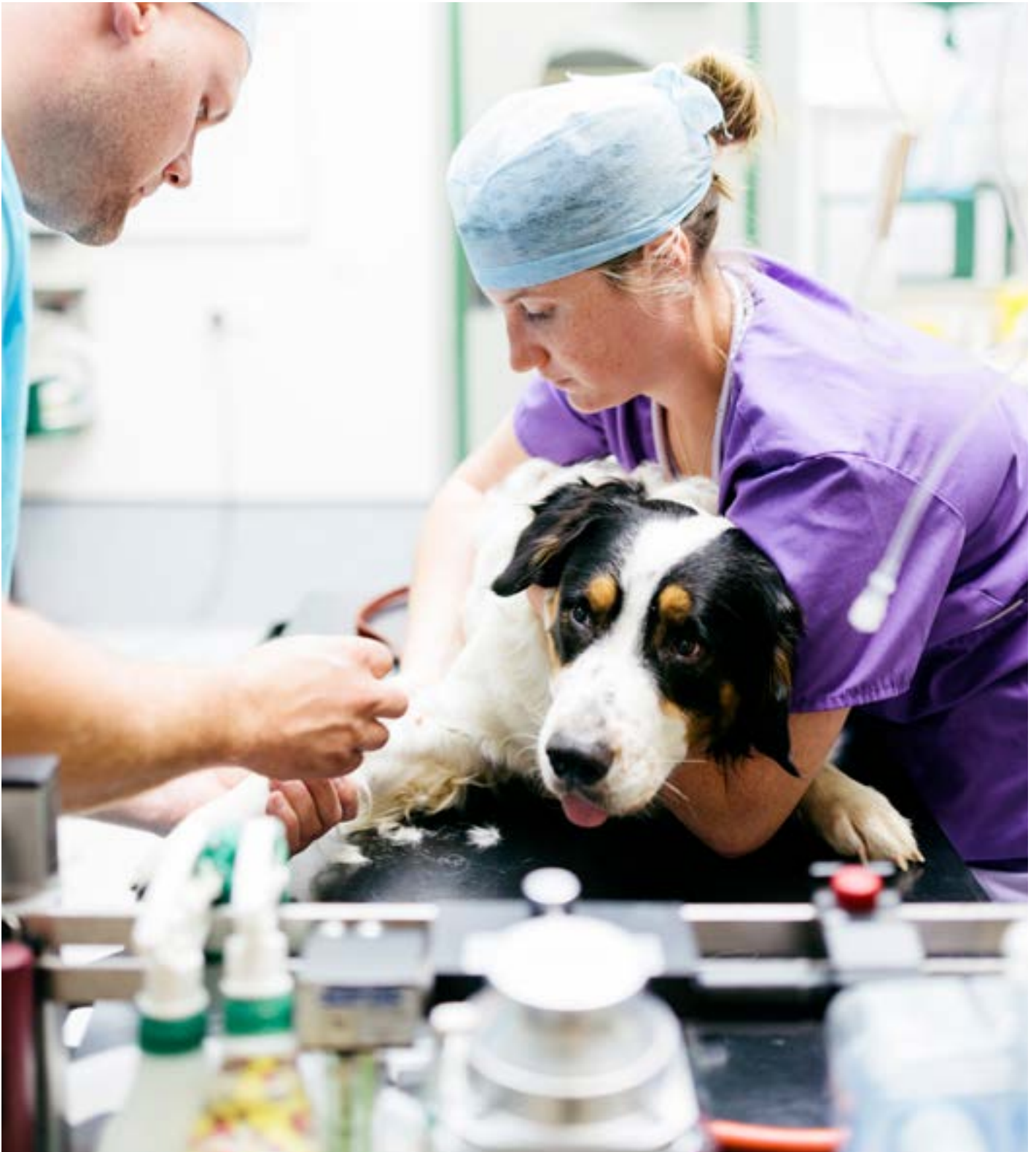


THE
AUSTRALIAN
VETERINARIAN MAGAZINE

Seeing the beauty in
animal bone research

**Canine parvovirus
rampant in Australia**

3D printing helping
to save dogs' lives



Vet-Tome

The atraumatic extraction system that greatly reduces extraction time and saves bone!



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“Our Vet-Tome arrived yesterday and we had occasion to use it across two of our four dental surgeries today. Both occasions unexpectedly. It is an absolute revolution. In under 60 minutes I extracted over 20 teeth including 4 canines without gingival flaps or osseous burring using the most conservative of settings and no experience of the device. I am certain that in one case it saved me over an hour of awkward mandibular flap creation and burring to remove two lower canines with roots extending all the way to Hades. No extraneous gingival trauma, easy closures and a patient freed from awful dental trauma.

Today, with the Vet-Tome, I had one of the most satisfying professional experiences of my career! Thank you.”

Dr Nick Taylor BVSc(Hons) GPCert(SAP) Dip. Mgt. ESVPS MRCVS (N7011)

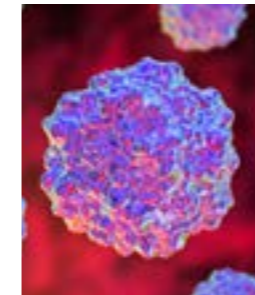


VET DENTAL UNITS | VET DENTAL X-RAY | ULTRASONIC SCALERS | HAND INSTRUMENTS | ACCESSORIES & CONSUMABLES

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CANINE PARVOVIRUS RAMPANT IN AUSTRALIA



A UNIVERSITY OF SYDNEY STUDY HAS FOUND THAT CANINE PARVOVIRUS (CPV), A HIGHLY CONTAGIOUS AND DEADLY DISEASE THAT TRAGICALLY KILLS PUPPIES, IS MORE PREVALENT THAN PREVIOUSLY THOUGHT WITH 20,000 CASES FOUND IN AUSTRALIA EACH YEAR, AND NEARLY HALF OF THESE CASES RESULT IN DEATH.

Despite the extent of this disease, this is the first survey study to examine the impact of CPV in Australia since 1982.

Published in *Transboundary and Emerging Disease*, the national survey of 534 veterinary clinics investigated the number of cases of CPV, their geographic distribution, and financial impacts on pet owners.

The survey revealed that CPV remains a major cause of disease in puppies and dogs across Australia, particularly in rural and remote areas of the country, despite improvements in vaccination technology over the last 40 years.

CPV in dogs causes the destruction of the intestinal lining and villous atrophy, resulting in severe gastroenteritis, haemorrhagic diarrhoea, vomiting and dehydration.

"CPV can kill puppies, so is an especially tragic disease, and most people are unaware that this is a big issue nationally," said lead researcher Dr Mark Kelman, a veterinarian and PhD candidate at the Sydney School of Veterinary Science.

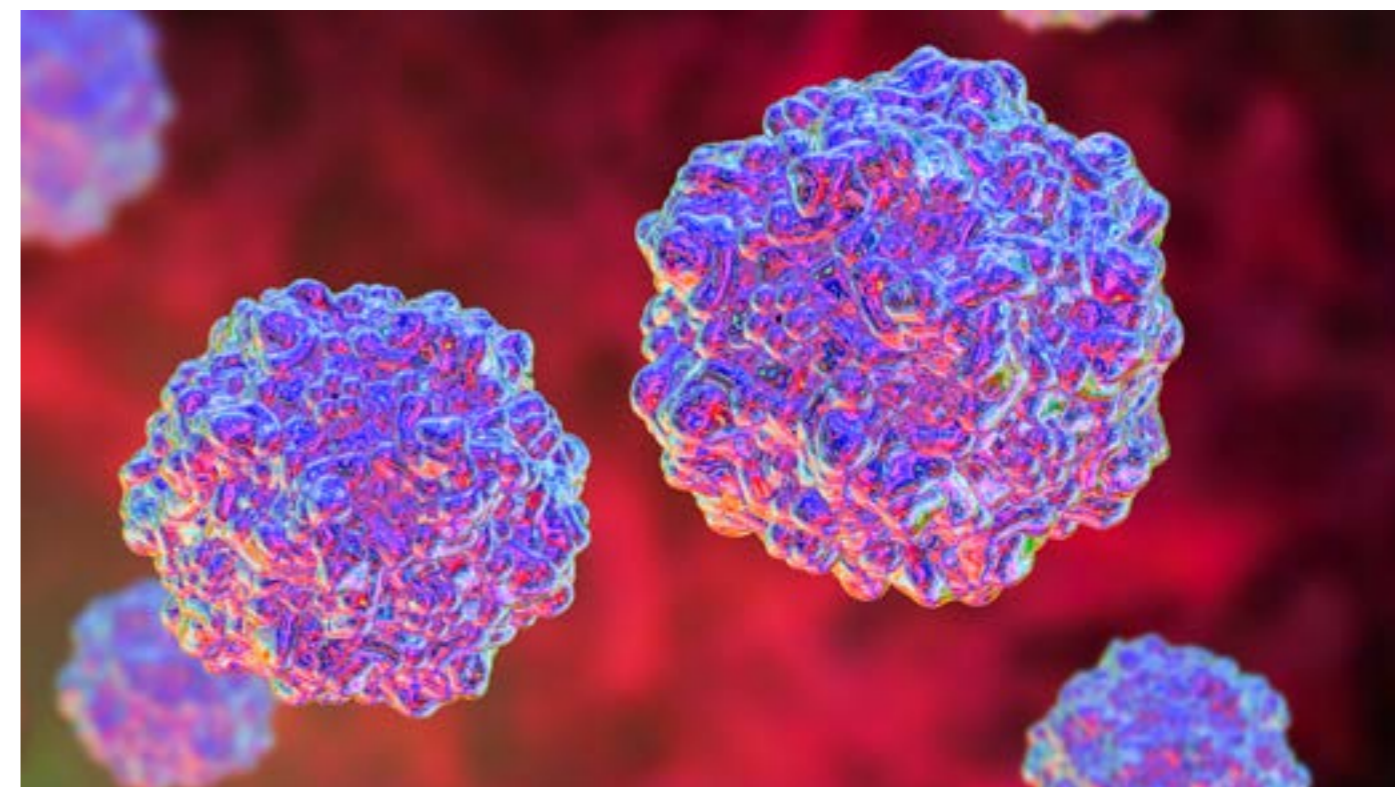
"The estimated number of cases of CPV across Australia was 20,661 in 2015 and 20,110 in 2016, and the overall reported euthanasia rate was 41 per cent," he added.

The survey identified large numbers of CPV in rural, remote, and lower socioeconomic areas of Australia. Where cases occurred in capital city areas, they were more commonly seen in outskirt areas, away from the inner city.

The Northern Territory had the highest rate of CPV, twice as high as New South Wales, highlighting the severity of the disease in this area. The only areas with relatively lower rates were the ACT and Victoria.

"A range of risk factors might contribute to these differences across the country and requires further research," said Dr Kelman.

"We suggest that socioeconomic factors and other issues in these regions may result in poor vaccination rates. If these rates could improve, this might stop these outbreaks and disease cases from occurring," he added.



The study found that the average cost to treat CPV cases was \$1,500 per patient, with a significant difference in the cost of treating cases between Australian states. Western Australia was the most expensive state, with a median cost of \$2,500.

"There was a strong link between the cost of treatment and the rate of euthanasia without treatment," Dr Kelman said.

"The data shows that cost factors were linked to the pet owner's decisions to seek treatment for their dog. Higher costs were linked to pet owners opting for euthanasia instead of seeking treatment. An inability to afford treatment might be a factor in the high euthanasia rates reported by veterinarians," he added.

"In my personal experience as a vet, the inability of a client to afford treatment for CPV is a common reason cited for euthanasia, surrender, or sometimes the abandonment of these animals," Dr Kelman said.

Dr Kelman stated that now that the impact of CPV in Australia has been estimated, and the regions where the highest numbers of cases have been identified, we need targeted communication and vaccination strategies in these areas to improve herd immunity and reduce CPV case numbers.

"Strategies could be developed to quickly intervene in CPV related disease outbreaks, or to address areas where CPV cases are endemic. This is now something that we are looking at, and a charity that I have started called Paws for a Purpose has also now begun some pilot vaccination programs in high-risk rural areas to try and prevent cases from occurring," he went on to add.

"We are currently heading into the worst time of year for parvovirus, so we also urge people to vaccinate their dogs if they aren't fully vaccinated, especially puppies," Dr Kelman said in conclusion.

This survey is the most comprehensive epidemiological investigation of canine parvoviral related disease to date globally, and provides a process for national disease surveillance.

"The estimated number of cases of CPV across Australia was 20,661 in 2015 and 20,110 in 2016, and the overall reported euthanasia rate was 41 per cent."

Dr Mark Kelman



SEEING THE BEAUTY IN ANIMAL BONE RESEARCH

AS TOLD TO STUART WINTHROPE

DR BABATUNDE AYODELE IS PART OF A TEAM RESEARCHING THE BONES OF RACEHORSES. NOW, HIS RESEARCH HAS INSPIRED THE FACADE OF A NEW UNIVERSITY BUILDING.

I had every intention of studying human medicine. I started my veterinary degree at the University of Ibadan in Nigeria and thought I would change over to human medicine in my second year. But there were opportunities to work in research and public health as a veterinarian. I enjoyed that, so I stayed.

After finishing my degree, I did national service. I was part of the National Youth Service Corps program in Nigeria where all graduates serve the government for one year. I was posted to Okitipupa in Ondo State, a very small town in an agricultural area.

My day normally started with a meat inspection at the abattoir and then I'd attend to animal patients, doing disease surveillance and control. There were no major outbreaks, but we reported a few tuberculosis cases to government.

I became interested in developmental conditions affecting bones. I was mostly influenced by the research that my supervisor at the time was doing on bones. My first experience of academic research was during my veterinary degree and during my national service, I then looked for further research opportunities and I saw that the University of Melbourne had a high ranking in the world.

I contacted Professor Eleanor Mackie at the University who was working on osteochondrosis – a developmental orthopaedic disease affecting rapidly growing animals, like horses, chickens, dogs and humans. Fortunately, I received a Graduate Research Scholarship and began my research career in Melbourne.

Cartilage is made up of cells called chondrocytes which undergo different stages of development. And Professor Mackie's team was studying the failure of normal bone formation during cartilage growth. The last stage of cellular activity, before bone is formed, is called chondrocyte hypertrophy. The failure of this stage of cartilage growth is associated with the development of osteochondrosis.

I wanted to understand the molecular mechanisms guiding the process of chondrocyte hypertrophy, and how the failure of that process may lead to osteochondrosis.

We use a lot of images to do our research. In order to see what's happening we apply stains to tissue samples to enhance contrast. When we examine a slide under a microscope, we

can more clearly see different components of the tissue and the arrangement of the cells that make up the tissue. The research identified a number of novel chondrocyte hypertrophy-associated genes.

When the University launched a competition for research images, specifically for bioscience academics, I had an image prepared. The idea was to use this image to influence the design of the facade of our new Western Edge Biosciences teaching building. I was so surprised when my image was selected.

The image shows us a section of a horse growth cartilage, also called growth plate. It shows the chondrocytes – the cells that make up cartilage – at different stages of cellular activities. The area labelled 'R' shows the reserve or resting zone with fully differentiated chondrocytes. The area labelled 'P' shows proliferative chondrocytes, which are increasing in number and are arranged like stacks of coins.

The area marked 'H' shows the hypertrophic zone, where the chondrocytes become enlarged and space out before preparing the matrix to be replaced by bone. This process is called endochondral ossification and it drives our growth from when we're a baby until adulthood. It's the same process for many animals.



Dr Babatunde Ayodele and his image of bone development printed on glass. Photo credit: Stuart Winthrop/ University of Melbourne

“I wanted to understand the molecular mechanisms guiding the process of chondrocyte hypertrophy, and how the failure of that process may lead to osteochondrosis.”

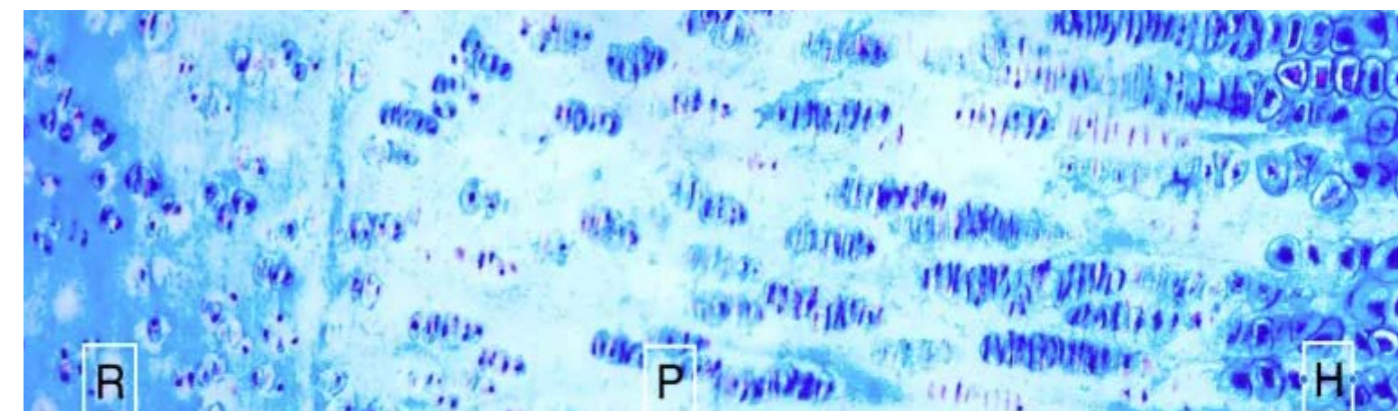
Dr Babatunde Ayodele

When I look at a growth cartilage, I see cellular activities and not the aesthetics. Incorporating the image into the design of the building is interesting because it's impressive to see the design that emerges from this image and it makes me proud of what we as researchers do.

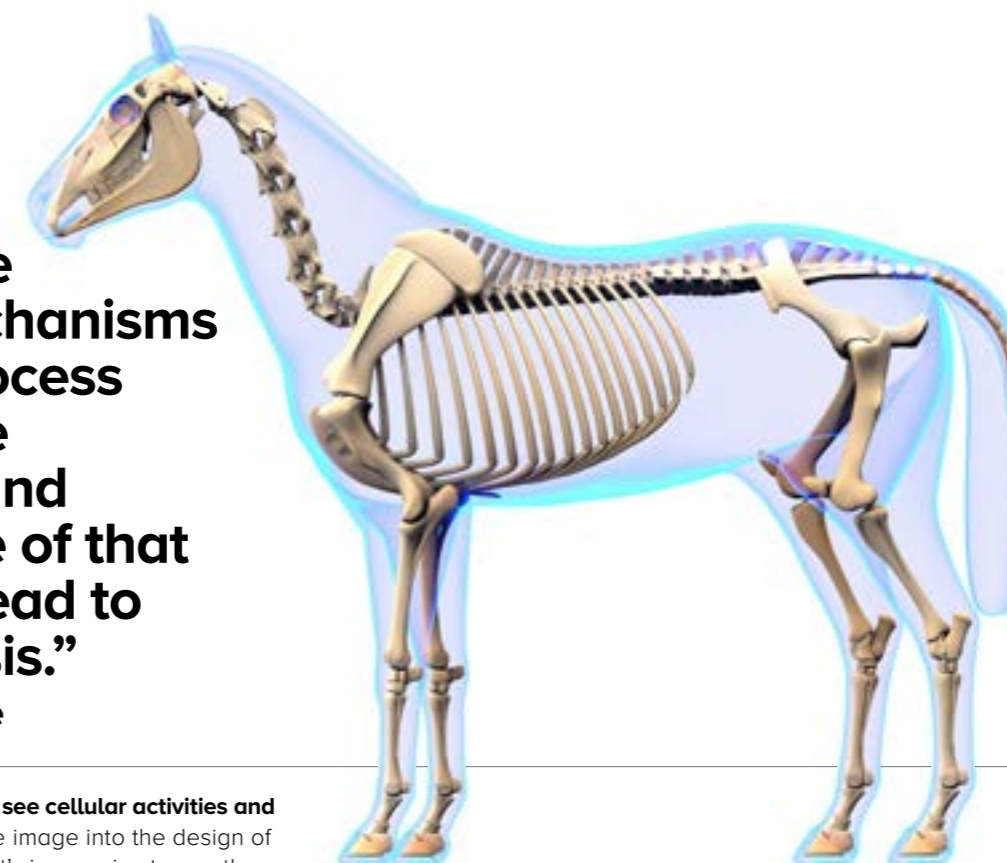
Now I'm part of a team looking at structural changes in the bones of racehorses. The Equine Limb Injury Prevention Program wants to understand how exercise and training affects the structure of bone and I'm working with veterinarians, epidemiologists, biomechanical engineers and other musculoskeletal biology researchers. We're analysing sections of bone from horses at different stages of training and rest.

We want to develop a model to help trainers reduce the risk of bone and joint injuries in racehorses. Bone is a living, flexible tissue, it's not static. Regions of bone sustain microfractures during exercise, which are resorbed and replaced during rest periods.

This process, known as remodelling, renews and maintains the strength of bone. But at the moment there's no way of knowing the amount of microdamage that intensive exercise causes



The cells that make up horse cartilage (chondrocytes) at different stages of development. The area labelled R shows the reserve or resting zone, P shows proliferating chondrocytes and H is the hypertrophic zone, where the chondrocytes become enlarged and space out before preparing the matrix to be replaced by bone. Photo credit: Babatunde Ayodele.



in bone because we can't measure microdamage in living animals with current imaging techniques.

Better understanding animals can help human beings. Cellular activities are similar, and what we understand of the molecular mechanisms regulating these activities in animals can be useful for humans as well.

I'd like to develop better ways to predict the risk of injury in equine athletes (like racehorses), possibly with the use of biomarkers. They are measurable elements in a biological system that indicate a pathological process or disease is occurring.

If we can better understand the mechanisms that lead to microdamage accumulation in bone and the development of bone fatigue, we'd be better at predicting the risk of injuries.

This understanding in horses may in turn be valuable for the bone health of other animal athletes and humans, too.

FOR GIANT PANDAS, BAMBOO IS VEGETARIAN ‘MEAT’



New research using an approach called nutritional geometry sheds light on giant panda evolution, and their unusual transition from carnivorous ancestry to extreme specialised herbivory.

Giant pandas are extremely specialised herbivores that feed almost exclusively on highly fibrous bamboo, despite descending from primarily flesh-eating carnivores.

New research suggests this switch to a restricted vegetarian diet wasn't as big an evolutionary leap as it may first seem.

Published in *Current Biology*, researchers from the University of Sydney and Chinese Academy of Science used an approach called nutritional geometry – that considers how mixtures of nutrients and other dietary components influence health and disease, rather than focusing on any one nutrient in isolation – to assess the macronutrient mix of the giant panda's diet.

"This study demonstrates the importance of considering both foods and nutrients in understanding the evolutionary ecology of animals – exactly what nutritional geometry is designed to do," said Professor David Raubenheimer, from the University of Sydney's Charles Perkins Centre and School of Life and Environmental Sciences.

Despite the plant-based diet of giant pandas, the protein and carbohydrate content of that diet looks more like that of a hypercarnivore – animals that obtain more than 70 percent of their diet from other animals.

About 50 percent of the panda's energy intake comes in the form of protein, placing them alongside feral cats and wolves. The macronutrient composition of the panda's milk is also like other carnivores.

"Based on what they eat, giant pandas absolutely belong to the herbivores, but considering the macronutrient composition of the ingested and absorbed diets, they could also belong to the carnivores," said co-author Fuwen Wei from the Chinese Academy of Science in Beijing.

Giant pandas have developed herbivore traits, including a skull, jaw musculature and teeth that are adapted for fibrous diets, and a 'pseudo-thumb' used for handling bamboo. They also have lost the ability to taste umami, which is often associated with meat eating.

However giant pandas also have a digestive tract, digestive enzymes, and gut microbes that resemble that of carnivores and not herbivores. This suggests minimal evolutionary modification from their ancestral state was needed to deal with the macronutritional properties of bamboo.

The researchers say the findings can help resolve long-standing questions concerning giant panda evolution, including the unusual transition from carnivorous ancestry to extreme specialised herbivory.

"In fact, the transition was likely more superficial than assumed, combining substantial adaptation to new food types with relatively smaller changes in macronutrient handling," the researchers write.

"It can also explain why pandas have a strange mix of have herbivore and carnivore traits. They are herbivores with respect to the foods they eat, but the macronutrient mix of the diet is more like carnivores," explained Professor Raubenheimer.

The team will continue to study the evolution and adaptation of the giant panda, and also apply that work to the panda's conservation management as an endangered species.



TECHNOLOGY IS HELPING TACKLE AUSTRALIA'S VET SHORTAGE



Technology and innovation could be the answer to the record number of Australian veterinarians abandoning the industry, which is prompting fears there won't be enough vets to take care of the nation's pets.

A just-released survey from leadership development company, The Lincoln Institute, found that nearly 90 per cent of veterinary business owners and managers reported unprecedented difficulty filling vacancies. 41 per cent waited longer than six months to fill positions and 18 per cent waited up to two years or more to find new vets to work in their clinics.

Adding to the concern is that demand is rising for Australia's \$4 billion vet industry, which is growing at around three per cent a year, according to an August 2018 IBIS World report, thanks to higher pet insurance uptake, growing awareness of animal health issues, and the increasing availability of advanced surgical and diagnostic procedures for animals.

A working paper with recommendations is due in March as an industry steering group look into the issues but some parts of the industry are worried pet owners could struggle to find a vet if the situation isn't addressed.

National mobile veterinarian booking service Pawssum, which utilises app-based technology to send vets to the homes of pet owners, believes it's helping to address the vet shortage by attracting experienced vets back into the industry.

"As a separate Lincoln survey showed, vets have been leaving the industry in droves, and many more are planning to leave, primarily due to poor work conditions, low remuneration, long hours and stress," said Pawssum CEO Dr Jon Berkowitz.

"However, there is some good news. Our service is helping vets return to the job they love – treating animals – because they

can sign up to work with us as a mobile vet and work as little or as much as they want. They can choose when they want to work, what type of work they want to do and they don't have to worry about invoicing clients or marketing or providing their own insurance, we take care of it all, which is helping vets choose to come back into the industry," explained Dr Berkowitz.

Melbourne-based vet Dr Tim White is one of more than 130 vets in the Pawssum community, joining the platform last year after a decade in the industry.

"It was an easy choice to start with Pawssum. Not only is it convenient for pet owners but it is convenient for vets," said Dr White.

"I can choose when I'm available and what cases I see, allowing me the flexibility to balance my work and family life and I find the house visits great for the pets and the clients are usually more relaxed as well," he added.

Dr Berkowitz said pet owners who in the past had to visit the surgery and wait, or pay a substantial call out fee, now have another option available.

"Many people are too time-poor to sit in a vet clinic and also many dogs and cats are anxious about heading to the clinic, making at-home visits very much in demand. If the pet needs further tests or surgery, we can refer them to one of our partner clinics," he said.

Pawssum now operates in Perth, Brisbane, Melbourne, Sydney, Adelaide and Canberra and has begun branching further out into locations such as Bendigo.



NEW CAMPAIGN AIMS TO SPREAD THE WORD ABOUT THE IMPORTANCE OF CANINE BLOOD DONATION



As clinicians, veterinarians or nurses, we are all aware of the need for blood within practice at times.

Maybe you work in emergency and use it regularly. Maybe your clinic doesn't have the facilities, so you refer on. You might have a bank, or a list of donors you can call upon, or maybe you simply rely on some very generous staff pets.

Regardless of your professional position, the majority of owners you come across have likely never thought about it until it's their own pet that needs a transfusion.

It's this gap that BLOOD Hound Australia aims to fill.

Bella Jaye, the founder of BLOOD Hound Australia, is a veterinary nurse. Due to her occupation, she took for granted her knowledge about the need for canine blood donors, but she has since come to recognise that there is a big gap in owner education regarding this vital aspect of pet health. It is literally a life and death issue that most pet owners have never considered.

The Blood Hound Australia campaign is still in its infancy, but it is already making a difference in owner awareness.

The campaign is a national effort, however so far it's the ACT, where Bella first launched the campaign that has benefitted the most.

Collecting clinics in Canberra have seen a rise in eligible dogs being registered for donation, and one clinic in particular has greatly appreciated the campaign as they have found they can approach BLOOD Hound Australia directly when in need, saving staff time when sourcing a donor.

Bella's own donor dog featured in an ABC news story which is how BLOOD Hound Australia began.

"I didn't want this to be a one-off, feel good story. I started BLOOD Hound Australia after our news appearance with the intention of it becoming a national campaign, so I could reach as many pet owners as possible", Bella explained.

"We want to help bridge the gap between vets and owners. We would love to see more clinics able to collect and store blood, so that pets in need have easier access to this life saving practice," she added.

Since starting the campaign, BLOOD Hound Australia has been featured in regional, national and international media, and has even placed in GIO's Act for ACT awards, the Companion Animal Rescue Awards and the Alliance Do Good Awards.

From a clinical point of view, having blood ready to go can save precious time in a critical case and significantly improve the outcome for the patient. This is why BLOOD Hound Australia doesn't just focus on educating the public but also encourages clinics of all kinds and sizes to keep an up to date list of eligible donors as well as a bag of blood on hand at any given time, because more clinics need to actively address the issue of access to blood.

BLOOD Hound Australia's website and social media is always searching for donor and recipient stories, as well as stories from clinicians, about their personal experiences with transfusions and why it is so important.

There is no other campaign like this, certainly not in Australia, and BLOOD Hound Australia is looking for the backing of the veterinary community to expand their reach.

Bella said she is wanting to meet and team up with more vet clinics to discuss ideas, get feedback and share stories about the need for blood.

BLOOD Hound Australia has some really big ideas that they want to implement long term and Bella said they can't do it alone. One such example is to start a national registry of donor dogs for veterinary staff, as well as increase collection and banking clinics across the country. The aim is to normalise pet blood donation, and although we are making progress, like-minded people are needed to make this a reality.

BLOOD Hound Australia is a not for profit campaign, that simply wants to ensure that every animal that could benefit from access to blood has that option.

To follow the BLOOD Hound Australia campaign, visit bloodhoundaustralia.wordpress.com



3D PRINTING HELPING TO SAVE DOGS' LIVES



3D printed models of dog skulls are helping University of Queensland (UQ) vets to save animals and educate tomorrow's veterinary students.

The models, showcased at the World Science Festival, were the result of a collaboration between UQ Library's Digital Scholars Hub and the School of Veterinary Science.

UQ veterinarian and Associate Professor Rachel Allavena used the skulls to help children understand how dogs with short noses can suffer from the condition brachycephalia.

"Some dogs – like pugs, French bulldogs and Boston terriers – can have such short faces that they have trouble breathing and keeping themselves cool, as they're unable to pant effectively," she said.

Professor Allavena said this trait has been selected by humans to make dogs look cute and more flat-faced like us, but it can result in significant suffering or invasive surgical treatments to help the dogs breathe.

"By having 3D models, we're able to show just how problematic this condition is and to easily explain tricky concepts like this to school kids. It also helps us explain why people should consider adopting shelter dogs, which are often greyhounds or mutts, and are generally very healthy and make excellent pets," she went on to add.

UQ Digital Scholars Hub's Nick Wiggins, who developed the models, is excited to use emerging digital technologies for science education.

"3D model creation is becoming more accessible, more affordable and improving in quality," he said.

"In this case, using the medical imaging data of a dog that had a CT scan at UQ, open-source medical imaging software, a low-end 3D printer and some biodegradable starch-made plastic, we can build something quickly and cheaply that will connect science to a whole new audience," Nick explained.

"And it's not just veterinary science. I'm working with a number of other disciplines, including archaeology, palaeontology, botany, zoology, geology, history, and human movement science. I'm in discussion with archaeobotanists, archaeologists that look at plant remains, to scan tiny seeds and then 3D print larger copies to better display their unique morphologies to students," he went on to add.

Professor Allavena believes educational displays are just the first step for 3D printing in veterinary science.

"Beyond veterinary education, 3D printing is now starting to be used to treat animals, particularly in surgical applications," she said.

"I know of a dog that had most of its skull removed due to a cancer, then had a custom-made 3D printed titanium plate implanted. And surgeons are creating unique 3D bone models for animals requiring surgery, in order to plan and practice a procedure before it's conducted," Professor Allavena said.

"3D printing will help us inspire future vets, create better educational outcomes for veterinary students and lead to happier, healthier animals," she concluded.



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18 / 06 / 19	Periodontal Disease
25 / 06 / 19	Radiology
02 / 07 / 19	Analgesia and Anaesthesia
09 / 07 / 19	Oral Surgery (Extractions)
16 / 07 / 19	Homecare / Business of Dentistry

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Initial 3 day workshop covering:	Clinical Anatomy, Periodontal Disease (charting, scaling and polishing), Radiology, Analgesia, and Extractions
Initial:	Feb 21-23, Mar 21-23, Jul 18-20, Aug 08-10, Nov 14-16, Nov 28-30
Location:	VDEC, 81 Belgrave-Hallam Road, Hallam, VIC, 3803, Australia

INSTRUCTORS:

Dr David E Clarke, DAVDC, Specialist Veterinary Dentist
 Dr Ira Luskin, DAVDC, Specialist Veterinary Dentist
 Dr Barden Greenfield, DAVDC, Specialist Veterinary Dentist
 Dr Angus Fechney, Resident Vet Dentistry
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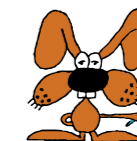
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GET 3 x Newtron Tips & 1 x F.L.A.G. for B.Led Dental Plaque discloser FREE



UNRAVELLING THE GENETICS OF DISC DISEASE IN DOGS

SINCE THE EARLY 1900S, VETERINARIANS HAVE OBSERVED INTERVERTEBRAL DISC DISEASE, A COMMON CAUSE OF BACK PAIN, REAR LIMB PARALYSIS AND INABILITY TO WALK, MORE FREQUENTLY IN DOGS WITH SHORT LEGS SUCH AS DACHSHUND, FRENCH BULLDOG, AND PEKINGESE TO NAME A FEW. BUT THEY COULDN'T PINPOINT WHY, UNTIL NOW.

Recently, researchers from University of California, Davis, in the United States have revealed the discovery of a genetic mutation across breeds that is responsible for chondrodystrophy (the skeletal disorder leading to shorter legs and abnormal intervertebral discs) in a study published in the Proceedings of the National Academy of Sciences.

"Dogs with intervertebral disc disease (IVDD) are 50 times more likely to have this mutation, that's an incredibly strong correlation with disc disease," said Danika Brannasch, a veterinary geneticist and the paper's senior author.

"Being able to identify the cause of this painful condition is the first step to alleviating pain and suffering for dogs at greatest risk," she added.

A dog lover and breeder of Nova Scotia duck tolling retrievers, Danika has long been fascinated by the makes and shapes of canines. As a geneticist, she is driven to understand what creates those physical characteristics. Her colleague, UC Davis veterinary neurologist Pete Dickinson, has witnessed all too often the correlation of unique shapes and debilitating disease in the neurology clinic.

"IVDD is the most common neurological condition we deal with in the clinic. It's the herniation of those abnormal discs that can lead to paralysis in the worst cases," Pete said.

Treatment can be quite costly and prohibitive for some.

"The disease cost our clients approximately US \$1.7 million last year on cases that were severe enough to lead to surgery. In

addition to the pain and discomfort it causes our patients, it takes an enormous financial and emotional toll on owners," Pete said.

Danika started her genetic search with the toller breed, some of whom also have shorter legs. Her laboratory found a genome-wide region of significance on chromosome 12 that appeared linked to abnormal long bone growth. When the group looked for other breeds that shared the DNA sequence in this region, they found that it was in the chondrodystrophic breeds such as beagles, dachshunds and spaniels.

Thanks to an extensive biorepository amassed at the UC Davis veterinary hospital over the past 15 years, Danika and her team were able to look at the DNA from cases with IVDD from a variety of dog breeds, which showed the same region was implicated. The hunt for the actual mutation took lots of hard work from DVM/Ph.D. student Emily Brown, who completed her doctoral thesis using this project.

At first, the results weren't revealing. It took meticulous combing through the genetic sequence by eye to detect the presence of an FGF4 retrogene insertion. Once Danika realised what they had uncovered, she went screaming down the hall with excitement.

"It was kind of like looking for a needle in a haystack," she said. "But I knew it was there somewhere."

The FGF4 retrogene is an important molecule involved in development. When its receptor FGF3R is mutated, it can also lead to dwarfism in humans.

"There's a lot of literature that points to chondrodystrophy in dogs



"Being able to identify the cause of this painful condition is the first step to alleviating pain and suffering for dogs at greatest risk."

Danika Brannasch

as an exciting animal model for degenerative disc disease in people," said Danika, who also holds the Maxine Adler Endowed Chair in Genetics.

"Now that we know more about why it's occurring, it might make it a better animal model," she added.

Being able to identify dogs with this genetic susceptibility could provide a valuable tool for owners, breeders and veterinarians for mitigating the risk of intervertebral disc herniation and resulting spinal cord disease.

"I am a geneticist but I am also a veterinarian and having the ability to eliminate a disease as painful and debilitating as IVDD is the most satisfying result of my scientific career. This is what research is all about, reducing pain and suffering in animals," Danika said.

"What we need to know now is the prevalence of this retrogene in all of these breeds. Without that, it's difficult to establish how to start breeding the condition out. We need as much information as possible to make a plan and help improve the well-being for dogs who suffer from this condition," Pete said in conclusion.

Additional UC Davis authors on the paper include Emily Brown (a DVM student who recently completed her Ph.D. in the Veterinary Scientist Training Program), Tamer Mansour, Beverly Sturges, Miriam Aguilar, Amy Young (UC Davis Genome Center), Courtney Korff, Jenna Lind, Cassandra Ettinger (Department of Animal Science), Samuel Varon (2017 DVM graduate), Rachel Pollard, and C. Titus Brown. Terje Raudsepp of Texas A&M University also contributed to the paper.



FIRST EVER REGISTERED STEM CELL-BASED VETERINARY MEDICINE LAUNCHES IN EUROPE

Equine lameness is truly common and impacts horse performance as well as equine welfare¹. Current treatment is not satisfactory for all cases and there is a clear need for innovation and new treatment options. Hence, the significant interest in treatment beyond symptoms and combatting the underlying root cause.

It is within this context that Boehringer Ingelheim has recently launched Arti-Cell® Forte in Europe for the 'reduction of mild to moderate recurrent lameness associated with non-septic joint inflammation in horses.'

Arti-Cell® Forte is a ground-breaking first-ever approved therapy, developed towards targeting lameness, utilising specifically primed, chondrogenic induced stem cells. Arti-Cell® Forte comes in an ultra-low frozen ready-to-use presentation.

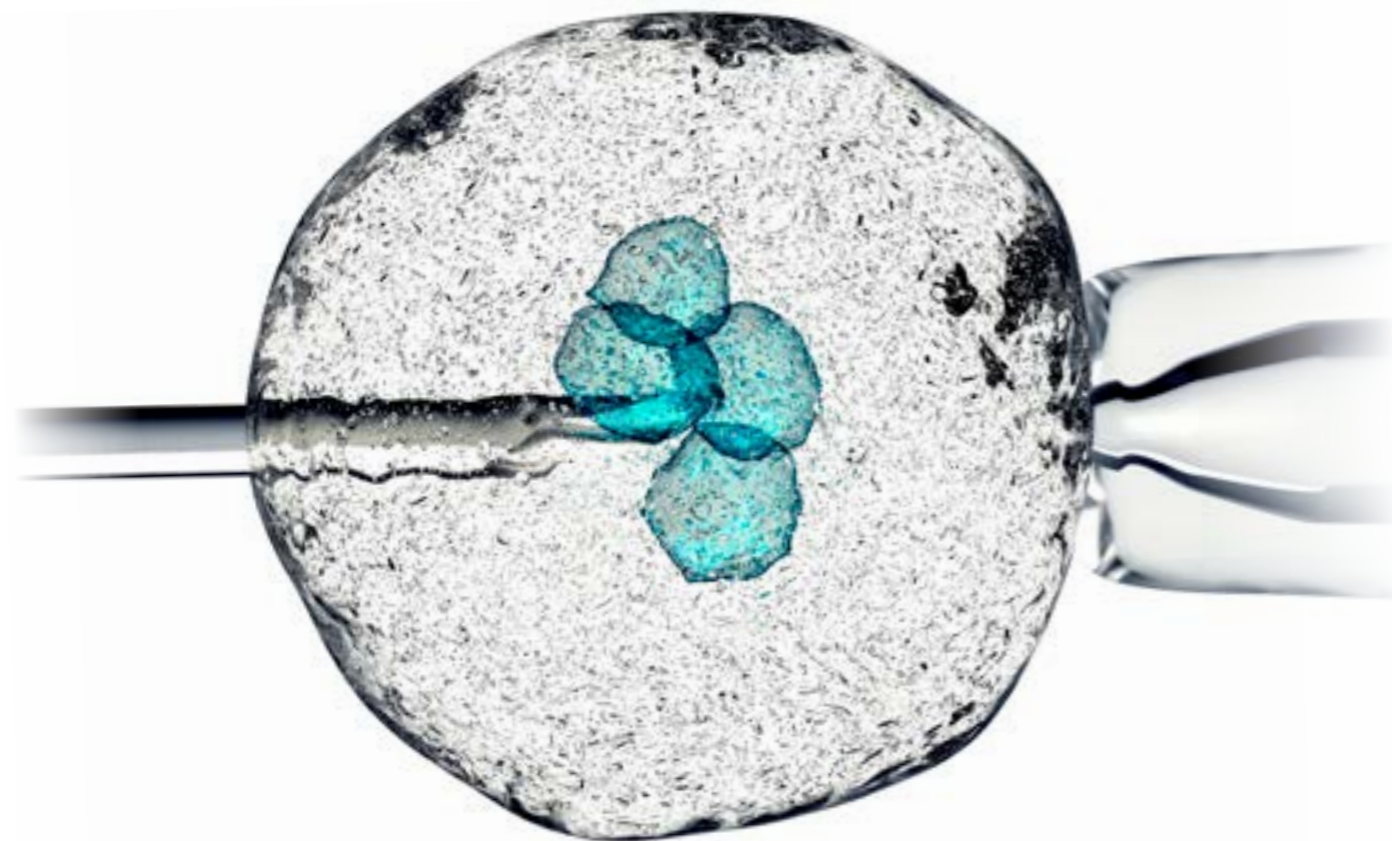
Boehringer Ingelheim, the second largest animal health company in the world, and Global Stem Cell Technology (GST) formed a partnership last year, and have the same ambition to bring new treatments and solutions to improve animal health. Therefore, Arti-Cell® Forte was specifically designed for horses to provide a convenient and long-term² solution for recurrent lameness.

"A quarter of the entire equine population¹ develops osteoarthritis at some point in their life. Priming the cells towards cartilage aids them to deliver the right activities in the affected joint," said Jan Spaas, CEO of GST.

"We are absolutely delighted with our first marketing authorisation from the European Commission and the first stem cell-based product in animal health. We are sure that with our partner Boehringer Ingelheim this product will become a game changer in equine health," he added.

Dr. Erich Schoett is Head of the Global Strategic Business Unit Equine at Boehringer Ingelheim. He said, "We are proud to continue to set new standards of care for horses to optimise their health and well-being in partnership with veterinarians. Early disease detection and early treatment are keys to ensure that horses are healthy and live longer, happier lives. Arti-Cell® Forte as the first-ever approved stem cell-based product offers to veterinarians and horse owners a ready-to-use solution to help raising the health and quality of life for horses with mild to moderate recurrent lameness."

Following the scientific review by the European Medicines Agency² and decision of EU marketing authorisation by the European Commission, Arti-Cell® Forte is now approved as a veterinary medicine for the treatment of equine lameness. It will be available from May and June 2019 onwards in a range of European countries.



References

1. Neundorff RH, MB Lowerison, AM Cruz, JJ Thomason, BJ McEwen and MB Hurtig. (2010). Determination of the prevalence and severity of metacarpophalangeal joint osteoarthritis in Thoroughbred racehorses via quantitative macroscopic evaluation. Am J Vet Res 71:1284–1293
2. Van Weeren PR and JC de Grauw. (2010). Pain in osteoarthritis. Vet Clin North Am Equine Pract 26:619–642
3. Goodrich, LR., Nixon, A.J., 2006. Medical treatment of osteoarthritis in the horse – a review. Vet. J. 171, 51–69. <http://dx.doi.org/10.1016/j.tvjl.2004.07.008> (link is external)
4. http://www.ema.europa.eu/docs/en_GB/document_library/Press_release/2018/06/WC500250844.pdf

100% NATURAL CHEWS AND MEAL TOPPERS ARE PET FOOD WITH PURPOSE

Some pet owners experience giving their pet medication akin to a wrestling match. Fortunately, Vetafarm's new Lovebites range of functional chews and meal toppers takes the stress out of supplementing the diet of dogs and cats, making it an enjoyable bonding experience for both the pet and pet owner.

"In the past, supplementing a dog or cat's diet might have left a bad taste in their mouth, literally. We designed the Lovebites range to ensure improving health through natural supplementation is a rewarding experience for all involved," said Dr Tony Gestier, Veterinarian and Director of Vetafarm, one of Australia's leading innovators in companion animal health and welfare

The Lovebites range is tasty and beneficial, designed and formulated by veterinarians and nutritionists at Vetafarm with the aim of assisting in the management of health conditions, such as arthritis, anxiety and liver disease, as well as supporting the animal's body functions and immune system.

The supplements are available in two delivery systems, soft chewables and sprayable meal toppers.

"Vetafarm's palatable Meal Toppers are for both companion dogs and cats and applied by a unique powder spray system. Simply spray the handy pump bottle straight onto their food, and away they go," said Tony. Lovebites Chews are a soft, moist heart-shaped chew for companion dogs. They not only provide

a specific treatment but taste great and are 100% natural too. "Lovebites Chews can also be fed as part of your dog's daily food/treats, particularly if they are overweight," said Tony.

The treats have a dosage rate determined by weight. For example, a 30kg dog will require three chews daily. Each chew is approximately 3 grams, so it is a relatively small but effective part a dog's daily food/treats.

Flexjoint Chews contain glucosamine and green lipped mussel, an antioxidant that reduces inflammation, stops cell disruption and breakdown, inhibits existing cartilage breakdown and helps to synthesise fluid production for repair, according to research.

B-Calm Chews contains L-tryptophan and thiamine which naturally assist in the management and reduction of stress and anxiety in companion canines.

"The non-drowsy, non-sedative action combats stress and anxiety naturally. Lovebites B-Calm Chews can be used daily to assist with travel, separation anxiety and noise. As the core ingredient L-Tryptophan is an essential amino acid required for healthy brain function, a daily supplement can have very positive effects in healthy behaviour and cognition," explained Tony.

As always, for severe behavioural problems, feeding B-Calm Chews should be coupled with veterinary and behavioural advice, said Tony in conclusion.

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NEW RESEARCH FINDS CANE TOADS USE POISON AS A LAST RESORT



University of Sydney research has shown cane toads are 'reluctant warriors' when it comes to oozing toxin. In fact, they are exhausted by releasing their deadly toxin and will go to great lengths not to release it. They far prefer to run or freeze when a predator approaches.

The cost to the cane toad for releasing the poison is substantial, including reduced growth and activity. The toad takes several months to replenish its toxin after using it to repel a predator, which could explain why it uses it frugally.

This is good news for Australian wildlife, said Dr Gregory Brown, the lead author on the paper recently published in Proceedings B of the Royal Society.

"Although cane toads possess outrageously potent toxin, they aren't out there using it to maliciously slaughter everything they encounter," said Dr Brown, an honorary associate in the School of Life and Environmental Sciences. "Instead, they will go to great lengths to avoid using it because manufacturing more is so costly. These animals are reluctant warriors."

The study, co-authored by acclaimed evolutionary biologist Emeritus Professor Rick Shine and Associate Professor Kim Bell-Anderson, has three major findings:

Cane toads produce potent toxin to protect themselves against predators but they are miserly with it.

The costs of producing toxin are more than just time and energy. There are flow-on costs, such as reduced growth and activity that can be more substantial.

Although the researchers measured the cost of deploying toxin specifically in cane toads, the concept is likely to apply to many toxic and venomous animals.

The cane toad is an invasive species in Australia and a fatal source of poison for many native fauna and pets. Toads mostly eat insects, including honey bees, ants, termites and beetles, but they

have been known to eat small native frogs, snakes and mammals. They have few predators in Australia.

"The cane toads possess toxin that is outlandishly lethal to many Australian predators, such as goannas and quolls," Dr Brown said.

"The toxin is less lethal to the toads' natural predators in South America because they have been engaged in an arms race with toads for millions of years and have had time to evolve resistance to their toxin. But many Australian predators are naive, and so sensitive to the toxin that even ingesting a tiny bit will quickly kill them," he explained.

Cane toads prefer to run away from a predator, or freeze and rely on their camouflage, rather than release their toxins, Dr Brown said. They also try puffing up to look bigger or jumping towards the predator to spook them.

"These tactics are often successful, the toad escapes and the predator is stymied but still alive. It's only as a very last line of defence, usually when the predator has them in its mouth and chewing on them, that toads use their 'nuclear option'. But you can imagine that a lot more predators would end up dead, if toads slathered themselves in toxin as a first, rather than a last, line of defence," Dr Brown said.

Dr Brown said the research probably doesn't have a practical application in slowing the spread of cane toads but it does have implications for understanding the factors that affect their rate of spread.

Predator density could have a big influence on the rate of spread. If toads continually encounter threats and have to repeatedly deploy and replace their toxin, they won't have the energy or inclination to disperse very far. Another implication is that the fastest invading toads may be individuals less disposed to use their toxin. It's possible the best dispersers are braver, bolder individuals who rarely release toxin," Dr Brown said in conclusion.



DESERT VET SERIES FOR AUSTRALIAN AND GLOBAL AUDIENCES



Hit Australian TV special Desert Vet is filming a four-part series for national and global screens in the heartland of Western Australia's Pilbara region where legendary kelpie Red Dog roamed, as well return to the state's stunning Gascoyne coast and, for the first time, head to the Goldfields.

The series, which will screen on the Nine Network in Australia, and wildlife, science and adventure programme channel Eden TV in the UK and Europe (airing as Outback Vet) is shooting in Karratha, Port Hedland, Shark Bay, central WA, and Kalgoorlie over four weeks from mid-March.

Desert Vet stars 2018 West Australian of the Year finalist Dr Rick Fenny, best known for being Red Dog's vet and laying him to rest in 1979, and centres around the heartache and joy witnessed by veterinarians, including his daughter Louisa, as they treat beloved animals at his Pets + Vets WA clinics across Western Australia's outback, as well as the dynamics of the old-school vet and 70-year-old grandfather's growing family.

Dr Fenny's marine biologist son Ed, who runs Ocean Park Aquarium in heritage-listed Shark Bay, will also be back for the series.

"It's incredibly exciting to be getting back out on the road to shoot Desert Vet, the series, and know that we're playing our part in building a narrative around what makes Western Australia different and unique, and taking that to the world, as well as underscoring the vital role vets play, especially in the outback where animals are often a major part of the family or even someone's closest companion," said Dr Fenny.

"WA still remains a hidden secret to so many. I've been blessed to grow up and build a great career here and it's fantastic to be able to give back to this great state," he added.

Desert Vet executive producer Matty Roberts said the cameras would again follow Rick on his regular travels through the red dirt regions of Western Australia treating animals – which he's been doing for 46 years – as well as capture day-to-day drama unfolding at his clinics in Karratha, South Hedland and Kalgoorlie with Louisa, and spend some time with Ed at famed tourist attraction Ocean Park to capture some jaw-dropping marine animal encounters.

"The feedback from the Desert Vet pilot episode, which was watched by more than 800,000 people last year, was that viewers wanted to see more of Rick's family, and engage more deeply with some of the unique animal stories, so we'll be looking to go over and above that episode via some really amazing new storylines and surprises," Matty said.

Hamish Turner is Nine Network Head of Programming. He said, "It's great to be partnering with Producer on this production. We were drawn to the diverse characters and storytelling the outback delivers. It prints a very unique range of real life Australian stories."

Charlie Charalambous is Acquisitions Manager for UKTV. He added, "We're delighted to be working with our production partners on another amazing series. The gripping animal stories and fantastic shooting locations will create a wonderful show that's perfect for Eden and its viewers."

Desert Vet is due to air on Nine's main channel at prime time on Friday nights in the second half of the year.



VOLUNTEER VETS, NURSES AND ANIMAL WELFARE WORKERS MAKE A DIFFERENCE

Vets Beyond Borders (VBB) is an Australian-based, international charity that deploys volunteer veterinarians, nurses and other animal welfare workers throughout the year to deliver animal health and community awareness where they are desperately needed. "Since 2003, VBB volunteers have made a measurable contribution to the health and welfare of animals and people in developing communities around the world. They have carried out extensive rabies vaccination, public education and animal birth control measures to assist prevention of the spread of zoonotic diseases in the population," said VBB CEO Maryann Dalton.

In the last financial year, VBB de-sexed more than 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 volunteers provided to hundreds of sick and injured domestic animals and wildlife¹.

Through its VetMatch and VetTrain programs, VBB provides the volunteers and facilitates clinical skill development of local vets.

VBB volunteer Dr Victoria Bondin, a veterinary surgeon in Malta, travelled last year to Ladakh, India, where she was involved in de-sexing and vaccinating street dogs for rabies.

"I want to make a difference, however small, in the suffering that stray animals endure," she said.

"I know there is a big stray dog problem in India, which brings with it a huge rabies problem. I look forward to the day when this disease can be eradicated for good," she added.

VBB also provides invaluable experiences for veterinary students, through its new partnership with the University of Sydney, to volunteer in Cambodia.

Emily Bidgood, final year vet student at Sydney University, said, "The opportunities for veterinary students to help in Cambodia are

endless, including sharing their academic knowledge and gaining practical experience. It opens your eyes to the difference within the world and makes you appreciate the extremely high level of veterinary care we have in Australia."

VBB's VetTrain program also offers training to veterinarians in developing countries on various clinical disciplines to allow appropriate treatment of the myriad of diseases and injuries that afflict animals struggling for survival on the streets of towns and cities around the world.

VBB VetTrain volunteer and veterinarian Dr Luke Michel of New South Wales said he always enjoyed teaching and finds that it helps him to continue learning and reminds him of important principles that he needs to use in his day-to-day work.

"I've been very lucky to work with some terrific vets over the years who have taught and mentored me, and I'd love to be able to pass on what they've shown me," he said.

"To stay passionate about my job I need to have new experiences that I enjoy and highlight how lucky we are to work in this industry," he added.

Ms Dalton said Vets Beyond Borders is grateful for the continued generosity of volunteers throughout the year. After all, volunteers pay for their own travel expenses.

"We need funds to purchase medical equipment and vaccinations to treat street dogs for distemper, parvo and rabies. We encourage animal lovers to support VBB volunteers in giving animals in developing communities access to basic veterinary care and training local vets to make a difference, too," she said.

To donate to Vets Beyond Borders or for more information about the animal health and community awareness programs in Australia and around the world, visit www.vetsbeyondborders.org



Reference

1. Eliminating Dog-Mediated Rabies in Sikkim, India: A 10-Year Pathway to Success for the SARA Program. *Frontiers in Veterinary Science Journal* (March 2017).

AN EXCITING NEW CHAPTER FOR INDEPENDENT ANIMAL HEALTH COMPANY

Elanco Animal Health Incorporated recently announced that it is now a fully independent company, becoming the second largest exclusively dedicated animal health company in the world. Last September, Elanco listed on the New York Stock Exchange, and on March 11 Eli Lilly and Company, Elanco's former parent company, completed the divestiture of its ownership. This completes the journey Elanco began in 2017, when Lilly first announced potential strategic alternatives for the 64-year-old animal health company.

Elanco's independence is a result of its diversification of the business and expansion of its global footprint, from largely a United States and livestock focused business to an even split between United States and international sales. Furthermore, the company built a strong pet business that now accounts for a third of the company globally.

"This is a historic day for everyone at Elanco," said Jeff Simmons, Elanco president and chief executive officer.

"It reflects our team's hard work over the past two years, the confidence that we have the right strategy and are successfully progressing the execution against it. With this milestone behind us, we look forward to a singular focus delivering innovative solutions and services for our customers, the farmers, veterinarians and pet owners that are central to our success. We welcome our new Elanco shareholders who join us and offer our appreciation to our customers, and Lilly for the decades of support," he went on to add.

Elanco is a leader in an attractive, growing global animal health market, which takes advantage of strong industry growth drivers: a global demand for protein – meat, milk, fish and eggs – increasing by around 75 percent by 2050¹. Furthermore, people have pets and are taking better care of them, which means pets are also

living longer and may experience diseases of aging, similar to people.

Animal well-being is also becoming increasingly important to consumers. Whether a cat, a cow or a chicken, people want animals to live quality lives and be well cared for. Sixty percent of consumers say they are increasingly concerned about animal welfare and how livestock are cared for.²

As a fully dedicated animal health company, Elanco will continue to identify targeted innovations to deliver on its promise of product and service innovation to benefit farmers, pet owners, veterinarians and the animals in their care.

"This milestone marks a new chapter in Elanco's history as we start our journey as an independent animal health company," said Dr Gunter Schuele, Acting Country Director, Elanco Australasia.

"Australia already has high rates of pet ownership, with the population of cats and dogs continuing to increase.³ Australia's livestock industries are also well-positioned to help meet the growing global protein demand," he added.

Elanco has established a portfolio of trusted global brands and built strong customer relationships over the years, offering additional solutions and services beyond the products to support producers operationally and analytically.

Elanco maintains a livestock research facility in Australia, to ensure future innovations meet the needs of local customers and local conditions.

"We are well positioned to capitalise on the strong industry growth drivers and look forward to building a bright future together with our customers and our employees in Australia", said Dr Schuele.



References

1. FAO. 2011. *World Livestock 2011 – Livestock in food security*. Rome, FAO. Retrieved from: <http://www.fao.org/3/i2373e/i2373e.pdf>
2. Packaged Facts. 2017. *Animal Welfare: Issues and Opportunities in the Meat, Poultry, and Egg Markets in the U.S.* April.
3. Animal Medicines Australia. 2016. *Pet Ownership in Australia*

IMPROVING YOUR DENTAL CHARTING, SCALING AND POLISHING IN DOGS

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

PERIODONTAL DISEASE AFFECTS 85% OF ALL DOGS OVER 2 YEARS OF AGE. IT IS A MULTI-FACTORIAL DISEASE THAT REQUIRES THE PRESENCE OF A NUMBER OF FACTORS SIMULTANEOUSLY. IN THE PAST, MANY VETERINARIANS HAVE CONSIDERED PERIODONTAL DISEASE TO BE AN INFECTION, BUT IT IS NOT, AND SHOULD BE CONSIDERED AN INFLAMMATORY DISEASE.

Whilst the initiation of gingivitis commences with plaque, the progression to periodontitis requires a number of factors including the individual's subgingival microbiome, calculus deposits, breed, bite type, malocclusions, genetics, epigenetics, the individual's immune response and overall general health, age, home dental care regime, chewing behaviour, composition and adequacy of saliva, muzzle hair, periodontal health and any existing pocket depths. Therefore, we need to treat the inflammation, as well as deal with the other factors, to ensure the health of the periodontal tissues.

The majority of our canine patients will suffer from Adult Onset Periodontal Disease (AOPD) at some point in their lives, commencing with gingivitis and progressing to periodontitis. Early periodontitis in juvenile patients has a greater genetic component, whilst older animals have a higher 'other factor' component.

TREATMENT GOALS of AOPD are:

1. Observe pathology and record it on a dental chart, for both your immediate history and clinic records and for future reference to confirm treatment success.
2. Remove plaque and calculus from the tooth surface - crown (including the sulcus) and root (periodontal pocket).
3. Remove diseased cementum and endotoxins from root surfaces and debride epithelial wall within periodontal pocket.
4. Provide a smooth tooth and root surface that slows the rate of plaque re-attachment and encourages pocket epithelium reattachment to the cementum/dentin.
5. Provide medications to control pain and decrease inflammation.

The primary purpose of general anesthesia and teeth scaling is to reduce the quantity of pathogens to a level that decrease inflammation and provide an environment for the host's immune system to commence healing.

STEPS are:

1. Provide the operator with the correct equipment.
2. Detect plaque in order to improve scaling.
3. Perform a thorough dental examination including sulcus and pocket depth measurement.
4. Record your findings on a permanent dental chart.
5. Scale and polish the teeth.

Detecting Plaque

Plaque is a mixture of bacteria and glycoproteins, invisible to the human eye that must be stained to be detected. The ideal way in your clinic to detect plaque is to use fluorosein and a blue light. This can be performed in the consulting room and in the dental suite. Plaque can be observed in the consulting room using commercially available fluorosein or a fluorosein strip, like the one you use to detect cornea ulcers and a blue light. Hills, the pet food company supplied a blue light for Pet Dental Month last year, so you may already have one in the clinic. Fluoresein liquid stain is available from K9 Gums, www.k9gums.com.au.

Figure 1. Plaque enhanced using a blue light after fluorosein application.



The new Newtron ultra-sonic scaler, manufactured by Acteon and available from K9 Gums, contains a blue lighted handpiece that highlights plaque following placement of fluorosein. Fluoresein can be manually brushed onto the tooth or simply added into the water bottle, where the handpiece sprays the teeth with water impregnated with fluoresein prior to scaling. It is a brilliant technique to train your vets and nurse to ensure complete teeth cleaning and is not as messy as the red erythrosine dyes that stain white muzzled dogs 'pink'.

Video of manual placement of fluorosein with a brush can be viewed at: <https://vimeo.com/302622654>

Video of scaling using fluoresein enhanced by blue lighted Newtron handpiece can be viewed at: <https://vimeo.com/339266559>

Probing and Charting

A healthy tooth is surrounded by a sulcus, which is lined on one side by the tooth crown and the other by an epithelial wall. The bottom of the sulcus is an epithelial attachment to the tooth at the cemento-enamel junction. Periodontitis, an inflammation of the tissues surrounding the tooth, results in a loss of attachment and a deepening of the sulcus to form a pocket that exposes the tooth root and the deeper epithelial tissues. Periodontal probes are used to determine the position of epithelial attachment and thereby measure the depth of the gingival sulcus and periodontal pockets.

A graduated probe is placed along the tooth, under the gingival margin, until it reaches the resistance of the epithelial attachment. Gentle force should be used, as it is easy to penetrate through inflamed tissues. The depth is measured in millimetres from the gingival margin to the epithelial attachment and should be performed in two to three places on both the buccal and lingual/palatal surfaces of each tooth. The sulcus should measure 2mm or less, whilst the pocket demonstrates greater measurements. If the gingiva has receded, the measurement from the epithelial attachment to the cemento-enamel junction gives the loss of attachment. The depth of the pocket, as well as, gingival recession should be recorded on the dental chart.

Figure 2. A graduated periodontal probe.



Figure 3. Diagram of 'how to use a periodontal probe'.

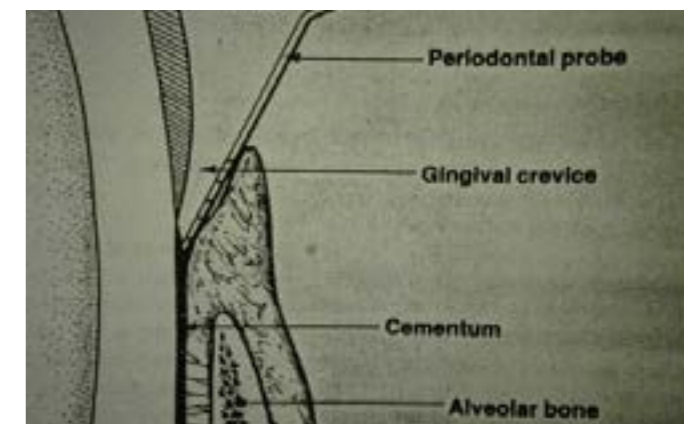


Figure 4. Using a periodontal probe to measure periodontal pocket depth of 10mm of the mandibular 3rd incisor tooth.



Video of periodontal probing can be viewed at: <https://vimeo.com/302620419>

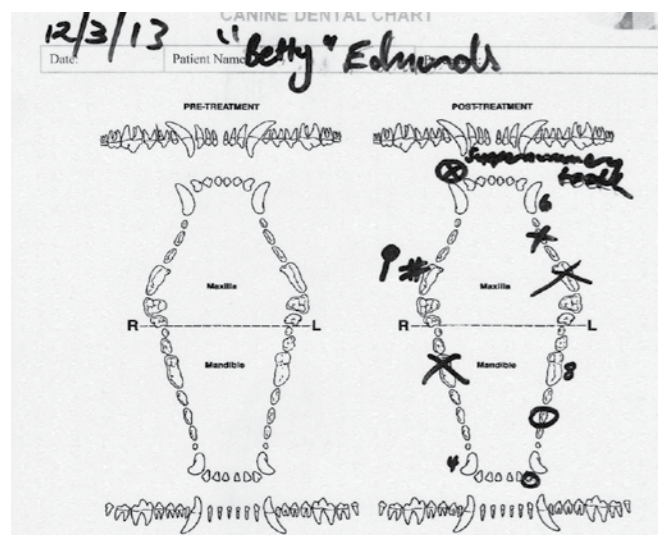
After measurement, each of the probing depths are recorded on the chart adjacent to the tooth, ie 6mm pocket on buccal surface of maxillary left canine tooth; 8mm pocket on buccal surface of mandibular left 1st molar tooth. All pathology should also be recorded on the dental chart.

This could include missing teeth, extra teeth, fractured teeth, gingival recession, gingival enlargement, furcation exposure, mobility, oral tumours.

Dental charts are available on paper or cloud based electronically. A copy of our clinic's paper and electronic charts are used as examples. On the paper chart, ie the maxillary right 4th premolar tooth was fractured and required a root canal treatment to be performed – represented by a # symbol and filled in 'lollipop'; a supernumerary maxillary right 3rd incisor required extraction – represented by a cross in a circle; the maxillary left 2nd and 4th premolars and mandibular right 1st molar were extracted – represented by crosses over the tooth; the mandibular left 2nd incisor and 3rd premolar were missing – represented by a circle around the tooth. The other pathology symbols are in the Abbreviation key text box on the left side of the chart. Gingivitis, plaque and calculus may also be recorded on the chart. These can be designated an index from 0 to 4, which represents the degree of gingivitis and the surface coverage of plaque and calculus. The numbers are then recorded on the chart. The paper charts are available on the internet. The electronic charts are available from www.vetdentalcharts.com and allow the veterinary nurse to record using an Apple ipad or tablet with a stylus on the basic draw-on-chart or the advanced version using dental nomenclature. It is even possible to customize your own terms. The charts are available for a trial period before subscribing.

Video of completing an electronic chart can be viewed at: <https://vimeo.com/339313768>

Figure 5. 'Betty Edmunds' written paper dental chart showing pathology



Supra-gingival Scaling

Gross plaque and calculus deposits can be removed from the supra-gingival surfaces of the teeth with tartar removing forceps, hand-held scalers or power scalers. Tartar removing forceps are designed in a similar fashion to extraction forceps, with the difference being they have one curved beak and one straight beak rather than two straight beaks. The straight beak is placed against the cusp of the tooth, whilst the curved beak is placed at the gingival margin. The handles are squeezed together which results in the calculus being chipped/shaved off. The force from the beaks is parallel to the long axis of the tooth, compared to extraction forceps, where the force would be across the tooth. Using tartar removing forceps, decreases the chances of fracturing the cusp.

Hand scalers

Hand scalers have a handle connected to a blade, which has a double-sided cutting edge that converges to a sharp point. The blade is triangular in cross section. The sharp blade is used to remove plaque, calculus and other deposits from the supra-gingival tooth surface. They are held in a modified pen type grasp. The blade is placed on the tooth surface at the gingival margin and used in a pull stroke that moves the blade away from the gingival margin. The most common scalers are the Universal (or H6/H7), the Jacquette and the Morse. The Universal is the most common in Veterinary practices. The Universal has a long blade, the Jacquette has a medium sized blade and the Morse have small, almost miniature size blades.

VIDEO of hand scaling can be viewed at: <https://vimeo.com/299761600>

Figure 6. The blade of a curved scaler (A Universal – H 6/7).



Ultrasonic scalers

Ultra-sonic scalers may be used for removal of supra-gingival plaque and calculus. Ultrasonic scalers operate at >25kHz. The principle action of plaque and calculus removal is either

by a mechanical action or cavitation. The mechanical action is achieved by the vibrating tip contacting the calculus and breaking it off. Cavitation is the production of sound waves derived from physical vibrations of the tip energizing the water spray, which then clean the tooth. The cavitation effect can be dangerous to the operator. Cavitation produces a bacteria laden aerosol that when inspired by the operator may result in a respiratory infection.

The handle of the ultrasonic scaler is held in a pen-like grip. The tip is placed against the tooth surface at the gingival margin and in light contact with the calculus. The tip is moved using light strokes over the surface of the tooth. The operator should allow the vibrations to shatter the calculus. If the tip is used like a hand-held scaler, and force is placed against the calculus, the tip is likely to break.

The ultrasonic scaler can be safely used on any tooth surface that you can visualize, but the tip of most scalers can get quite hot without adequate water cooling, to the point where damage to the tooth and surrounding tissues occurs. The water spray should be directed at the end of the tip to dissipate heat. If used inappropriately or for excessive amounts of time on a single tooth or on young growing tissue, damage will result. To avoid excessive heating of an individual tooth and tissue damage, the tip should be continuously moved over the tooth surface and a single tooth should only be scaled for the shortest time possible. If the ultrasonic scaler does not remove the calculus from the developmental ridges and cusps, then a hand-held scaler should be employed.

Care must be used when using most ultrasonic scalers is the gingival sulcus, as they can easily overheat the epithelial tissues and the tooth. The NEW Newtron ultrasonic scaler produces minimal heat and can safely be used on the crown with no time limit as well as subgingivally without heating and damaging the delicate tooth root surface and pulp. The Newtron is also safe to use with the curette shaped tip in periodontal pockets.

Video of ultrasonic scaling can be viewed at: <https://vimeo.com/299769052>

Figure 7. Teeth prior to ultrasonic scaling



Figure 8. Teeth after ultrasonic scaling



Polishing

Polishing the tooth surface following scaling is performed to remove any microscopic plaque and calculus and to provide a smooth tooth surface that retards the re-attachment of plaque and calculus. Supra-gingival scaling and root planing, even when done correctly, will leave a roughened enamel surface that will encourage plaque reattachment. Polishing is performed by applying an abrasive paste in a cup to the tooth surface. Pressure on the cup will flare the edges, which can then be directed slightly under the gum, to polish sub-gingivally.

Generally speaking, there are two types of polishing actions. The traditional cup, which rotates continuously at 5,000 rpm and the newer type of cup with a reciprocating action, back and forward. The cups should not be applied to the tooth surface for greater than two seconds duration as the heat generated can cause an increase in dentine temperature and an irreversible pulpitis. Pastes are available in different flavours and grades. Bubblegum, Mint, Pina Colada and Banana are popular. Fine grades produce a smoother finish, whereas course grades will remove more enamel and produce a rougher surface. It is also possible to purchase paste in a multi-use jar or individual caplets. The same prophyl cup should not be repeatedly dipped into the multi-use jar during teeth polishing, as it will become contaminated. The paste can be placed into separate dappen dishes for each patient. A new cup should be used for each patient.

Video of polishing can be viewed at: <https://vimeo.com/299764076>

Figure 9. Polishing cup on slow speed motor



Figure 10. Prophyl paste in a multi-use jar.



Sulcular lavage is the term used to describe flushing the gingival sulcus and periodontal pockets with saline or water after the teeth have been polished to remove any free-floating debris and polish. VIDEO of sulcular lavage can be viewed at: <https://vimeo.com/299763377>

If you would like to watch a presentation on Improving your Periodontal Cleaning, it can be viewed here: <https://vimeo.com/270919552>

STUDENT ACCEPTS INTERNATIONAL EQUINE RESEARCH INTERNSHIP

Charles Sturt University (Charles Sturt) Bachelor of Equine Science student Adelaide Kovac has been accepted into the prestigious and highly competitive Kentucky Equine Research internship program.

The 12 month internship program is open to four people annually and is conducted in the Kentucky Equine Research (KER) headquarters in the United States. The centre is considered an industry leader in equine nutrition and exercise physiology research across a wide range of equestrian disciplines.

Ms Kovac said the internship is a highly sought after program and was surprised and thrilled to be accepted.

“To be considered for the internship I had to have already undertaken equine studies and at least five years working with horses,” Ms Kovac said.

Over the 12 months of the internship Ms Kovac said she will be involved in equine research and attending nutrition conferences in Kentucky and Florida as well as attending the Kentucky Derby and the Land Rover Kentucky Three Day Event.

Ms Kovac said the internship was an exciting opportunity to blend her passion for research and managing horses on the centre's farm.

“The internship program covers all aspects of equine nutrition and monitoring horse health and fitness but I will also be doing day-to-day applied management of the horses on the farm,” Ms Kovac said.

Charles Sturt associate Professor in Equine Science, Hayley Randle said Adelaide was a great ambassador for the Bachelor of Equine Science.

“Adelaide is passionate about horses and will be a strong ambassador for the Charles Sturt University Equine Science courses. As well as being a keen competitor in eventing, she is always keen to put the latest theory into practice and having the opportunity to work with KER is a perfect next step before coming back to us for the next step in her higher education studies,” said Associate Professor Randle.

“With only four internships offered each year, selecting an Australian shows the world respects what we are doing and that we are pulling our weight internationally in terms of research and industry relevance,” she added.

Kentucky Equine Research already employs several Charles Sturt graduates in Australia.

Ms Kovac will move to the United States at the end of June to commence the internship. Following the internship Ms Kovac said she will return to Charles Sturt to complete an Honours project.

STUDY SHOWS ENDOCRINE-DISRUPTING CHEMICALS LINKED TO EQUINE METABOLIC SYNDROME



Endocrine-disrupting chemicals (EDCs) in a horse's environment may play a role in the development of equine metabolic syndrome (EMS).

This finding, made by Morris Animal Foundation-funded researchers at The University of Minnesota, in the United States, could explain some of the variability in EMS severity that can't be explained by other commonly measured factors, such as diet, exercise and season. The study was published in *Chemosphere*.

"This is a pivotal piece of a very complicated jigsaw puzzle. There are a lot of horse owners out there who are very diligent about providing their horses with fantastic care, but the horse is still diagnosed," said Dr Molly McCue, Professor and interim Associate Dean of Research in the College of Veterinary Medicine, University of Minnesota.

"It's important to be aware that these chemicals contribute to the problem, so we can look for ways to reduce horses' exposure to them," she added.

The team studied more than 300 horses from 32 farms in the United States and Canada. They focused on Welsh ponies and Morgan horses, as these breeds are more likely to develop EMS than others. The team collected data on the horses' lifestyles, including diet, exercise and past illnesses, as well as their farm location.

Researchers also examined plasma from the horses and looked for EDCs that have effects on receptors in the horse (estrogen [EEQ] and aryl hydrocarbon [TEQ] receptors). Simultaneously, they determined whether an individual horse had blood test results consistent with an EMS profile (including insulin and glucose at rest and following a sugar challenge). The team then analysed the results to look for correlations between plasma EDC concentration and these variables.

The team concluded that accumulation of EDCs may explain some environmental variance seen in horses with EMS, but the precise role and dose response to EDCs in horses with EMS is not clear at this time.

Endocrine-disrupting chemicals are usually man-made substances, found in products such as pesticides, plastics and personal care products. They are heavily prevalent in the

environment and can mimic a body's hormones, blocking real ones from doing their jobs. Because of this, they are known to produce harmful effects in humans and wildlife. Horses likely come into contact with EDCs through their food.

Equine metabolic syndrome, which has no cure, is characterised by endocrine abnormalities in horses and ponies. Affected horses and ponies have a tendency to develop pockets of fat and/or become obese, and they have altered insulin dynamics. EMS also is one of the most common causes of laminitis, a painful and very debilitating inflammation of tissue in a horse's hooves, leading to reduced performance, and in severe cases necessitating euthanasia.

"The more we know about a disease, especially a devastating and incurable disease like EMS, the more we can find innovative ways to prevent it," said Dr Kelly Diehl, Morris Animal Foundation Interim Vice President of Scientific Programs.

"While EDCs are difficult to avoid at the moment, the information from this study will greatly improve veterinarians' ability to predict the disease and provide opportunities to prevent it," she added.

This is the first study to examine associations between EDCs and disease in domestic animals. Dr McCue said it remains to be seen how significant the association is, but hopes future studies will further scientific understanding and help advance veterinary care for horses.



AUSTRALIANS COME TOGETHER TO IMPROVE ANIMAL WELFARE



If there is one thing most Australians agree on, it's that we all want better animal welfare.

A recently launched University of Queensland (UQ) initiative, The Animal Welfare Collaborative, brings together all interested Australians to work towards a shared goal, to make Australia a global leader in animal welfare.

UQ Professor of Animal Welfare Alan Tilbrook said that the Collaborative is currently working with 60 agricultural industry, government, academic, animal welfare and community groups.

"We have embraced all, no matter their disposition on the use of animals, and have brought them all to the table to talk," said Professor Tilbrook.

"The strength of the Collaborative is that it is led by Australian universities and thus provides non-partisan independence, credibility, and scientific rigour, allowing us to lead initiatives with a clear focus on the animals," he added.

The Animal Welfare Collaborative is funded by The University of Queensland and is powered by the tireless efforts of researchers at The University of Queensland, The University of Newcastle, The University of Western Australia and The University of Adelaide. The Collaborative is committed to working closely with all Federal, State and Territory Governments.

The Animal Welfare Collaborative has four key goals:

- Encouraging all of society to contribute their ideas on how to improve animal welfare
- Facilitating an inclusive, constructive, evidence-based discussion about animal welfare
- Promoting best practices in animal welfare
- Translating and enhancing a science-based approach to animal welfare

"The Collaborative has a broad remit of animal species to cover, but the group's initial focus is Australia's animal production and horse racing industries, which have been the focus of public concern in recent years," Professor Tilbrook said.

At a recent summit held in Sydney, the Collaborative brought together 60 organisations with a broad range of opinions to

'custom build' the Collaborative so that it becomes an efficient and novel instrument to achieve its goals.

Animal Health Australia CEO Kathleen Plowman said it was encouraging to see so many groups with a diverse range of views represented at the summit.

"The summit provided a respectful forum for discussion and debate, with everyone in agreement that providing animals with the highest level of welfare outcomes was the main priority," said Ms Plowman.

Nearly two thirds of the organisations present at the summit voiced their enthusiasm for continuing to work together to make The Animal Welfare Collaborative a success.



Dr Jill Fernandes and Professor Alan Tilbrook (The University of Queensland) photo by Cam Neville



Associate Professor Dominique Blache (The University of Western Australia), Dr Jill Fernandes (UQ), Professor Alan Tilbrook (UQ), Professor Rohan Walker (The University of Newcastle), Andrew Spencer (Australian Pork Limited), Wayne Bryden (UQ). Photo by Cam Neville.

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RESEARCH INDICATES MANY PET OWNERS KEEN TO HAVE VEGAN PETS



A surprising number of pet owners, particularly those who are vegan, are interested in feeding their pets a plant-based diet, according to new research from the University of Guelph (U of G) in Canada.

Researchers with U of G's Ontario Veterinary College (OVC) along with colleagues in New Zealand conducted an online survey of 3,673 dog and cat owners from around the world to learn about what kinds of foods they fed their pets and themselves.

Published in the journal PLoS One, the survey found that 35 per cent of pet owners whose pets ate conventional diets were interested in switching their animals to a vegan diet.

More than half of them (55 per cent) added, though, that they had certain stipulations that had to be met first before they would make the switch. Those stipulations included needing further evidence that a plant-based diet would meet their pets' nutritional needs, wanting approval from their veterinarians, and wanting plant-based pet foods to be easily available.

Just under six per cent of the survey respondents were vegan, meaning they ate no meat, dairy or fish, honey or other animal products, and more than a quarter (27 per cent) of them reported they already fed their pets plant-based diets.

Among the rest of the vegans, a full 78 per cent were interested in helping their pets to switch to a plant-based diet if one were available that met their needs.

Lead author Dr Sarah Dodd, currently a PhD candidate at the OVC's Department of Population Medicine, said even she was surprised by how many vegans had already chosen to eliminate meat from their pets' diets.

"That percentage, 27 per cent, might sound like a small number, but when you think of the actual numbers of pets involved, that's huge, and much higher than we expected," Dr Dodd said.

In total, 1.6 per cent of the 2,940 dogs in the survey and 0.7 per cent of the 1,545 cats were being fed a strictly plant-based diet. Only vegans and one vegetarian chose to exclusively feed plant-based diets.

Another 10.4 per cent of the dogs and 3.3 per cent of cats were intermittently fed vegetarian diets or plant-based foods.

Of the 3,673 pet owners surveyed, 6 per cent were vegetarian (meaning they ate no meat but did eat dairy, eggs or honey), 4 per cent were pescatarian (meaning they ate no meat but fish, and may eat dairy, eggs or honey), and nearly 6 per cent were vegan (meaning they ate no animal products).

Dr Dodd performed this study in fulfillment of her MSc degree in Clinical Studies under the supervision of Dr Adronie Verbrugge, associate professor of Canine and Feline Clinical Nutrition at the OVC's Department of Clinical Studies.

Dr Dodd said while her team's research was not designed to assess whether vegan pet diets are a growing trend, she expects interest in the diets to increase.

"People have been hearing about how vegan diets are linked to lowered risks of cancer and other health benefits in humans. There is also growing concern about the environmental impact of animal agriculture," she said.

Previous studies have also shown that pet owners tend to offer the same kind of diets to their dogs and cats that they adopt for themselves.

"So, while only a small proportion of pet owners are currently feeding plant-based diets to their pets, it is safe to say that interest in the diets is likely to grow. However, there has not been much research on the nutritional suitability of vegan diets for dogs and cats, nor on the health benefits and risks of plant-based diets in these animals, said Dr Dodd.

"This study shows there is a clear need for further research in this area," she concluded.



Reference:
Sarah A. S. Dodd, Nick J. Cave, Jennifer L. Adolphe, Anna K. Shovetter, Adronie Verbrugge. Plant-based (vegan) diets for pets: A survey of pet owner attitudes and feeding practices. PLOS ONE, 2019; 14 (1): e0210806 DOI: 10.1371/journal.pone.0210806

PETTING ZOOS HAVE POTENTIAL TO TRANSMIT HIGHLY VIRULENT DRUG RESISTANT BACTERIA



New research presented at this year's recent European Congress of Clinical Microbiology & Infectious Diseases (ECCMID) in Amsterdam, Netherlands shows that petting zoos can create a diverse reservoir of multidrug resistant (MDR) bacteria, which could lead to highly virulent drug-resistant pathogens being passed on to visitors.

The study is by Professor Shiri Navon-Venezia of Ariel University, the Israeli university located in the Israeli settlement of Ariel in the West Bank, and her colleagues. It aimed to explore the prevalence, molecular epidemiology, and risk factors for animals in petting zoos becoming colonised by MDR bacteria.

Petting zoos are a popular attraction around the world, allowing direct and indirect exposure of both children and adults to a diverse range of animal species. They are different from regular zoos because rather than visitors just looking at the animals, petting zoos are interactive with children visiting, holding and petting the animals.

Extended spectrum beta-lactamase (ESBL) and AmpC-producing Enterobacteriaceae (AmpC-E), which are resistant to a number of commonly used antibiotics, have become a matter of great concern in both human and veterinary medicine, so understanding the likelihood of them colonising the animals is critical to evaluating the risk that may be posed to visitors.

The researchers did a study across eight randomly chosen petting zoos geographically distributed throughout Israel, taking samples of faecal matter as well as from the body surface (skin, fur, or feathers) from 228 animals belonging to 42 different species.

Genetic sequencing was used to identify both the species of bacteria in each sample, and the presence of ESBL and AmpC drug resistance genes. Zoo owners were given questionnaires about the ages and medical histories of their animals which were analysed to determine additional risk factors.

In total, 382 samples were collected from 228 animals, and 12% of the animals were found to be colonised with at least one ESBL/AmpC-producing bacterial strain, with 35 different recovered species of bacteria. The majority (77%) of the MDR bacteria were obtained from faeces, with the remaining 23% coming from skin, fur, or feathers.

A quarter of those animals which tested positive for drug-resistant bacteria were colonised by more than one bacterial strain. Among the bacterial strains identified, were the highly virulent E. coli ST656, which causes travellers' diarrhoea, and E. coli ST127; a frequent cause of urinary tract infections in humans.

Analysis of the data revealed that if an animal was treated with antibiotics it was seven times more likely to shed MDR bacteria.

The study found that petting zoos provide a reservoir for a diverse range of ESBL/AmpC-E species, and are a potential source for shedding these highly virulent pathogens that may be transmitted to humans, mostly children, that occasionally visit these facilities.

"Our findings demonstrate that animals in petting zoos can result in shedding and transmission of MDR pathogens that may cause illness for human visitors, even when the animals appear healthy. We recognise the high educational and emotional value of petting zoos for children, therefore, we strongly recommend that petting zoo management teams implement a strict hygiene and infection control policy, together with rationalised antibiotic policy, in order to reduce the risk of transmission between animals and visitors," Professor Navon-Venezia explained.

"Immediate actions by zoo operators should include installation of handwashing stations to ensure proper handwashing before and after petting animals, prohibiting food and drinking near animals, and also not allowing petting of animals receiving antibiotic treatment," she concluded.



Materials provided by European Society of Clinical Microbiology and Infectious Diseases.

DROUGHT COULD BE INCREASING Q FEVER RISK, BUT THERE ARE WAYS TO PROTECT OURSELVES

WITH SEVERAL HUNDRED CASES DIAGNOSED EACH YEAR, AUSTRALIA HAS ONE OF THE HIGHEST RATES OF Q FEVER WORLDWIDE.

Q fever is a bacterial infection which spreads from animals, mainly cattle, sheep and goats. It can present in different ways, but often causes severe flu-like symptoms.

Importantly, the bacteria that cause Q fever favour dry, dusty conditions, and inhalation of contaminated dust is a common route of infection.

There are now fears the ongoing droughts in Queensland and New South Wales may be increasing risk of the disease spreading.

But there are measures those at risk can take to protect themselves, including vaccination.

What is Q fever and who is at risk?

Q fever is an infectious illness caused by the bacterium *Coxiella burnetii*, one of the most infectious organisms around.

Q fever is zoonotic, meaning it can transmit to people from infected animals. It's usually acquired through either direct animal contact or contact with contaminated areas where animals have been.

Goats, sheep and cattle are the most commonly reported Q fever hosts, although a range of other animals may be carriers.

Because of this association with livestock, farmers, abattoir workers, shearers, and veterinarians are thought to be at the highest risk of Q fever.

People who also may be at risk include family members of livestock workers, people living or working near livestock transport

routes, tannery workers, animal hunters, and even processors in cosmetics factories that use animal products.

Q fever can be difficult to diagnose (it has sometimes been called 'the quiet curse'). Infected people usually develop flu-like fevers, severe headaches and muscle or joint pain. These symptoms typically appear around two to three weeks after infection, and can last up to six weeks.



A small proportion of people will develop persistent infections that begin showing up later (up to six years post-infection). These can include local infections in the heart or blood vessels, which may require lifelong treatment.

Are Q fever rates on the rise?

In Australia, 500 to 800 cases of Q fever (2.5 – 5 cases per 100,000 people) were reported each year in the 1990s according to the National Notifiable Diseases Surveillance System.

A national Q fever management program was designed in 2001 to combat this burden. This program provided subsidised vaccination to at-risk people including abattoir workers, beef cattle farmers and families of those working on farms.

Results were positive. Q fever cases decreased during the program and following its conclusion in 2006, leading to a historic low of 314 cases (1.5 cases per 100,000 people) in 2009.

But since 2010, Q fever cases have gradually increased (558 cases or 2.3 per 100,000 were reported in 2016), suggesting further action may be necessary.

Every year, the highest numbers of people diagnosed are from Queensland and New South Wales.

And the true number of affected people is likely to be under-reported. Many infected people do not experience severe symptoms, and those who do may not seek health care or may be misdiagnosed.

Q fever and drought

The reason people are more susceptible to Q fever in droughts lies in the bacteria's capacity to survive in the environment. *Coxiella burnetii* spores are very resilient and able to survive in soil or dust for many years. This also helps the bacteria spread. It can attach to dust and travel 10km or more on winds.

The Q fever bacteria is resistant to dehydration and UV radiation, making Australia's mostly dry climate a hospitable breeding ground.

Hot and dry conditions may also lead to higher bacterial shedding rates for infected livestock.

The ongoing drought could allow Q fever to spread and reach people who were previously not exposed.



One study suggested drought conditions were probably the main reason for the increase in Q fever notifications in 2002 (there were 792 cases that year). This was the fourth driest year on record in Australia since 1900.

We still need more evidence to conclusively link the two, but we think it's likely that drought in Queensland and New South Wales has contributed to the increased prevalence of Q fever in recent years.

How can people protect themselves?

National guidelines for managing Q fever primarily recommend vaccination.

The Q-VAX® vaccine has been in use since 1989. It's safe and has an estimated success rate of 83–100%.

However, people who have already been exposed to the bacteria are discouraged from having the vaccination, as they can develop a hypersensitive reaction to the vaccine. People aged under 15 years are also advised against the vaccine.

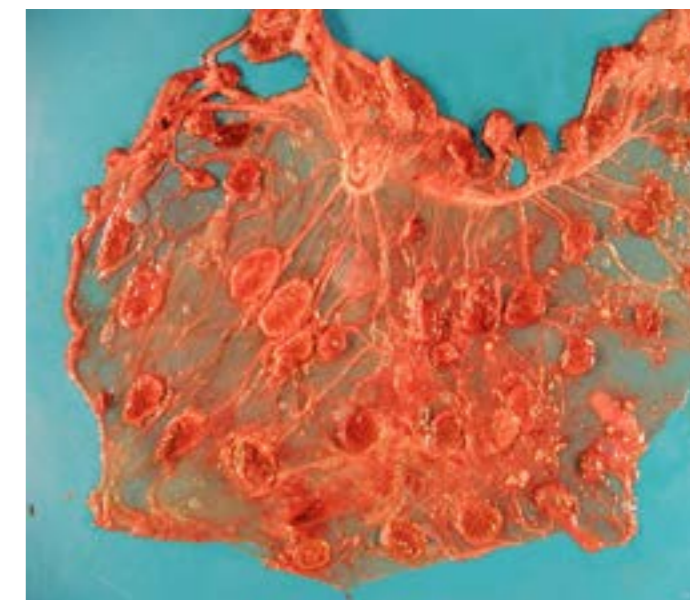
What else can be done?

Vaccination for people in high-risk industries is effective to prevent Q fever infection, but must be administered well before people are actually at risk.

Pre-testing requires both a skin test and blood test to ensure people who have already been exposed to the bacteria are not given the vaccine. This process takes one to two weeks before the vaccine can be administered, and it takes a further two weeks after vaccination to develop protection. This delay, along with the cost of vaccination, is sometimes seen as a barrier to its widespread use.

Awareness of the vaccine may also be an issue. A recent study of Australians in metropolitan and regional centres found only 40% of people in groups for whom vaccination is recommended knew about the vaccine, and only 10% were vaccinated.

We also need to better understand how transmission occurs in people who do not work with livestock ('non-traditional' exposure pathways) if we want to reduce Q fever rates.



A BRIGHTER FUTURE FOR ANIMALS IN NEED

Thanks to the generous donations of Australians across the nation, The Petbarn Foundation has raised an incredible \$1,070,506 which will go towards helping animals in need through the Tree of Hope Appeal.

Chief Executive Officer at Greencross Limited, Simon Hickey said, "We are incredibly humbled by the support and kindness of Aussies who have donated to the Tree of Hope Appeal this year. Collectively, over \$1 million was raised nationwide, which will go directly towards providing care and treatment for sick, injured, lost and abandoned animals, rescuing animals in crisis and educating people on responsible pet ownership".

"The generous contribution of the community will help thousands of Australian animals and will give them the chance to put a better paw forward in 2019," he added.

The appeal ran for six weeks with the goal to assist animal welfare groups in continuing the great work they do in building a positive future for animals of all shapes and sizes. The national appeal raised funds through selling \$3 JOY, \$5 LOVE, \$10 HOPE Christmas decorations in Petbarn, City Farmers and Greencross Vets locations.

Since launching in 2012, over \$11.7 million has been raised through The Petbarn Foundation for their foundation partners which includes over 100 animal shelters and welfare agencies from across Australia.



NEW TECHNOLOGY TO ASSIST PET OWNERS

UK based Sure Petcare is a leading pet technology specialist and soon to launch two new products in Australia.

Launching June this year, Animo dog behaviour and activity monitor enables owners to identify changes in behaviour, such as increased barking, scratching and shaking as well as managing sleep quality. And the SureFeed Microchip Pet Feeder Connect has integrated weighing scales to accurately portion a pet's food. Working with the Sure Petcare App, owners can see how much their pet has eaten, how often and when, supporting healthy eating, pets on specialist diets and medication.

The Sure Petcare app can be used to connect up to 10 Sure Petcare connected products including the SureFlap range of connected pet doors such as the SureFlap Microchip Cat Door Connect and SureFlap Microchip Pet Door Connect. When used in the same Sure Petcare app, owners can get a far more detailed view of their pet's behaviour, all in one place.

Animo, the dog behaviour and activity monitor delivers insights into a dog's activity and sleep, as well as problem behaviours such as shaking, scratching and barking. These insights help owners to understand the changing needs of their pet over its lifetime, enabling them to provide proactive and personalised pet care.

Worn on the dog's collar, Animo is lightweight, waterproof and suitable for dogs of all sizes. When used with the Sure Petcare

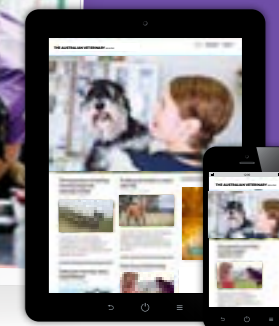


Animo app, owners can set and monitor daily activity goals for their pet, as well as view their pet's activity and behaviour reports by day, week, month or year. The app also provides an hour-by-hour sleep quality report every night, which can be compared against previous nights to easily spot changes in sleep patterns.



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COMPANION ANIMAL RESCUE AWARDS BACK TO INSPIRE PET RESCUE

AFTER A SUCCESSFUL LAUNCH IN 2018 ATTRACTING 517 ENTRIES, THE COMPANION ANIMAL RESCUE AWARDS ARE BACK AGAIN THIS YEAR TO INSPIRE RESCUE GROUPS AND ANIMAL SHELTERS TO CONTINUE THEIR EFFORTS IN SAVING COMPANION ANIMALS.

The 2019 Jetpets Companion Animal Rescue Awards program launched recently amongst rescue felines at the Cat Protection Society of NSW shelter in Sydney. New judges, categories and supporters were revealed. The Cat Protection Society was the recipient of the 2018 'Community Education and Outreach Program' Award for its Good Neighbour Project.

"Every year, 186,000 pets remain unclaimed in Australia's pounds and shelters, and thousands of volunteers support over 900 rescue and animal shelters across Australia," said Cathy Beer, Rescue Awards founder and rescue advocate from Pets4Life, an independent education resource for cat and dog guardians and those thinking of getting a pet.

The Jetpets Companion Animal Rescue Awards is a for purpose program whose mission is to celebrate and recognise achievements in the rescue, rehabilitation and rehoming of companion animals in Australia. The Rescue Awards is the platform to showcase excellence and innovation in rescue.

"In 2019, we're building on the success of last year. The judges are looking forward to receiving more outstanding submissions from the rehoming industry and I'll have the tissues handy when I read the entries for the 'Advocate® People's Rescue Story'" said Cathy.

"The Rescue Awards has not only unveiled the extraordinary work of an amazing rescue community, but also inspired the industry to improve processes, collaboration and innovation to help companion animals get a second chance in a loving home," she added.

This year, Jetpets is again the Platinum Rescue Hero and naming Partner. Sandy Matheson, Jetpets Managing Director said, "We are excited to come on board again as the Platinum Partner for the Jetpets Companion Animal Rescue Awards. Our motivation was simple. We want to support the amazing work being done by so many individuals and rescue groups across the country. I'm looking forward to congratulating the winners at this year's ceremony."



Categories

The 2019 Rescue Awards has eight categories with one winner for each category.

Award categories 1 – 7 are for rehoming organisations, including a new category 'Outstanding New Rescue Group' for rescues operating 12 – 36 months.

Category 4 Innovation in Rescue is now open to individuals/ organisations including veterinarians, who are doing things differently to help improve welfare outcomes for companion animals who need a home.

Category 8 'Advocate® People's Rescue Story' is for Aussie pet guardians who have adopted or fostered a pet.

"It's clear, pet adoption changes lives for the better. This year we're looking for 1,000 Advocate® People's Rescue stories about how an adopted or foster pet has transformed and changed their human's life," said Cathy.

The 2019 Jetpets Companion Animal Rescue Awards welcome back last year's judges who are looking for inspiring examples of excellence and innovation within and beyond the shelter.

The Rescue Awards is thrilled to announce new Judges Bondi Vet Dr Alex Hynes (and rescue dog Yoshi), Anne Boxhall who brings 28 years' experience in sheltering and rescue, and Bayer Veterinarian Dr Liisa Ahlström (with rescue cats Charlie & Olive).

The judges are:

1. Nell Thompson, Coordinator for Getting 2 Zero (G2Z) and Secretary of the Australian Institute of Animal Management (AIAM).
2. Tim Vasudeva, Director of Corporate Affairs at Animals Australia.
3. Vickie Davy, Co-Founder & joint CEO of PetRescue, not for profit organisation that brings thousands of rescue pets face-to-face with thousands of potential adopters every day.
4. Dr Anthony Bennett, Veterinarian & Co-star of Lifestyle Channel's TV series Village Vets.
5. Sandy Matheson, Founder & Managing Director of Jetpets, a pet travel company focused on the safety, comfort and welfare of pets.
6. Dr Anne Fawcett, Animal Welfare Veterinarian. Dr Anne's blog is smallanimaltalk.com.
7. Dr Michael O'Donoghue, Small animal veterinarian and Co-Founder of 'People and Pets', a nationwide grief and pet loss counselling service.
8. Dr Alex Hynes, Emergency Veterinarian and co-star in the new series of Bondi Vet TV show.
9. Anne Boxhall, Companion animal welfare advocate with 28 years' experience in sheltering and rescue
10. Dr Liisa Ahlström, Veterinarian, Companion Animal Products, Bayer Animal Health (category 8 Judge)
11. Dan White, Senior Brand Manager, Bayer Animal Health (category 8 Judge)
12. Cathy Beer, Founder of Pets4Life (category 8 Judge)

Pets4Life welcomed back renowned animal behaviourist Dr Joanne Righetti of Pet Problems Solved, as the Rescue Awards Ambassador.

Enter online from 1 May to close midnight on 30 June.

To enter, visit www.rescueawards.com.au and follow the links.

The winners will be celebrated at the Jetpets Companion Animal Rescue Awards ceremony on 12 September 2019 during the G2Z Summit on the Gold Coast, Queensland.

Jetpets rescue awards 2019 categories

1. Outstanding Rescue Group
2. Outstanding New Rescue Group
3. Outstanding Animal Shelter
4. Outstanding Council Animal Shelter
5. Innovation in Rescue
6. Community Education and Outreach Program
7. Volunteer of the Year
8. Advocate® People's Rescue Story



NEW

3D Joints tool

WIN
an iPad
Pro

The new digital education app that provides your clients with a realistic virtual 3D simulation of common joint conditions.

Packed with interactive features for a hands-on educational experience:

Show or hide anatomical labels

Capture screenshots that become customised disease information sheets for patient treatment plans

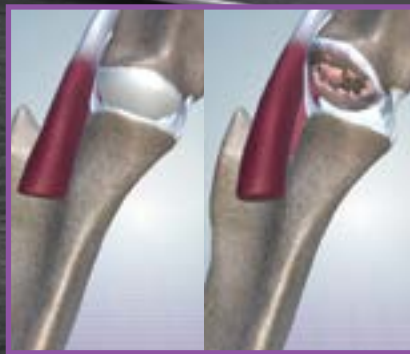
Show and hide layers of soft tissue and joint structures plus common pathologies

Zoom for closer examination

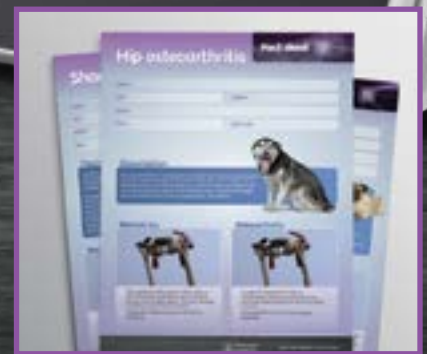
Realistic flexion-extension movement



Select from four joint areas; shoulder, elbow, hip and stifle to view and interact with realistic anatomical images from any angle.



Engage your clients with one touch comparisons between healthy and diseased joints.



Create personalised diagnostic documents for patients or Fact Sheets for pet owners.

Ask your Boehringer Ingelheim Territory Manager or call 1800 808 691 for a hands-on walk-through to experience this innovative tool.*

