which resulted in irreversible pulpitis and necrosis.

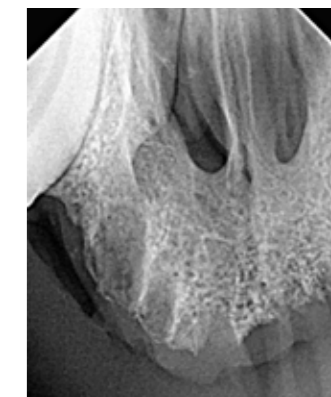


Figure 14. Radiograph demonstrating extraction of the maxillary right incisor teeth.



Figure 15. Radiograph demonstrating extraction of the maxillary left incisor teeth.



Figure 16. Radiograph demonstrating extraction of mandibular incisor teeth.

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## BE AWARE OF THE SPREAD OF RABIES, VACCINATE TO ELIMINATE



World Rabies Day was on September 28 this year and Australian-based international animal charity Vets Beyond Borders have been highlighting the importance of vaccinating dogs to help prevent the spread of the deadly rabies virus.

Rabies kills nearly 60,000 people around the world every year, according to the World Health Organisation. The virus is spread through the saliva of infected animals by biting another animal or a person, and it is always fatal once clinical symptoms appear. An estimated 5.5 billion plus people live at daily risk of rabies<sup>1</sup>.

"Rabies is nearly always fatal but it's 100 per cent preventable by vaccination," said Maryann Dalton, CEO of Vets Beyond Borders, which deploys volunteer veterinarians and veterinary nurses across the globe to deliver animal health and community awareness programs where they are desperately needed. "Australia does not have rabies. But we need to bring this deadly dog-mediated disease to the Australian public's attention."

### Rabies warning in Australia

The Australian Government Department of Agriculture is warning the virus could reach Australia's shores at any time as it spreads across our northern neighbours. There is the risk of yachts carrying rabies-infected dogs from Indonesia landing on Australia's northern coastline and mixing with dingoes and community cats and dogs. If these dogs become infected with rabies, they would be a huge threat to the health and safety of the Aboriginal and Torres Strait Islander people living in northern Australia communities.

This year's World Rabies Day awareness theme was Rabies: Vaccinate to Eliminate and highlights the importance of keeping dogs vaccinated, helping people in need to seek and obtain life-saving treatment (post-exposure prophylaxis), and committing to

the 2030 goal of eliminating rabies by death. "Dog bites cause almost all human cases of rabies," said Ms Dalton. "We can prevent rabies deaths through increased awareness, vaccinating dogs to prevent disease at its source, and timely life-saving post-bite treatment for people."

### VBB anti-rabies program eliminating dog-mediated deaths

Vets Beyond Borders has been running animal birth control and anti-rabies programs in India (which carries a third of the world's rabies burden) for nearly 15 years, providing canine rabies vaccination, humane dog population control, community education and treatment of sick and injured animals. "VBB's Sikkim Anti-Rabies and Animal Health (SARAH) program is the first state-wide rabies program and has demonstrated successful near elimination of this dog-mediated disease<sup>2</sup>," said Ms Dalton.

In the last financial year, VBB desexed over 7,000 animals, administered nearly 36,000 doses of anti-rabies vaccine and 290 doses of distemper vaccine, in addition to the medical, surgical and hospital care VBB provides to hundreds of sick and injured domestic animals and wildlife.

During the current financial year, in addition to treating sick and injured animals, VBB will administer 30,000 to 40,000 rabies vaccinations plus approximately 200 distemper vaccinations and sterilisation of up to 9,000 dogs, Ms Dalton added.

"Vets Beyond Borders provides the volunteers and facilitates clinical skill development of local vets," she said. "We need funds to purchase medical equipment and vaccinations to treat street dogs for distemper, parvo and rabies."

**For more information about Vets Beyond Borders' animal health and community awareness programs, please visit [www.vetsbeyondborders.org](http://www.vetsbeyondborders.org)**



Vets Beyond Borders volunteers vaccinating dogs in Cambodia

### Journal Reference:

<sup>1</sup>Global Alliance for Rabies Control

<sup>2</sup>Eliminating Dog-Mediated Rabies in Sikkim, India: A 10-Year Pathway to Success for the SARAH Program. Frontiers in Veterinary Science Journal (March 2017).

## AMRRIC RECOGNISED WITH NATIONAL AWARD

Animal Management in Remote and Rural Indigenous Communities, or AMRRIC, has received a prestigious award for managing companion animal health in Indigenous communities.

"We are a partnership organisation and we're proud to share this recognition with Aboriginal and Torres Strait Islander communities and their people, and with our other program partners," said Dr. Brooke Rankmore, the CEO of AMRRIC, an NT-based not-for-profit organisation.

"This award is also a testament to our dedicated staff, volunteers and veterinary program partners, who travel to some of the most remote corners of Australia, working in what are sometimes very challenging conditions," added Dr. Rankmore.

AMRRIC received the honour on 12 September at the Jetpets Companion Animal Rescue Awards ceremony held at the Gold Coast in Queensland. The awards attracted more than 1,000 entries-twice as many as the previous year.

AMRRIC's award was in the Innovation in Rescue category, identifying their One Health program model which recognises the inextricable links between human, animal and environmental health and well being. In the area of rescue and re-homing, AMRRIC works to stem the flow of unwanted animals through increased desexing. The key elements of AMRRIC's One Health program include:

- Facilitation and access to veterinary services
- Building local knowledge and capacity in communities
- Providing strategic planning and support
- Advocacy and promotion of community driven change

In 2018-19, AMRRIC desexed 2,840 dogs and 203 cats through its veterinary programs. School programs were delivered to 667 students, and 4,299 community members were engaged in door-to-door and community event education.

AMRRIC is a key knowledge broker for local government and municipal service providers, including facilitating on-ground veterinary services, enhancing programs through increased capacity, and the delivery of educational programs. AMRRIC creates tools which support communities and councils to monitor and evaluate animal management programs, such as the AMRRIC App and data analysis services, assisting with strategic planning and support services.

AMRRIC is proudly supported by the Australian Government. AMRRIC is also grateful for the many years of support from its dedicated members, donors and project partners.

The Jetpets Companion Animal Rescue Awards 2019 acknowledges the efforts of those who give tirelessly of their time to rescue groups and animal shelters. Values include compassion for animals and their guardians, commitment, dedication, caring, respect, innovation, and integrity.



A Tiwi Island Ranger with patients for desexing



AMRRIC CEO Dr Brooke Rankmore with the Jetpet award



Shania and Russel learned about puppy care in Kintore



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## ONLINE PET SUPPLIES BUSINESS CELEBRATES 20 YEARS



The year was 1999. The world was worried about Y2K, eBay had just launched in Australia and brothers Mark and Steven Perissinotto were preparing to launch Australia's first online pet supplies business.

Now twenty years and over 2.5 million orders later, VetShop Australia celebrated over 100 dog years of business on the 17th of November.

Like many great businesses, Steven says it all started over the table at a big family lunch.

"We came up with the idea over lunch and were able to launch VetShop Australia three months later," Mr.Perissinotto said.

The brothers saw the huge opportunity the internet provided, and started the business part-time out of the back of veterinarian Mark's Nambour clinic.

"We were working fifty hours a week at our original jobs and then putting in another twenty or so hours to only be getting ten orders per day," Mark Perissinotto said.

**"Success didn't come to us overnight, running your own business is always ninety percent perspiration, ten percent inspiration" said Steven.**

The breakthrough came in 2001 when, recognising high levels of interest from US buyers, the international website changed its currency to USD and sales instantly grew around 10-12% month-on-month between 2001-2006.

This success enabled Mark to leave his veterinary practice in 2005 and saw Steven leave law in 2007 to allow them to concentrate on the business full time.

In 2009, the business moved from Image Flat to a larger premises at Forest Glen where it remains today, shipping orders to over 1 million customers in over 70 countries.

Over the years, the business has picked up a number of awards including a Telstra Business People's Choice Award in 2011, Power Retail Top 100 Retailer in 2017 and the Top 150 in 2018.

Both Mark and Steven have also been nominated for a variety of awards. Mark was a finalist in the EY Entrepreneur of the Year awards in 2015 and Steven was recently named as one of the Top 50 People in E-Commerce by Internet Retailing.

VetShop Australia has also been the sponsor of the Surfing Dog Championships, held as part of the Noosa Festival of Surfing, since 2012.

### About VetShop Australia

VetShop Australia is an online pet retailer that has been proudly serving Australian pet owners since 1999. With its head office and distribution centre located in Forest Glen, on Queensland's Sunshine Coast, VetShop Australia stock a huge range of over 1000 pet-related products; including international brand name animal health products such as NexGard, Bravecto, Revolution, Advocate, Hills and Royal Canin.

### Awards

- 2009 - AIMIA Online Retailer of The Year
- 2011 - QLD Telstra Business Award People's Choice
- 2013, 2014, 2016 & 2017 - Word of Mouth Service Award - Queensland
- 2015 - EY Entrepreneur of The Year Finalist (Mark)
- 2016 - St. George Business Champion
- 2017 - Power Retail Top 100 Retailer
- 2017 - Golden Brontos Most Successful Campaign Finalist
- 2017 - Google Regional Online Heroes (Steven)
- 2018 - Power Retail Top 150 Retailers
- 2019 - Internet Retailing Top 50 in e-Commerce (Steven)

### Sponsorship

2012 - 2020 - Sponsor of the largest Surfing Dog Competition in the world, VetShop Australia Surfing Dog Championships, part of the Noosa Festival of Surfing



VetShop Australia is the brainchild of brothers Mark (a veterinarian) and Steven (a lawyer) Perissinotto and sells pet and vet supplies to over 70 countries.

## WSAVA'S GLOBAL PAIN COUNCIL AIMS TO RAISE STANDARDS OF PAIN MANAGEMENT BY 'TEACHING THE TEACHERS'

### LAUNCHES SCHOLARSHIP FOR A VETERINARIAN AND A VETERINARY TECHNICIAN/NURSE

The Global Pain Council (GPC) of the World Small Animal Veterinary Association (WSAVA) has launched a program called 'Teach the Teachers,' which aims to create a global network of key opinion leader (KOLs) - 'teachers' - in pain management, who are motivated to propagate and disseminate their knowledge within their regions.

As the first step in the Program, the GPC has launched a scholarship competition to identify one veterinarian and one veterinary technician/nurse with a demonstrated interest in pain management and the potential to become its first global KOLs.

The GPC is working to an ambitious agenda to enhance companion animal health care and welfare globally through increasing the confidence and competence of veterinarians and veterinary technicians/nurses around the world in managing the pain suffered by their patients. Its Global Pain Guidelines are the WSAVA's most frequently accessed free resources for veterinary professionals.

In Phase One of the GPC Scholarship, the selected candidates will travel to a host location to receive 8-12 weeks of training in small animal pain management from members of the GPC, focused on:

- The pathophysiology of pain
- The assessment of acute and chronic pain in dogs and cats
- The treatment of acute and chronic pain in dogs and cats
- An understanding of how to approach clinical pain research.

In Phase Two, the candidates will return to their country and run courses on pain management to local veterinarians or veterinary technicians/nurses and their WSAVA member association's members. Their completion Certificate will be awarded on the successful completion of both phases of the Scholarship.

Commenting on the launch of the GPC's Teach the Teachers program, Dr Duncan Lascelles, Chair of the GPC, said "All companion animals are sentient so feel pain and this is what makes pain management such an important issue for veterinary professionals. We are working to reduce the variation in the assessment and management of pain around the world through the creation of regionally specific resources and targeted education.

**"Our Teach the Teachers program is an exciting new initiative which we hope will lay the foundations of a global network of veterinarians and veterinary technicians/nurses with specific expertise in pain management and the passion and knowledge to educate their colleagues."**

He added "We are looking forward to reviewing applications for our first GPC Pain Management Scholars."

Full details of the application and selection process for the GPC Scholarship are available on the WSAVA's website at [www.wsava.org/Our-Members/Job-Opportunities/Scholarship-Competition-for-Veterinary-Nurses-Tech](http://www.wsava.org/Our-Members/Job-Opportunities/Scholarship-Competition-for-Veterinary-Nurses-Tech).

The deadline for applications from veterinarians is 31 December 2019. The deadline for applications from veterinary technicians/nurses is 30 June 2020.

Priority will be given to candidates from WSAVA Tier 1 and Tier 2 countries and to members of WSAVA member associations.

The WSAVA represents more than 200,000 veterinarians worldwide through its 113 member associations and works to enhance standards of clinical care for companion animals. Its core activities include the development of WSAVA Global Guidelines in key areas of veterinary practice, including pain management, nutrition and vaccination, together with lobbying on important issues affecting companion animal care worldwide.



Dr Duncan Lascelles - Chair of the GPC



## JAW-SOME WOMBATS MAY BE GREAT SURVIVORS



Flexible jaws may help wombats better survive in a changing world by adapting to climate change's effect on vegetation and new diets in conservation sanctuaries.

An international study, co-led by The University of Queensland's Dr Vera Weisbecker, has revealed that wombat jaws appear to change in relation to their diets.

**“The survival of wombats depends on their ability to chew large amounts of tough plants such as grasses, roots and even bark,” Dr Weisbecker said.**

“Climate change and drought are thought to make these plants even tougher, which might require further short-term adaptations of the skull.

“Scientists had long suspected that native Australian marsupial mammals were limited in being able to adapt their skull in this way.

“But in good news, our research has contradicted this idea.”

The team used a technique known as geometric morphometrics - the study of how shapes vary - to characterise skull shape variation within three different species of wombat, with each species having a slightly different diet.

The data were collected with computed tomography - known to most as CT scanning - and analysed with new computation techniques developed by UQ's Dr Thomas Guillerme.

Dr Olga Panagiotopoulou, who co-led the research project from the Monash Biomedicine Discovery Institute, said the study suggested that short-term jaw and skull adaptation was occurring.

“It seems that individuals within each wombat species differ most where their chewing muscles attach, or where biting is hardest,” Dr Panagiotopoulou said.

“This means that individual shapes are related to an individual's diet and feeding preferences.

“Their skulls seem to be changing to match their diets.

“There are a number of factors that can influence skull shape, but it seems that wombats are able to remodel their jaws as the animals grow to become stronger and protect themselves from harm.”

Dr Weisbecker said the team was particularly excited that the critically endangered northern hairy-nosed wombat, with around 250 individuals left, seemed to be able to adapt to new diets.

“In order to protect endangered animals, it's sometimes necessary to translocate them to new sanctuary locations where threats are less, but diets may be quite different,” she said.

“Our findings suggest that future generations of these northern hairy-nosed wombats will adapt well to a different diet in a new home.

The researchers are planning to use a similar analysis on koala skull shapes.

### Journal References:

Vera Weisbecker, Thomas Guillerme, Cruise Speck, Emma Sherratt, Hyab Mehari Abraha, Alana C. Sharp, Claire E. Terhune, Simon Collins, Stephen Johnston, Olga Panagiotopoulou. Individual variation of the masticatory system dominates 3D skull shape in the herbivory-adapted marsupial wombats. *Frontiers in Zoology*, 2019; 16 (1) DOI: 10.1186/s12983-019-0338-5

## PLANNING WILL SAVE PETS IN BUSHFIRES



The Australian Veterinary Association (AVA) is warning of serious impacts of bushfires on Australian wildlife and pets.

Dr Julia Crawford, President of the AVA, said that with so many Australians living in bushfire zones it's critical that they are prepared in an emergency and pet owners should include their pets in any emergency plans.

**“Planning is key, and can not only help save human lives, but also save pets' lives.**

“The decision to evacuate or stay at home is always a critical one. Try to confine your pets to the safest enclosed room of the house, such as the bathroom, where they can be quickly collected if you need to leave urgently, and make sure you have their carry cages and leads on hand.

“Put together an emergency kit for your animals with lots of non-perishable food and water in spill-proof containers.

“If you become separated from your pet in an emergency evacuation advise local vets, animal welfare shelters and rescue

organisations. It's crucial that your pet is microchipped and registered with the local council to make it easier to be re-united in an emergency,” said Dr Crawford.

Fires don't just threaten people, their homes, pets and livestock, but the wildlife that make their homes in bushes, hollow logs, trees and underground.

“While it's absolutely tragic when wildlife is destroyed or injured in a bushfire it's important not to put your own life at risk when rescuing an animal.

“Extra care should be taken with venomous or aggressive animals. If you find injured or orphaned wildlife call your nearest wildlife rescue organisation or local vet,” urged Dr Crawford.

Veterinarians across fire affected areas are working with wildlife rescue groups and treating pets and wildlife in the aftermath of the fires.

AVA resources on protecting horses, livestock and pets in natural disasters are available for download from the AVA website [www.vetvoice.com.au/ec/animals-and-natural-disasters](http://www.vetvoice.com.au/ec/animals-and-natural-disasters)

## HORSE NUTRITION: PREBIOTICS MAY DO MORE HARM THAN GOOD



Prebiotics are only able to help stabilise the intestinal flora of horses to a limited degree. Before they can reach the intestines, commercially available supplements partially break down in the animals' stomachs, which can lead to inflammation of the stomach lining. This was discovered by researchers at Martin Luther University Halle-Wittenberg (MLU) and the University of Veterinary Medicine Hannover (TiHo). The team therefore suggests preparing prebiotic food supplements so that they don't take effect until they reach the large intestine. The study appeared recently in the journal PLOS ONE.

Prebiotics are often added to horse feed in order to stabilise the horse's health. They are indigestible fibres that can stimulate the growth and activity of certain beneficial bacteria in the large intestine. “Horses have a relatively small, non-diverse core microbiome and are therefore very susceptible to digestive disorders,” explains Professor Annette Zeyner, head of the animal nutrition group at MLU. However, according to the scientist, insufficient research has been conducted on whether the use of prebiotics actually does produce the desired effects. Her research group explored this question in partnership with Professor Gerhard Breves' lab from TiHo.

For the study, the team investigated the effect of feeding Jerusalem artichoke meal (JAM) on horses. This is a typical prebiotic for horses. In addition to their normal feed, six animals received JAM containing high amounts of certain carbohydrates, so-called fructo-oligosaccharides (FOS) and also insulin. Another group of six horses received a placebo with their normal feed. The researchers then analysed the balance of bacteria in the digestive tract of the animals of both groups. It was discovered that the prebiotics were already being fermented in the stomach by the microorganisms naturally living there - i.e. they were taking effect much too early. “The fermentation process leads to the formation of organic acids that - unlike in the large intestine - can damage the mucous membrane of the horse's stomach,” says Maren Glatter, a member of Zeyner's group and lead author of the study.

However, the bacterial diversity of the entire digestive tract did increase, which probably also produces the desired protective effect. “Still, the prebiotics are probably more harmful than beneficial when used in their present form,” Zeyner surmises. Instead, the substances must be treated so that they arrive in the large intestine in one dose in order to have a positive effect on the intestinal bacteria living there without stimulating overactivity.

### Journal Reference:

M. Glatter, K. Borewicz, B. van den Bogert, M. Wensch-Dorendorf, M. Bochnia, J. M. Greef, M. Bachmann, H. Smidt, G. Breves, A. Zeyner. Modification of the equine gastrointestinal microbiota by Jerusalem artichoke meal supplementation. *PLOS ONE*, 2019; 14 (8): e0220553 DOI: 10.1371/journal.pone.0220553

# Charity Ball

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## LOP-EARED RABBITS MORE LIKELY TO HAVE TOOTH/EAR PROBLEMS THAN ERECT EARED COUSINS



Lop (floppy) eared rabbits are more likely than erect ('up') eared breeds to have potentially painful ear and dental problems that may ultimately affect their ability to hear and eat properly, finds a small observational study published in *Vet Record*.

These findings call into question the ethics of breeding and buying one of the UK's most popular types of pet rabbit, say the researchers.

Breeding animals for 'aesthetic' features that are linked to pain and discomfort is coming under scrutiny, but has mainly focused on dogs, they point out.

Some vets have voiced concerns that breeding for large floppy ears is associated with health problems that cause rabbits distress.

Anecdotal evidence indicates that lop eared rabbits (lops) are prone to ear canal narrowing and consequently reduced airflow and the build-up of ear wax. This may trigger ear infection (otitis) which can be painful and cause deafness.

The altered head shape of lops can also affect jaw and teeth alignment, potentially causing tooth overgrowth, pain, and eating difficulties.

But there has been no hard evidence to inform a debate about the ethics of buying and breeding lops, say the researchers.

To try and address this, they examined the teeth and ears of various breeds and ages of 15 lops and 15 erect eared rabbits in a rabbit rescue centre.

They also observed their behaviour, looking for signs of discomfort/pain, expressed as bouts of head shaking or ear scratching, and flinching or struggling when being examined, and checked their medical records.

The results confirmed that lops did indeed have much higher levels of ear and dental problems than erect eared rabbits.

They were 43 times more likely to have narrowed ear canals and significantly more likely to have a build-up of ear wax. And they were 15 times more likely to exhibit a potential pain response during ear examination.

Ear wax build-up was noted in the medical records of 14 of them, and repeated ear cleaning in nine. The equivalent figures for erect eared rabbits were 3 and none.

The lops were 23 times more likely to have diseased incisor teeth; 12 times more likely to have overgrown molar teeth; 13 times more likely to have sharp molars; and significantly more likely to have molar spurs - sharp points on the edges as a result of uneven wear.

Their health records showed that half of them (8/15) had dental abnormalities, and six had needed dental treatment, compared with none of the erect eared rabbits.

**“The welfare consequences of a rabbit having lop ears include pain, as indicated by statistically significantly increased pain responses during examination of lop ears,” write the researchers.**

“Additionally, the higher frequency of signs consistent with [outer ear] otitis found in the lop eared compared with the erect eared rabbits, suggest potential for pain, [impaired hearing], or even deafness,” they add.

This is an observational study, and as such, can't establish cause, and rabbits in a rescue centre may not be typical of pet rabbits in general, they point out.

Nevertheless, the findings confirm the anecdotal reports of vets in practice. And they conclude: “This brings into debate the ethics of breeding and buying lop-eared rabbits, as they may be more likely to suffer from these conditions, which can be painful and often chronic and recurrent.”

Commenting on the findings, Daniella Dos Santos, British Veterinary Association President, said “As well as being likely to suffer from ear and dental problems, lop-eared rabbits are also at increased risk of injury and prone to obesity, as for some, the length of their ears can restrict their movement. Sadly, vets tell us that all too often they're seeing clients who have chosen a pet with certain features without being aware of the serious health and welfare problems they may have as a result.

“It's critical that prospective owners think 'health over looks' when choosing a pet, as extreme features may come hand in hand with hereditary problems that can lead to serious health problems and be distressing and costly to treat. Vets are happy to give advice on how to find a happy, healthy pet and keep them that way.”

#### Journal Reference:

Jade C Johnson, Charlotte C Burn. Lop-eared rabbits have more aural and dental problems than erect-eared rabbits: a rescue population study. *Veterinary Record*, 2019; vetrec-2018-105163 DOI: 10.1136/vr.105163



## GENETIC RISK FACTOR FOR LARYNGEAL PARALYSIS IN MINIATURE BULL TERRIERS IDENTIFIED



A genetic test can now be developed for the mutation discovered in the RAPGEF6 gene in miniature bull terriers

Laryngeal paralysis is a serious and sometimes deadly disease in some dog breeds that prevents proper opening of the larynx for breathing. In a new study published 24th October in *PLOS Genetics*, a team of German specialists in canine head and neck surgery and geneticists from the University of Bern identify a mutation responsible for laryngeal paralysis in Miniature Bull Terriers, enabling the development of a genetic test for the disease.

Laryngeal paralysis most commonly affects middle-aged or geriatric dogs belonging to large and giant dog breeds, but recently breeders observed a rise in laryngeal paralysis striking in young Miniature Bull Terriers. To identify a genetic cause, researchers performed a genome-wide association study and analysed genome sequences of several hundred dogs to find mutations that occur in Miniature Bull Terriers with the disease. In the genome of affected dogs, they discovered an extra piece of DNA inserted into the RAPGEF6 gene that results in production of an incomplete, non-functional RAPGEF6 protein. Miniature Bull Terriers that carried only mutant versions of the gene had a 10-

17-fold increased risk of laryngeal paralysis.

The researchers did not detect a perfect correlation between the mutation and the laryngeal paralysis, which suggests that other genetic and environmental factors also may contribute to the development of the disease. Additionally, this mutation only occurred in Miniature and standard Bull Terriers, and thus cannot explain laryngeal paralysis in other dog breeds. However, the study identifies an important role for RAPGEF6 in laryngeal nerve function.

The authors emphasise the important contribution of concerned dog owners in initiating this research: “We are very excited about this breakthrough in research that has been made possible by a fantastic effort of many highly motivated dog breeders and owners who alerted us to the problem and donated samples from their dogs,” commented senior author Tosso Leeb. “Targeted breeding should drastically reduce the frequency of this devastating disease in the future.”

With this information, a genetic test for the mutation can now be developed to prevent the breeding of Miniature Bull Terriers and Bull Terriers that are at risk for the disease.

#### Journal References:

Sheida Hadji Rasouliha, Laura Barrientos, Linda Anderegg, Carina Klesty, Jessica Lorenz, Lucie Chevallier, Vidhya Jagannathan, Sarah Rösch, Tosso Leeb. A RAPGEF6 variant constitutes a major risk factor for laryngeal paralysis in dogs. *PLOS Genetics*, 2019; 15 (10): e1008416 DOI: 10.1371/journal.pgen.1008416

## BETTER MANAGING ANIMAL DISEASE THREATS



Australia will be better prepared to manage significant animal biosecurity threats, such as African swine fever (ASF), through a new comprehensive online field guide for emergency animal diseases.

Head of Biosecurity, Lyn O'Connell, said the guide will help vets with early detection, diagnosis and control of exotic and emerging infectious diseases in livestock.

“Early identification and reporting is critical to minimise the devastating impact that these diseases can pose for our animals, industries, jobs and environment,” Ms O'Connell said.

“ASF and Foot and Mouth Disease could wipe out industries, jobs, impact on trade and availability of the Australian produce we all enjoy, so we need to be as prepared as possible because the threat is real.

**“Australia's vets are vital for biosecurity. If the unthinkable happened and a significant animal disease was to hit our shores, our vets would play a key role in managing and minimising the risks.**

“This guide will help vets identify emergency animal diseases in the field, ensure they consider priority diseases when conducting diagnosis and take appropriate action when they suspect signs of a biosecurity threat.

“The disease list included in the guide will be reviewed and updated to address emerging threats so we are best placed to manage them as they arise.

“We have some of the best vets in the world and this gives them another tool to improve the work they do in protecting Australia from deadly animal diseases.”

The guide is in addition to a range of measures in place to better manage animal biosecurity threats. This includes increased intervention measures at our borders, testing of intercepted meat produce for ASF and FMD, as well as stronger enforcement approaches for biosecurity breaches relating to meat products.

A round-table was recently held between leaders, scientists and governments to discuss the actions needed to keep African swine fever out of Australia.

A simulation exercise will also be held later this year to test our disease response capabilities to make sure we're as prepared as we can be.

The field guide was produced by the Department of Agriculture and Australia's Animal Health Laboratory.

The 270 page resource is available on the Outbreak website at [outbreak.gov.au/for-vets-and-scientists/emergency-animal-diseases-guide](https://outbreak.gov.au/for-vets-and-scientists/emergency-animal-diseases-guide).



## VETS CRASH IMPROVE INTERNATIONAL WEBSITE AT RELEASE OF NEW AES ACCELERATED EMERGENCY PROGRAM

Vets crash Improve International website at release of new AES Accelerated Emergency Program Veterinarians in the APAC region have registered in droves to Australia's first fast-tacked emergency and critical care program, with it selling out in just one week.

**“The response to this program has been overwhelming,” Dr Carmel Griffin, Director of Operations for Improve International shares.**

“Because there is nothing like this course in Australia - or even the APEC region, we are getting a higher level of interest than we ever anticipated; from vets who want to improve their confidence in emergency and critical care.”

Announced earlier this year, Animal Emergency Service and Improve International partnered to launch the AES Accelerated

Emergency Program, available to veterinarians including recent graduates who want to transition into emergency practice.

Dr Rob Webster, Co-Founder and Director of Animal Emergency Service has announced they have now closed a third intake with a fourth intake scheduled for early 2020. “Once the website crashed and we saw the response, we knew we had to open up another intake - our team worked overtime to line up tutors to accommodate the extra interest.”

The AES Accelerated Emergency Program consists of 15 online weekly Modules, designed for vets to update their critical care knowledge quickly and is more affordable than other Continuing Education (CE) programs.

Animal Emergency Service veterinarians who have undergone the program speak highly of it, finding as well as providing knowledge in diagnostics the course also builds their confidence in managing emergency cases.

### PROGRAM DETAILS

**Name:** AES Accelerated Emergency Program

**Time frame:** 15-weeks, register interest now for 2020 intake

**Delivery:** Online

**Qualifications:** 75 CPD units, Certificate of Completion upon completion of elective exam

**Cost:** \$3,450

For more information about the AES Accelerated Emergency Program visit [improveinternational.com.au/courses/accelerate-emergency-program](http://improveinternational.com.au/courses/accelerate-emergency-program)



## VET ASSOCIATION SAYS NATIONAL HORSE REGISTER IS A NO BRAINER



The Australian Veterinary Association (AVA) is highlighting that the current catastrophic bushfires in New South Wales and Queensland, plus those earlier this year in Victoria, reinforce the need for an immediate implementation of a national horse register.

**Dr Sam Nugent, President of AVA's Equine Veterinarians Australia (EVA) group said that “efficient, practical and functional radiofrequency identification (RFID) devices and a national horse register would provide traceability to ensure that we can easily return horses to their rightful owner following any natural disaster”.**

“If we review the evidence from the extreme bushfires in Victoria this year, we found that tracing the owners of horses which were found after the event, sometimes injured and in need of treatment, was extremely difficult”, he said. In the wake of recent events, the EVA urges all horse owners to act to ensure that the identity of their horses is secured.

Electronic identification of horses and the implementation of a national horse register is essential for traceability, not just in natural disasters, but throughout a horse's life. Microchips allow operators to identify individual animals by means of a unique identification number. The implanted microchips must conform to Australian Standard AS 5019-2001, and should an animal change ownership or residence, the system can be easily updated to ensure accurate records are on file. Improved traceability of all horses is essential to ensure the best possible health and welfare outcomes for all horses during the course of their lives.

## HORSES BLINK LESS, TWITCH EYELIDS MORE WHEN STRESSED

How can you tell when a horse is feeling stressed? It's all in the eyes and the way their eyelids twitch, University of Guelph researchers have discovered.

A horse will blink less and twitch its eyelids more when it's under mild stress, the research team found - a new finding that could offer handlers a simple, easy-to-spot sign their animal is becoming agitated.

The study, published in the journal *Animals*, is thought to be the first to reveal the significance of eyelid twitches as an indicator of stress, says Prof. Katrina Merkies, the study's lead author.

“With humans, we already know our blinking changes when we are under pressure. Some studies have shown we blink more when agitated while others found we blink less. We wanted to see if horses blink rates change too,” said Merkies, a professor in the Department of Animal Biosciences at the Ontario Agricultural College.

Although many horse handlers can tell when their animals are agitated, it can sometimes be hard to get a good read on a horse's mood - particularly if the animal has been well trained.

“When we train horses, we specifically teach them to suppress their stress responses because we don't want horses to react when they are startled or nervous. But even if they've learned to suppress their reaction, it doesn't actually decrease the stress they feel,” she said.

While stress can be measured through heart rate monitors or blood cortisol levels, Merkies and her team wanted a non-invasive measurement, so they decided to test whether a horse's eyes could offer clues.

They recruited 33 horses of various breeds from three riding lesson facilities in eastern Ontario and exposed them to three mildly stressful scenarios.

In the first, a ball was thrown in front of the horse in an attempt to startle the animal. In the next, the horse was visually separated from its herd for a few minutes. Finally, the horse's food was withheld for three minutes at feed time while its herd mates were allowed to begin eating.

The researchers filmed the horses, watching for changes in eye and ear movement, head tilt and general restlessness.

They found that withholding the feed for a few minutes was the most stressful for the horse as indicated by its increased heart rate, restlessness and head movement. Conversely, separation and the startle test evoked little response.

Researchers attempted to startle the horses by throwing a ball in front of them.

“It's important to remember these were riding school horses, so they were used to being startled and being separated. But the withholding of food was new, so that's likely why they became stressed,” she said.

When researchers reviewed videos of the horses' eyes during feed withholding, they noticed the horses blinked less but twitched their upper eyelids more.

On average, the horses' full blink rate decreased to an average of five blinks per minute during the stress compared to the eight



to nine times per minute when relaxed. During the feed restriction, when the horses felt the most stress, their eyelid twitches increased from an average of two twitches per minute to six twitches per minute. There was no increase in eyelid twitches with the other stress tests.

Merkies said she hopes her team's finding will help horse handlers looking for simple ways to gauge their animals' moods.

**“There's no one measure that is going to tell us everything, but this is another tool we can add to the toolbox that we can use together to understand our animals better,” she said.**

#### Journal References:

Merkies, Ready, Farkas, Hodder. Eye Blink Rates and Eyelid Twitches as a Non-Invasive Measure of Stress in the Domestic Horse. *Animals*, 2019; 9 (8): 562 DOI: 10.3390/ani9080562



# JETPETS COMPANION ANIMAL RESCUE AWARDS WINNERS REVEALED

The Jetpets Companion Animal Rescue Awards is thrilled to announce the WINNERS for 2019. The Rescue Awards is a national program that celebrates and recognises achievements in the rescue, rehabilitation and re-homing of companion animals Australia-wide.

"In our second year, it was very competitive with more than 1,000 entries across 8 categories, which made it very difficult for the judges! Our amazing winners demonstrated excellence and innovation in their approach to improving the lives of companion animals in their communities," said Cathy Beer, Rescue Awards Founder and pet adoption advocate from Pets4Life, an independent education resource for cat and dog guardians.

Following the announcement of the Finalists in August, one winner from each category was selected by an expert panel of 12 Judges. The winners were revealed on 12 September 2019 among hundreds of their peers at a special Rescue Awards Ceremony held during the 8th National G2Z Summit & Workshops in Queensland. Bondi Vet, Dr Alex Hynes and her rescue dog, Yoshi announced the winner of the Volunteer of the Year. The Ceremony was broadcasted live across the country via the Rescue Awards Facebook page.

This year, Jetpets is again the Platinum Rescue Hero and naming Partner. Sandy Matheson, Jetpets Managing Director, said, "Jetpets congratulates this year's winners of the Companion Animal Rescue Awards. The quality of the entries were outstanding, and we are humbled to be able to share in celebrating the achievements of rescue organisations, volunteers and adopters alike, who have had a significant impact on the welfare of companion animals Australia wide.

For category 8, the Advocate® People's Rescue Story received hundreds of entries from Aussie pet guardians who shared their stories about pet adoption and fostering. Dan White, Senior Brand Manager of Advocate® at Bayer said it was incredibly difficult narrowing our choice down to 10 Finalists, let alone choose an overall winner!

**Dan said, "The judging, although a lengthy process, has also been a thoroughly rewarding and uplifting one. All the stories - although different in a number of ways - have one thing in common: they demonstrate the difference a re-homed pet can make to an individual or people's lives.**

"Moreover, the fact that almost twice as many stories were submitted as last year further demonstrates there are still many amazing and inspiring stories to be told. Our overall winner (Sally and her hero cat Sandy) really exemplifies a real-life rescue story because Sandy literally saved Sally's son's life. It's been a real privilege for Advocate® and Bayer to be involved for the second year running."

Cathy thanked Supporters for making the Rescue Awards possible, and acknowledged the great efforts of rescue groups, animal shelters and thousands of volunteers across the country. Rescue Awards Ambassador and Animal Behaviourist Dr Joanne Righetti also congratulated the winners and thanked rescue organisations and their volunteers for helping surrendered and abandoned pets get a second chance in a loving home.



Advocate® People's Rescue Story winner Beau and Sandy



2019-Judges-with-Cathy-Beer



2019-Jetpets-Companion Animal Rescue-Awards-winners

## 2019 WINNERS

- **Category 1: Outstanding Rescue Group**  
Maneki Neko Cat Rescue (VIC)
- **Category 2: Outstanding New Rescue Group**  
Dandy Cat Rescue (VIC)
- **Category 3: Outstanding Animal Shelter**  
Second Chance Animal Rescue (VIC)
- **Category 4: Outstanding Council Animal Shelter**  
Sutherland Shire Animal Shelter (NSW)
- **Category 5: Innovation in Rescue**  
AMRRIC's One Health Program (NT)
- **Category 6: Community Education and Outreach Program**  
Camden Council's PAWS: Pet Awareness and Safety Program (NSW)
- **Category 7: Volunteer of the Year**  
Sue Quartermain (RSPCA Victoria)
- **Category 8: Advocate® People's Rescue Story**  
Sally Gaunt and her hero cat, Sandy (VIC) adopted from RSPCA Burwood (VIC)

**About Pets4Life:** Pets4Life is an independent education resource for cat and dog guardians and those who are thinking of getting a cat or dog. Our goal is to help reduce cat and dog surrender and improve pet well-being in Australia. After over 20 years in the corporate world as a professional marketer, Cathy Beer pursued her passion for pet welfare and created Pets4Life in 2013 after interviewing leaders in the companion animal welfare space. Cathy is completing the Delta Institute of Australia course to attain a Cert IV Companion Animal Services and an accredited Delta dog trainer. Cathy is a voluntary member of Willoughby Council's Companion Animals Committee and a volunteer instructor at the Sydney All Breeds Dog Club. Visit [pets4life.com.au](http://pets4life.com.au)

**About Jetpets:** Jetpets are Australia's leading pet travel experts. Their in house team of pet travel consultants, pet handlers and resident vets have been caring for people's beloved pets for over 27 years. Setting the highest standards of care for pets travelling interstate and overseas, the Jetpets team love nothing more than reuniting and bringing families together. Jetpets provide a complete pet travel service, taking care of everything involved in transporting a pet from their home to their final destination. For helpful information on pet travel visit [www.jetpets.com.au](http://www.jetpets.com.au), or to speak with an experienced pet travel consultant on 1300 668 309.



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## BATS DON'T RELY ON GUT BACTERIA THE WAY HUMANS DO



Just about all mammals, including humans, rely on a community of helpful bacteria living in our guts to help us digest food and fight off diseases. We've evolved along with these bacteria, to the point that closely related species have similar microbiomes in their guts. Scientists just discovered that bats break that rule. That tells us that bats probably don't rely on their microbiomes the way other mammals do - we think it's because they fly.

Right now, there are trillions of bacteria living in your gut, making up about one percent of your body weight. They're supposed to be there - we need them to help us digest food and fight off diseases. The same is true for most mammals; in general, just about every mammal from dogs to dolphins relies on a community of helpful bacteria, called a microbiome, living inside them for health and survival. Many animals have even evolved along with their gut bacteria to better work together, to the point that closely related host species typically share more similar microbiomes. But a new study has identified one group of mammals that seems to buck that trend: bats. A new paper in *mSystems* reveals that the microbiomes of closely-related bats can be totally different from each other, which suggests that having a community of helpful gut bacteria may not be so important for this already eccentric group of mammals.

"It shifts the paradigm we've been operating under, that animals require microbes for digestion and nutrient acquisition. That's true for us, but it may not be true for all species," says lead author Holly Lutz, a research associate at Chicago's Field Museum and post-doctoral researcher at the University of California, San Diego.

**"The trends we're seeing suggest that bats may not depend on bacteria the same way many other mammals do, and that they can survive just fine without a strict suite of bacteria in their guts to help them digest their food."**

To learn about the relationships between bats and their microbes, Lutz and her colleagues took samples of bacteria from the skin, tongues, and guts of 497 bats from 31 different species in Kenya and Uganda. The team then compared the genetic codes present in the bacteria.

The researchers discovered that bats have fewer bacterial species living in their guts than in their mouths and on their skin. What's more, the kinds of bacteria living in the bats' guts varied from species to species without following any apparent evolutionary pattern. This struck the scientists as strange, since for most other mammals that have been studied, closely-related hosts share more similar microbiomes, a pattern called "phylosymbiosis." Bats seem to play by a different set of rules.

"There's essentially no relationship between the bat microbiome and bat evolutionary history," says Lutz. "You'd expect to see similar microbiomes in closely-related bat species if these animals depended strongly on their bacteria for survival. This is largely

what we've seen in other mammals that have been studied, but it's just not there in bats." While host identity-what species a bat is- is still an important factor in predicting the microbiome, this may simply be tied to where those bats live and what they eat. In other words, the bat microbiome may be the result of bacteria that the bats pick up from their environment rather than from an evolutionary predisposition to hosting specific bacteria. "The same species of bat in five locations might host five very different microbial communities," says Lutz. The fact that bats' gut bacteria are more closely tied to where bats live than where those bats fall on the bat family tree indicates that evolving a special relationship with just-right gut bacteria may not have been as important for bats as it has been for other mammals.

Lutz suspects that bats' unique relationships with gut bacteria are related to another trait that sets them apart from their fellow mammals: their ability to fly.

"Bats have extremely shortened guts," she explains. Food takes just fifteen to thirty minutes to pass through a bat's digestive system, a third as long as it would take for a similarly-sized rodent. That's likely because a long, winding digestive tract would weigh the bats down. "For bats, you can't be carrying around non-essentials. You need to reduce weight for flying - you don't want a heavy gut." Since bats evolved short digestive tracts, presumably to make them lighter for flight, they may not have evolved the same intimate relationships with their gut bacteria that us land-dwelling mammals have.

The discovery that bats' microbiomes are closely linked to the world around them means that changes to that world could put the bats in danger. In addition to helping digest food, stable gut bacteria help maintain healthy immune systems to fight off disease, and scientists are still learning about the relationship between microbes and skin, gut, and oral health in wildlife. "Bats may be very susceptible to environmental change - if they have a transient microbiome, they might not have the most stable defence mechanisms," says Lutz. "Human-caused disturbances to the environment are a very important issue. Bats may be extra-fragile and more at risk."

In addition to lead author Holly Lutz of the Field Museum, University of Chicago, and UC San Diego, the study was contributed to by senior author Jack Gilbert at UC San Diego, Field Museum co-authors Julian Kerbis Peterhans, Terry Demos, and Bruce Patterson, Elliott Jackson of Cornell University, Paul Webala of Maasai Mara University in Kenya, and Waswa Babyesiza of the Sokoine University of Agriculture in Tanzania.

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## GENETIC HISTORY OF ENDANGERED AUSTRALIAN SONGBIRD COULD INSPIRE AN ENCORE



The genetic history of a critically endangered songbird shows its best chance of survival is to protect its rapidly disappearing habitat.

Researchers from The Australian National University (ANU) used DNA samples from museums around the world, dating back to the 1800s, to study the genetic impact of severe population decline on the regent honeyeater.

Their study shows that while the birds' genetic diversity remains intact, giving it a fighting chance, the best way to save the species from extinction is by protecting what little habitat it still has access to.

Dr Ross Crates and Dr George Olah from the Difficult Bird Research Group say while regent honeyeaters were common less than 60 years ago, they're now critically endangered.

"Best estimates suggest there may be as few as 250 left in the wild," Dr Crates said.

"The population has suffered a rapid decline due to the widespread loss of breeding habitat caused by land clearing, as well as competition with larger bird species for access to remaining habitat."

The birds can be found from northern Victoria to southern Queensland - an area of over 600,000km<sup>2</sup>.

Because of this massive distance, studying the birds is difficult. That's why the researchers hunted down DNA in museums.

"It's a real challenge to locate so few birds over such a huge area," Dr Crates said.

"Regent honeyeaters can travel hundreds of kilometres to find blossom nectar to feed on. We don't know where they will turn up and breed from one year to the next.

"If we are going to save this species from extinction, we need to know if there is anything we can do to help maintain genetic diversity in the remaining population."

The team compared the genetic makeup of the regent honeyeater when it was abundant and widespread, to the genetic makeup of the remaining population today.

"When populations become small and isolated, genetic diversity can be lost, reducing the survival of the remaining individuals. In some species, this can severely impact the chances of population recovery," Dr Olah said.

The team extracted DNA from tiny fragments of tissue from regent honeyeater specimens housed in museums. They also used blood samples collected by BirdLife Australia over the past 30 years.

They then sampled DNA from wild birds, and compared the patterns in the genetic data.

Despite the small numbers of birds left in the wild, the researchers found little genetic diversity has been lost over time.

"Birds in the north of the range are closely related to both their

near neighbours and birds in the south of the range," Dr Crates said.

"This strongly suggests that small numbers of birds are travelling long distances to breed with each other."

The team says this is both "good news and bad news."

**"The good news is the birds' long-distance movements are naturally helping to maintain genetic diversity in the population," Dr Crates said.**

"The bad news is this means there's little we can actually do in terms of conservation action to help manage their genetic makeup.

"It means our best chance of saving regent honeyeaters from extinction is by protecting remaining breeding habitat, restoring as much lost breeding habitat as possible and protecting nests from predators."



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## GENES PLAY A ROLE IN DOG BREED DIFFERENCES IN BEHAVIOUR

Given the dazzling array of dog breeds, from dachshunds to mastiffs, from poodles to bloodhounds, it's easy to forget that most of that diversity arose only in the last few centuries or so, thanks to human tinkering. People have bred dogs for their looks, but the lion's share of breeding efforts have taken aim at eliciting particular behaviours, according to the University of Pennsylvania's James A. Serpell.

**"If you look at the evolution of the dog, selection has been primarily for behaviours: hunting behaviours, guarding behaviours, or giving companionship to humans," he says.**

In a new study, Serpell and colleagues Evan L. MacLean of the University of Arizona, Noah Snyder-Mackler of the University of Washington, and Bridgett M. vonHoldt of Princeton University offer strong evidence to support what scientists have long suspected: that some of the behaviours that help characterise breeds - a drive to chase, for example, or aggression toward strangers - are associated with distinct genetic differences between them. Their findings were published in the Proceedings of the Royal Society B.

"Dogs present a good model for understanding what portion of the variation in their behaviour is attributable to differences in genetics, and how much to their environment and experiences," says Snyder-Mackler, who earned his undergraduate and doctoral degrees from Penn.

What seems obvious - that genes can influence an individual's behaviours - has not always been easy to support with evidence, in large part because behaviours are complex traits. Tendencies such as aggression, anxiety, or a compulsion to chase anything that moves are governed by many genes, not just one.

But dog breeds, being highly inbred, have allowed researchers to make progress in this area. Serpell and his colleagues recognised that, if a dog breed is associated with a particular behaviour that distinguishes it from other breeds, it might be easier to detect the genetic variants contributing to that behaviour if you compared that breed's genome to a host of others.

It helped that Serpell was in possession of a treasure-trove of behaviour data from C-BARQ, short for Canine Behavioural Assessment and Research Questionnaire, a survey that more than 50,000 dog owners have filled out about their pets. C-BARQ returns a result on 14 behavioural "factors" about each dog surveyed, giving a measure of traits such as stranger-directed aggression, excitability, energy level, and predatory chasing drive.

For this study, the researchers pulled 14,020 of those entries that included information about pure-bred dogs. To look for associations with genetics, they borrowed data from two earlier studies, together representing 5,697 dogs, for which 172,000 points in the genome had been sequenced.

They found that about half of the variation in the 14 measured behaviours across breeds could be attributed to genetics - a greater proportion than previous studies have found.

"This was based on breed-average behaviours," notes MacLean, "because we didn't have behavioural and genetic information from the same animals."

What stood out to the researchers was that the traits with the highest rates of heritability - in other words, those that seemed to be most influenced by genetic factors rather than environmental ones - were behaviours such as trainability, predatory chasing, stranger-directed aggression, and attention seeking. For these traits, genetics explained 60 to 70 percent of variation across breeds.

"These are exactly the types of traits that have been selected for in particular breeds of dogs," says Serpell. "So for trainability, you're thinking of breeds like border collies that have to respond to human signals to accomplish complicated tasks; for chasing behaviour you can think of something like a greyhound, which is innately predisposed to chase anything that runs; and for stranger-directed aggression you might focus on some of the guard dog breeds that are highly protective and tend to respond in a hostile way to unfamiliar people."

Taking advantage of their vast pool of genomic data, the researchers looked for genetic variants associated with breed differences in the 14 C-BARQ traits. They found 131 variants tightly linked to these behaviours. Some were located in genes that have been implicated in influencing behaviour, including in humans. But many were unknown and provide fodder for future study.

"This gives us an encouraging start and places to look," says MacLean. "We have ongoing projects where we've obtained genetic and behavioural data from the same individuals, so we'll be able to dive deeper into some of these traits and variants to see if the patterns we found here hold up."

If these genetic differences influence behaviour, a good assumption would be that they somehow affect the brain. So, as a final step, the team looked to see where the genes in which key variants appeared were expressed in the body. Their analysis showed the genes were much more likely to be expressed in the brain than in other tissues in the body.

Of note, however, is that the researchers' results also leave plenty of room for individual differences and an animal's environment in influencing behaviour.

"It's important to keep in mind that we looked at breed averages for behaviour," says Snyder-Mackler. "We're not at a point yet where we can look at an individual's genome and predict behaviour. Environment and training still has a very, very strong effect."



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## BODY LANGUAGE KEY TO ZOO ANIMAL WELFARE



Watching the behaviour and body language of zoo animals could be the key to understanding and improving their welfare, new research suggests. Traditionally, zoos have focussed on more straightforward measures such as whether animals are eating, sleeping and breeding.

The new review, by the University of Exeter and the University of Winchester, says zoos have made vast improvements in recent years, but closer observation of animal behaviour - a method called Qualitative Behavioural Assessment, developed in livestock farming - could reveal even more about their psychological state.

An animal's posture, facial movements and activity levels are among the things that might reveal whether it is excited, calm, interested, nervous, relaxed, etc.

"Zookeepers are dedicated and knowledgeable about their animals, and they will often recognise the psychological state of an animal by its behaviour and body language," said Dr Paul Rose, of the University of Exeter. "What we are suggesting is a more consistent version of this, carried out over time.

"Certain behaviours will indicate certain moods in a particular species, and we should build our knowledge of this for different species that live in zoos.

"For example, lions have a wide range of facial expressions, and

research on these expressions could help zoos understand the animals' state of mind.

"This information could then be used to improve welfare by adjusting enclosures, diets, feeding times or any number of other aspects of the way animals are kept."

Dr Rose conducts much of his research at WWT Slimbridge Wetland Centre, and is currently examining how the swans there might reveal their psychological state via their behavioural expression. "We're looking at how much time they spend investigating and exploring their habitat, which could show that they're feeling emotions like being bold or confident or interested," he said.

"When they're apprehensive or unsure, they appear to move less and be more vigilant, and keep their feathers compressed close to their bodies."

The study evaluates existing research on Qualitative Behavioural Assessment, much of it from farming, and suggests research opportunities and practices that could be adopted by zoos.

"Animal welfare in zoos has improved dramatically in the last 10 or 20 years, and this method gives zoos another way to recognise and promote positive welfare," Dr Rose said.

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# IDENTIFYING A GENE FOR CANINE NIGHT BLINDNESS

Creating an effective gene therapy for inherited diseases requires three key steps. First, scientists must identify and characterise the disease. Second, they must find the gene responsible. And finally, they must find a way to correct the impairment.

Four years ago, a team from the University of Pennsylvania, in collaboration with a group from Japan, ticked the first box of that checklist with regard to a form of congenital night blindness in dogs. Now, in a paper in the journal Scientific Reports, they announce success in the second stage: they've identified the gene responsible.

"We have indeed nailed down the exact genetic mutation that is causing this disease," says Keiko Miyadera, an assistant professor of ophthalmology at Penn's School of Veterinary Medicine and the senior author on the paper. "The next stage is to work on treating this condition; that is to come, and we're very excited about it."

People with congenital stationary night blindness (CSNB) have virtually normal vision during the day, but struggle to make out objects in dim light. The heritable condition is present from birth and can arise from mutations in a number of genes. While the modern world is generally well-lit, this form of blindness can seriously impact quality of life in areas where artificial lighting is not as readily available.

In a 2015 publication in the journal PLOS ONE, a team including Miyadera and Gustavo Aguirre, a professor of ophthalmology and medical genetics at Penn Vet, and Rueben Das, then of Penn Vet and now of Penn's Perelman School of Medicine, in collaboration with a team led by Mie University's Mineo Kondo, announced that they had, for the first time, found a form of true CSNB in dogs.

In the current work, the researchers continued their collaboration, this time working to identify the genetic mutation responsible. Taking advantage of relatively affordable genome sequencing technology, the team performed a genome-wide association study to narrow down the candidate genetic regions potentially involved.

Using a chip capable of identifying single nucleotide changes at 170,000 points in a dog's genome, the researchers studied 12 dogs with this form of CSNB and 11 unaffected dogs. All of the animals came from a closely related family, helping the differences between them stand out.

That analysis narrowed their target to a region of the genome roughly 4 million nucleotide basepairs in size - still too large to search gene by gene. Instead, they carried out whole genome sequencing and used the results to compare to an international dataset containing genomic information from more than 250 dogs and looked for genes in which affected dogs had two copies of a mutation, carriers had one, and other dogs had none.

"We found a mutation that was quite convincing," says Miyadera. The mutation affects the LRIT3 gene, involving a deletion of one basepair, causing the resulting protein to be truncated. Notably, LRIT3 mutations have also been implicated in CSNB in people.

In its normal form, LRIT3 ensures that a molecular channel protein, TRPM1, is properly localised at the tip of a cell type adjacent to

the retina's light-sensing photoreceptor cells. This secondary layer of retinal neurons, called ON bipolar cells, relay signals from the photoreceptors on their path to the brain. The mutation appears to specifically affect those ON bipolar cells that are associated with rod cells - those that kick in strongly allowing vision in dim light.

Once they had zeroed in on the LRIT3 mutation, they were able to firm up the evidence that it was the gene responsible, examining tissue from affected dogs and examining how having a normal versus mutant LRIT3 affected the cell and protein markers and expression of TRPM1 in laboratory experiments.

While the mutation affects the function of the ON bipolar cells, the researchers found that the structure of the retina appeared to be relatively unaffected by the mutation.

**"That's critical for developing a gene therapy," says Aguirre. "If the structure isn't in place, you're not going to be able to restore vision with that approach."**

The team is already at work designing a gene therapy approach to correcting the mutation. The effort entails a different challenge from previous forms of blindness the group has worked on, as targeting the ON bipolar cells requires approaching the retina at a different layer that is not as readily accessible as the photoreceptor cells. "What's unique about this area of work is that we are trying to target a cell type that has been under-utilised as a therapeutic target before," says Miyadera.

As a result, the researchers hope their work may give rise to strategies for treating other conditions involving the ON bipolar cell layer.



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