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THE AUSTRALIAN VETERINARIAN MAGAZINE

Buying pets online: what you see is not always what you get

Vets help pets with cancer

Cat plague is back after nearly 40 years in hiding

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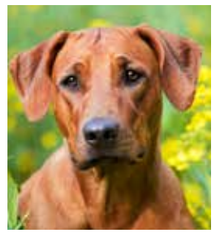

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THE AUSTRALIAN VETERINARIAN

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VETS HELP PETS WITH CANCER

NINE-YEAR-OLD RHODESIAN RIDGEBACK CROSS, GUS HAS PARTICIPATED IN AN INNOVATIVE AUSTRALIAN PILOT STUDY FOR DOGS WITH CANCER, WHICH HAS ACHIEVED SOME POSITIVE RESULTS.

University of Queensland (UQ) School of Veterinary Science senior pathologist Associate Professor Rachel Allavena said the trial involved directly injecting treatments into the dogs' tumours.

"The treatments resulted in 20 per cent of the dogs being cured of their cancer. For some of the other dogs, expected survival time was extended, from eight weeks to 12 months in one case, and 17 months in another," Dr Allavena said.

"My research uses immunotherapies, to 'wake up' the immune system so it recognises the foreign cancer, and starts to destroy it," she added.

Dr Allavena said the team was also trialling a vaccine made by extracting proteins from the dog's own cancer, customising it for each canine patient.

"In dogs which respond to the vaccine, the cancer melts away or stops growing, and Gus fortunately has benefited," Dr Allavena said.

"In both cases we know the treatments are safe for the pet dog, which gets to remain with their family throughout the treatment," she went on to say.

Gus's owner, Angela de Villiers, said she was heart-broken when she learned he had an aggressive cancer known as a mast cell tumour on his leg.

"His prognosis was not good and they told us they could not remove all of the cancer with margins due to its location," she said.

"We love our dogs, so subjecting Gus to a nasty surgery and then radiation therapy was just not an option, and we decided to just try and make what time he had left awesome. Dr Annika Oksa Walker and the UQ team looked at his case and assured me that he would not have to undergo too many long sessions," Angela explained.

"Luckily, although mast cell is bad, it responds well to the treatment. Gus started his treatments in early September and his tumour has not grown. He has no pain and there are no signs of it anywhere else on his body. Although there are no guarantees, we are very hopeful that Gus will be able to live a full life and enjoy his old age," said Dr Annika Oksa Walker.

Dr Allavena said canine cancers had similar appearance, behaviour, genetics and environmental causes to human cancers, so the study effectively advances both human and canine medicine.

"Cancer is common in our pet dogs, and certain breeds are very prone to specific cancers, creating a powerful research opportunity. The new treatments have cured pets, and provided safety and efficacy data for ongoing human clinical trials." she said.

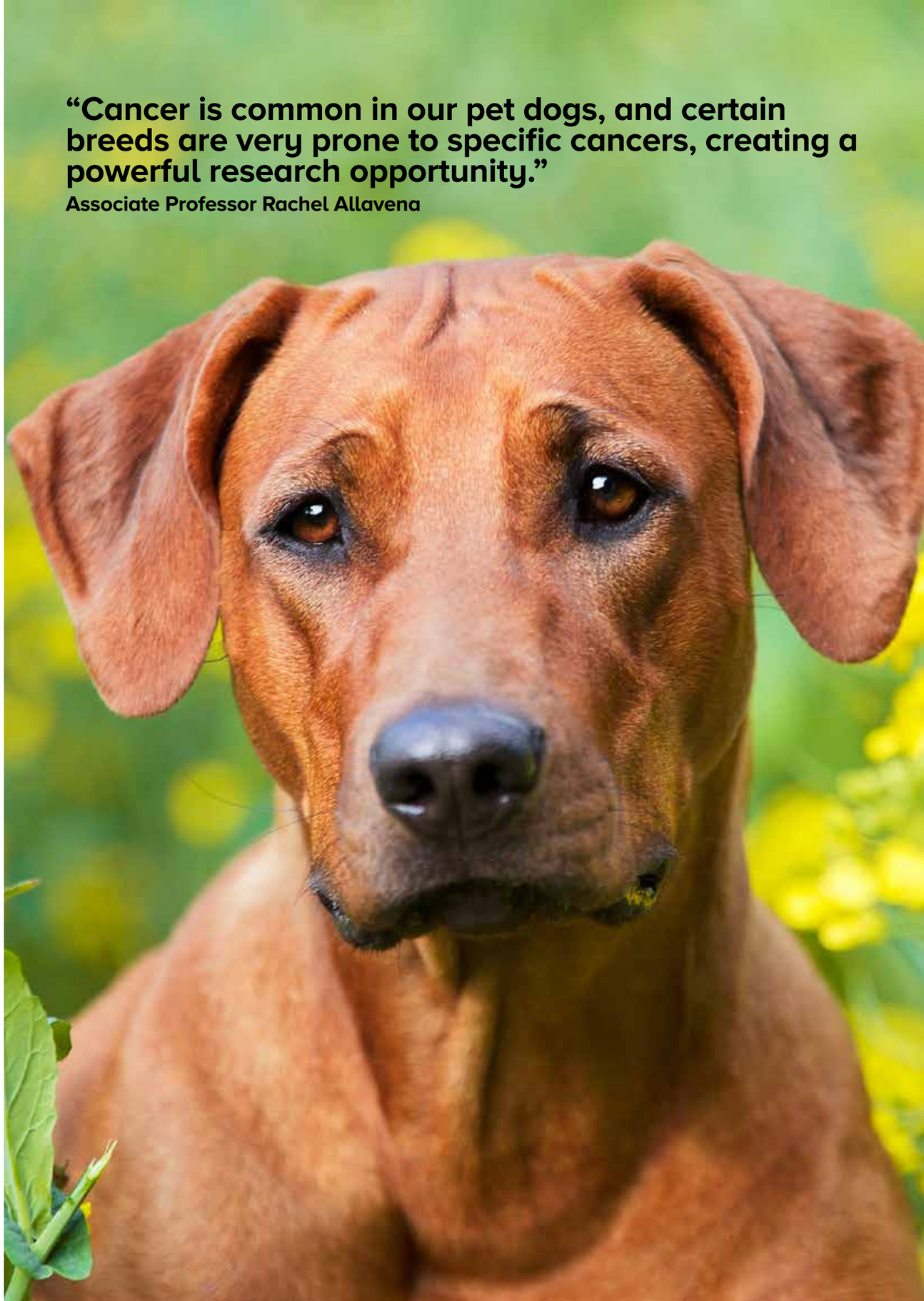
Dr Allavena's research group studies several major common and devastating cancers in pet dogs, including mast cell tumour, lymphoma, melanoma and carcinomas.

The UQ VETS Small Animal Hospital at the University's Gatton campus has internal medicine specialists who perform pet cancer treatments.

Dr Allavena said researchers appreciated community support to improve the health and welfare of pets such as Gus at the UQ VETS Small Animal Hospital.

"Our research has advanced with the support of the John & Mary Kibble Trust, Canine Research Foundation and private donors," she said.

The study is being conducted by UQ, in conjunction with colleagues at Australian National University and the University of Sydney.



CAT PLAGUE IS BACK AFTER NEARLY 40 YEARS IN HIDING

A DEADLY FELINE DISEASE IS NOW SPREADING BETWEEN CATS AFTER HIDING IN NATURE FOR NEARLY 40 YEARS. MULTIPLE CASES OF FELINE PARVOVIRUS, ALSO KNOWN AS CAT PLAGUE, OR PANLEUKOPENIA, HAVE RECENTLY BEEN REPORTED IN STRAY KITTENS IN THE GREATER MELBOURNE AREA.

Feline parvovirus was a common disease in the 1960's and 1970's. Australia was one of the first countries to develop an effective vaccine. Once widespread vaccination became routine, the disease was pushed back into nature.

In the 1970's, cases were typically seen in unvaccinated kittens purchased from markets or pet stores, and in shelters where vaccination protocols were lax.

Between the early 1980's and 2015, cases were unreported, but no doubt feral and semi-owned cats were still sporadically infected.

The re-emergence first occurred in animal shelters in Mildura and Melbourne in 2016 and south-western Sydney in 2016. Many cats died. Even survivors suffered greatly. In all these outbreaks, affected cats had one thing in common. They had not been vaccinated.

What is feline parvovirus and how does it kill?

Feline parvovirus has a predilection for infecting rapidly dividing tissues. Cells lining the small intestine of infected cats are killed, resulting in vomiting, diarrhoea (often bloody), fever, lethargy, anorexia and sometimes sudden death.

The bone marrow is transiently wiped out by the virus, resulting in a depletion of white blood cells. As a result, infected cats are unable to fight the invasion by secondary bacteria that attack the leaky gut wall.

Most cases of feline parvovirus are in unvaccinated kittens or young cats. The welfare of cats is hugely impacted by this terrible disease. It makes cats miserable for many days, if they survive.

Treatment involves intensive therapy in hospital: intravenous fluids by infusion pump, medication to reduce vomiting, expensive anti-viral treatment (omega-interferon), opioids for pain relief, antibiotics to treat secondary bacterial infections, and occasionally blood or plasma transfusions and nutritional support (feeding tubes).

Treatment can costs thousands of dollars, and many owners just can't afford it. But even with treatment, the fatality rate remains high.

Feline parvovirus is spread by faeco-oral contamination: from infected cats shedding virus in their faeces. Litter trays and natural latrines (such as sandboxes) are prime sources of infection.

This may occur where infected cats are kept close to uninfected cats (in shelters and pounds), and in homes where cats have outdoor access. But people can track feline parvovirus into their house on their shoes or clothing, so even 100% indoor cats are not safe.

Feline parvovirus can usually be quickly diagnosed by veterinarians using rapid point-of-care test kits and then confirmed in a lab. There is no risk of this virus spreading to human patients.

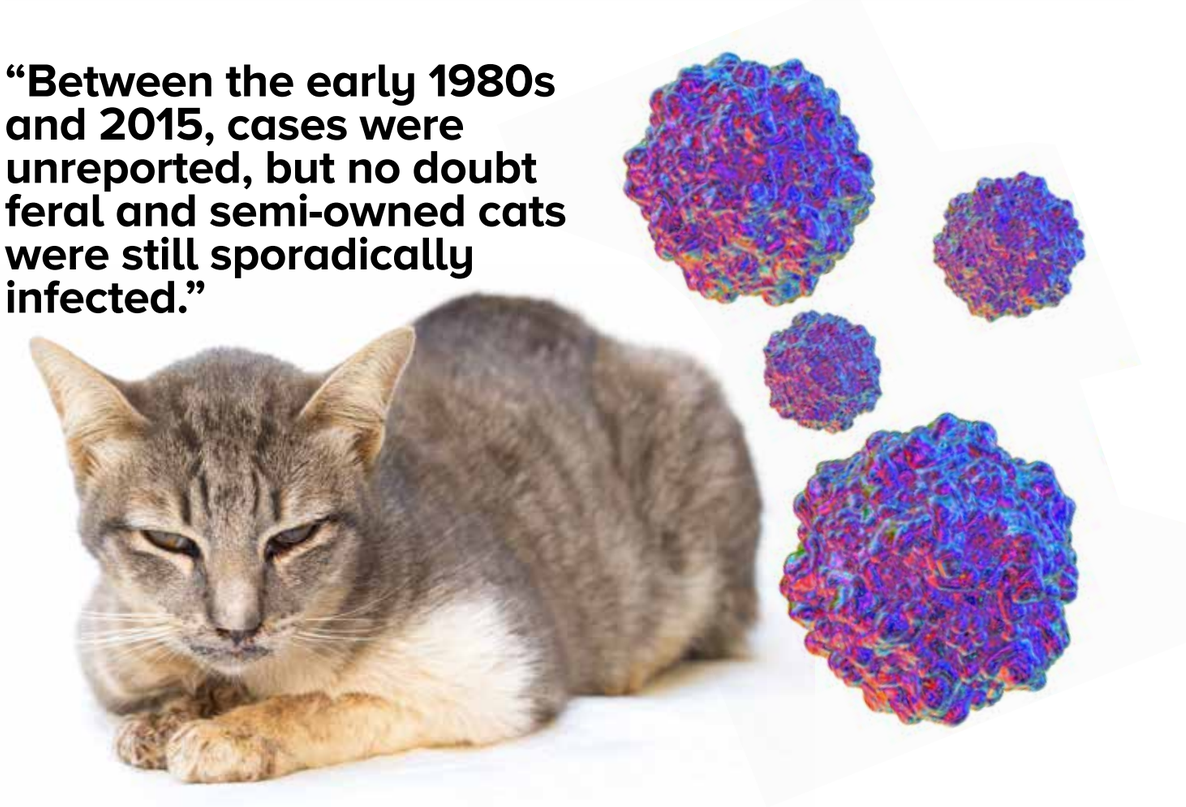
How did it re-emerge?

Feline parvovirus was never completely eliminated from the Australian cat population and instead has been maintained at low levels in the unowned and feral cat population for the past 40 years. Remember, there are perhaps six times as many unowned cats than owned cats in Australia!

This adaptable virus also has the potential to infect foxes and wild dogs, only later to be passed back to cats, providing a variety of potential environmental reservoirs.

Perhaps with an increased effort to rehabilitate and re-home 'fringe dwelling cats', it was inevitable that the virus would spill back from these unvaccinated cats into the general pet cat population, given waning herd immunity.

"Between the early 1980s and 2015, cases were unreported, but no doubt feral and semi-owned cats were still sporadically infected."



Consistent with this hypothesis is the first outbreak occurring in rural Mildura, a somewhat underprivileged socio-economic area compared to average (government figures show the median household income is A$878 per week), and subject to incursions by feral cats, foxes and wild dogs, including dogs used for hunting.

It is suspected that the cost of vaccinating the family cat (currently more than A$200 for a kitten requiring a course of two to three vaccines) exceeds the budget for many pet owners.

The best protection for any cat (and every cat) is widespread vaccination of as many cats as possible in the community at large. This 'herd immunity' is the best protection against this highly contagious, persistent, resistant virus. When vaccination rates fall below 70%, cat populations are in trouble.

How do we protect pet cats?

Vaccination against feline parvovirus is highly effective (more than 99%) and is given by veterinarians as part of an F3 or F4 vaccine at the same time as a routine health check.

The Australian Veterinary Association recently recommended all cats be vaccinated annually. But with the modern range of vaccines, there is good evidence that in kittens older than 16 weeks, a single vaccination produces immunity which last several years If a kitten has received two or three kitten vaccinations (the last one at 16-18 weeks of age), and a booster one year later, it likely has excellent protection against the virus, probably for several years, and possibly for life.

If an adult cat has received an annual vaccination in the past three years, it likely has excellent protection.

If a cat is more than three years overdue for its vaccination, it is sensible to visit a veterinarian soon. A cat will develop or maintain excellent protection within a few days of vaccination.

But what about unowned and feral cats?

We need to support efforts to vaccinate cats that have never been vaccinated against feline parvovirus – cats owned by people who are unable to afford vaccinations, and cats that have been dumped and are now unowned and free-roaming.

New South Wales is making some progress in this area. The NSW Cat Protection Society responded to a 2017 outbreak by subsidising free vaccinations for cat owners in Sydney. RSPCA NSW has ongoing targeted low-cost vaccination programs for cat owners, particularly in regional and remote areas of NSW.

Trap-neuter and return programs, while controversial, usually involve administering a F3/F4 vaccination to unowned and feral cats, thereby boosting herd immunity against feline parvovirus and also possibly reducing cat numbers.

CRITICALLY ENDANGERED FISH FIGHTING UPSTREAM BATTLE AGAINST BRUMBIES

Wild horses in the Kosciuszko National Park are trampling the habitat of critically endangered fish and, unchecked, could wipe out an entire species, a University of Canberra researcher has warned.

The Stocky Galaxias, a small freshwater fish, is fighting an upstream battle to remain in existence as the small body of water it exists in continues to be damaged by brumbies.

The species, which was listed as critically endangered by the New South Wales Government in 2016, is now confined to a single population in a three kilometre section of a small headwater stream in the Kosciuszko National Park.

Stocky Galaxias have previously fallen victim to the predatory brown and rainbow trout, which is responsible for a 98 per cent reduction in the fish's distribution.

But researchers from the University's Institute for Applied Ecology are becoming increasingly alarmed at the impact brumbies are having on the fish's habitat.

Associate Professor Dr Mark Lintermans, who is leading the study, said without intervention, the species is heading for further trouble.

"The decision by the New South Wales Government not to proceed with any lethal culling of wild horses removes the most viable method for quickly reducing the number of horses in sensitive habitats," Dr Lintermans said.

"Brumbies are very abundant in the small catchment where the Stocky Galaxias live, and they are eroding stream banks at their numerous creek crossings. This degradation means that sediment is now smothering the galaxias' breeding and feeding habitats," he added.

Dr Lintermans explained that Stocky Galaxias need clean rocky-bottomed streams to breed. They attach their eggs to the underside of rocks, with the eggs taking 30-40 days to hatch in the cold upland environment.

"Sediment smothers spawning sites and kills eggs, as well as filling up important pools where the fish live," he added.

University of Canberra Master of Applied Science (Research) student Hugh Allan, who has been studying the species' ecology since it was listed as critically endangered, said the study has also found that brumbies are impacting streamside vegetation, removing shading of streams and affecting the food supply to the fish.

"Streamside and overhanging vegetation is known to be a food source for many freshwater fishes, particularly in small upland streams, and the galaxiids family is no different," Hugh said.

"Stocky Galaxias are generally opportunistic feeders and it has been found in other galaxiid species that terrestrial invertebrates associated with native streamside vegetation comprise a substantial portion of their diet," he explained.

Dr Lintermans said Australia's national parks have an important role to play in protecting native flora and fauna and if non-native animals are threatening natural species, they needed to be adequately controlled.

"While replacement measures for culling such as fertility control and the relocation of horses sound good in theory, we need immediate solutions to save our endangered species," Dr Lintermans said.

"Fertility control prevents the continued expansion of horses, but it is a long-term solution, while relocating the animals is made difficult by the sheer number of horses. Neither of these methods will achieve a timely reduction of the threat to the Stocky Galaxias," he said in conclusion.

A stocky galaxias freshwater fish, which is part of a critically endangered population in Kosciuszko National Park. Photo: University of Canberra

Fine sediment in a horse crossing of Tantangara Creek, in Kosciuszko National Park. Photo: University of Canberra

The edge of a stream in Kosciuszko National Park that University of Canberra researchers say has been degraded by brumbies. Photo: University of Canberra

Brumbies in the high country near Kiandra, in Kosciuszko National Park. Photo: Karleen Minney

NEW TREATMENT TO TURN DOWN THE VOLUME OF 'ROARING' IN HORSES

The effects of a breathing condition in thoroughbred and tall horses is set to be reduced by new University of Queensland (UQ) treatment techniques.

School of Veterinary Science equine surgeon Dr Ben Ahern is investigating treatments for laryngeal hemiplegia, a degenerative condition known as 'roaring' that restricts oxygen intake during exercise in horses.

"The condition affects approximately 1350 Australian thoroughbreds every year, as well as other breeds such as draft horses, and results in exercise intolerance due to obstruction of airflow," Dr Ahern said.

"This obstruction causes the characteristic whistling or roaring noise for which the disease is colloquially known," he added.

Dr Ahern has dual qualifications from the American College of Veterinary Surgeons and the American College of Veterinary Sports Medicine and Rehabilitation, and said the current surgical treatment had a 70 per cent success rate, but was associated with a variety of potential complications.

Recently researchers in the United Kingdom and the United States have pioneered performing a standing surgery technique to correct the airway obstruction caused by the condition. The standing technique that Dr Ahern performs at UQ VETS Equine Specialist Hospital is aimed at reducing surgical complications and optimising the horse's post-operative performance.

In addition to these recent improvements, Dr Ahern has recently developed a prototype prosthesis which could replace functional muscle and can be customised to individual horses' requirements.

Dr Ahern said the prototype had proved successful in pilot studies but was still only proof-of-concept and not yet ready for commercial production.

He said breathing problems in horses were always complex, but the recent advances and techniques improved the quality of life and athletic careers of horses.

BIRD BACTERIA LINKED TO HORSE AND HUMAN HEALTH

Pregnancy losses in horses have been traced to a strain of bird chlamydia by researchers from the New South Wales Department of Primary Industries (NSW DPI) and University of the Sunshine Coast (USC).

Lead researchers, Dr Martina Jelocnik from USC's Animal Research Centre and NSW DPI microbiologist, Cheryl Jenkins, said veterinarians and people who are in contact with infected horses could also be at risk.

"The fact that birds can transfer chlamydia to humans is well known, now there is more evidence horses may transmit the disease too," Dr Jelocnik said.

"When humans are infected with the disease they can develop serious respiratory disease, which can require hospitalisation and antibiotic treatment, with a risk of long-term health problems," she added.

A team of researchers from USC, NSW DPI, Scone Equine Group and Hunter New England Health studied cases of pregnancy loss and foal death in 2016.

Dr Jenkins said DNA studies found at least 20 per cent of the cases may have been caused by the chlamydia strain Chlamydia psittaci, a bird pathogen.

"Further research is necessary to determine the range of potential factors influencing infection from birds and the risk equine infections pose to human health," Dr Jenkins said.

"Hendra and all infectious diseases which can be transmitted from horses to humans are reminders of the care people need to take when handling horses in Australia," she said in conclusion.

AIRWAY DISEASE IN RACEHORSES MORE PREVALENT THAN PREVIOUSLY THOUGHT

Racehorses need their breath to run their best. But inflammatory airway disease (IAD) can rob them of their stamina.

New research in the Ontario Veterinary College at the University of Guelph in Canada shows the disease is much more common than previously thought.

"We looked microscopically at the lung tissue of horses that died during or just after races, and quantified the inflammatory cells within their airways," said Professor Luis Arroyo, Department of Clinical Studies.

"We expected to find that the majority of the animals would have normal airways, with only a small number actually affected with the disease, but that was not the case," he went on to say.

Along with graduate student Federika ter Woort and Pathobiology Professor Jeff Caswell, Professor Arroyo discovered that most of the horses had some degree of IAD, with mild to severe airway changes.

Previous research suggested the disease occurs in up to half of equine athletes.

"The disease was known to be common in racehorses, but not as widespread as this study reveals," said Professor Caswell.

"The findings suggest that IAD does not result from unique exposure of an affected horse to the stimulus that causes the disease. But rather the research suggests that all racehorses may be exposed, with inflammation of the airways experienced by many," he explained.

Published in the American Journal of Veterinary Research, the study examined lung tissue from 95 deceased racehorses, including thoroughbreds, standardbreds and quarter horses that had actively raced or trained before their deaths.

This was the first study to assess inflammation on a tissue level and the first to discover airway inflammation in horses not specifically selected for poor performance.

"None of the deceased horses showed obvious signs of airway inflammation in their final three races," said Professor Arroyo. "The research shows that inflammation is always prevalent in racehorses, even those that may or may not have respiratory signs."

Unlike equine asthma in older horses, IAD causes no observable symptoms at rest but only during exercise. It most readily shows itself in poor race times, said Professor Caswell.

Possible causes of IAD include recurrent pulmonary stress, deep inhalation of dust, atmospheric pollutants and persistent respiratory viral infections. Young horses have higher risk of exposure to these factors because of frequent transport, intense exercise and time spent in stables.

Little is known about how IAD changes an affected horse's lungs, said Professor Arroyo.

"At this stage, the findings are mainly relevant to understanding the nature of the disease and how it develops. Until now, there was no knowledge about a potential correlation between the classification of the inflammatory cells in the airways and the lung tissues."

The Ontario Racing Commission requires a mandatory autopsy when a horse dies in or soon after a race. That means experts know a lot about what causes racehorses to die. But since IAD is not fatal, it has not been closely examined until now, Professor Arroyo said.

"This project gives important information regarding the health status of the performing horse. Developing a better understanding of IAD could lead to better health in horses and a more competitive horse racing industry."

Journal Reference:

Fe ter Woort, Jeff L. Caswell, Luis G. Arroyo, Laurent Viel. Histologic investigation of airway inflammation in postmortem lung samples from racehorses. American Journal of Veterinary Research, 2018; 79 (3): 342 DOI: 10.2460/ajvr.79.3.342

FUTURE VET KIDS CAMP ALL SET FOR ANOTHER SUCCESSFUL SUMMER PROGRAM

BY CAROLINE ZAMBRANO

SOME KIDS LOVE ANIMALS, AND FOR THOSE INTERESTED, PERHAPS EVEN A LITTLE OBSESSED WITH THEM, AN ANIMAL INSPIRED CAMP COULD WELL BE THE PERFECT SCHOOL HOLIDAY ACTIVITY.

Future Vet Kids Camp is an exciting veterinary-inspired school holiday program that caters to kids aged 9 to 16 years from around Australia.

It offers a safe, comfortable environment that explores and nurtures the human/animal bond, all under the supervision of highly qualified, enthusiastic instructors and specialised animal handlers.

The goals are to promote responsible pet ownership, the profession of veterinary medicine and to encourage children to love and appreciate animals of all kinds.

The camp has more than 20 partners that offer years of specialised animal experience and professionalism that contributes greatly to the programming.

The Camp operates out of Waverley College in Waverley, Sydney and runs every January for two weeks during the school holidays. Programming is split into three separate age groups running simultaneously each week: Wombats (ages 9 - 11), Kookaburras (ages 12 - 14) and the Junior Vet program (ages 14 - 16).

Some say Future Vet Kids Camp is like 'watching "Bondi Vet, except you're in it!"

In fact, the kids who recently attended the camp's 2019 program launch in Sydney with special guest 'Bondi Vet' Dr Alex Hynes thought just that.

The event took place at PetSure's pet-friendly workplace in Chatswood, where Dr Hynes gave a group of young animal lovers a taste of life as a veterinarian.

The Queensland vet said, "I'm so excited to be a part of the Future Vet Kids Camp. I grew up surrounded by animals and from an early age my dream was to become a vet, so the idea of a camp to show children what it's like to be a veterinarian is just brilliant."

"Plus, I have my own animal- obsessed daughter at home who shares my passion and it makes me so proud when I hear her tell her friends 'my mum saves animals," Dr Hynes added.

Dr Hynes shared her story, inspiring and educating the young animal lovers about "all the different kinds of animals, what care and protection they need and the types of patients I help every day, to showing them that even the shyest kid can achieve incredible things if they have self-belief, work hard and are surrounded by supportive people."

"Whether or not the kids end up following the path to a vet career, simply being around lots of animals and animal lovers will have such a positive impact on them. Animal interaction develops compassion, empathy and responsibility, as well as improving social skills and self-esteem," she said.

The kids also watched dog training in action by Jess Standstrom and inspiring videos from Camp graduates who are now in vet school and shared their advice and how they followed their dreams to become a vet.

Each year, the camp offers new experiences that inspire kids to return multiple times, said veterinarian and camp director Dr Scott Bainbridge, who appears on Animal Planet's TV show 'Animal House Call'.

"Future Vet Kids Camp encourages responsible pet ownership, the profession of veterinary medicine and a love and appreciation of animals of all kinds and their habitats," he said.

"We love to see the campers get excited about pursuing their dream to work with animals, and then go out with the knowledge and experiences they've gained at the camp and start making a difference for pets and people around the world. Camp graduates have already embarked on their educational journey at veterinary school and we look forward to following their successes."

The January 2019 schedule is once again packed with fun and educational animal adventures, excursions and talks by veterinarians, behaviourists and experts from animal rescue, reptile, small animal, canine sports groups and more. Campers will learn about scent detection, stem cell therapy, pet first aid, how to draw blood and suture and much more. They will get up close and personal with creepy crawlies, learn about wildlife conservation and animal rescue, and venture behind the scenes at vet hospitals.

Dr Magdoline Awad, PetSure Chief Veterinary Officer said "PetSure are proud to support the Future Vet Kids Camp by providing two scholarships to aspiring vets to attend the camp and the popular excursions that are part of the program." .

"The veterinary industry is such a wonderful and rewarding space and we are excited to be a part of a program that inspires young animal lovers to pursue their dream of becoming a veterinarian one day," she added.

The next Future Vet Kids Camp will run from January 7 - 11 and January 14 – 18, 2019. To find out more visit www.futurevetkidscamp.com

"The veterinary industry is such a wonderful and rewarding space and we are excited to be a part of a program that inspires young animal lovers to pursue their dream of becoming a veterinarian one day."

Dr Magdoline Awad

ACUPUNCTURE CAN HELP TREAT CHRONIC PAIN AND OTHER CONDITIONS IN HORSES

An Auburn University equine veterinarian is having success treating horses with chronic pain and other conditions by using a form of integrative medicine: acupuncture.

Kara Lascola, DVM, MS, Dipl. ACVIM (LA), CVA, an associate professor of equine internal medicine in the Auburn University's College of Veterinary Medicine Department of Clinical Sciences, in Alabama, in the United States.

She said acupuncture, a key component of traditional Chinese medicine, has been used in humans for over a thousand years. "In veterinary medicine, it has become more widespread in just the last 10 to 15 years," she added.

"While it is probably used more commonly on dogs, I routinely use acupuncture on horses for pain management associated with musculoskeletal condition, such as arthritis, and for treating neuropathies," said Associate Professor Lascola.

Veterinarians must be trained and certified to practice acupuncture, and Auburn currently has small and large animal veterinary faculty certified to practice this technique.

"For me and some of my colleagues, our interest in acupuncture stemmed from frustration with the limited options available for treating pain in horses, particularly pain associated with chronic conditions," she said.

There are different approaches to explain how acupuncture works.

"According to traditional Chinese medicine, there are pathways in the body along which energy flows. As a very simplified explanation, illness results in imbalances of this flow of energy. Inserting needles into acupuncture points, which are located on or near these pathways, are believed to correct these imbalances in energy flow. The choice of which acupuncture points to use depends on the underlying problem as well as a variety of patient factors," explained Associate Professor Lascola.

She said acupuncture can be an effective treatment method for a variety of conditions.

"It has even been shown that acupuncture stimulates the body's own release of endorphins, which are natural pain killing hormones. Acupuncture also seems to stimulate circulation and may increase the pain threshold," she added.

Individual animals respond differently to acupuncture therapy, and lasting results involve a series of treatments that are typically tailored to meet the needs of the individual patient.

"It is important to remember that acupuncture is not just a one-time treatment that produces long-term results. Treatment involves a series of sessions to be effective," said Associate Professor Lascola.

Associate Professor Lascola obtained her Doctor of Veterinary Medicine degree in 2003 from Tufts University's Cummings School of Veterinary Medicine, in North Grafton, Massachusetts, where she also achieved board certification in large animal internal medicine in 2007 and completed a post-doctoral fellowship in 2008. Subsequently she worked as an assistant and associate professor of equine medicine at the University of Illinois College of Veterinary Medicine, in Urbana. She became certified in acupuncture in 2015 and is trained to perform acupuncture on horses as well as small animals. She joined Auburn's equine faculty in January. In addition to animal healthcare, she and other faculty members have also introduced the therapy in the classroom, lecturing on acupuncture to senior veterinary students.

DOGS PREFER TO EAT FAT, AND CATS TEND TOWARD CARBS

DOGS GRAVITATE TOWARD HIGH-FAT FOOD, BUT CATS POUNCE ON CARBOHYDRATES WITH EVEN GREATER ENTHUSIASM, ACCORDING TO RESEARCH INTO THE DIETARY HABITS OF OUR TWO MOST POPULAR PETS.

The American study sheds new light on optimal nutrition for the animals and refutes a common notion that cats want and need a protein-heavy regimen.

Findings were recently published in the Journal of Experimental Biology.

“The numbers were much different than what traditional thinking would have expected,” said the study’s corresponding author, Jean Hall, a professor in the Carlson College of Veterinary Medicine at Oregon State University.

“Some experts have thought cats need diets that are 40 or 50 percent protein. Our findings are quite different than the numbers used in marketing and are going to really challenge the pet food industry,” Professor Hall said.

Dietary proteins contribute to a number of important physiological functions such as blood clotting, production of hormones and enzymes, vision and cell repair. Protein also has the most power to make the eater feel satiated. Carbohydrates are number two in that regard, followed by fat.

Professor Hall’s research involved monitoring 17 healthy adult dogs and 27 cats over 28 days and used four types of foods that were designed to taste equally good. With flavour out of the equation, the animals could make macronutrient choices based only on what their bodies were telling them they needed.

“Previous studies have shown that if you don’t balance palatability between foods, cats do in fact prefer to eat very high levels of protein and dogs want to eat a lot of fat. When you balance palatability, both dogs and cats prefer significantly different macronutrient content than what they would choose based on taste,” Professor Hall explained.

The animals studied by Professor Hall and her collaborators could choose among high-fat, high-carbohydrate, high-protein and balanced foods. Each day, dogs had an hour to eat all they wanted up to a predetermined caloric intake. That is, they could get all the calories they needed for metabolic requirements and to maintain weight, but no more.

The cats in the study were likewise not allowed to overeat, though even if given unlimited access to food that tastes how they like it, cats tend to eat in a weight-maintenance way by adjusting their intake based on the food’s energy density. In the study, cats had 24 hour food access up to the point of hitting their caloric threshold.

Food container placement for both dogs and cats was changed daily to guard against ‘bowl position bias’ affecting the results, which showed the cats on average chose to get 43 percent of their calories from carbohydrates and 30 percent from protein.

Dogs on the other hand went for 41 percent fat and 36 percent carbohydrates.

“Some experts have thought cats need diets that are 40 or 50 percent protein. Our findings are quite different than the numbers used in marketing and are going to really challenge the pet food industry.”

Jean Hall

Not a single dog or cat chose to get the highest percentage of its calories from protein.

Within the aggregate cat findings were trends correlating with age and lean body mass ie: how much muscle an animal has.

Younger cats with less lean body mass tended more strongly toward protein consumption than younger cats with more lean body mass. Younger cats in general wanted protein more than older cats.

On the dog side of the study, high-protein foods were the least popular among younger animals with less fat body mass. Dogs with greater fat body mass had the strongest preference for getting calories from protein.

“Because the choice of macronutrients was influenced in both dogs and cats by age and either lean body mass or fat body mass, that suggests a physiological basis for what they chose to eat,” Professor Hall said.

The research also involved determining the diets’ effect on selected metabolites of each macronutrient class ie: what they break down into in the body. Professor Hall found the older cats’ blood had much lower levels of DHA, a long-chain omega-3 fatty acid that’s important for the brain, heart and eyes, than the younger cats.

“None of the foods had ingredient sources of DHA or EPA, another long-chain omega-3, but cats are able to synthesize DHA by elongating and desaturating fatty acids. The older cats, though, are a lot less efficient at that,” explained Professor Hall.

More potential bad news for the older cats was that their concentrations of sulfated microbial catabolic products, protein-breakdown leftovers that in humans are connected to cardiovascular and kidney disease, were significantly higher.

“Just like with older people, older cats may have a different gut microbiome than younger cats, which would mean different microbial metabolic activities,” Professor Hall said.

Basically, if a younger cat gets more protein than it can use, it can safely deal with and dispose of the excess a lot better than an older cat can.

The Pet Nutrition Center of Hill’s Pet Nutrition, Inc., supported this research.

Journal Reference:

Jean A. Hall, Jodi C. Vondran, Melissa A. Vanchina, Dennis E. Jewell. When fed foods with similar palatability, healthy adult dogs and cats choose different macronutrient compositions. The Journal of Experimental Biology, 2018; jeb.173450 DOI: 10.1242/jeb.173450

ENHANCED THERAPEUTIC VACCINE PLATFORM ACHIEVES 2 PROOF-OF-CONCEPTS IN VETERINARY MEDICAL USE

SCIENTISTS FROM THE UNIVERSITIES OF BERN, ZURICH AND OXFORD AS WELL AS THE LATVIAN BIOMEDICAL RESEARCH & STUDY CENTRE LED BY PROFESSOR MARTIN F. BACHMANN (UNIVERSITY CLINIC OF RHEUMATOLOGY, IMMUNOLOGY AND ALLERGOLOGY, UNIVERSITY OF BERN) HAVE DEVELOPED A NEW THERAPEUTIC VACCINE TECHNOLOGY BASED UPON ENHANCED VIRUS LIKE NANOPARTICLE CONJUGATES. THESE VACCINES ARE BEING DEVELOPED BY JOINT EFFORTS OF ACADEMIC LABS, UZH SPIN-OFF COMPANIES (EVAX AG AND HYPOPET AG), A PRIVATELY HELD BIOTECH COMPANY SAIBA GMBH AND INNOVATIVE BRITISH ANIMAL HEALTH COMPANY BENCHMARK HOLDINGS PLC.

"This cutting-edge technology enables the latest advances in biologic medicines to be translated for use in companion animals at affordable prices - an option that will likely change the way we will medically treat our furry partners."

Prof. Martin F. Bachmann

Professor Bachmann has been working for many years on the development of therapeutic vaccines with notable successes that include a vaccine against hypertension (Lancet. 2008 Mar 8;371(9615):821-7) and CAD106, a vaccine against Alzheimer`s disease that is now in registration studies with Novartis.

The new enhanced vaccine platform has been engineered to incorporate a universal T-cell epitope for adaptive immune activation, a stimulator of innate immunity, and repetitive antigen presentation in a nanoparticle. Thus the vaccine platform is optimised for elderly and immuno-compromised individuals leading to induction of strong immunity and a high responder rate. This cutting edge technology enables the latest advances in biologic medicines to be translated for use in companion animals at affordable prices, an option that will likely change the way we will medically treat our furry partners.

The clinical potential of these vaccine candidates for use in veterinary medicine is now highlighted by two articles published back to back on the 4th of April 2018 in The Journal of Allergy and Clinical Immunology (JACI), the most-cited journal in the field of allergy and clinical immunology.

The team of scientists developed breakthrough therapies for insect-bite hypersensitivity in horses and atopic dermatitis in dogs by displaying either equine IL-5 or canine IL-31 on the immunologically optimised virus-like particles (NPJ Vaccines. 2017 Oct 23;2:30.). Thus, the researchers were able to generate vaccines that induced clinically effective levels of neutralising target specific anti-cytokine antibodies, which resulted in dramatically improved disease symptoms in immunised animals. This has previously only been achieved by passive immunisation with high amounts of monoclonal antibodies.

These vaccines are now being developed as first-in-class breakthrough medicines for treating chronic allergic diseases in the respective target species.

Vaccine against insect-bite hypersensitivity (IBH) in Horses

Allergic skin reactions caused by insect bites are the most common type of allergies in horses. One important form of such a skin allergy is called sweet itch, summer eczema or insect-bite hypersensitivity (IBH), and manifests in weeping and bleeding lesions including crust formation, scales, swelling and lichenification of the skin.

Thirty-four sweet itch affected Icelandic horses participated in a placebo-controlled double blinded clinical study performed by Fettelschoss-Gabriel et al., in which 19 horses received vaccine and 15 horses received placebo.

The vaccine consisted of two components coupled together. The first component is a general immune activation part based on the above mentioned enhanced virus like nanoparticle, and the second component is IL-5, a self-molecule. IL-5 is a cytokine and the master regulator of eosinophil development and activation, a major effector cell type in allergy. Immunisation with this conjugate vaccine was well tolerated and resulted in IL-5 specific auto-antibodies which neutralised its target. This limited the number of eosinophils localised to the skin and thereby reducing tissue damage. This resulted in strongly reduced skin lesion scores in vaccinated compared to the previous season, as well as placebo.

Unlike done in classical desensitisation, where one tries to make the immune system tolerant to the allergens, Fettelschoss-Gabriel et al. targeted the key effector cell in insect bite hypersensitivity, the eosinophil. This cell type also plays a key role in allergic human asthma and moncolonal antibodies against IL-5 have recently become an important new weapon for the treatment of the human disease. The new insights gained in horses may help to develop a similar new medicine in humans.

Vaccine against atopic dermatitis in dogs

Atopic dermatitis (AD) is the most common allergic skin disease in dogs. Extensive itching causes scratching which results in loss of fur and secondary infections of the skin, accelerating the symptoms. AD not only affects the well-being of dogs but also impacts the quality of life of their owners.

IL-31 is a key cytokine driving itching, and a monoclonal antibody against IL-31 has been licensed for use in dogs for the treatment of AD. The teams of Professor Bachmann and Professor Claude Favrot describe the development of a virus-like particle based vaccine against canine IL-31, and demonstrate that immunised dogs mount a robust IgG response which essentially abrogates symptoms of itching in house-dust mite sensitised and challenged dogs.

Hence, Bachmann et al. present a breakthrough therapy of vaccination against IL-31, which is not only a promising mode to treat AD in dogs but may also facilitate development of a similar vaccine in humans.

Journal References:

1. Fettelschoss-Gabriel et al. Treating insect-bite hypersensitivity in horses with active vaccination against IL-5. Journal of Allergy and Clinical Immunology, April 2018 DOI: 10.1016/j.jaci.2018.01.041

2.Bachmann et al. Vaccination against IL-31 for the treatment of atopic dermatitis in dogs. Journal of Allergy and Clinical Immunology, 04 April 2018 DOI: 10.1016/j.jaci.2017.12.994

GLENN BROWNING AWARDED REDMOND BARRY DISTINGUISHED PROFESSOR TITLE

Professor Glenn Browning has received one of the University of Melbourne's highest recognitions of academic excellence, the title of Redmond Barry Distinguished Professor.

Professor Browning is Director of the Asia Pacific Centre for Animal Health and Head of the Department of Veterinary Biosciences at the Melbourne Veterinary School, Faculty of Veterinary and Agricultural Sciences, University of Melbourne.

The Redmond Barry Distinguished Professor title is awarded in recognition of outstanding leadership in the University and the wider community, coupled with pre-eminence in research, teaching and creative activity.

A veterinarian and microbiologist, Professor Browning applies fundamental knowledge of the biological mechanisms and epidemiology of animal disease to the development of vaccines, diagnostic tests and other solutions to maintain animal health.

He has published over 240 research papers and book chapters and supervised over 50 higher degree research students.

With a team of researchers within the Faculty, Professor Browning has built the Asia Pacific Centre for Animal Health into a world class veterinary research centre. The Centre has made a significant contribution to production, companion and wildlife animal health through the development and provision of diagnostic services, the creation and commercialisation of vaccines and the delivery of research to elucidate fundamental disease processes.

Together with his colleagues, Professor Browning has developed a range of tests for animal diseases, which have improved the health and welfare of animals in farming systems and the economic wellbeing of people worldwide.

An example is the development of an assay for bovine mastitis, allowing easier detection of this potentially fatal bacterial inflammation of the udder.

Mastitis is the most common disease among dairy cattle worldwide and has severe effects on farm animal welfare and dairy productivity. His team has also been instrumental in the development of vaccines for a number of bacterial and viral diseases of chickens, and for pneumonia in pigs and cattle.

In recent years, Professor Browning has added to the growing awareness of responsible and sustainable antibiotic use as a chief investigator with the National Centre for Antimicrobial Stewardship.

He has advised a range of agencies and authorities, including as:

- Scientific advisor to the national regulatory agency for veterinary medicines, the Australian Pesticides and Veterinary Medicines Authority, on the regulation of anti-infective agents and vaccines
- A member of scientific and technical advisory groups to the New Zealand government on their current response to the incursion of Mycoplasma bovis into their dairy industry
- A contributor to the development of antibiotic use guidelines for the Australian veterinary profession
- An advisor on accreditation of animal health diagnostic laboratories.

Professor Browning is the third Faculty of Veterinary and Agricultural Sciences academic to receive the title of Redmond Barry Distinguished Professor following animal physiologist Frank Dunshea in 2016 and parasitologist Robin Gasser in 2017.

PREVENTATIVE TREATMENT IS THE ANSWER

When it comes to a pet's health, preventative treatment is the answer. The effects of many diseases and injuries are preventable and can be managed better if identified, treated and managed early on by a veterinarian. Including ailments like hip and elbow dysplasia and other form of joint disease.

Why is it that we don't promote more to our Clients the need for them to think proactively as a pet owner and invest in preventative options for their pet particularly with Joint Disease?

Here are some trends which support the need for Veterinary Clinics to start to think more about prevention and suite of dietary supplements as part pf their role with the Pet Owners:

- The Australian trend for Pet Owners buying dietary supplements is now the highest growing pet product. In 2015 it was worth $46 million, then in 2016 the market was valued at $51 million and is now forecast to grow to $67 million by 2020.
- Pet owners are becoming increasingly educated on pet health and are seeing dietary supplements as a viable solution for safe guarding their pets health, we need to embrace this desire and be proactive in engaging with them on options.
- Pets are living longer and subsequently developing more age related problems. People are taking clues from their own ways of staying healthier and applying to their pets.

The most common question asked of a veterinarian by their clients is "What is the best joint product for me to use?".

Veterinarians have not always liked answering this because there are so many options available but honestly don't have the time to truly evaluate the actual data behind the products. The biggest criticism within the veterinary profession of joint related products has been:

- Lack of scientific validation behind the products and their claims
- Issues associated with product administration (site reactions, withholding periods, etc)
- Ease and cost per dose of administration.

Joint disease/arthritis is degenerative and is a slowly progressing disease often occurring in a pet long before they show physical signs. Pet owners as they become more educated are looking for options and when not presented with an option by their considered expert (the Veterinarian) often turn to invalidated options.

However there is now a genuine option for use as a preventative and treatment in pets with joint health concerns.

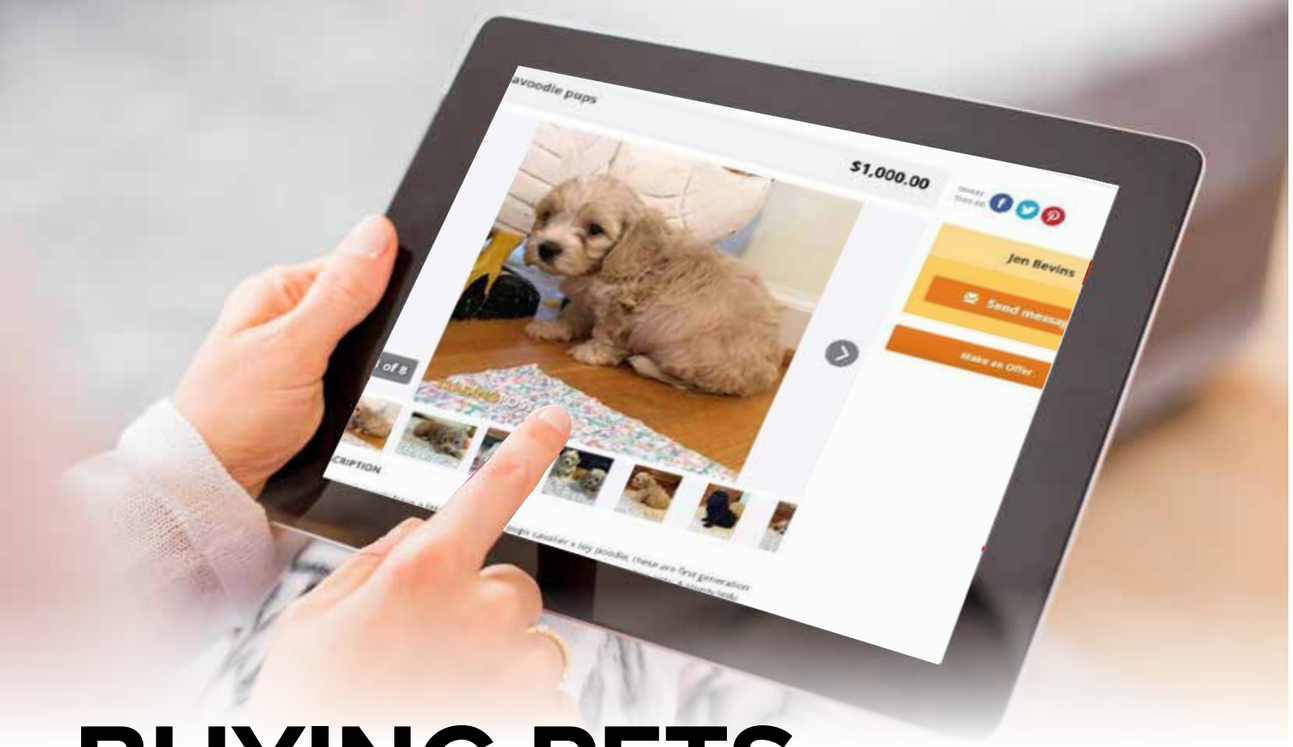
4CYTE is a powerful new generation approach scientifically developed to address the clinical signs of joint health and modify the process by reversing and repairing the pathological process that is occurring in the diseased joint. It contains the new active Epiitalis – patented for its ability to proliferate chondrocyte cells in an inflamed environment and anti-inflammatory properties. It has demonstrated safety and efficacy through 12 years of clinical and research and studies.

"We have been using 4CYTE Canine now for almost 2 years with excellent results and one of the biggest areas of use and its recommendation is as a preventative treatment option for degenerative joint disease, particularly in very active dog breeds, working dogs and large breeds. At our clinic, we promote to our clients that prevention is better than cure and we have utilised 4CYTE and its disease modifying capabilities to that effect.

We are pleased to see the quality research validating its capabilities which has given our team and our client's confidence that the product they are using in their pets is providing genuine benefit. It is also a simple cost effective application that our team of vets and our clients have been extremely pleased with.

We recommend 4CYTE as both a preventative and also treatment in cases where physical symptoms are evident and post-surgical cases such as cruciate surgery.

Why wait for pain and discomfort in a clients pet before acting, talk to your clients about what they can be doing which may include the use of 4CYTE." Dr Rob Page – Eureka Veterinary Hospital



BUYING PETS ONLINE: WHAT YOU SEE IS NOT ALWAYS WHAT YOU GET

THE INTERNET HAS DRAMATICALLY CHANGED THE WAY PEOPLE FIND THEIR NEW PETS. BUT WHAT ARE THE DANGERS OF BUYING A PET ONLINE?

Dr Susan Hazel from the University of Adelaide discussed this at the recent Australian Veterinary Association (AVA) Annual Conference in Brisbane.

“We don’t know exactly how many pets are sold online in Australia, but recent research into the numbers of dogs and cats advertised for sale online indicate that tens of thousands of pets are advertised every year,” Dr Hazel said.

“It’s not uncommon to come across misleading ads or outright scams online. There have been many cases of people receiving a sick or diseased animal, or a breed unlike the description in the online ad. The truth is, it’s difficult for members of the public to differentiate between good and bad ads,” she added.

Another concern with the online sale of pets is that animals traded online can often arrive with a blank medical history. Dr Hazel says that while responsible pet owners will advise potential new owners of a health or behavioural problem, not all owners are responsible.

“Even people who want to do the right thing might mislead a potential owner. If a seller is desperate to find their pet a new home, they may not disclose the real reasons for giving it up,” Dr Hazel said.

Fortunately, not all websites that advertise pets for sale are bad.

“There are also some highly reputable websites like PetRescue that help to find homes for surrendered pets in shelters or pounds,” Dr Hazel said.

AVA President, Dr Paula Parker said that it’s important for websites or online trading platforms that advertise dogs and cats for sale to follow standards that support animal welfare and protect potential buyers.

“Traditionally, companion animals have been advertised for sale in printed media such as newspapers or magazines. More recently there has been a move to the internet and social media as the primary place to source pets, and this trend is growing rapidly,” Dr Parker said.

“There are concerns that internet sites may be used for puppy farm sales and that the animal welfare standards of the sellers are not regulated. Some online sales may also breach legislation, for example, selling banned breeds or animals that are not microchipped,” she added.

The AVA has developed some guidelines around the sale of pets online:

- Animals advertised for sale must be weaned and independent of the mother and their age or date of birth must be included in the advertisement.
- A unique microchip number must be made available to the purchaser, and a recent picture of the animal should be included.
- Ideally, the medical history, including vaccination status, and pictures of the parents should be available to view on request.
- Where a permit or licence is required to keep or breed an animal, a copy of the permit (with personal identifiers removed for public viewing if necessary) should be displayed. The full permit should be available on request.
- Pregnant and lactating animals must not be offered for sale.
- Banned breeds must not be offered for sale.
- The advertisement should state whether the sale is from a private seller, commercial establishment or a re-homing centre or shelter.
- Sales of pets should be from a legitimate fixed address and not at markets or temporary locations.
- The website should include prominent information for buyers about how to avoid puppy farms, and recommend meeting the seller, the parent animals, and inspecting the breeding facility before purchase.
- The website host should ensure that no pets are advertised for swapping with other pets, goods or services.
- The website should be monitored and there should be a mechanism for the public to report non-compliant advertisements to the website host.

“The key is for people who are considering buying a pet online to first speak to a veterinarian who can provide some guidance and practical tips on where and how to find the right pet,” Dr Parker said.

“Even people who want to do the right thing might mislead a potential owner. If a seller is desperate to find their pet a new home, they may not disclose the real reasons for giving it up.”

Dr Susan Hazel

WORKING DOGS CAN ALSO BECOME VICTIMS OF THE US OPIOID EPIDEMIC

BY KATHERINE UNGER BAILLIE

IT'S HARD TO OVERSTATE THE MAGNITUDE OF THE CURRENT OPIOID CRISIS IN THE UNITED STATES OF AMERICA, WHICH CLAIMS MORE THAN 100 LIVES EACH DAY DUE TO OVERDOSES.

The impact of opioids radiates beyond the direct users, however, as secondary exposure to drugs can harm first responders such as police officers, firefighters, and even working dogs, which can use their perceptive noses to find illicit drugs.

Cynthia Otto, director of the University of Pennsylvania's School of Veterinary Medicine's Working Dog Centre, has been leading research to examine the effect of opioid exposure on the canine members of law enforcement teams.

Ranked among the top ten veterinary schools worldwide, the University of Pennsylvania School of Veterinary Medicine (Penn Vet) is a global leader in veterinary education, research, and clinical care. Founded in 1884, Penn Vet is the first veterinary school developed in association with a medical school. The school is also a member of the One Health initiative, linking human, animal, and environmental health.

Presented below is an edited and condensed version of an interview conducted by Knowledge@Wharton's Dan Loney on SiriusXM Business Radio. Here Cynthia Otto shares the latest findings about how dogs respond to opioids, how to protect them while they're working, and what police officers should do if their canine partners find their noses in opioids.

Q: Working dogs are being used to help combat the problem with opioid drugs, yet seemingly they are becoming part of the story. Tell us what you're seeing.

A: The really big issue is that fentanyl, which is one of the drugs that's lacing the heroin, can be absorbed across mucus membranes. When dogs are out there sniffing, if they get into a pile of powder, fentanyl can be absorbed across their mucous membranes in their nose, and they can face a life-threatening overdose. We want to help people to understand what that looks like, how we are going to treat that, and what the risks are that handlers and other people may face.

Q: What are you working on at Penn Vet now to investigate these issues and determine how we can mitigate the problems moving forward?

A: We're really focused on the police canines that are at the highest risk of being exposed. With support from the Department of Homeland Security and the Department of Defence, we have been conducting a study to determine what happens when these dogs are exposed to fentanyl. First of all, I have to explain the fentanyl is a drug that we use in normal clinical practice for anaesthesia all the time. We know about fentanyl in dogs when it's given intravenously. We don't know exactly what might happen when they inhale a bunch of it. But when we did our study, we gave it intravenously so it could be safe, just like we're doing in the hospital setting. We wanted to ask, how can we reverse an overdose? What does an overdose look like in terms of their behaviour? Do they just kind of go to sleep or do they have different effects that the handler could recognise?

Q: How similar are dogs' opioid receptors to that of human beings?

A: They have the same opioid receptors, but what most people don't realise is that dogs are not as sensitive to opioids as humans are. When we provide an opioid for a dog to create anaesthesia, it takes about 20 times the dose. If the dog is showing some signs of opioid intoxication, that means that was a really big dose, which means that there's probably a lot of that available to affect people as well.

Q: Naloxone is used to reverse overdoses with humans, correct? Could that be used with dogs and other pets as well?

A: Absolutely. That was our big question. In the hospital setting we use Naloxone all the time, but we give it in the muscle as an injection. We didn't know if using the intranasal Naloxone, which is what a lot of first responders have available, would be safe and effective in the dog. We needed to understand if the dose was appropriate. Our study compared the intramuscular injection versus the intranasal spray.

Q: What did you find? How fast is the recovery time for these animals after they receive a dose of Naloxone?

A: It's great. An injection or an intranasal spray gives a response in about a minute.

Q: Wow, that's quick.

A: By five minutes, they're totally back to normal. Now the thing we don't know is if the dog got a really, really high dose that lasts longer than the study we did, or a more potent dose of something like carfentanil, we don't know if one dose of Naloxone is sufficient. No matter what, a dog that's exposed should go to the veterinarian to check everything out.

Q: How fast do you need to give the Naloxone?

A: Dogs exposed to opioids can stop breathing in a minute or two, so you don't have time to say, "Oh, let's go to the vet." We have to treat in the field, and then we go to the vet and make sure everything else is okay.

Q: How can police officers prepare themselves to address an overdose in their dogs?

A: First of all, they have to recognise the signs that their dog might have been exposed. At an early phase, the dog's respiration rate increases. They may start panting, they may start salivating. They may actually whine or become a little anxious. And then it progresses on as the dose increases to becoming very sedate. Their heart rate slows down, then their breathing slows down, and then eventually their breathing stops.

We want the handlers to recognise the earliest signs, because we don't want it to progress to the signs where they're at risk. But one of the really important parts of all of this, if the dog's exposed, the powder will be everywhere. So a handler treating that dog has to realise that they now are also going to be exposed to that fentanyl that's on the dog, and they need personal protective equipment to prevent their own exposure. If the officer only has one dose of Naloxone, and you also are affected, it's going to be a really hard situation. We're recommending that officers carry multiple doses because we have to address the dogs and the humans for sure.

Q: What does all of this mean for the average person who may have a dog come into contact with opioids?

A: I think for pet dogs, it's probably a relatively low risk. But if you're in an environment where there may be these opioids out and around, that is a potential. We do know that ingesting the opioids, they're going to have to eat a lot more because it's processed by the liver and so it doesn't have as much of an effect as that absorption across the mucus membranes. They have to actually inhale it, as opposed to eating a bottle of oxycodone or something. If there is some exposure, then they need to get to the vet.

Q: What are your next steps?

A: We're doing the final analysis of our data and we want to have that published so that everyone can have access to it. We've already done webinars with a lot of the K9 groups through the Department of Homeland Security, and we want to create a video with a very clear explanation.

Q: There seems to be a growing recognition that this is something that K9 officers can face on the job.

A: The Pennsylvania State Police had me come in several months ago to train a whole group of their K9 officers on how to give Naloxone. At that time, we were giving it in the intramuscular route because we had data that it worked and was safe in the dog. So we had to train the handlers. What we've learned since then is, yes, the intranasal route can be very safe for the dogs.

The risk is out there. Luckily there have only been a few reported cases of dogs being affected, but there are groups now that are trying to really track and follow that, and know how real this is. Even if it's only one case, if we lose one of these police dogs, it's a huge loss. It's losing one of our first responders. It's losing an important member of the community. So we want to make sure we have all the tools in place.

DOGS COULD BE MORE SIMILAR TO HUMANS THAN WE THOUGHT

Dog and human gut microbiomes have more similar genes and responses to diet than we previously thought, according to a study published in the open access journal, Microbiome.

Dr Luis Pedro Coelho and colleagues from the European Molecular Biology Laboratory, in collaboration with Nestlé Research, evaluated the gut microbiome of two dog breeds and found that the gene content of the dogs' microbiome showed many similarities to the human gut microbiome, and was more similar to humans than the microbiome of pigs or mice.

Dr Luis Pedro Coelho is corresponding author of the study."We found many similarities between the gene content of the human and dog gut microbiomes. The results of this comparison suggest that we are more similar to man's best friend than we originally thought," he said.

The researchers found that changes in the amount of protein and carbohydrates in the diet had a similar effect on the microbiota of dogs and humans, independent of the dog's breed or sex. The microbiomes of overweight or obese dogs were found to be more responsive to a high protein diet compared to microbiomes of lean dogs. This is consistent with the idea that healthy microbiomes are more resilient.

Dr Luis Pedro Coelho, commented:

"These findings suggest that dogs could be a better model for nutrition studies than pigs or mice and we could potentially use data from dogs to study the impact of diet on gut microbiota in humans, and humans could be a good model to study the nutrition of dogs," said Dr Coelho.

"Many people who have pets consider them as part of the family, and like humans, dogs have a growing obesity problem. Therefore, it is important to study the implications of different diets," he added.

The researchers investigated how diet interacted with the dog gut microbiome with a randomised controlled trial using a sample of 64 dogs, half of which were beagles and half were retrievers, with equal numbers of lean and overweight dogs.

The dogs were all fed the same base diet of commercially available dog food for four weeks then they were randomised into two groups. One group consumed a high protein, low carb diet and the other group consumed a high carb, low protein diet for four weeks.

A total of 129 dog stool samples were collected at four and eight weeks. The researchers then extracted DNA from these samples to create the dog gut microbiome gene catalogue containing 1,247,405 genes.

The dog gut gene catalogue was compared to existing gut microbiome gene catalogues from humans, mice and pigs to assess the similarities in gene content and how the gut microbiome responds to changes in diet.

The authors caution that while humans and dogs host very similar microbes, they are not exactly the same microbes, but very closely related strains of the same species.

INNOVATIVE VACCINE OFFERS CANINE CANCER PATIENTS A SHOT AT A LONGER, HAPPIER LIFE

By Katherine Unger Baillie

Dr Nicola Mason is an associate professor of medicine at the University of Pennsylvania School of Veterinary Medicine in the United States. She is leading a multi-institutional clinical trial evaluating an immunotherapy approach to treat dogs with osteosarcoma, a cancer of the bone.

Osteosarcoma is the most common bone cancer to affect dogs. It is a painful and aggressive disease. Affecting more than 10,000 dogs in the USA annually, predominantly larger breeds, it kills more than 85 percent within two years.

As a researcher and veterinarian, Dr Mason is working to put a dent in those figures. Since she was a postdoctoral fellow in the laboratory of Carl June, the Perelman School of Medicine researcher behind the breakthrough CAR-T immunotherapy for treating blood cancers, Dr Mason has steadily pushed forward the field of immunotherapy in the veterinary arena.

A new US$775,000 grant from the Morris Animal Foundation will help her build on her past successes to test a vaccine that could improve longevity and quality of life for dogs with osteosarcoma. Dr Mason's team will conduct clinical trials to evaluate a novel immunotherapy treatment which combines a molecule expressed by cancer cells with a modified live form of the bacteria Listeria monocytogenes.

A pilot study demonstrated that this combination elicited a powerful, targeted immune response directed against osteosarcoma cells.

"We know that the traditional standard-of-care treatments we use for osteosarcoma are not effective at eliminating all tumour cells because the majority of dogs still die from metastatic disease. This immunotherapeutic approach is very promising as it stimulates the patient's own immune system to seek out and specifically kill cancer cells that remain after traditional standard-of-care therapy," Dr Mason explained.

The prevailing treatment for osteosarcoma consists of amputation followed by chemotherapy. Though the primary tumour is often vanquished with this approach, it typically fails to prevent the spread of cancer cells to other organs, leading to deadly metastasis of the disease.

The vaccine supplements standard treatment by attacking these stray cancer cells before they can cause problems. The vaccine is a highly attenuated Listeria bacteria that is genetically modified to express a tumour marker expressed by the osteosarcoma cells.

After receiving the vaccine, the patient's immune system is activated by the Listeria and then directed to recognise cells that express the osteosarcoma marker, eliminating them and thus removing the cells responsible for relapse.

Researchers tested the vaccine in a pilot study with 18 dogs. Those that received the vaccine lived more than twice as long as the historical, matched, control group, with median survival times of 956 days compared to 423 days.

The current prospective, controlled, clinical trial, funded by the Morris Animal Foundation and performed through the Comparative Oncology Trials Consortium at the National Institutes of Health will evaluate this novel immunotherapy in 80 dogs at 11 of the top, university-based veterinary centres across the United States, including Penn.

The study will compare the immune responses and overall survival of immunised dogs to a group of dogs that received standard of care alone. The study also will address the ability of the immunotherapy to retard metastatic disease in enrolled patients that develop metastatic disease prior to their scheduled receipt of the immunotherapy.

EXCESS PHOSPHORUS DAMAGES THE FELINE KIDNEY

A new study carried out by veterinarians at Ludwig-Maximilians-Universitaet (LMU) in Munich, Germany, shows that high phosphorus intake, comparable to the average level provided by prepared cat food, can be deleterious to kidney function in healthy cats.

An LMU study has found that phosphate concentrations that exceed the daily intake required for health maintenance by more than fivefold can damage kidney function in healthy cats.

The investigation was led by Professor Ellen Kienzle and Doctor Britta Dobenecker of the Chair of Animal Nutrition at LMU.

"For hitherto unknown reasons, some 35% of older cats suffer from chronic kidney disease," said Professor Kienzle.

The results of the new study suggest that excess phosphate has a deleterious effect on indicators of kidney function in cats, and could contribute to the high incidence of chronic kidney diseases in elderly cats. The new findings appear in the Journal of Feline Medicine and Surgery.

Earlier work had shown that high phosphorus intake exacerbates the course of chronic kidney disease in cats. Professor Kienzle and her team have now looked at the impact of excess phosphorus on mature and healthy cats. Their results essentially confirm the conclusions reached in a previous study. The new work shows the appearance of glucosuria and albuminuria, both indicators of renal damage, in cats eating high phosphorus diets.

Moreover, creatinine clearance, which is measure of the overall performance of the organ, also dropped markedly within 28 days in cats that received a diet rich in phosphorus. "We were surprised to find that creatinine clearance was so strongly affected within such a short time," said Professor Kienzle. Tests of commercial cat foods available in Germany, carried out by the consumer organisation Stiftung Warentest, have revealed that, in particular, moist food formulations contain on average several times the amount of phosphorus required to keep cats healthy. This level has so far been regarded as harmless.

However, the maximum level detected in these tests (nearly nine times the required amount) might be sufficient to damage the healthy feline kidney within a few weeks. The phosphates in animal foods are in part derived from natural sources, mainly bone and cereals. However, pet food manufacturers also add inorganic phosphates to achieve the appropriate texture and extend shelf life.

Professor Kienzle and Doctor Dobenecker are now investigating the impact of different phosphate sources on feline kidney function, together with the role of phosphate solubility, as these factors have an impact on the bioavailability of phosphate in the diet.

Among other experiments, they will compare rates of phosphate excretion following uptake of excess amounts of monophosphates in the form of calcium and potassium monophosphates, respectively.

"We would predict that the water soluble potassium monophosphate has a greater effect on kidney function than phosphate derived from the calcium salt," said Professor Kienzle. In contrast to bound phosphate provided by natural sources in prepared foods, water soluble inorganic phosphate additives are immediately available for absorption.

In addition, the impact of excess dietary phosphate on the health of dogs is now the subject of a dissertation in Professor Kienzle's working group. The initial results suggest that the concentration of phosphate in the blood rises significantly following the intake of inorganic phosphates.

BIGGEST EVER CHANGES TO SOUTH AUSTRALIAN DOG AND CAT LAWS

Sunday 1 July marked the start of the biggest ever shake-up in South Australia's dog and cat management laws.

Changes include mandatory microchipping and de-sexing, compulsory breeder registration, and the introduction of an online state wide dog and cat database.

The new laws will increase the number of lost dogs and cats returned to their owners, promote responsible pet ownership, reduce the number of unwanted animals ending up in shelters, and improve council services for dog and cat owners.

Dog and Cat Management Board Chairperson Dr Felicity-ann Lewis said these four major changes to dog and cat management in South Australia were bigger even than the introduction of dog registration more than a century ago.

"We've had strong support for the changes," Dr Lewis said.

"The consultation process to get to today was long and thorough, stretching back to 2014 and including public consultations and close liaison with breeders, councils, the RSPCA, the Animal Welfare League and vets," she explained.

Dr Lewis said while these changes to legislation will help in the fight against irresponsible breeders and puppy farms, the onus remains on buyers to be vigilant to make sure they are buying pets from reputable breeders and sellers.

DOGS SET TO BENEFIT FROM SIMPLE BLOOD TEST TO SPOT LIVER DISEASE

Veterinarians at the University of Edinburgh in Scotland have developed a blood test that quickly spots early signs of liver disease in dogs, a study suggests.

Experts say that the test, based on insights gained from human patients, could help vets identify damage and start treatment early, saving the lives of many dogs.

Findings suggest that he test, which is to be launched worldwide, means that fewer dogs will have to undergo invasive liver biopsies.

Diagnosing canine liver disease is challenging and catching early signs of damage is the key to its treatment, vets say. Current diagnosis is based on biopsies, which are expensive and can lead to complications.

Vets based at the University's Royal (Dick) School of Veterinary Studies teamed up with medical doctors to look at blood levels of a molecule known as miR-122 in dogs. This molecule is found in high levels in people living with liver disease.

They worked with pets and their owners to test miR-122 levels in 250 dogs, including Cocker Spaniels, Labradoodles and Old English Sheepdogs.

Dogs with liver disease were found to have significantly higher levels of a miR-122 compared with healthy dogs and dogs who had a different disease that did not affect the liver.

The team now plan to launch a testing kit to help vets worldwide quickly assess if their canine patients have liver damage.

The study is published in the Journal of Veterinary Internal Medicine.

Lead vet researcher, Professor Richard Mellanby, Head of Companion Animal Sciences at The Hospital for Small Animals at the University of Edinburgh said "We have found a specific, sensitive and non-invasive way to detect liver damage in dogs. We hope that our test will greatly improve outcomes by allowing vets to make rapid and accurate diagnosis."

Dr James Dear, Reader at the University of Edinburgh's Centre for Cardiovascular Science and NHS doctor, who co-led the study, said: "I'am delighted that the blood test we developed to improve the diagnosis of liver disease in humans can be used to help dogs too."

Journal Reference:
W. Oosthuyzen, P.W.L. Ten Berg, B. Francis, S. Campbell, V. Macklin, E. Milne, A. G. Gow, C. Fisher, R.J. Mellanby, J.W. Dear. Sensitivity and specificity of microRNA-122 for liver disease in dogs. Journal of Veterinary Internal Medicine, 2018; DOI: 10.1111/jvim.15250

FUNDING BOOST FOR BIOSECURITY WELCOMED BY VETERINARIANS

The Australian Veterinary Association (AVA) has welcomed the government's announcement of increased funding for disease surveillance as part of a $137.8 million investment in biosecurity.

President of the AVA, Dr Paula Parker, said that general disease surveillance is important to maintain Australia's favourable animal health status and for the early detection of animal disease outbreaks.

"Emergency animal diseases are a significant threat to animal industries and we look forward to seeing greater use of private veterinary practitioners to support animal disease surveillance and investigation to protect animal industries and public health," Dr Parker said.

"We commend the government on investing in initiatives to prevent incursions of diseases, such as Foot-and-Mouth, by strengthening border surveillance technologies," she added.

"The movement of animals and people around the world has never been so rapid. In a single day, a person can wake up on one side of the globe, and before the day is over, fall asleep on the other side.

As towns and suburbs expand further into farming regions and bushland, we are living closer and closer to animals and impinging on their habitats. The risk of disease spread, both to and from animals, has never been greater, and we have seen this with emerging diseases such as Hendra and Lyssa viruses," Dr Parker explained.

As Australia's agricultural sector looks to reach its goal of a $100 billion industry by 2030, investment in biosecurity is essential.

"This is an asset that the government must protect. Every dollar spent on prevention and preparedness protects against potential billions in losses," Dr Parker said.

The AVA has also commended the surveillance initiative in northern Australia but has stressed the need for ongoing support from government veterinarians and diagnostic laboratories in supporting this work.

"The role of veterinarians is critical to effective disease surveillance and response capabilities.

"We look forward to the government implementing these initiatives," Dr Parker said.

AI TECH HELPING TO FIND AND CONSERVE DUGONGS

Artificial intelligence technology from Google has revolutionised the way a Murdoch University dugong researcher finds and studies the gentle marine mammals.

For the last decade, Dr Amanda Hodgson has been using a high end military drone, called the ScanEagle, to generate aerial images in trial surveys of the Shark Bay region in Western Australia, one of the areas where the critically endangered dugong, or sea cow, can be found.

But manually going through each of the 37,000 drone images generated to detect dugongs has been labour intensive and time consuming. So Dr Hodgson collaborated with her colleague Dr Frederic Maire from the University of Queensland to find an automated solution.

"To help conserve dugongs, we need to understand where their important habitat areas are so we can push for their protection. We also need to gain an understanding of whether their numbers are increasing or decreasing," Dr Hodgson said.

"Google's machine learning package helped Frederic develop a learning computer algorithm that is saving us time and money in detecting the dugongs in the surveys. We estimated it would take 377 hours to go over each of the images manually. But this technology is helping us to do it with a decent degree of accuracy in just 18 hours of verification work," she added.

The AI detector picks out anything in the images it thinks looks like a dugong, and then a human goes through potential detections to pick out the mammals.

The research team used both true and false detections to continue to train the algorithm, so that it correctly identified 71 per cent of dugongs in the images.

Dr Hodgson and Dr Maire are continuing to work on the technology to improve its accuracy before embarking on a full survey of Shark Bay.

They have high hopes their drone survey methods and the improved AI will provide researchers around the world, including in developing countries, the opportunity to conduct surveys without the need for specialist expertise or expensive planes.

"As we refine this technology, it will help us fill in huge gaps in our knowledge about the status of dugongs and other species around the world," Dr Hodgson said.

SCIENTISTS HELP CRACK GENETIC CODE OF KOALAS

Koalas could be less at risk of extinction after a team of scientists, including two from the University of Canberra (UC), successfully completed the full sequencing of the animal's genome.

The major breakthrough, which has been published in Nature Genetics, has given scientists unprecedented insights into the animal's unique biology as they work to preserve it.

Koalas are not listed as endangered, but the animal is under threat from diseases such as chlamydia and koala retrovirus. The findings could help researchers develop treatments for the two devastating diseases.

Professor of Genomics Janine Deakin and Professor Arthur Georges, an expert in ecology and herpetology, from the University's Institute for Applied Ecology (IAE) contributed to the work of the Koala Genome Consortium. Dr Deakin said it was a significant step toward ensuring the species' long-term survival.

"Koalas are one of Australia's most iconic animals and this important research will go a long way to ensuring we don't lose them," Dr Deakin, who is the Director of the IAE, said.

"Not only did we find out interesting facts about the koala, but it represents a new generation of science-based conservation policy. Our work will be an important pillar in the NSW Koala Strategy 2018 and our discoveries have been deposited into a public database for scientists around the world to access," she added.

Researchers analysed over 3.4 billion base pairs and more than 26,000 genes in what is the most complete marsupial genome sequence to date.

At 95.1 per cent accuracy, it is comparable to that of the human genome.

The genetic blueprint not only unearthed a wealth of information about koalas' unusual and highly specialised diet of eucalyptus leaves, but it also provides important insights into their immune system, population diversity and their evolution.

"We helped assemble fragments of DNA in the right order," Dr Deakin said.

"Think of DNA fragments as lots of different words in no particular order. We put these words in the right sequence, so we can now read the koala's story. It was a huge task, but it represents a significant step forward in the fight to protect this iconic animal," she added.

The animal's ability to survive on eucalyptus leaves that are toxic to other animals is due to two large expansions in a gene family known to be integral to detoxification.

Researchers found these genes are expressed in many koala tissues, particularly in the liver, indicating they have a very important function in detoxification and likely allowed koalas to survive on eucalyptus leaves.

The team also discovered that koalas can potentially fine-tune milk protein composition across different stages of lactation to meet the changing needs of their young.

The project, led by Director of the Australian Museum Research Institute Dr Rebecca Johnson, was first launched in 2013.

"The Koala Genome Consortium has been a monumental journey into understanding our koala – one of the world's most charismatic and iconic mammals," Dr Johnson said.

"Sequencing the koala genome was a pioneering venture with risks and uncertainties, but its success has started a revolution with conservation at its core."

NEW HOPE FOR THE GILBERT'S POTOROO

The critically endangered Gilbert's potoroo has been given another reprieve from extinction, following promising results from two trial translocations to Middle Island, east of Esperance, in Western Australia.

The trials were carried out to assess the suitability of the island for the establishment of a new population.

The species was believed to be extinct until it was rediscovered in 1994 at Two Peoples Bay Nature Reserve, near Albany. In the following years, new populations were set up close by on Bald Island and in a fenced enclosure in Waychinicup National Park.

In 2015, however, a lightning strike sparked a 1,230 hectare fire at Two Peoples Bay, destroying 90 per cent of the potoroo's habitat at that location.

Following the fire, the then Department of Parks and Wildlife moved swiftly to protect the remaining critically endangered Gilbert's potoroos.

The rescued animals were held in captivity until a more suitable translocation site could be found, and habitat recovered at Two Peoples Bay to allow animals to be returned.

In 2016, the Federal Government's National Landcare Program provided Albany-based community group Gilbert's Potoroo Action Group (GPAG) with a $250,000 grant to establish another population on an offshore island.

Two four-week trial translocations, one in winter and one in summer, were carried out over 2017 and 2018 to assess the suitability of Middle Island to support the marsupials. The translocations were a collaboration between the Department of Biodiversity, Conservation and Attractions, and the GPAG.

Environment Minister Stephen Dawson said during each trial, a group of four potoroos were released onto the island for a four-week period and closely monitored.

"Results from the trial are very encouraging and have shown that the island habitat will be able to support a potoroo population," said Minister Dawson.

TECHNOLOGY BREAKTHROUGH FOR WHALE DISENTANGLEMENTS

Western Australian government scientists have partnered with marine wildlife experts to develop a new whale rescue tool that tracks the real time location of whales entangled in fishing gear.

The technology allows responders from the Parks and Wildlife Service at the Department of Biodiversity, Conservation and Attractions to remotely monitor the whale before safely attempting disentanglement.

A total of 10 trackable buoys have been provided to specialist whale disentanglement teams at strategic locations between Esperance and Broome, including three in Perth.

The technology was developed by Department of Primary Industries and Regional Development scientists, with $73,000 in funding from the Australian Department of the Environment and Energy. The Western Rock Lobster Council has provided $20,000 for the purchase of the 10 buoys.

Environment Minister Stephen Dawson said about 35,000 whales are currently migrating from Antarctic waters to calving areas in the Kimberley.

"Previously, it was extremely difficult to find an entangled whale off the WA coast once it was lost from sight, and some opportunities to rescue distressed animals were missed as it was unsafe to attempt disentanglement due to poor weather and light," said Minister Dawson.

"This new technology allows time for disentanglements to be carried out in safe weather conditions and with sufficient daylight, while being aware of the whale's location at all times," he added.

Fisheries Minister Dave Kelly said that during their migration, whales travel through a number of commercial and recreational fisheries, occasionally becoming entangled in fishing gear.

"While whale disentanglements from lobster fishing gear have steadily decreased from 17 in 2013 to six in 2017 due to gear modification, it is pleasing to see that the rock lobster industry is showing its commitment to protecting whales further by funding these buoys," said Minister Kelly.

"The development and deployment of this technology demonstrates the State Government's commitment to working with the fishing industry to investigate new measures to minimise entanglements along the coast," he said in conclusion.

SURVEY SHEDS LIGHT ON PROBLEMS PLAGUING THE VETERINARY PROFESSION

A large scale 2015 survey of vet students and graduates by the British Veterinary Association and Royal College of Veterinary Surgeons in the United Kingdom has shed light on the levels of dissatisfaction within the profession.

Mental health issues, alcohol and drug abuse, a high incidence of stress and suicide, excessive staff turnover rates, and a failure to adapt to the increasing demographic dominance of women are all serious challenges facing the veterinary profession in the United Kingdom. They require urgent attention. Yet veterinary medicine often obscures the messy, complex, ambiguous and uncertain reality of practice.

Despite their considerable financial, emotional and intellectual investment, 10% of vet graduates leave the profession every year. More than half consider a change of job. Only 46% say they would choose vetting as a career again.

Many suffer considerable anxiety, depression, doubt, and tragically in some cases, suicide. Much has been written about the potential causes of this. A lot of analysis points to the 'types' of people who are recruited into vet school (over-achieving perfectionists). But the Royal College of Veterinary Surgeon's code of conduct places the onus on vets to "take reasonable steps to address adverse physical or mental health" issues.

Certainly, the struggle to manage the complex problems that come with being a vet relates to individual characteristics or 'private troubles'. But these are too pervasive not to be treated as public matters. The three year study involving 75 interviews and numerous observations of equine, small, and large animal vets, suggests that these problems cannot be resolved through individual resilience and coping mechanisms alone.

Rather, there are wider issues at play, starting with training. This is shown by the fact that just 34% of vets that had graduated five or more years ago, think their degree had prepared them very well.

Unrealistic expectations

In interviews, it was found that people's insecurities and anxieties get tangled up with extremely high expectations of the perfect self and their expertise, that are embedded within the culture of the profession. Vets, and their clients, tend to attach themselves to an unrealistic world view of rational science and medicine as a panacea for all ills.

Based on certainty, predictability and control, these ideals may be partly understood by the way scientific knowledge is portrayed in the media and taught in schools as simply 'objective', with a clear separation between right and wrong answers.

Despite attempts to broaden their curriculum, veterinary colleges reinforce this attachment to science with a heavy focus on clinical skills. Expertise gets viewed largely as a technical accomplishment.

One consequence of this is to encourage vets to accept impossible demands placed on them, by their practice, clients, the media (such as programmes about 'super vets') and their own idealism.

While the allure and comfort drawn from faith in scientific and objective knowledge is understandable, it creates an illusion of control that is routinely contradicted in practice.

When the people interviewed experienced the inevitable uncertainty and failure that comes with practising medicine, many were shocked and struggled to reconcile these contradictions.

Practising imperfection

The limitations of science, particularly in relation to certainty and predictability, tend to go unacknowledged in veterinary practice. This leaves many vets pained by the occurrence of what they see as failures. Rather than acknowledging the limitations of medicine that can never fully deliver on its promise, vets will tend to blame themselves.

Of course, the researchers are not suggesting that vets do not make mistakes, or shouldn't be concerned about them. But this tendency to translate anything that has not gone to plan into their own incompetence creates a set of circumstances that are ripe for constant rumination, doubt and potentially destructive narratives of self-blame.

In considering whether practice ever makes vets perfect, some discovered that their anxieties reduced with experience. Others did not. Many outside the study will already have left the profession due to issues such as a lack of support and confidence.

One necessary way of dealing with these problems is for individual veterinary practices and educators to address, or at least minimise, the tendency for vets to interpret failings as their own lack of perfection, or inadequate knowledge.

Instead, it would make sense to be more explicit about the limitations and uncertainties surrounding the job that vets do. Once these are acknowledged and accepted, anxiety and doubts about failure would inevitably recede.

This, however, demands humility and courage from the profession as a whole, and individuals within it, to debunk some of the myths surrounding certainty and expertise. This is no easy task. All too often expertise is conflated with ideas of strength, infallibility and an invulnerability that pervade our culture in general, and veterinary practice in particular.

It is not enough simply to teach young veterinary surgeons about resilience and coping. This merely disguises these public matters by transferring the responsibility for failure from the profession back onto the individual. And this will only intensify the doubts and anxieties that vets seem already to have in abundance.

A UNIQUE INTERNSHIP OPPORTUNITY FOR PRODUCTION ANIMAL VETS

A young yet rapidly growing veterinary business comprising of production animal clinics in Victoria, New South Wales, Queensland, Tasmania and Western Australia, as well as veterinary wholesale, logistics and other ancillary services is providing new veterinary graduates with a unique opportunity to develop their knowledge, skills and burgeoning careers as production animal vets.

Apiam Animal Health's clinic network comprises of many well-known and long established rural and regionally based clinics with key opinion leader veterinarians. The variety of species serviced includes dairy, feedlot beef, pastoral beef, pigs, poultry, companion animals, equine and advanced genetics services to the sheep industry.

Not only does Apiam provide the highest quality veterinary care to its clients, the business also has a focus on staff development. With this in mind, the company delivers a Production Animal Internship Program for aspiring vets with a special interest in production animal medicine and consultancy.

The 24 month program offers the chance to work in Australia's leading production animal veterinary clinics, aiming to produce veterinarians with knowledge and competency in individual and herd-level veterinary medicine.

The program is half way through a second cohort of intern veterinarians, currently made up of Dr Nina Matsumoto, Dr Katelyn Braine and Dr Will Jarrett.

Nina Matsumoto is in her second year of the internship program. Since starting as a new graduate in 2016, she has undertaken clinical research work in the feedlot industry, an outcome of which she has presented at the Australian Cattle Veterinarians national conference in Perth in April 2018.

Nina has also developed an academic poster detailing this work that was accepted at the World Buiatrics Congress in Sappuro, Japan which she attended at the end of August 2018.

Nina has also worked with leading pig veterinarians in New South Wales, Victoria and Western Australia, along with nationally recognised dairy veterinarians in south west Victoria and Tasmania. She has developed an interest in pig practice and is undertaking an eight week research project of her own at the end of this year. Safe to say, that Nina has fast-tracked her career with this program and is looking forward to new opportunities in 2019.

Katelyn Braine also undertook clinical research work in the beef feedlot industry during 2017. Here she developed skills in recognition and treatment of feedlot diseases.

With a flair for research, Katelyn is near completion of a retrospective study investigating the relative accuracy of early ultrasound pregnancy diagnosis when compared to a PAG-ELISA blood test in commercial dairy herds. This work will allow informed decisions to be made regarding choice of pregnancy diagnosis method for both veterinarians and dairy farmers. Katelyn has worked in dairy practice in south west Victoria in 2018, with placements within the pig and poultry sectors in the second half of 2018.

Will Jarrett is over half way through the first year of his internship. From a predominantly dairy background, Will was keen to explore the other production animal industries that were available to him across the Apiam network. To date, he has developed additional skills working in the feedlot and pig industries, along with reinforcing his knowledge in dairy medicine and surgery.

Will has acquired new skills from working in different clinics, including using laparoscopy in dairy cows for correction of common gastrointestinal disorders. Will also attended the World Buiatrics Congress in Japan as part of his continuing education and is now spending time working alongside the Apiam Genetics Services veterinarians.

The Apiam Production Animal Internship Program is truly unique, and whilst hard work, is very rewarding. It provides exposure to and development of veterinary skills in the key production animal species in Australia, an experience that simply cannot be replicated elsewhere.

CALL FOR DONORS: CATS TO HELP OTHER CATS AT NEW FELINE BLOOD BANK

A new feline blood bank is being launched at the University of Melbourne's U-Vet Animal Hospital in Werribee, Victoria.

U-Vet Werribee Animal Hospital is home to one of the first centres for veterinary emergency and critical care in the country. Its emergency room is staffed to see sick pets 24 hours, every day of the year, with about 5000 patients annually.

U-Vet's ability to store cat blood for life-saving transfusions means the animal hospital now meets the highest standards for feline emergency and critical care.

Veterinarians are calling for owners to volunteer their cats as blood donors to provide urgently-needed transfusions for other felines.

Blood Donor Program co-ordinator Kerry Bozicevic said cats require emergency blood transfusions in the same way humans do.

"If a cat loses blood due to trauma, surgery, immune system diseases, cancer or has a blood clotting disorder, it may require a blood transfusion to survive and to return to a meaningful life," Kerry said.

"Time is critical when in need of a life-saving blood transfusion, and having blood products readily available may make all the difference," she added.

Each blood donation is separated into its red blood cell component and its plasma component. This allows the most efficient use the of blood donation, with red blood cells given to cats with a very low red blood cell count, and the plasma component given to cats that are bleeding due to blood clotting issues.

"One blood donation can potentially save the lives of two cats," Kerry said.

The U-Vet Feline Blood Bank collects blood from cats kept as pets and volunteered as donors by their owners.

Donating cats need to be:

- between 1 and 5 years of age
- 4kg or more in weight
- healthy and with a calm temperament
- up to date with vaccinations and parasite control
- a Victorian resident (never travelled out of the state) and already not a blood transfusion recipient

All possible donor cats are tested to ensure that it is safe for them to donate blood and that the blood is of the highest quality. In the blood bank, red blood cells can be stored for 35 days. Plasma can be stored for up to three years.

For further information please visit u-vet.com.au/news/Donor-blood-saves-lives-pets-animal or email UOM-Blood-Donor-Program@unimelb.edu.au

NEW WEAPON AGAINST FERAL CATS IN DETECTOR DOG TRIAL

An innovative trial using expertly trained dogs to detect feral cats in a Wheatbelt reserve in Western Australia could help protect threatened species, such as numbats and woylies.

In stage one of the trial this month, three dogs - a Malinois, a terrier cross, and a Labrador cross - and their handlers are working in Tutanning Nature Reserve, near Pingelly, to detect the presence of feral cats.

Stage two, scheduled for 2019, will determine their effectiveness, in comparison with other control techniques and test combining techniques, to win the fight against feral cats. The dogs are trained to not attack the cats or native animals.

Tutanning Nature Reserve is home to several threatened species that are vulnerable to feral cat predation, including numbats, woylies, chuditch and red-tailed phascogales.

The trial is funded by a $165,000 grant from the Australian Government, which has been matched by the Foundation for Australia's Most Endangered Species (FAME), and is being carried out by the WA Department of Biodiversity, Conservation and Attractions.

Environment Minister Stephen Dawson said introduced predators such as foxes and feral cats have been the key factor in the decline of small mammal species in Western Australia, and the McGowan Labor Government is committed to finding new, innovative ways to complement existing cat control methods.

"Under our leading wildlife conservation program, Western Shield, we are aiming to recover native animal populations in the wild through broadscale fox and feral cat baiting, however, we are always looking at new ways to protect our native animals. If we can use dogs to identify areas of the highest cat activity, we can make more informed decisions about how, when and where to target feral cats with the aim of reducing the threat of predation on species like numbats and woylies," he explained.

"I am pleased to see the support of FAME and the Federal Government, including the Threatened Species Commissioner, in recognising the threat of feral cats in Western Australia and I thank them for their contribution to this important research," the Minstier said in conclusion.

OLDEST EVIDENCE OF HORSE VETERINARY CARE DISCOVERED IN MONGOLIA

New research reveals that the practice of veterinary dentistry was innovated on the open steppes of Mongolia and eastern Eurasia, and dates back more than 3,000 years.

A team of scholars, led by Dr William Taylor of the Max Planck Institute for the Science of Human History, analysed horse remains from an ancient Mongolian pastoral culture known as the Deer Stone-Khirigsuur Culture (ca. 1300-700 BC).

Deer stones, with their beautiful deer carvings, and their accompanying stone mounds (khirigsuurs) are famous for the impressive horse burials that are found alongside them in the dozens, hundreds, or even thousands.

Through careful study of skeletal remains from these burials, published in Proceedings of the National Academy of Sciences and funded in part by a grant from the National Geographic Society, William Taylor and colleagues found that Deer Stone-Khirigsuur people began using veterinary dental procedures to remove baby teeth that would have caused young horses pain or difficulty with feeding, the world's oldest known evidence for veterinary dental care.

Previous research has shown that these early herders were the first in eastern Eurasia to rely heavily on horses as livestock for food products, and may have been among the first to use horses for mounted riding.

Drawing on insights from his Mongolian colleagues, Jamsranjav Bayarsaikhan and Tumurbaatar Tuvshinjargal of the National Museum of Mongolia, DrTaylor argues that the development of horseback riding and a horse-based pastoral economy was a key driver for the invention of equine veterinary care.

"We may think of veterinary care as kind of a Western science, but herders in Mongolia today practice relatively sophisticated procedures using very simple equipment. The results of our study show that a careful understanding of horse anatomy and a tradition of care was first developed, not in the sedentary civilizations of China or the Mediterranean, but centuries earlier, among the nomadic people whose livelihood depended on the well-being of their horses," Dr Taylor explained.

Additionally, he and his team discovered that changes in horse dentistry accompanied major developments in horse control technology, including the incorporation of bronze and metal mouthpieces into bridles used for riding. This equipment, which spread into eastern Eurasia during the early first millennium BC, gave riders more nuanced control over horses, and allowed them to be used for new purposes, especially warfare.

However, using metal to control horses also introduced new oral problems, including painful interactions with a vestigial tooth that develops in some animals, known as a 'wolf tooth'. Dr Taylor and his team discovered that, as herders began to use metal bits, they also developed a method for extracting this problematic tooth, similar to the way most veterinary dentists would remove it today.

In doing so, these early riders could control their horses in high stress situations using a metal bit, without accompanying behavioural or health complications, which may have had major implications for the ancient world.

Nicole Boivin, Director of the Department of Archaeology at the Max Planck Institute for the Science of Human History, explained, "In many ways, the movements of horses and horse-mounted peoples during the first millennium BCE reshaped the cultural and biological landscapes of Eurasia."

Dr. Taylor's study shows that veterinary dentistry, developed by inner Asian herders, may have been a key factor that helped to stimulate the spread of people, ideas, and organisms between east and west."

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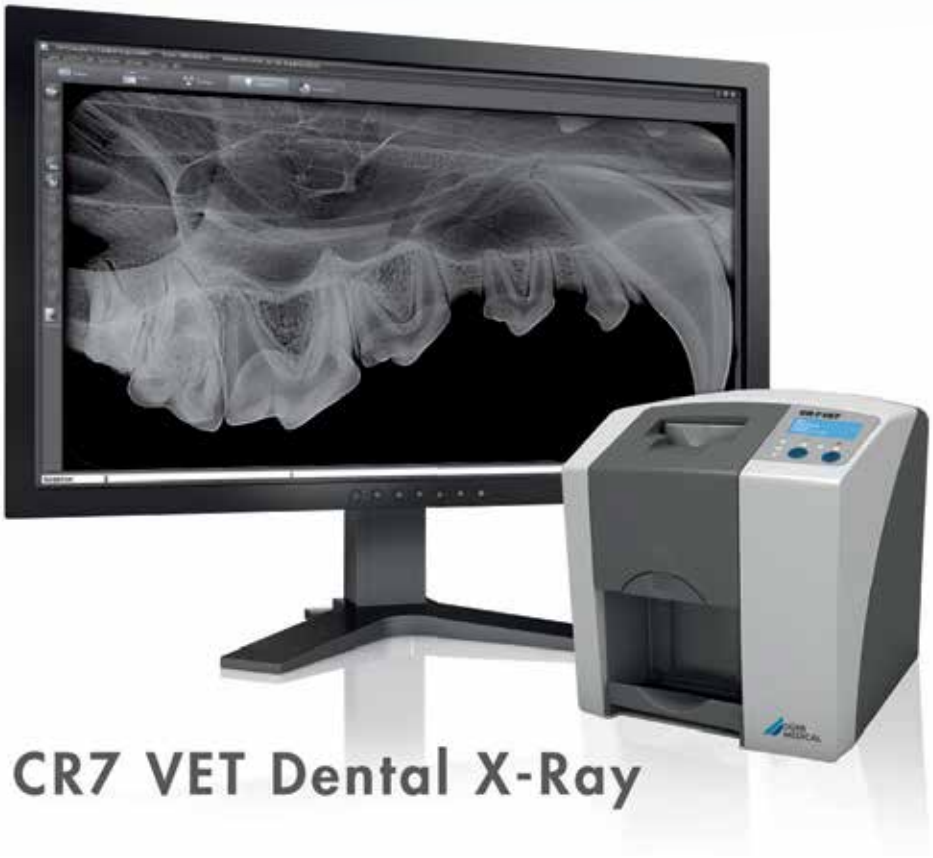

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