$12.95 AUS

SUMMER 2020/21 ISSUE 10

THE AUSTRALIAN VETERINARIAN MAGAZINE

Key to harmonious pet relationships: Pheromones

Vets would not manage Covid-19 this way

Prudent Antibiotic Use in Veterinary Dentistry

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THE AUSTRALIAN VETERINARIAN

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DOZENS OF MAMMALS COULD BE SUSCEPTIBLE TO SARS-COV-2

NUMEROUS ANIMALS MAY BE VULNERABLE TO SARS-COV-2, THE VIRUS THAT CAUSES COVID-19, ACCORDING TO A LARGE STUDY MODELLING HOW THE VIRUS MIGHT INFECT DIFFERENT ANIMALS' CELLS, LED BY UCL RESEARCHERS.

The study, published in Scientific Reports, reports evidence that 26 animals regularly in contact with people may be susceptible to infection.

The researchers investigated how the spike protein from SARS-CoV-2 could interact with the ACE2 protein it attaches to when it infects people.

The focus of the investigation was whether mutations in the ACE2 protein in 215 different animals, that make it different from the human version, would reduce the stability of the binding complex between the virus protein and host protein. Binding to the protein enables the virus to gain entry into host cells; while it is possible the virus might be able to infect animals via another pathway, it is unlikely based on current evidence that the virus could infect an animal if it cannot form a stable binding complex with ACE2.

The researchers found that for some animals, such as sheep and great apes (chimpanzee, gorilla, orangutan, and bonobo, many of which are endangered in the wild), the proteins would be able to bind together just as strongly as they do when the virus infects people. Some of the animals, such as sheep, have not yet been studied with infection tests, so this does not confirm that the animal can indeed be infected.

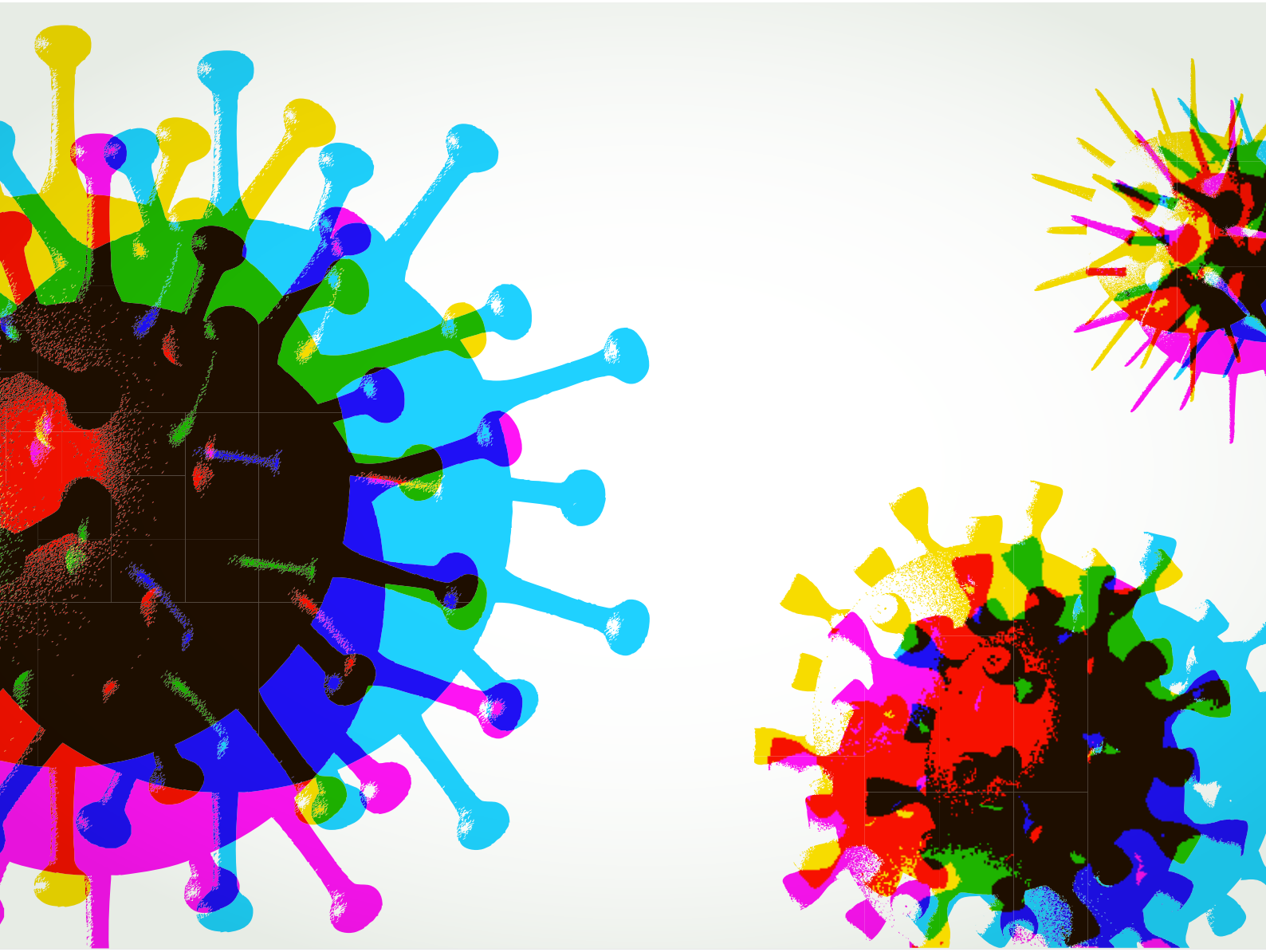
Lead author Professor Christine Orengo (UCL Structural & Molecular Biology) said: "We wanted to look beyond just the animals that had been studied experimentally, to see which animals might be at risk of infection, and would warrant further investigation and possible monitoring.

> **"The animals we identified may be at risk of outbreaks that could threaten endangered species or harm the livelihoods of farmers. The animals might also act as reservoirs of the virus, with the potential to re-infect humans later on, as has been documented on mink farms."**

The research team also performed more detailed structural analyses for certain animals, to gain a better understanding of how infection risks may differ across animal species. By comparing their findings to other experimental data, they set thresholds to predict which animals are at risk of infection, and which ones most likely cannot be infected.

They found that most birds, fish, and reptiles do not appear to be at risk of infection, but the majority of the mammals they reviewed could potentially be infected.

Professor Orengo added "The details of host infection and severity of response are more complex than just the interactions of the spike protein with ACE2, so our research is continuing to



explore interactions involving other host virus proteins."

The team's findings mostly agree with experiments conducted in living animals and with reported cases of infections. They predict possible infection in domestic cats, dogs, mink, lions, and tigers, all of which have had reported cases, as well as ferrets and macaques, which have been infected in laboratory studies.

First author, Su Datt Lam (UCL Structural & Molecular Biology and the National University of Malaysia) said: "Unlike laboratory-based experiments, the computational analyses we devised can be run automatically and rapidly. Therefore, these methods could be applied easily to future virus outbreaks that, unfortunately, are becoming more common due to human encroachment into natural habitats."

Co-author Professor Joanne Santini (UCL Structural & Molecular Biology) said: "To protect animals, as well as to protect ourselves from the risk of one day catching Covid-19 from an infected animal, we need large-scale surveillance of animals, particularly pets and farm animals, to catch cases or clusters early on while they're still manageable.

"It may also be important to employ hygiene measures when dealing with animals, similar to the behaviours we've all been learning this year to reduce transmission, and for infected people to isolate from animals as well as from other people."

The study was conducted by researchers in UCL Biosciences, UCL Science & Technology Studies, National University of Malaysia, King's College London, and Oxford Brookes University, and was supported by Wellcome, the Newton Fund UK-China NSFC initiative, BBSRC, EDCTP PANDORA-ID NET, NIHR UCLH/UCL Biomedical Research Centre, and the Medical Research Council.

Journal Reference:

S. D. Lam, N. Bordin, V. P. Waman, H. M. Scholes, P. Ashford, N. Sen, L. van Dorp, C. Rauer, N. L. Dawson, C. S. M. Pang, M. Abbasian, I. Sillitoe, S. J. L. Edwards, F. Fraternali, J. G. Lees, J. M. Santini, C. A. Orengo. SARS-CoV-2 spike protein predicted to form complexes with host receptor protein orthologues from a broad range of mammals. Scientific Reports, 2020; 10 (1) DOI: 10.1038/s41598-020-71936-5

PETS LINKED TO MAINTAINING BETTER MENTAL HEALTH AND REDUCING LONELINESS DURING LOCKDOWN, NEW RESEARCH SHOWS

Sharing a home with a pet appeared to act as a buffer against psychological stress during lockdown, a new survey that took place in the UK shows.

Most people who took part in the research perceived their pets to be a source of considerable support during the lockdown period (23 March - 1 June, 2020).

The study - from the University of York and the University of Lincoln - found that having a pet was linked to maintaining better mental health and reducing loneliness. Around 90 per cent of the 6,000 participants who were from the UK had at least one pet. The strength of the human-animal bond did not differ significantly between species with the most common pets being cats and dogs followed by small mammals and fish.

More than 90 per cent of respondents said their pet helped them cope emotionally with the lockdown and 96 per cent said their pet helped keep them fit and active.

However, 68 per cent of pet owners reported having been worried about their animals during lockdown, for example due to restrictions on access to veterinary care and exercise or because they wouldn't know who would look after their pet if they fell ill.

Lead author, Dr Elena Ratschen from the Department of Health Sciences University of York said "Findings from this study also demonstrated potential links between people's mental health and the emotional bonds they form with their pets: measures of the strength of the human-animal bond were higher among people who reported lower scores for mental health-related outcomes at baseline.

"We also discovered that in this study, the strength of the emotional bond with pets did not statistically differ by animal species, meaning that people in our sample felt on average as emotionally close to, for example, their guinea pig as they felt to their dog.

> **"It will be important to ensure that pet owners are appropriately supported in caring for their pet during the pandemic."**

Co-author, Professor Daniel Mills from the School of Life Sciences at the University of Lincoln said "This work is particularly important at the current time as it indicates how having a companion animal in your home can buffer against some of the psychological stress associated with lockdown. However, it is important that everyone appreciates their pet's needs too, as our other work shows failing to meet these can have a detrimental effect for both people and their pets."

Dr Ratschen added "While our study showed that having a pet may mitigate some of the detrimental psychological effects of the Covid-19 lockdown, it is important to understand that this finding is unlikely to be of clinical significance and does not warrant any suggestion that people should acquire pets to protect their mental health during the pandemic."

More than 40% of UK households are estimated to own at least one pet.

The study also showed that the most popular interaction with animals that were not pets was birdwatching. Almost 55 per cent of people surveyed reported watching and feeding birds in their garden.

The paper, "Human-animal relationships and interactions during the Covid-19 lockdown phase in the UK: investigating links with mental health and loneliness" was published in the journal PLOS ONE.

Journal Reference:

Elena Ratschen, Emily Shoesmith, Lion Shahab, Karine Silva, Dimitra Kale, Paul Toner, Catherine Reeve, Daniel S. Mills. Human-animal relationships and interactions during the Covid-19 lockdown phase in the UK: Investigating links with mental health and loneliness. PLOS ONE, 2020; 15 (9): e0239397 DOI: 10.1371/journal.pone.0239397

ABBEY LABS

RESEARCHERS IDENTIFY FIVE TYPES OF CAT OWNER

Cat owners in the UK fall into five categories in terms of their attitudes to their pets' roaming and hunting, according to a new study.

University of Exeter researchers surveyed UK cat owners and found they ranged from "conscientious caretakers" concerned about cats' impact on wildlife and who feel some responsibility, to "freedom defenders" who opposed restrictions on cat behaviour altogether.

"Concerned protectors" focussed on cat safety, "tolerant guardians" disliked their cats hunting but tended to accept it, and "laissez-faire landlords" were largely unaware of any issues around cats roaming and hunting.

Conservation organisations have long been concerned about the numbers of animals caught by the UK's large population of domestic cats.

Most pet cats kill very few wild animals, if any, but with a population of around 10 million cats, the numbers of birds, small mammals and reptiles taken can accumulate.

Apart from their role as "mousers," most owners find the dead animals brought home an unpleasant reminder of their pet's wilder side.

Addressing this problem has been difficult because of disagreements between people prioritising cat welfare and those focusing on wildlife conservation.

The Exeter team's ongoing research project "Cats, Cat Owners and Wildlife" aims to find a conservation win-win, by identifying ways of owners managing their cats that benefit the cats as well as reducing wildlife killing.

This research is a step towards understanding how cat owners view their cats and how best to manage them.

The researchers say their findings demonstrate the need for diverse management strategies that reflect the differing perspectives of cat owners.

"Although we found a range of views, most UK cat owners valued outdoor access for their cats and opposed the idea of keeping them inside to prevent hunting," said lead author Dr Sarah Crowley, of the University of Exeter's Environment and Sustainability Institute in Cornwall.

"Cat confinement policies are therefore unlikely to find support among owners in the UK.

"However, only one of the owner types viewed hunting as a positive, suggesting the rest might be interested in reducing it by some means.

"To be most effective, efforts to reduce hunting must be compatible with owners' diverse circumstances."

Suggested measures to reduce hunting success include fitting cats with brightly coloured "BirdsBeSafe" collar covers. Many owners also fit their cats with bells.

The research team are now examining the effectiveness of these and other new measures and how owners feel about them, with a view to offering different solutions.

"This latest research we have funded reveals the incredibly diverse perspectives amongst cat owners in regard to their pets' hunting behaviour," said Tom Streeter, Chairman of SongBird Survival.

"If nature is to 'win' and endangered species thrive, a pragmatic approach is needed whereby cat owners' views are considered as part of wider conservation strategies.

"The study highlights the urgent need for cat owners and conservationists to work together to find tailored solutions that are cheap, easy to implement, and have a positive effect on wildlife and bird populations across the UK."

iCatCare's Head of Cat Advocacy, Dr Sarah Ellis, said: "The finding that many UK cat owners actually care a great deal about wildlife conservation and their cats' impact on it, suggests that some owners are receptive to employing cat-friendly ways of reducing hunting.

"The right interventions could improve wildlife conservation efforts, maintain good cat mental-wellbeing, and at the same time improve the cat-human relationship.

"This would be especially true for 'tolerant guardians' and 'conscientious caretakers', by reducing the internal conflict of loving an animal that often hunts other animals they also care about."

The study included 56 cat owners, some from rural parts of the UK (mostly in south-west England) and some from urban areas (Bristol and Manchester).

The paper, published in the journal Frontiers in Ecology and the Environment, is entitled: "Diverse perspectives of cat owners indicate barriers to and opportunities for managing cat predation of wildlife."

Alongside the detailed research survey, the researchers have created a simple quiz so cat owners can find out which category bests describes them.

Journal Reference:

Sarah L Crowley, Martina Cecchetti, Robbie A McDonald. Diverse perspectives of cat owners indicate barriers to and opportunities for managing cat predation of wildlife. Frontiers in Ecology and the Environment, 2020; DOI: 10.1002/fee.2254

MORE CATS MIGHT BE COVID-19 POSITIVE THAN FIRST BELIEVED, STUDY SUGGESTS

A recently published study looking at cats in Wuhan, where the first known outbreak of COVID-19 began, shows more cats might be contracting the disease than first believed.

Researchers from Huazhong Agricultural University, in the Chinese city, took blood samples from 102 cats between January and March 2020, following the first outbreak. Nasal and anal swabs were also collected.

Reporting their findings in peer-reviewed journal Emerging Microbes & Infections, they show COVID-19 antibodies present in 15 of the blood samples taken from the cats. Of these, 11 cats had neutralising antibodies - proteins that bind so successfully to a virus they block the infection.

None of the cats actually tested positive for COVID-19 or displayed obvious symptoms and, according to the results of return visits, none of these felines have died.

The sample of cats looked at included 46 abandoned from 3 animal shelters, 41 from 5 pet hospitals, and 15 cats were from COVID-19 patient families.

The three cats with the highest levels of antibodies were all owned by patients who had been diagnosed with COVID-19, whilst there were also signs of cats being infected with the virus by other cats from those that were abandoned (4) or based in the pet hospitals (4).

Commenting on the findings, lead author Meilin Jin states that whilst there is currently no evidence for cat-to-human transmission, precautions should be considered.

“Although the infection in stray cats could not be fully understood, it is reasonable to speculate that these infections are probably due to the contact with SARS-CoV-2 polluted environment, or COVID-19 patients who fed the cats.

“Therefore measures should be considered to maintain a suitable distance between COVID-19 patients and companion animals such as cats and dogs, and hygiene and quarantine measures should also be established for those high-risk animals.”

The team assessed the type of antibody reactions in thorough detail and were able to describe the dynamic characteristics of the antibodies found.

Amongst many discoveries within the antibodies, they saw that the type of reaction produced by the cats resembles those observed in seasonal coronavirus infections, implying that the cats who have had SARS-CoV-2 infection “remain at risk of re-infection.”

The authors state that this is a similar transient antibody response to also be observed in humans, and that their study should be used going forwards as a “reference for the clinical treatment and prevention of COVID-19.”

“We suggest that cats have a great potential as an animal model for assessing the characteristic of antibody against SARS-CoV-2 in humans,” they add.

From here, the team state that more research is needed to establish the route of Covid-19 from humans to cats.

“Retrospective investigation confirmed that all of antibody positive samples were taken after the outbreak, suggesting that the infection of cats could be due to the virus transmission from humans to cats. Certainly, it is still needed to be verified via investigating the SARS-CoV-2 infections before this outbreak in a wide range of sampling,” Jin states.

Journal Reference:

Qiang Zhang, Huajun Zhang, Jindong Gao, Kun Huang, Yong Yang, Xianfeng Hui, Xinglin He, Chengfei Li, Wenxiao Gong, Yufei Zhang, Ya Zhao, Cheng Peng, Xiaoxiao Gao, Huanchun Chen, Zhong Zou, Zheng-Li Shi, Meilin Jin. A serological survey of SARS-CoV-2 in cat in Wuhan. Emerging Microbes & Infections, 2020; 1 DOI: 10.1080/22221751.2020.1817796

DENTAL CARE FOR PETS

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SUGAR PROMOTES SPERM LONGEVITY IN PIG REPRODUCTIVE TRACT

For many livestock species, artificial insemination (AI) is standard. But it can be tricky to achieve success the first time, thanks to variability in ovulation timing across the herd.

Sperm remains viable for a day or two once they reach the oviduct, the tube connecting the uterus with the ovaries, in pigs and cattle. The amount of time sperm can be stored in the oviduct has a direct bearing on AI success; if ovulation happens just outside that window, the effort and expense of AI has to be repeated.

A new University of Illinois study identifies a naturally occurring sugar that slows the maturation of sperm in pigs, opening up the possibility of extending sperm storage time within the female reproductive tract and increasing the chances of successful fertilisation through AI.

"We knew there was something about the oviduct that was increasing sperm lifespan, but we didn't know what it was, exactly," says David Miller, professor in the Department of Animal Sciences at Illinois and co-author on the PLOS One study. "In this study, we discovered the molecules of the oviduct that bind sperm and increase their lifespan are complex sugars called glycans."

After screening more than 400 sugars for their capacity to hold sperm, Miller's team had an inkling glycans were a candidate for pigs. To confirm, they isolated various sugars from the pig oviduct and applied them to beads in the laboratory, mimicking the oviduct lining. Compared with other sugars, the glycan-treated beads bound more sperm.

But it wasn't just the physical act of slowing sperm down that increased their lifespan.

"We found out glycans were delaying the normal influx of calcium into sperm," Miller says. "Normally, calcium slowly comes into sperm as they mature, and that triggers them on their differentiation pathway, which makes them capable of fertilisation. But binding to these immobilised sugars actually stops that calcium movement inside the cells. So it in a sense, the glycans are blocking their differentiation pathway and making them live longer."

Miller sees several potential applications for this discovery. For example, it might be possible to conduct a fertility test for sperm using glycans in the lab. Sperm whose lifespan didn't increase when exposed to glycans would likely be less fertile and could be discarded. It might also be possible, someday, to introduce supplemental glycans in the oviduct during AI to create a larger reservoir of viable sperm.

The results also extend scientists' understanding of fertility across animal species. Miller has done research to show a similar sugar binds and extends longevity in bovine sperm, and he's currently looking for genetic similarities in sperm storage organs among a wide variety of animal groups. Nature may use the same mechanisms to lengthen sperm lifespan after mating in several species.

Journal Reference:

Sergio A. Machado, Momal Sharif, Govindasamy Kadirvel, Nicolai Bovin, David J. Miller. Adhesion to oviduct glycans regulates porcine sperm Ca2 influx and viability. PLOS ONE, 2020; 15 (8): e0237666
DOI: 10.1371/journal.pone.0237666

INTERNATIONAL HONOUR FOR CHARLES STURT VET IN WAGGA WAGGA

A Charles Sturt University academic has been recognised internationally for his work to advance clinical practice in large animal reproduction and production.

Dr Allan Gunn from the Graham Centre for Agricultural Innovation and School of Animal and Veterinary Sciences has been made a Fellow of the Royal College of Veterinary Surgeons in the United Kingdom.

The prestigious Fellowships have been awarded by the College for more than 140 years to veterinary surgeons who have demonstrated excellence and shown commitment to using their experience and knowledge to enhance the profession.

Dr Gunn has worked primarily in cattle and horse reproductive practice in Zimbabwe, Australia, the UK and Beijing.

His research and teaching focuses on veterinary reproduction, and with the diseases and physiology of animal reproductive systems.

Dr Gunn said he's humbled to be counted among the RCVS Fellows.

"It is humbling in that one of the oldest and prestigious professional bodies in the world has recognised my contribution to the clinical practice of the veterinary profession," Dr Gunn said.

"I'm grateful for the support and advice that colleagues from all around the world have freely given to me to enhance the growth of my career.

"I've also been pleased to do the same for others and place a high value on mentoring, disseminating peer-reviewed research, and leadership.

"That's something that I aim to continue to do in my teaching role working with the veterinary professionals of the future at Charles Sturt University.

"It is our responsibility to highlight the importance and value of veterinarians to the global 'one health' concept for the well-being of the planet," Dr Gunn said.

The COVID-19 pandemic prevented Dr Gunn being able to attend the Fellowship presentation in the United Kingdom in person, but his achievement was acknowledged in an online ceremony.

WHY RATS WOULD WIN AUSTRALIAN SURVIVOR

Australian rodents skulls all correspond to one simple, size-dependent shape that is more than ten million years old but it turns out this lack of change is the secret behind their survivor reputation.

A new study, co-led by scientists from Flinders University and The University of Queensland, has revealed that the skulls of rodents resemble each other in any given size, meaning little adaptation seems to be necessary for a rodent to survive in a variety of habitats.

Flinders University Associate Professor Vera Weisbecker, who supervised the study says everyone knows rodents all look similar, but researchers expected far more variety in the details of their skull shape when compared to what was found.

"It seems intuitive that a group of animals that displays a wide variety of shapes should be more successful in evolution. However, Australian rodents demonstrate that shape diversity doesn't always mean evolutionary success. So it really does show if the skull ain't broke, don't fix it."

Dr Ariel Marcy, from The University of Queensland, says rodents first entered Australia around four million years ago, and quickly adapted to the diversity of habitats available on our continent.

"Because well-adapted skulls are key to the survival of mammals, we expected to find a lot of locally adapted skull shapes."

"What we found was the opposite of what we expected: there was low variation in the skull shape of rodents, and body size explained most of it."

"Native rodents just scale from being a small 'mouse' shape to being a bigger 'rat' shape!" Dr Marcy said.

"And this relationship between skull shape and size is at least ten million years old, because invasive rodents - like the house mouse and Norway rat - share this pattern, too."

To understand the patterns of adaptation they expected to see, the team scanned hundreds of rodent skulls of 38 species from museums using 3D surface scanners, and analysed their shape using a statistical procedure called geometric morphometrics.

The researchers think this astonishing conservatism of shape may have to do with the very successful specialisation of rodent jaws, allowing their skulls to be a true multi-purpose tool.

"Rodent skulls and jaws have a complicated yet highly versatile arrangement that seems to work well in a multitude of conditions. We think that this discourages evolutionary change. We saw unusual skull shapes only in extreme cases of ecological adaptation, for example in the water mouse or rakali which is a very unusual meat-eating predatory rodent."

Dr Weisbecker notes that the results make an important point in one of the biggest questions in evolutionary biology - why some groups of animals are more diverse than others.

Australia's smallest rodent, the molinipi (Pseudomys delicatulus), considers one of Australia's largest rodents, the otter-like rakali (Hydromys chrysogaster). They share an skull shape gradient that goes back further than either species' arrival to their shared continent. Photo credit: Illustration by Alison K. Carlisle (aka Papadore Illustrations).Photography

Associate Professor Vera Weisbecker holding rodent skull at Flinders University paleontology lab. Photo credit: Flinders University

Dr Ariel Marcy at the University of Queensland. Photo credit: Dr Ariel Marcy

Journal Reference:

Ariel Emily Marcy, Thomas Guillerme, Emma Sherratt, Kevin C. Rowe, Matthew J. Phillips, Vera Weisbecker. Australian rodents reveal conserved Cranial Evolutionary Allometry across 10 million years of murid evolution. The American Naturalist, 2020; DOI: 10.1086/711398

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PAUL MCGREEVY WINS GLOBAL ANIMAL WELFARE AWARD

University of Sydney Professor Paul McGreevy has been recognised with one of the most prestigious veterinary awards in the world for his pioneering contribution to animal welfare.

Professor Paul McGreevy has been named a winner in the World Veterinary Association's 2020 Global Welfare Awards.

The awards recognise individuals and institutions for going 'above and beyond' in protecting animals and promoting animal welfare.

"This is a very welcome award because it recognises that veterinarians are now expected to be advocates for animal welfare," said Professor Paul McGreevy, from the Sydney School of Veterinary Science.

A ceremony announcing the recipients of the 2020 Global Animal Welfare Awards was held on October 29, 2020 during the WVA Virtual Seminar on the Impact of COVID-19 on the veterinary profession.

"I want to thank my students, colleagues and my Dean for their support of animal welfare research," Professor McGreevy said.

In 2019 Professor McGreevy was awarded the Royal College of Veterinary Surgeons Impact Award for showing how the training of veterinary surgeons can lead to international impact on animal welfare.

In 2017 he received a Lifetime Achievement Award at the International Canine Health Awards.

Professor McGreevy works closely with the RSPCA Australia and has also spearheaded a number of initiatives including:

- One Welfare teaching portal used by veterinary teachers worldwide
- VetCompass - a national database to trace pet health, with potential implications for human health and the environment.
- Advocating for a ban on whips in Australian horse racing
- Dogmanship - focusing on people's ability to interact with and train dogs.

Professor Frazer Allan, Head of School and Dean of Sydney School of Veterinary Science, said Professor McGreevy's research was inspirational.

"Paul McGreevy is an inspirational veterinary scientist whose contribution to the One Welfare agenda has been justifiably recognised," Professor Allan said. "The University of Sydney is immensely proud of his achievements."

WHY CATS HAVE 9 LIVES - HIGH-QUALITY CAT GENOME HELPS IDENTIFY NOVEL CAUSE OF DWARFISM

A new and improved cat genome developed by the feline research teams at the University of Missouri and Texas A&M University has already proven to be a valuable tool for feline biomedical research by helping to confirm existing gene variants and new candidate genes underlying diseases in cats. The new findings were published in October in PLOS Genetics.

The 94 million furry feline friends living in the U.S. suffer from many of the same diseases as their human caretakers. However, scientists don't have the depth of genetic tools necessary to develop new tests and treatments for cats. To help correct this deficit, a team of researchers developed a new, high-quality genome sequence from an Abyssinian cat named Cinnamon, which greatly improves the ability to identify more complex DNA variants that cause diseases. They also used 54 additional cat genomes from the 99 Lives Cat Genome Project and compared them to Cinnamon's genome to identify genetic variations possibly causing disease. One of their discoveries was a gene disruption that had not previously been linked to dwarfism in humans and may in rarer cases be involved in the human form of the condition.

The new high-quality cat genome, and the genetic variants it has helped uncover, demonstrate the value of this resource for discovering genetic explanations of diseases in domestic cats. In future work, the team plans to expand the use of precision genomic medicine for cats using this resource and others, which could provide veterinarians more informative genetic screening, earlier disease detection and subsequent therapeutic options that will give better outcomes with fewer side effects. In addition, wildlife conservation research and investigations into how cats came to be domesticated and split into different breeds could also benefit from the new genome.

Journal Reference:

Buckley RM, Davis BW, Brashear WA, Farias FHG, Kuroki K, et al. (2020) A new domestic cat genome assembly based on long sequence reads empowers feline genomic medicine and identifies a novel gene for dwarfism. PLOS Genetics 16(10): e1008926. https://doi.org/10.1371/journal.pgen.1008926

A munchkin cat sitting on a table. The munchkin is a popular dwarf cat breed. Photo credit: Tasy Hong, Pixabay

COWS PREFER “LIVE” CO-MOO-NICATION, STUDY REVEALS

After months of technology-based communication enforced by COVID-19, many of us are missing a “live” human voice. But we’re not the only ones - a new study reveals that cows also prefer a face-to-face chat. The research, published in Frontiers in Psychology, discovers that cows are actually more relaxed when spoken to directly by a live human, rather than when listening to a recorded voice via a loudspeaker.

“Cattle like stroking in combination with gentle talking,” says Annika Lange of the University of Veterinary Medicine, Vienna, Austria. “In scientific contexts, a recording of a human voice speaking gently could be used to relax the animals, because it can be difficult to repeat the same phrases in the same way during experiments.”

Using a recorded voice means conditions are as similar as possible in each trial, following a concept known as “standardisation” - an important principle of scientific experimentation. However, the team of scientists wanted to find out if cows respond differently to the sound of recorded voices compared to a human talking directly to them. “Our study suggests that live talking is more relaxing for our animals than a recording of a human voice”, Lange says. “Interactions may be less positive when they become artificial through standardisation”.

The team worked with a herd of 28 cattle, comparing the benefits of either stroking the animals while playing a recording of an experimenter’s voice, or stroking while speaking to the animals directly. After monitoring the animals’ responses during the experiments, they found live talking was the best mood enhancer for their bovine friends.

Heart rate variability was higher when cattle were spoken to directly, indicating they were enjoying themselves. After this treatment, heart rates were lower than after listening to a recorded voice, showing that the animals were more relaxed following the live chat.

How does a chilled cow behave? “When relaxed and enjoying the interaction, the animals will often stretch out their necks as they do when they groom each other,” says Lange. “Additionally, it is thought that ear positions may indicate mood: hanging ears and low ear positions appear to be linked to relaxation.”

The experiment included only one herd and one playback recording. Lange calls for further research to see if results are also valid for different herds and situations, such as with cows that are more fearful of humans. This will help in further studies on the improvement of cattle-human relationships, an important aspect of animal welfare.

Journal Reference:

Annika Lange et al, Talking to Cows: Reactions to Different Auditory Stimuli During Gentle Human-Animal Interactions, Frontiers in Psychology (2020). DOI: 10.3389/fpsyg.2020.579346

DOG BRAINS DO NOT PREFER FACES

Even though dogs gaze into man’s eyes, dog brains may not process faces as human brains do. A new study from JNeurosci suggests that the canine visual system is organised differently: the face network found in primates may not extend to all mammals.

Faces constitute a critical part of communication for humans and other primates, so much so that faces have a special status in their visual system. Areas in the face network, like the fusiform face area, activate specifically to faces. Dogs care about faces, too, but they may not have face areas.

Bunford, Hernández-Pérez et al. used fMRI to compare the brain activity of humans and pet dogs as they watched brief videos of other humans and dogs. Human brains showed a preference for faces, meaning that some visual areas had greater activity in response to a face compared to the back of the head. A subset of these regions also displayed species preference, with increased activity in response to viewing a human over a dog. In contrast, dog brains only showed species preference. Visual areas had greater activity in response to seeing a dog over a human, and no activity difference between seeing a face vs. the back of the head.

Journal Reference:

Nóra Bunford, Raúl Hernández-Pérez, Eszter Borbála Farkas, Laura V. Cuaya, Dóra Szabó, Ádám György Szabó, Márta Gácsi, Ádám Miklósi, Attila Andics. COMPARATIVE BRAIN IMAGING REVEALS ANALOGOUS AND DIVERGENT PATTERNS OF SPECIES- AND FACE-SENSITIVITY IN HUMANS AND DOGS. The Journal of Neuroscience, 2020; JN-RM-2800-19 DOI: 10.1523/JNEUROSCI.2800-19.2020

TOXIC MASCULINITY: WHY MALE FUNNEL WEB SPIDERS ARE SO DANGEROUS

A team of University of Queensland researchers has revealed why male funnel web spiders develop much deadlier venom than their female counterparts.

Led by University of Queensland's Associate Professor Bryan Fry, the team has spent 20 years investigating delta-hexatoxins, the venom peptides that make funnel web spider venom so dangerous.

"Australian funnel-web spiders are infamous for causing human fatalities with this particular range of toxins," Dr Fry said.

"Delta-hexatoxins exert fatal neurotoxic effects in humans by keeping nerves turned on, so that they keep firing over and over again.

"It has puzzled scientists why these toxins are so deadly to humans, when they and other primates, haven't featured as either prey or predator during the spider's evolution.

"And we couldn't understand why most human deaths were being caused by male funnel web spiders, which seemingly had much deadlier venom than females."

Using molecular analysis of the venom, Dr Fry and the team decided to take a closer look.

Although 35 species of funnel-web spiders had previously been described, only eight delta-hexatoxins from five species had been analysed.

Dr Fry and his team almost tripled the data - profiling 22 novel delta-hexatoxins from the venom of 10 funnel-web species.

"Having much more data helped paint a much clearer picture, revealing an incredibly interesting evolutionary story - one that had been hypothesised, but we've now proven," he said.

"These toxins had originally evolved to kill insects such as cockroaches and flies.

"But, when male funnel web spiders become sexually mature, they leave the safety of their burrow and wander quite considerable distances in search of females.

"This can be quite treacherous, and these male funnel web spiders started to encounter dangerous vertebrate predators, such as the dunnart, a small nocturnal mouse-like marsupial.

"The data shows that natural selection put the necessary pressure on to switch an insect-specific venom into a vertebrate-specific defensive venom.

"And, unluckily for us, we're a vertebrate species which copped it in the process."

With a stronger evolutionary understanding of delta-hexatoxins, Dr Fry and his team are now endeavouring to put this new knowledge to use.

"We're hoping this research will give us a better understanding of exactly what funnel web spider venom does to the human body," he said.

"And - medically speaking - this could be critical for the design of evidence-based treatment strategies for bite victims.

"We're also hoping it will help researchers discover novel insecticides, finding better sources for insect-specific toxins.

"They're dangerous as hell, but male funnel web spiders offer us some real opportunities."

Journal Reference:

Volker Herzig, Kartik Sunagar, David T. R. Wilson, Sandy S. Pineda, Mathilde R. Israel, Sebastien Dutertre, Brianna Sollod McFarland, Eivind A. B. Undheim, Wayne C. Hodgson, Paul F. Alewood, Richard J. Lewis, Frank Bosmans, Irina Vetter, Glenn F. King, Bryan G. Fry. Australian funnel-web spiders evolved human-lethal δ-hexatoxins for defense against vertebrate predators. Proceedings of the National Academy of Sciences, 2020; 202004516 DOI: 10.1073/pnas.2004516117

FELINE FRIENDLY? HOW TO BUILD RAP-PAW WITH CATS

A TEAM OF PSYCHOLOGISTS AT THE UNIVERSITIES OF SUSSEX AND PORTSMOUTH HAVE PURR-FECTED THE ART OF BUILDING A BOND WITH CATS.

The new study 'The role of cat eye narrowing movements in cat-human communication', published online in the Nature journal Scientific Reports, has shown for the first time that it is possible to build rapport with a cat by using an eye narrowing technique with them. This eye narrowing action by humans generates something popularly known as a cat smile - the so called "slow blink" - and seems to make the human more attractive to the cat. Eye narrowing movements in cats have some parallels with the genuine smile in humans (the Duchenne smile), as well as eye narrowing movements given in positive situations in some other species.

The team, led by Dr Tasmin Humphrey and Professor Karen McComb, animal behaviour scientists at the University of Sussex, undertook two experiments. The first revealed that cats are more likely to slow blink at their owners after their owners have slow blinked at them, compared to when they don't interact at all. The second experiment, this time with a researcher from the psychology team, rather than the owner, found that the cats were more likely to approach the experimenter's outstretched hand after they'd slow blinked at the cat, compared to when they had adopted a neutral expression. Taken together, the study shows that this slow blinking technique can provide a form of positive communication between cats and humans.

The study found

- Cats were more likely to slow blink at their owners if their owners had slowed blinked at them, compared to when the owner was present in the room but not delivering a slow blink stimulus.· Cats were more likely to slow blink when an unfamiliar experimenter slow blinked at them, compared to when they had maintained a neutral expression.
- Cats preferred to approach an experimenter after they had slow blinked at the cat than if they had maintained a neutral expression.

Professor Karen McComb, from the School of Psychology at the University of Sussex, who supervised the work, said: "As someone who has both studied animal behaviour and is a cat owner, it's great to be able to show that cats and humans can communicate in this way. It's something that many cat owners had already suspected, so it's exciting to have found evidence for it.

"This study is the first to experimentally investigate the role of slow blinking in cat-human communication. And it is something you can try yourself with your own cat at home, or with cats you meet in the street. It's a great way of enhancing the bond you have with cats. Try narrowing your eyes at them as you would in a relaxed smile, followed by closing your eyes for a couple of seconds. You'll find they respond in the same way themselves and you can start a sort of conversation."

Dr Tasmin Humphrey, a PhD student in the School of Psychology at the University of Sussex during the work, who was the first author of the study said: "Understanding positive ways in which cats and humans interact can enhance public understanding of cats, improve feline welfare, and tell us more about the socio-cognitive abilities of this under-studied species.

"Our findings could potentially be used to assess the welfare of cats in a variety of settings, including veterinary practices and shelters.

"In terms of why cats behave in this way, it could be argued that cats developed the slow blink behaviours because humans perceived slow blinking as positive. Cats may have learned that humans reward them for responding to slow blinking. It is also possible that slow blinking in cats began as a way to interrupt an unbroken stare, which is potentially threatening in social interaction.

Dr Leanne Proops at University of Portsmouth who co-supervised the work said: "It's definitely not easy to study natural cat behaviour so these results provide a rare insight in to the world of cat-human communication."

How the experiments worked

Two experiments were conducted to explore the significance of the slow blink in cat-human communication. The first experiment included a total of 21 cats from 14 different households. Fourteen different owners participated in experiment 1. Ten of the cats were male and 11 of the cats were female, with cat age ranging from an estimated 0.45-16 years. The experiments took place in each cat's home. The psychologist advised the cat's owner on how to slow blink. Once the cat had settled down in one place, the psychologist asked the owner to either sit approximately 1 m away from the cat.

Experiment 2 included a total of 24 additional cats. Twelve cats were male and 12 cats were female, with cat age ranging from an estimated 1-17 years old. The cats included in the final analyses were from 8 different households. In this experiment, the researcher, who was unfamiliar to the cat, either slow blinked at the cat or adopted a neutral face without direct eye contact. This experiment also tested which context the cats preferred to approach the unfamiliar experimenter, by them offering the cat a flat hand with palm faced upwards whilst sat or crouched directly opposite the cat. Both experiments were video recorded.

Cat psychology - the existing context

In the new paper, the authors provide some context for their findings. The psychology of cats hasn't been studied as extensively as dogs, but what is already known includes:

- That cats have been shown to attract and manipulate human attention effectively through 'solicitation purring'.· That cats can discriminate their name from other words, even when unfamiliar humans are calling.
- That cats may be sensitive to human emotional cues, and will rub or butt their head against a an owner who feels sad.

Journal Reference:

Tasmin Humphrey, Leanne Proops, Jemma Forman, Rebecca Spooner, Karen McComb. The role of cat eye narrowing movements in cat-human communication. Scientific Reports, 2020; 10 (1) DOI: 10.1038/s41598-020-73426-0

MAKING DOG FOOD MORE DELECTABLE BY ANALYSING AROMAS

Dogs aren't known for being picky about their food, eating the same foods day after day with relish. However, owners of pampered pooches want their pets to have the best possible culinary experience, especially for those rare finicky canines. Now, researchers reporting results from a pilot study in ACS' Journal of Agricultural and Food Chemistry have identified key aroma compounds in dog food that seem to be the most appealing to canines.

For dogs, palatability depends on a food's appearance, odour, taste and texture - just as it does for people. Previous studies have suggested that odour is especially important for dogs. Some scientists have identified volatile compounds in dog food, but not much is known about how specific aroma compounds influence how readily the dog eats the food. Maoshen Chen and colleagues wanted to identify the key aroma compounds in six dog foods and correlate the compounds with dogs' intake of the foods.

The researchers began by feeding six adult beagles one of six foods for one hour each and determining how much the dogs ate. The intake of three of the foods was two to four times higher than that of the other three foods. Using mass spectrometry, the researchers found that 12 volatile aroma molecules were correlated, either positively or negatively, with the beagles' intake of the six foods. Then, the researchers added each aroma compound to an odourless food and gave the beagles a choice between food containing one of the compounds and the odourless food itself. From these experiments, the team determined that the dogs preferred food containing (E)-2-hexenal (which humans associate with an unpleasant, fatty odor), 2-furfurylthiol (sulfury, roasted, smoky odour) and 4-methyl-5-thiazoleethanol (meaty odour). In contrast, the dogs didn't care for food containing (E)-2-octenal (a slightly different unpleasant, fatty odour). Although other dog breeds and more subjects should be tested, these results could help dog food manufacturers formulate more palatable chow, the researchers say.

Journal Reference:

Ming Yin, Shengjie Shao, Zhilei Zhou, Maoshen Chen, Fang Zhong, Yue Li. Characterization of the Key Aroma Compounds in Dog Foods by Gas Chromatography-Mass Spectrometry, Acceptance Test, and Preference Test. Journal of Agricultural and Food Chemistry, 2020; 68 (34): 9195 DOI: 10.1021/acs.jafc.0c03088

AUSTRALIA'S FIRST PET FOOD PACKAGING RECYCLING PROGRAM LAUNCHES

Australian pet owners can now care for their pets and the planet thanks to a new recycling initiative by Open Farm and TerraCycle.

Ethically sourced pet food company, Open Farm, and recycling pioneers, TerraCycle, recently announced their partnership to launch the Open Farm Recycling Program which allows Australians to easily recycle Open Farm packaging nationwide.

Australians spend more than $12 billion annually on their pets. With limited recycling options available for pet owners, many of the pet products purchased will end up in landfill. Open Farm co-founder and CBO Jacqueline Prehogan hopes the launch of the program will encourage conscious consumerism, even when it comes to caring for our fur babies.

"Open Farm is committed to raising the bar on the way we feed our pets. From our ethically sourced ingredients to our strict quality standards, our goal is to provide a product pet parents can trust to give their pets the premium nutrition they need to keep them happy and healthy. Part of this commitment also means giving pet parents better choices when it comes to their impact on farm animals and the environment," she said.

Jean Bailliard, General Manager of TerraCycle Australia and New Zealand, was happy to be offering Australians another way to be a responsible pet owner.

"Every year, Australians produce 130,000 tonnes of plastic that will eventually find its way into our land, oceans and waterways. For the responsible pet owners out there, participating in the Open Farm Recycling Program is a great way to minimise your pet's impact on the planet."

Pet owners wishing to join the program are encouraged to sign up through the TerraCycle website and head to **www.terracycle.com/en-AU/brigades/openfarm-au**

Collectors simply sign up online, collect their packaging in a used cardboard box, download a free shipping label through the TerraCycle website and drop it off at an Australian Post office. As an added incentive, for every kilogram of Open Farm packaging sent to TerraCycle, collectors will earn a small donation toward the Australian charity of their choice. Open Farm products can be purchased online through Pet Circle.

FEEDING INDOOR CATS JUST ONCE A DAY COULD IMPROVE HEALTH

Got a cat that always seems hungry? New University of Guelph research suggests you might want to reduce - not increase - how often you feed them.

Animal nutrition specialists in University of Guelph's Ontario Veterinary College (OVC) and Ontario Agricultural College (OAC) have found that feeding cats one large meal a day may help control hunger better than feeding them several times a day.

The research, published in the journal PLOS One, revealed that cats that ate one meal a day were more satisfied, which could result in less food-begging behaviour.

The results also suggest cutting back feeding frequency could help reduce the risk of obesity by controlling cats' appetite and potentially making them eat less - an important discovery given that obesity is the most common nutritional problem affecting cats.

"These findings may surprise the veterinary community and many cat owners who have been told their animals need several small meals a day," said study co-author Prof. Adronie Verbrugghe, a veterinarian with OVC's Department of Clinical Studies, who specialises in companion animal nutrition. "But these results suggest there are benefits to this approach."

Previous research has examined the effects of meal frequency on cat behaviour, but this study is the first to use a comprehensive approach analysing effects on appetite-suppressing hormones, physical activity, energy expenditure and use of energy sources, said co-author Prof. Kate Shoveller, an expert in animal nutrition with University of Guelph's Department of Animal Biosciences.

"There was no good research to back up the several-meals-a-day approach that many owners hear, and so we wanted to put some real data behind current feeding recommendations to be sure they were right for cats," she said.

The study involved eight healthy-weight, indoor cats under the age of five. Each cat was exposed to both feeding regimens and each for a total of three weeks, with the same diet and amount being offered in either one meal or four meals. Some of the cats were fed only in the morning, while the others were fed the same amount in four smaller meals.

The cats were equipped with activity monitors on harnesses to measure their voluntary physical activity. Food intake was recorded daily, and body weight was measured weekly. Researchers also measured cat metabolism through breath and blood.

Physical activity was higher in cats fed four times a day, but overall energy expenditure was similar between the groups. The weights of the cats in both groups did not change over the study period, no matter which feeding schedule they were on.

Cats that ate just once a day had higher post-meal levels of three key appetite-regulating hormones, suggesting they were more satisfied. These cats also showed lower fasting respiratory quotient, suggesting they were burning their fat stores, which is key to maintaining lean body mass.

The cats that ate only one meal a day also had a larger increase in blood amino acids, meaning more protein was available to them to build muscle and other important proteins. This is important given that many cats lose muscle mass as they age, a condition known as sarcopenia.

"Physiologically, it makes sense that feeding only once a day would have benefits," said Shoveller. "When you look at human research, there's pretty consistent evidence that there are positive health outcomes with intermittent fasting and improved satiety."

Even big cats in the wild engage in a form of intermittent fasting, the authors note, feasting when they make a kill and fasting before the next one.

While their data suggest feeding once a day may be a good way to promote satiation and lean body mass, the researchers would like to do longer studies.

"This approach is really yet another tool in a veterinarian or a cat owner's toolbox for managing a cat's weight and keeping their animals healthy and happy," said Verbrugghe, who is the Royal Canin Veterinary Diets Endowed Chair in Canine and Feline Clinical Nutrition. "But we always have to look at each individual animal and account for the cat's and owner's lifestyle. So although this approach might be helpful to promote satiety in some cats, it might not help another."

The research was funded with support from the Winn Feline Foundation and Simmons Pet Food.

Journal Reference:

Alexandra Camara, Adronie Verbrugghe, Cara Cargo-Froom, Kylie Hogan, Trevor J. DeVries, Andrea Sanchez, Lindsay E. Robinson, Anna K. Shoveller. The daytime feeding frequency affects appetite-regulating hormones, amino acids, physical activity, and respiratory quotient, but not energy expenditure, in adult cats fed regimens for 21 days. PLOS ONE, 2020; 15 (9): e0238522 DOI: 10.1371/journal.pone.0238522

SWINE CORONAVIRUS REPLICATES IN HUMAN CELLS

New research from the University of North Carolina at Chapel Hill suggests that a strain of coronavirus that has recently alarmed the swine industry may have the potential to spread to humans as well.

The coronavirus strain, known as swine acute diarrhea syndrome coronavirus (SADS-CoV), emerged from bats and has infected swine herds throughout China since it was first discovered in 2016. Outbreaks of such an illness have the potential to wreak economic havoc in many countries across the globe that rely on the pork industry.

The virus' potential threat to people was demonstrated in lab tests that revealed SADS-CoV efficiently replicated in human liver and gut cells, as well as airway cells. The findings were published in PNAS.

Though it is in the same family of viruses as the betacoronavirus SARS-CoV-2, which causes the respiratory illness COVID-19 in humans, SADS-CoV is an alphacoronavirus that causes gastrointestinal illness in swine. The virus causes severe diarrhea and vomiting and has been especially deadly to young piglets.

SADS-COV is also distinct from two circulating common cold alphacoronaviruses in humans, HCoV-229E and HCoV-NL63.

"While many investigators focus on the emergent potential of the betacoronaviruses like SARS and MERS, actually the alphacoronaviruses may prove equally prominent - if not greater - concerns to human health, given their potential to rapidly jump between species," said Ralph Baric, professor of epidemiology at UNC-Chapel Hill Gillings School of Global Public Health.

While SADS-CoV has not been known to affect humans to-date, the COVID-19 pandemic serves as a potent reminder that many coronavirus strains found in animals have the potential to infect humans as well - an effect known as spillover.

The Baric lab worked with Caitlin Edwards, a research specialist and master of public health student at UNC-Chapel Hill, on the study which suggests humans may be susceptible to spillover of SADS-CoV.

Edwards, the study's first author, tested several types of cells by infecting them with a synthetic form of SADS-CoV to understand just how high the risk of cross-species contamination could be.

Evidence from the study indicates that a wide range of mammalian cells, including primary human lung and intestinal cells, are susceptible to infection. According to Edwards, SADS-CoV shows a higher rate of growth in intestinal cells found in the human gut, unlike SARS-CoV-2, which primarily infects lung cells.

Cross-protective herd immunity often prevents humans from contracting many coronaviruses found in animals. However, results from the testing done by Edwards and her team suggest that humans have not yet developed such immunity to SADS-CoV.

"SADS-CoV is derived from bat coronaviruses called HKU2, which is a heterogenous group of viruses with a worldwide distribution," Edwards said. "It is impossible to predict if this virus, or a closely related HKU2 bat strain, could emerge and infect human populations. However, the broad host range of SADS-CoV, coupled with an ability to replicate in primary human lung and enteric cells, demonstrates potential risk for future emergence events in human and animal populations."

In response to these findings, Edwards and colleagues tested the broad-spectrum antiviral remdesivir as a potential method of treatment for the infection.

Working with Gilead Sciences, remdesivir was developed by the Baric Lab to combat all known coronaviruses, including SADS-CoV. It is currently being used to treat COVID-19 infections in humans, including the United States president. Preliminary results from this study show that it has robust activity against SADS-CoV, though Edwards cautions that more testing is necessary on additional cell types and in animals to confirm these findings.

"Promising data with remdesivir provides a potential treatment option in the case of a human spillover event," she said. "We recommend that both swine workers and the swine population be continually monitored for indications of SADS-CoV infections to prevent outbreaks and massive economic losses."

SADS-CoV could also pose a threat to the U.S. economy, which was third in global pork production in 2019. In 2012, the U.S. pork industry was devastated by different swine coronavirus that emerged from China.

"Not surprisingly, we are currently looking for partners to investigate the potential of SADS-CoV vaccine candidates to protect swine," Baric said. "While surveillance and early separation of infected piglets from sows provide an opportunity to mitigate larger outbreaks and the potential for spillover into humans, vaccines may be key for limiting global spread and human emergence events in the future."

Other members of the Department of Epidemiology involved in the study include Boyd Yount, Assistant Professor Rachel Graham, PhD; Sarah Leist, PhD; Yixuan Hou, PhD; Associate Professor Amy Sims, PhD; Jesica Swanstrom, Trevor Scobey, Michelle Cooley and Caroline Currie.

Journal Reference:

Caitlin E. Edwards, Boyd L. Yount, Rachel L. Graham, Sarah R. Leist, Yixuan J. Hou, Kenneth H. Dinnon, Amy C. Sims, Jesica Swanstrom, Kendra Gully, Trevor D. Scobey, Michelle R. Cooley, Caroline G. Currie, Scott H. Randell, Ralph S. Baric. Swine acute diarrhea syndrome coronavirus replication in primary human cells reveals potential susceptibility to infection. Proceedings of the National Academy of Sciences, 2020; 202001046 DOI: 10.1073/pnas.2001046117

JETPETS COMPANION ANIMAL RESCUE AWARDS WINNERS REVEALED

In a year that has pushed limits and tested emotions across the rescue industry, the Jetpets Companion Animal Rescue Awards is thrilled to announce the Winners for 2020. The Rescue Awards is a national program that celebrates and recognises achievements in the rescue, rehabilitation and rehoming of companion animals Australia-wide.

"In our third year, the Rescue Awards has been very competitive with more than 1,000 entries across 10 categories, which made it very challenging for the judges! Our amazing winners demonstrated excellence and innovation in their approach to improving the lives of companion animals during these difficult times," 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 September, one winner from each category was selected by an expert panel of 20 Judges. The winners were revealed yesterday (Oct 15) at a virtual Rescue Awards Ceremony run by Gold Rescue Partner, Refuel Creative in Adelaide. The Ceremony was broadcasted live at 4pm AEDT across the country via the Rescue Awards Facebook page.

This year, Jetpets is again the Platinum Rescue Hero and naming Partner. Jetpets General Manager Sandy Matheson said, "In a year of challenges and hardship for so many people, we are very humbled to be able to share in celebrating the achievements of rescue organisations, volunteers and adopters who have made significant sacrifices and devoted their efforts into caring for the welfare of companion animals in such difficult times. On behalf of the entire Jetpets team, we thank and congratulate this year's winners of the Companion Animal Rescue Awards."

The Advocate® People's Rescue Story award category (sponsored by Advocate®) and the Drontal® Foster Carer Story award category (sponsored by Drontal®) received hundreds of entries from Aussie pet guardians who shared their stories about pet adoption and fostering. Mel Hutchinson, Marketing Associate from Elanco (formerly Bayer Animal Health) said it was incredibly difficult to narrow the choice down to just a small group of finalists, let alone choose an overall winner for each of the categories!

Mel said, "We're proud to support the Rescue Awards for a third year running. The number of entries increases every year as does Aussies' passion for pet adoption. This year we chose Wolf the Maremma as our pet adoption story winner and Sass the kitten as our foster carer story winner. Also, we were so moved by the story of Mumma Zura, a rescue dog who looks after puppies for the RSPCA NSW, that we created the Drontal® Special Foster Carer Award."

Cathy thanked Supporters for making the Rescue Awards possible by donating exciting Prizes and acknowledged the great efforts of rescue groups, animal shelters and thousands of volunteers across the country.

This year's Rescue Awards Ambassador Lara Shannon, Certified Dog Trainer, Animal Welfare Advocate and Host of Channel 10's Pooches at Play, 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.

2020 WINNERS

- **Category 1:** *Outstanding Rescue Group* - Greyhound Rescue NSW
- **Category 2:** *Outstanding New Rescue Group* - Liberty Foundation Australia (NSW)
- **Category 3:** *Outstanding Animal Shelter* - Cat Haven WA
- **Category 4:** *Outstanding Council Animal Shelter* - Shoalhaven Animal Shelter (NSW)
- **Category 5:** *Innovation in Rescue* - Central Coast Animal Care Facility's Freedom Busters (NSW)
- **Category 6:** *Community Education and Outreach Program* - Banyule's Free Cat Desexing Program (VIC)
- **Category 7:** *Volunteer of the Year* - Shelley Tinworth (Greyhound Rescue NSW)
- **Category 8:** *Refuel Digital Technology Award (new)* - The Rabbit Sanctuary (NSW)
- **Category 9:** *Advocate® People's Rescue Story* - Kate O'Donnell and her dog Wolf (NSW) adopted from Dog Rescue Newcastle
- **Category 10:** *Drontal® Foster Carer Story (new)* - Rachel Arthur and her foster cat Sass (NSW); foster carer for Sydney Dogs and Cats Home
- **Plus a Special Drontal® Foster Carer Award** - Mumma Zura, an American Staffy who has fostered over 200 puppies.

Rescue Awards Founder Cathy Beer and Daisy the rescue dog at Refuel Creative HQ.
Photo credit: Jo Lyons Photography

Photo credit: Jo Lyons Photography

RESEARCH REVEALS AUSTRALIAN BURMESE CATS HAVE HIGHER DIABETES RISK

West Australian diabetes researchers have for the first time discovered six genes that put Australian Burmese cats at higher risk of developing type 2 diabetes.

Professor Grant Morahan from WA's Centre for Diabetes Research, which is supported by charity Diabetes Research WA, said Australian Burmese cats were significantly more likely to develop type 2 diabetes (T2D) than other cat breeds.

"Burmese cats in Australia are more at risk of type 2 diabetes than American Burmese cats, or other cat breeds in Australia. They were bred from only a few founder cats brought here in the 1960s, which by chance had more type 2 diabetes susceptibility genes than usual," said Professor Morahan.

"Our eight-year research project investigating the genetic makeup of these cats has discovered six genes that are overrepresented in Australian Burmese cats with type 2 diabetes, and some of these genes are also involved in human diabetes."

The discovery paves the way for vets to be able to arrange genetic testing, and work with owners to help prevent high-risk cats from developing the condition. Cat breeders can also use the information to breed low-risk cats.

Cats with type 2 diabetes tend to develop it later in their lives and experience health impacts similar to humans with the condition. Symptoms include inadequate insulin secretion and impaired insulin action, and they are more at risk of obesity and physical inactivity.

"On top of the harmful health effects, which can lead to these cats dying prematurely, it can prove costly for owners," Professor Morahan.

"Knowing if a cat is at higher risk allows vets and owners to pay closer attention to early intervention strategies such as weight control and diet changes, and medication can also be introduced if needed but until now hasn't often been used because of the difficulty in identifying at-risk pre-diabetic cats.

"Further, general dietary and body weight recommendations for cats aren't always adopted by owners but may have increased uptake if owners know their cat is genetically at-risk.

"This is important as we knowearly diagnosis of diabetes and quick implementation of tight blood sugar control can lead to remission rates in more than 80 percent of cases, compared to 30-40 percent if tight blood sugar control is delayed.

Diabetes Research WA executive director Sherl Westlund said it was a step in the right direction for Australian Burmese cat lovers.

"Breeders may also be able to use this discovery to reduce the breed's risk of developing type 2 diabetes which is a great advance," she said.

More than 100 Australian Burmese cats were involved in the project, with their genetic information compared to the genetic information of 84 American Burmese cats.

The project was done in conjunction with Caroline O'Leary from the University of Queensland, Dr Morahan's Centre for Diabetes Research colleague Dr Lois Balmer and US scientists.

Diabetes Research WA, based at Royal Perth Hospital, was established in 1976 to stimulate research into diabetes in Western Australia.

A Burmese cat. Australian Burmese cats are at higher risk of developing type 2 diabetes.

Professor Grant Morahan from WA's Centre for Diabetes Research

STUDY OF ANCIENT DOG DNA TRACES CANINE DIVERSITY TO THE ICE AGE

A global study of ancient dog DNA, led by scientists at the Francis Crick Institute, University of Oxford, University of Vienna and archaeologists from more than 10 countries, presents evidence that there were different types of dogs more than 11,000 years ago in the period immediately following the Ice Age.

In their study, published in Science, the research team sequenced ancient DNA from 27 dogs, some of which lived up to nearly 11,000 years ago, across Europe, the Near East and Siberia.* They found that by this point in history, just after the Ice Age and before any other animal had been domesticated, there were already at least five different types of dog with distinct genetic ancestries.

This finding reveals that the diversity observed between dogs in different parts of the world today originated when all humans were still hunters and gatherers.

Pontus Skoglund, author and group leader of the Crick's Ancient Genomics laboratory, says "Some of the variation you see between dogs walking down the street today originated in the Ice Age. By the end of this period, dogs were already widespread across the northern hemisphere."

This study of ancient genomics involves extracting and analysing DNA from skeletal material. It provides a window into the past, allowing researchers to uncover evolutionary changes that occurred many thousands of years ago.

The team showed that over the last 10,000 years, these early dog lineages mixed and moved to give rise to the dogs we know today. For example, early European dogs were initially diverse, appearing to originate from two highly distinct populations, one related to Near Eastern dogs and another to Siberian dogs. However, at some point this diversity was lost, as it is not present in European dogs today.

Anders Bergström, lead author and post-doctoral researcher in the Ancient Genomics laboratory at the Crick, says "If we look back more than four or five thousand years ago, we can see that Europe was a very diverse place when it came to dogs. Although the European dogs we see today come in such an extraordinary array of shapes and forms, genetically they derive from only a very narrow subset of the diversity that used to exist."

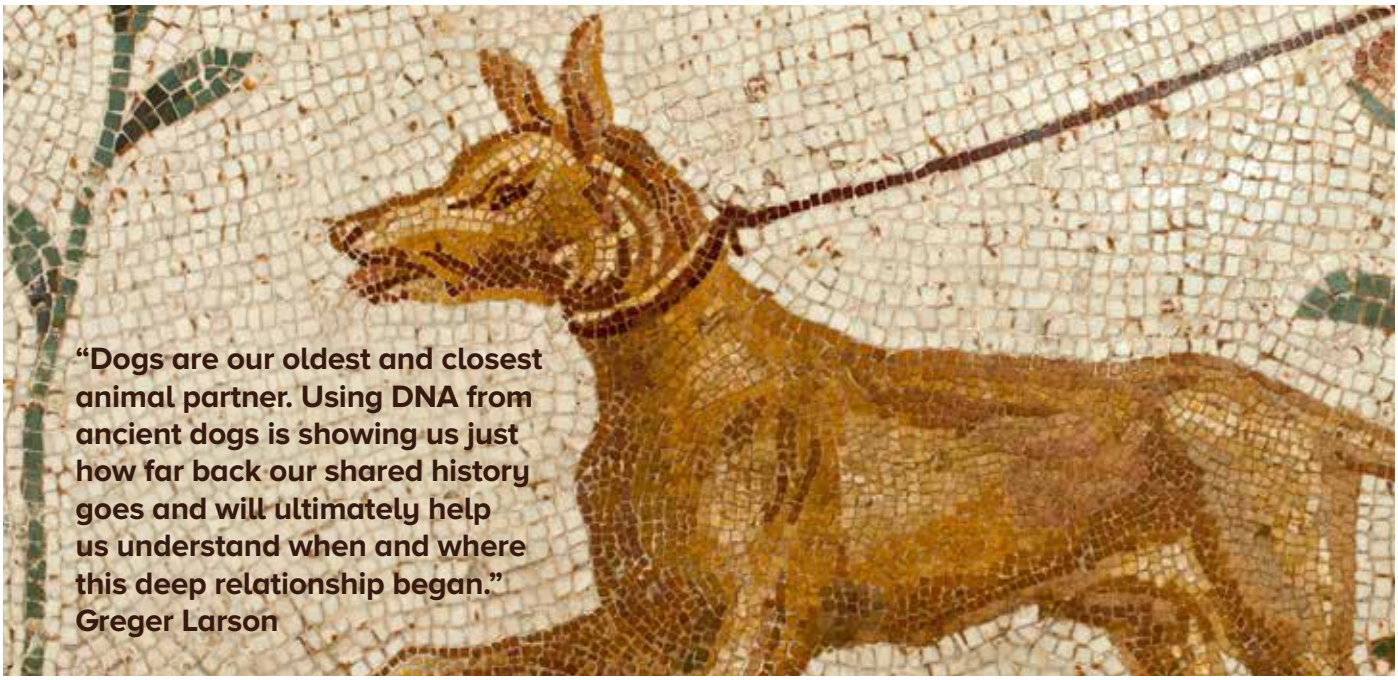
The researchers also compared the evolution in dog history to changes in human evolution, lifestyles and migrations. In many cases comparable changes took place, likely reflecting how humans would bring their dogs with them as they migrated across the world.

But there are also cases when human and dog histories do not mirror each other. For example, the loss of diversity that existed in dogs in early Europe was caused by the spread of a single dog ancestry that replaced other populations. This dramatic event is not mirrored in human populations, and it remains to be determined what caused this turnover in European dog ancestry.

Greger Larson, author and Director of the Palaeogenomics and Bio-Archaeology Research Network at the University of Oxford, says "Dogs are our oldest and closest animal partner. Using DNA from ancient dogs is showing us just how far back our shared history goes and will ultimately help us understand when and where this deep relationship began."

Ron Pinhasi, author and group leader at the University of Vienna, says "Just as ancient DNA has revolutionised the study of our own ancestors, it's now starting to do the same for dogs and other domesticated animals. Studying our animal companions adds another layer to our understanding of human history."

While this study provides major new insights into the early history of dog populations and their relationships with humans and each other, many questions still remain. In particular, research teams are still trying to uncover where and in which human cultural context, dogs were first domesticated.



Journal Reference:

Anders Bergström, et al. Origins and genetic legacy of prehistoric dogs. Science, 2020 DOI: 10.1126/science.aba9572 *The researchers sequenced ancient DNA from 27 dogs. Their analysis also included previously sequenced genomic data from a further 5 dogs.

THE VITAL ROLE OF STAFF POST SALE

BY SIMON PALMER

When a new owner buys an existing business, the staff will often play a crucial role in ensuring a smooth transition. In many ways, the staff are more important to the owners than ever before. While the new owners are still getting to know the area, practice and Clients, the staff:

- know the supply reps and local businesses
- know where everything is kept
- have existing relationships with clients

Clients of the practice and the community at large may ask the staff of the practice about the new owners: "What they are like/ what is their background/are they nice/are they any good?"

Unfortunately, it can come at a time when staff confidence and morale can be at its lowest. When a new owner takes over, staff are often:

- Worried about their jobs: "what if the new owner has someone else in mind for my job?"
- Worried that the new owner will not like them: "I had a great rapport with my old boss; I wonder if it'll be the same."
- Worried about shifting goalposts, in terms of how things should be done.
- Suspicious of changes: "Dr Old always said that serious vets didn't need to advertise…" or "Dr Old didn't feel comfortable doing this specialised clinical work…"

The new owner will often have an uphill battle on their hands to get the staff onside. And yet many new owners will enter their new practice and start work after only a brief introduction, hoping that everything will just fall into place.

Here are some Best Practice tips to ensure that things go as smoothly as possible:

1. Have a lunch with all the staff members as close to the first day as possible. At the lunch, take a minute to:

- Acknowledge their reasonable concerns during a transition like this.
- Let them know about you, your background, and your experience in the field - that you aren't an ogre, and they will find you to be a reasonable person.
- Tell them what you like about the practice, area and community.
- Acknowledge the great foundation that the previous owner has laid.
- Acknowledge that there will be differences in practice, preferences and leadership style, and that the first few months will be an adjustment for everyone.
- Tell them you're confident that you will work through this difficult period together, and come out the other side as a strong team.
- Tell them you are looking forward to getting to know each of them; appreciate that they have a view of the practice that you don't, and that you value their perspective and hope for their best efforts, feedback and input as to what will make the practice a success.

2. Take the time to have a coffee or lunch with each of the team individually in the first month. Get to know a bit about them personally.

3. Help the front desk answer the questions that they will get asked about you by the clients, by preparing a cheat sheet of bullet points for them about your age, experience, background, history, clinical strengths, etc.

4. If possible, ask them to bring their pet in for a check at no cost. Client are going to ask your staff what they think of you. It is best if they can speak from experience, telling patients that their pet has seen you personally.

5. You may see a lot of things that aren't ideal when you take over. It may be tempting to make a clean sweep through the practice and change anything that you don't feel is right straight away. Resist this temptation as much as possible for the first month or two. Try to change as few policies as possible at first, to give them chance to get to know you and give them a sense of continuity. Once they know and trust you, you'll encounter far less resistance to any changes - major or minor - that you want to make.

6. Schedule weekly meetings with the team at least for the first month, so that you can give and get some course correction on how things could be integrating more smoothly. This isn't an opportunity for you to unload on everyone whose work or attitude you find unsatisfactory. It is a time to acknowledge things that are working well, things that could be working better, and to get some feedback and input from the team on some ideas about how things could be going better.

Being the new boss will always involve a period of adjustment and stress, for all parties involved. While the business purchaser has a huge learning curve it's important to realise that the staff can usually be the best possible tool to mitigate this stress early on.

There will always be things you want to change immediately, but if you are able to wait until you win the staff over, they will be your greatest advocates. Keeping them onside during this unpredictable period will help to ensure that the transition is an easy one for you, your staff and your clientele.

Simon Palmer is the Founder and Managing Director of Practice Sale Search, the leading practice brokerage in Australia, with the region's largest database of registered buyers and practices for sale. **For more information, call 1300 282 042 or email info@practicesalesearch.com.au.**

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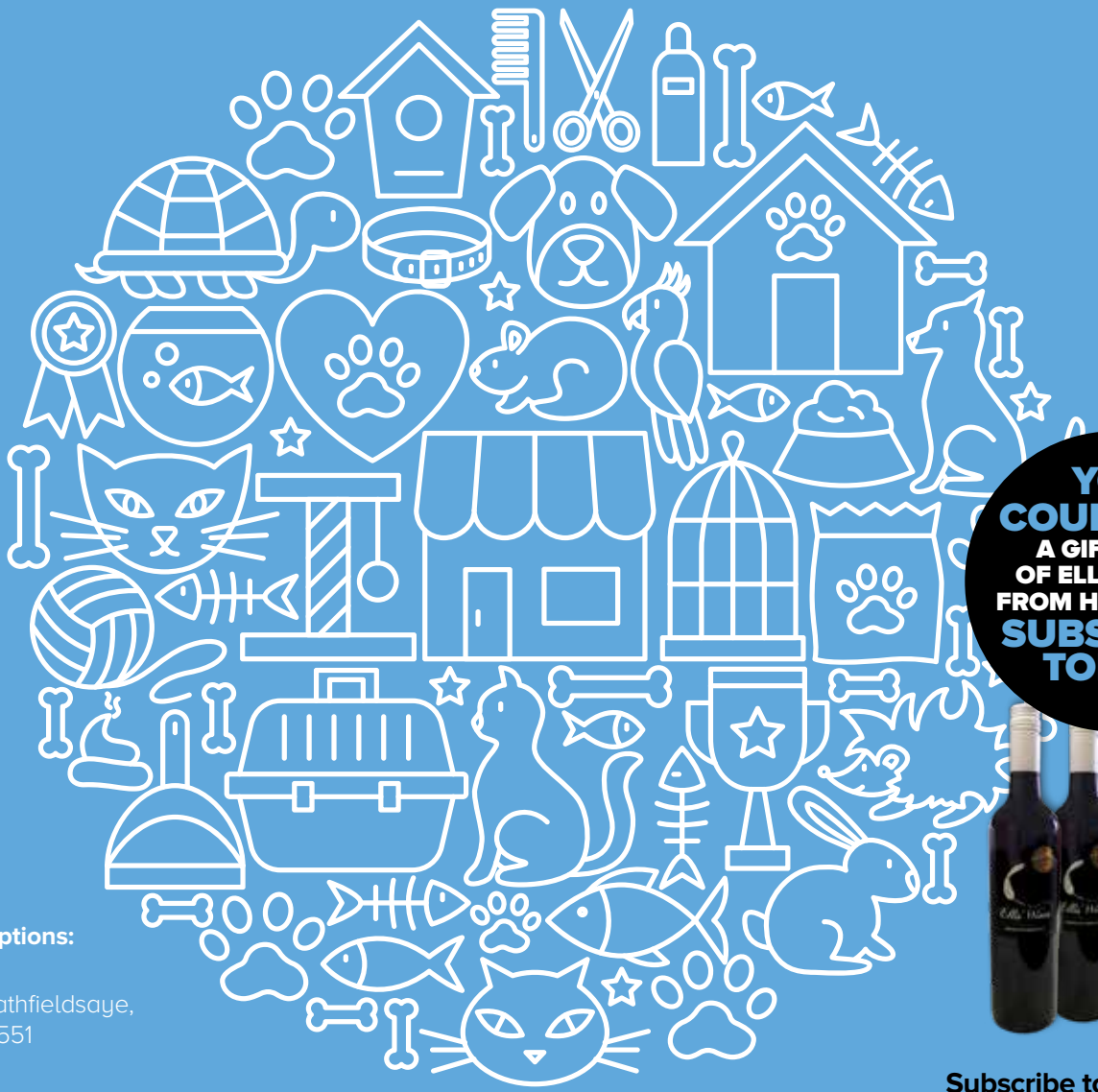

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AMRRIC SUPPORTING REMOTE COMMUNITIES TO TREAT DOGS THREATENED BY NEW TICK-BORNE DISEASE

Companion animals in remote communities across Australia have experienced a challenging year so far. Due to restrictions around the COVID-19 pandemic, roughly 27,500 dogs have had reduced access to veterinary services and parasite protection - some have had absences of vet services for more than 12 months. Further to this, a rare and life-threatening tick-borne disease affecting dogs, Ehrlichiosis, was discovered in the Kimberley in May, and has since been detected in other regions in WA, as well as throughout the NT.

Together with its partners and with communities, AMRRIC, or Animal Management in Rural and Remote Indigenous Communities, has been working hard to improve health outcomes for these animals. Following the resumption of remote travel, teams of veterinary service providers have been on the road non-stop delivering veterinary services and parasite protection. A key focus for AMRRIC's vet team has been working to collect samples to allow the NT Department of Primary Industries to test animals for Ehrlichiosis, which has now been discovered in remote communities and urban centres throughout the NT.

To address this growing issue, AMRRIC has secured a large quantity of parasite medication through generous support from Boehringer Ingelheim, the manufacturers of NexGard. AMRRIC's investment of $20,000, together with generous discounts from Boehringer Ingelheim, will result in almost 3000 dogs receiving NexGard - a highly effective anti-parasite treatment targeting ticks, fleas and mange.

AMRRIC has also had additional support from PETstock Assist in coordinating stock delivery and providing a $10,500 donation of food and enrichment products for companion animals in remote communities. PETstock Assist Charity and Events Coordinator, Jessica Guilfoyle, says supporting members of the community hardest hit by COVID-19 has been a key focus for the charity; "Throughout the pandemic our charity has been working closely with community groups such as AMRRIC to determine where the greatest need is, and how we can provide support." she says. 'Ehrlichiosis is only magnifying the need for this support to remote communities.

AMRRIC CEO Dr. Brooke Rankmore says "AMRRIC works with our partners to provide support for companion animals in remote communities- when animals are healthy, people and communities are healthy. Ehrlichiosis poses a massive threat to the health of not only dogs but the whole community. By providing anti-parasitic medications to at-risk communities, the threat posed by ticks infected with the Erhlichiosis bacteria is lessened. The valuable contribution and support provided by Boehringer Ingelheim and PETstock Assist will go a long way in supporting communities with this emerging issues.

Starting in September, AMRRIC will begin distributing NexGard, with the help of residents, to communities in need. This medication will treat dogs who may not have had access to vet services since 2019. AMRRIC Program Manager-Strategic Delivery Dr Bonny Cumming says "In the absence of vet programs due to the wet season and the pandemic, it can be hard for owners in remote communities to access effective animal health products. Administering regular tick prevention like NexGard aids in protecting dogs from Ehrlichiosis, and is a great way to support their general health."

With Ehrlichia canis potentially making its way into more and more communities, the work that AMRRIC is doing in collecting data and distributing anti-parasitic medication is increasingly important. AMRRIC has always had a focus on meeting critical needs in community in a collaborative and consultative way; in the past, this had meant delivering emergency support following a cyclone or natural emergency, but in this case, the emergency is a zoonotic disease new to Australia.

Background on AMRRIC

AMRRIC - Animal Management in Rural and Remote Indigenous Communities - is a national not-for-profit organization. Our One Health, One Wellbeing approach recognises the inextricable links between human, animal and environmental health and wellbeing. By working with remote Aboriginal and Torres Strait Islander communities across Australia to improve the health of their companion animals, AMRRIC is helping to create healthier, safer and happier communities.

In the communities where AMRRIC works, access to veterinary services is extremely limited, due to a variety of geographic, social-economic and cultural factors. Without veterinary services, the health and welfare of animals suffers, as does the health and wellbeing of community members. AMRRIC works with a range of stakeholders including veterinarians, regional councils and Indigenous corporations, to ensure remote communities have access to culturally appropriate, effective and ongoing veterinary services. We also employ education programs within local schools and other community groups to share knowledge with children and adults about animal health and wellbeing, and discuss links to human health and wellbeing. The longer-term objectives of our model are sustainability and capacity building, so that ultimately, communities can confidently and effectively manage their own companion animal populations.

About PETstock Assist

PETstock Assist is a registered charity committed to making a long-term difference and positive change in the lives of pets and humans through education, awareness and donations. 100% of donations to PETstock Assist are donated to charities that share its mission.

Since inception, PETstock Assist has microchipped more than 22,000 pets, found homes for more than 12,000 rescue pets, coordinated food drives to the value of $5 million, donated more than $3 million to charities and founded 'The Pet Mob' - a program that sees PETstock Vets visit Papunya in the NT to provide veterinary services including desexing and parasite treatments.

Background on Ehrlichiosis

Ehrlichiosis is a disease of dogs that occurs when a brown dog tick infected with the bacteria, Ehrlichia canis, bites a dog. It can result in death if not properly treated.

In very rare cases, infected ticks may infect people.

Dog owners should have their dogs on a tick control program, regularly check their dogs for ticks and be on the lookout for signs of the disease.

E. canis occurs around the world, particularly in tropical and

subtropical regions. Infection with E. canis (ehrlichiosis) was confirmed for the first time in Australian dogs in May 2020 in the Kimberley region of Western Australia and June 2020 in the Northern Territory.

Dogs develop ehrlichiosis after being bitten by a brown dog tick (Rhipicephalus sanguineus) infected with E. canis. The brown dog tick is widely distributed worldwide and is present across northern Australia.

AMRRIC and PETstock staff at the Petstock Berrimah shop in Darwin with some of the NexGard and donated food.

AMRRIC CEO Brooke Rankmore with PETstock Darwin Manager Daniel Brockhurst.

HOLIDAY SEASON PET CARE TIPS & ADVICE FOR PET OWNERS

BY VETERINARIAN DR SASHA NEFADOVA

1. Holiday travel

It's never been easier to incorporate furry friends into Christmas plans with so many great dog-friendly campsites and pet-friendly accommodation around Australia. If you are holidaying with your pets, remember to make preparations for your pets as well; have bedding, food, medications and water ready to go and make sure you can transport them safely to your holiday destination.

So pets can be identified easily should they become lost while holidaying, ensure registered microchips are up to date and include your details such as your phone number on collars. Most importantly, never leave your pet alone in a locked car as pets can die very quickly from heatstroke, even in milder weather.

2. Beach safety

Long days and warm nights mean there's no better time than summer to exercise your dog at the beach over the holiday break. While dogs love a day on the beach, it's important that pet owners keep a close eye for any potential risks that could spoil a great day out. Things to look out for include signs of heat stroke, ticks and things that can be swallowed such as jellyfish, sea urchins and snakes.

Beach essentials include plenty of water, a bowl, towels, sunscreen (for you and your buddy), toys and waste bags.

3. Christmas conscious diet

It can be very tempting to sneak a treat under the table to furry family members during the festive season. However, certain foods that we love to indulge in can actually be harmful or fatal to our fur-babies including:

- **Raisins and grapes -** Raisins and grapes can be fatally toxic to dogs, even in small quantities, so no Christmas pudding or cake for our four-legged friends.
- **Pork, bacon and ham -** Some pork products contain a high amount of fat, which can lead to illnesses like pancreatitis. Statistics show an increase of pancreatitis cases in dogs at Christmas time.
- **Macadamia Nuts -** Macadamia nuts are readily enjoyed at Christmas but are poisonous to dogs and can cause vomiting, weakness, fever, muscle tremors and depression.
- **Onions -** Ingestion of onions can contribute to stomach upsets and even cause anaemia.
- **Lollies -** Loaded with sugar and even worse for our pets than they can be for us, lollies can disrupt your pet's metabolism and eating lollies with some artificial sweeteners can be life threatening.
- **Alcohol -** While it may seem obvious, allowing our pets to consume any alcohol is dangerous. It can cause alcohol toxicity and even seizures.
- **Milk and dairy products -** It may surprise many to learn that dogs' and cats' bodies weren't designed to process dairy. Consuming dairy can cause stomach upsets, vomiting and diarrhea.

Speak to your vet for more information on a healthy and balanced diet for your pet. Monitor your pet for signs such as odd behaviour, dehydration or general feeling of being unwell. Contact your closest vet immediately if you are concerned.

4. Keep Christmas decorations out of paws reach

While baubles hanging from the tree may look conveniently like toys or tennis balls to your inquisitive cat or playful dog, if a plastic or glass ornament breaks in their mouth, it could cause serious long-term damage or even pet fatality. Keep edible decorations like candy canes and tinsel or tree lights out of reach to avoid food toxicity or electric shock.

Ensure wrapping paper is cleaned up immediately after presents have been opened as when chewed, wrapping paper and ribbons can be very dangerous for a pet's intestines.

If you have a real tree, ensure tree needles are cleaned up regularly as they can be sharp and become stuck in your pet's paw or throat. It's a good idea to securely anchor the tree so an inquisitive pet doesn't knock it over. Cover the watering hole from thirsty pets as the water can contain traces of fertiliser and bacteria that can cause your pet to be nauseous.

5. Pet care

If you are hosting celebrations or planning to spend time away from your pet on Christmas day, ensure your pet is properly exercised beforehand to help them de-stress. This will also likely make your pet sleep throughout the day once Christmas celebrations are underway. Create a safe environment for your pet to have some alone time away from guests throughout the day or night.

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