

VET CANDY

OCTOBER 2022

RESEARCH SHOWS
WHAT IS DRIVING
**SHELTER
OVERPOPULATION**

**NEARLY ONE
IN 10 IN THE
US REPORTS
HAVING
DEPRESSION**

**BUST
THE STRESS
WITH THESE TIPS**

WHAT ARE SIGNS
YOU NEED THERAPY?

WANT TO CHANGE
YOUR HABITS?
JUST DO IT!

**FELINE INFECTIOUS
PERITONITIS (FIP)
DIAGNOSIS
GUIDELINES
RELEASED**

GENETIC DISCOVERY
COULD LEAD TO BETTER
**TREATMENTS FOR
COMMON TUMOR IN DOGS**

**HEALED BY
NATURE**

MAGGIE ROSE MACAR

Tackles Mental Health Roadblocks
with zant.

+ much more

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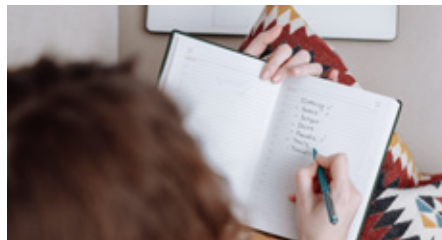
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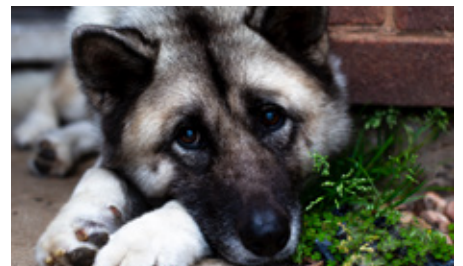


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Welcome to the world of
VET CANDY

Dr. Jill Lopez



One of few good things that changed in the past couple of years is that the veterinary community started speaking more openly and honestly about mental health. This conversation is long overdue and very welcomed.

Veterinary professionals are some of the most highly trained individuals when it comes to caring for animals, but they often don't have access to the same level of care when it comes to their own well-being. Studies have shown that even those who were mentally healthy and had high levels of well-being overall experienced these negative emotions with some frequency.

However, there's something that has been left out of the conversation. The traits that help us be successful in our industry - perfectionism, competitiveness, drive, and dedication- are the same qualities that when taken to extremes, can lead to dangerous mental health issues like addiction, depression and eating disorders.

That is why Vet Candy is teaming up with zant. - a mental health services app connecting mental health providers to those in need. The goal of this partnership is to bring much-needed tools and support to the veterinary profession and to normalize the mental health conversation.

Vet Candy is committed to supporting physical and emotional wellness for the veterinary profession. By collaborating with zant., we hope to normalize the need for accessible mental health resources and help remove the stigma surrounding mental health treatment.

zant. is growing the largest network of underrepresented mental health providers with services ranging from anxiety, burnout, addiction recovery, eating disorders, depression, and more, in an effort to connect them with those in need across the U.S.

I encourage you to start taking care of your mental health and sign up for free at zant.app. I signed up and hope you will, too!

As always, I would like to thank our team of amazing writers and Dr. Shannon Gregoire, our Assistant Editor. We love you for reading!

Maggie Rose Macar Tackles Mental Health Roadblocks with zant.



The word “cognizant” means to have knowledge or come to a place of self-awareness gained through personal experience.

But for Maggie Rose Macar, the word also has special significance. As the Founder and CEO of a new tech startup called zant., she is no stranger to becoming more cognizant and aware of mental health struggles. At just 19 years old, she lost a close friend to suicide. Since that time, Macar has witnessed firsthand just how difficult it can be to access affordable, timely, and personalized mental health services.

Recognizing this void, the entrepreneur created zant.

She explains:

“With over twenty-five niche categories to choose from and over one-thousand providers currently enduring a rigorous onboarding process, zant. is revolutionizing the provider and patient experience by streamlining its features to find a provider, schedule, and manage payment.”

Now, Vet Candy is teaming up with zant. to increase awareness for the veterinary community to access affordable mental health services.

We talked to Maggie about why mental health is so important (and underserved) in the veterinarian community, and also learned how zant. provides the support veterinarians need.

The Startling Truth About the Veterinary Mental Health Crisis

Cute kittens and playful puppies – that’s the part of the job veterinarians love!

However, vet med isn’t all sunshine and rainbows. In fact, a dark shadow has been on the horizon of the field for decades. Right now, we are at a crisis point.

The issue?

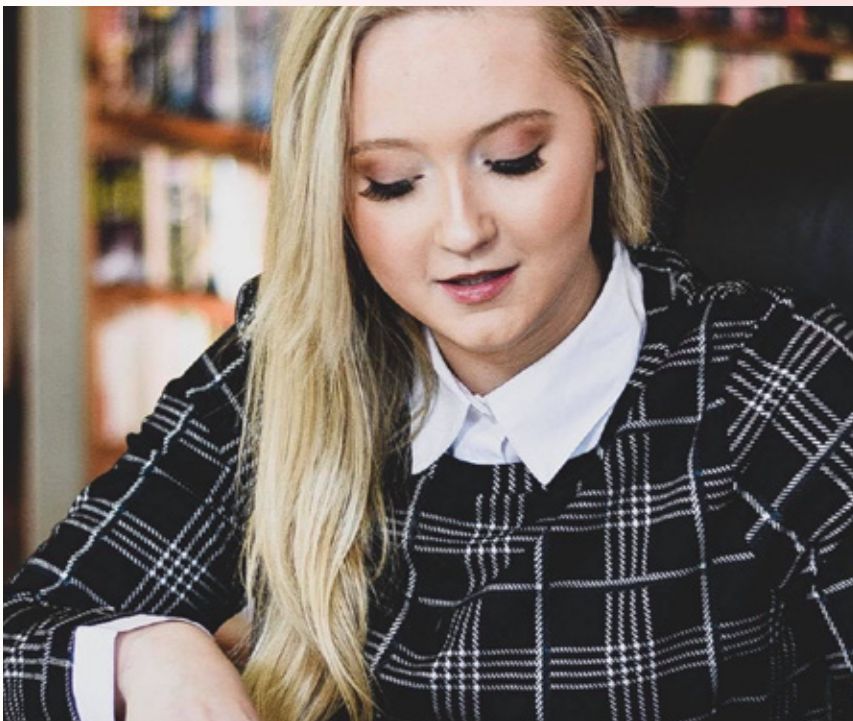
Mental health and wellbeing.

The decline in veterinary professionals’ mental health is no longer a secret. Statistics from a research study carried out by Merck Animal Health (MAH) show that 9.1% of veterinarians suffer from poor well-being, with a noticeably higher frequency of distress among both female and younger veterinarians. From stress, compassion fatigue, and burnout to depression and chronic anxiety about their patients, career growth, student debt, etc., those who work with animals are the first to offer a helping hand, but unfortunately often the last to receive one.

In fact, according to the National Library of Medicine, “The rate of suicide in the veterinary profession has been pegged as 4 times the rate in the general population.”

Thankfully, having an open dialogue about these problems is becoming easier. Rather than bottling up mental health issues, innovators like Maggie Rose are finding ways to tackle mental health roadblocks.

And yes...even save lives.



How Can zant. Help?

No matter how big or small your mental health struggle is, know that it matters.

Together, Vet Candy and zant. are eager to connect the animal community with qualified counselors and mental health professionals.

How does it work?

Conversations are carried out via in-app video or by phone call.

Maggie shares, “With zant., finding the right fit has never been easier. With the ability to choose tags associated with your current experience and struggle, easily sort and favorite providers that match your needs, and schedule an always FREE first consultation with no roadblocks or headaches.”

Maggie Rose knows that your best work happens when roadblocks stay out of the way.

So, she encourages you to be the best veterinarian “paw-sibile” by taking care of your mental health with zant.!



Research shows what is driving shelter overpopulation

Progress made over decades to control overpopulation of dogs and cats through high-volume spay-neuter surgeries is at risk thanks to the ongoing COVID-19 pandemic, a team of UF researchers conclude in a new study.

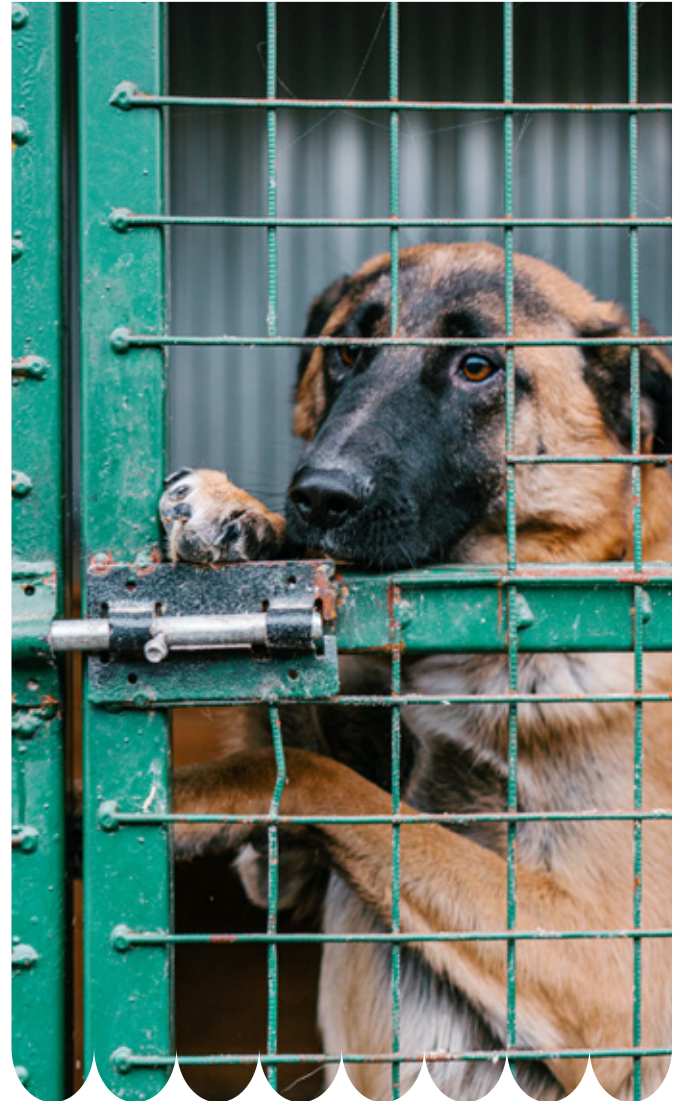
The impact — felt both at community shelters and veterinary clinics — includes sharp declines in spay-neuter surgeries after the initial pandemic-triggered lockdowns, followed by staffing shortages in clinics and shelters, overcrowding and lagging pet adoption rates. All of these problems are compounded by a nationwide shortage of veterinarians, which has been felt even more acutely in shelters and spay-neuter clinics, the researchers say in a study that appears today (Sept. 13) in *Frontiers of Veterinary Science*.

Progress made over decades to control overpopulation of dogs and cats through high-volume spay-neuter surgeries is at risk thanks to the ongoing COVID-19 pandemic, a team of UF researchers conclude in a new study.

The study focused on the effect of the COVID-19 pandemic on the volume of surgical procedures performed by spay-neuter clinics, said Simone Guerios, D.V.M., Ph.D., a clinical assistant professor of shelter medicine at UF and the study's lead author.

The team drew its research from 212 clinics nationally, all of which make use of the cloud-based clinic management software program Clinic HQ, which is specifically designed for facilities that focus on spay-neuter and preventive health care services.

"The high level of spay-neuter achieved over the past five decades is the single most important driver of reduced pet overpopulation and euthanasia in animal shelters," Guerios said. "The rise in subsidized spay-neuter access helped drive the euthanasia of shelter pets in the United States from an estimated 13.5 million in 1973 to 1.5 million in 2019."



Using 2019 as a baseline, the UF team aimed to determine the impact of the pandemic on the volume of spay-neuter procedures performed in 2020-2021 at the 212 clinics, which collectively performed more than 1 million surgeries per year and were on track to increase surgeries by 5% over the previous year.

But in the 24 months from January 2020 through December 2021, 190,818 fewer surgeries were performed at the clinics studied than would be expected had 2019 levels been maintained, the researchers found.

“If a similar pattern was experienced by other spay-neuter programs in the United States, it would suggest there is a deficit of more than 2.7 million spay-neuter surgeries that animal welfare organizations have yet to address,” said co-author Julie Levy, D.V.M., Ph.D., the Fran Marino Endowed Distinguished Professor of Shelter Medicine Education at UF’s College of Veterinary Medicine.

All the impacts of the pandemic combined have the potential to undermine progress made in controlling pet populations and euthanasia in shelters, Levy added.

“Currently, shelters are in crisis mode, with overcrowding and lagging adoptions,” Guerios said. “Pet overpopulation seems to be increasing, leading to increased shelter euthanasia for the first time in many years.”

The UF College of Veterinary Medicine is responding to societal needs by increasing class size and remodeling its surgical training facility to enhance surgical skills development. The college also offers four courses and clerkships specifically designed to provide students with real-world spay-neuter experience, Levy said.

As part of these hands-on learning opportunities, UF veterinary students spay and neuter thousands of cats and dogs in their local communities, she added.

“Through our recent expansion of class size to meet the increasing demand for veterinary graduates, along with unique certificate programs and shelter medicine internships, our college is taking proactive action to address these disturbing trends in animal healthcare and well-being,” said Christopher Adin, D.V.M., chair of UF’s department of small animal clinical sciences, which oversees the college’s shelter medicine program.



A close-up photograph of a man with a beard kissing a black and white dog on the cheek. The image is overlaid with a teal gradient.

zant.

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What are signs you need therapy?

by Shauna Simmons

Taking care of your mental health is just as important as your physical health. It can be easy to write off these needs with minor fixes. These things often come as advice from our loved ones suggesting we simply need a vacation, a friend to confide in, or to treat ourselves to something nice.

While these are all great suggestions for self-care, they often fail to address larger underlying issues. You might struggle to cope with something deeper that requires a more long-term and mindful fix. It's okay to ask yourself if you need professional help from therapy. As the stigma surrounding mental health dissipates in society, it has become more accessible for you to seek professional help.

Therapy is for Mental Growth

Think about a person who decides they are going to become physically fit. It's a great start to get to the gym, start on some cardio, and maybe even dabble in some weight lifting and strength training. But along the journey, reaching out to others who specialize in fitness becomes important. This could be a fitness trainer, a yoga instructor, or just a professional that might offer more clear direction on fitness and growth.

A lot of our mental health is dependent on the experiences we have had in our lives and our childhood. These experiences have shaped many of our coping mechanisms and other habits we lean toward for solace when we feel disrupted.

Therapy is for Anyone

Therapy is for anyone looking to understand themselves in a better light in hopes of taking charge of their habits and making better choices. If you are considering therapy, ask yourself what you are looking for? If the answer is a safe space to learn better communication and healthy life habits, then therapy might be the perfect option for you.



Machine learning gives glimpse of how a dog's brain represents what it sees



Scientists have decoded visual images from a dog's brain, offering a first look at how the canine mind reconstructs what it sees. The *Journal of Visualized Experiments* published the research done at Emory University.

The results suggest that dogs are more attuned to actions in their environment rather than to who or what is doing the action.

The researchers recorded the fMRI neural data for two awake, unrestrained dogs as they watched videos in three 30-minute sessions, for a total of 90 minutes. They then used a machine-learning algorithm to analyze the patterns in the neural data.

"We showed that we can monitor the activity in a dog's brain while it is watching a video and, to at least a limited degree, reconstruct what it is looking at," says Gregory Berns, Emory professor of psychology and corresponding author of the paper. "The fact that we are able to do that is remarkable."

The project was inspired by recent advancements in machine learning and fMRI to decode visual stimuli from the human brain, providing new insights into the nature of perception. Beyond humans, the technique has been applied to only a handful of other species, including some primates.

"While our work is based on just two dogs it offers proof of concept that these methods work on canines," says Erin Phillips, first author of the paper, who did the work as a research specialist in Berns' Canine Cognitive Neuroscience Lab. "I hope this paper helps pave the way for other researchers to apply these methods on dogs, as well as on other species, so we can get more data and bigger insights into how the minds of different animals work."

Phillips, a native of Scotland, came to Emory as a Bobby Jones Scholar, an exchange program between Emory and the University of St Andrews. She is currently a graduate student in ecology and evolutionary biology at Princeton University.

Berns and colleagues pioneered training techniques for getting dogs to walk into an fMRI scanner and hold completely still and unrestrained while their neural activity is measured. A decade ago, his team published the first fMRI brain images of a fully awake, unrestrained dog. That opened the door to what Berns calls The Dog Project — a series of experiments exploring the mind of the oldest domesticated species.

Over the years, his lab has published research into how the canine brain processes vision, words, smells and rewards such as receiving praise or food.

Meanwhile, the technology behind machine-learning computer algorithms kept improving. The technology has allowed scientists to decode some human brain-activity patterns. The technology “reads minds” by detecting within brain-data patterns the different objects or actions that an individual is seeing while watching a video.

“I began to wonder, ‘Can we apply similar techniques to dogs?’” Berns recalls.

The first challenge was to come up with video content that a dog might find interesting enough to watch for an extended period. The Emory research team affixed a video recorder to a gimbal and selfie stick that allowed them to shoot steady footage from a dog’s perspective, at about waist high to a human or a little bit lower.

They used the device to create a half-hour video of scenes relating to the lives of most dogs. Activities included dogs being petted by people and receiving treats from people. Scenes with dogs also showed them sniffing, playing, eating or walking on a leash. Activity scenes showed cars, bikes or a scooter going by on a road; a cat walking in a house; a deer crossing a path; people sitting; people hugging or kissing; people offering a rubber bone or a ball to the camera; and people eating.

The video data was segmented by time stamps into various classifiers, including object-based classifiers (such as dog, car, human, cat) and action-based classifiers (such as sniffing, playing or eating).

Only two of the dogs that had been trained for experiments in an fMRI had the focus and temperament to lie perfectly still and watch the 30-minute video without a break, including three sessions for a total of 90 minutes. These two “super star” canines were Daisy, a mixed breed who may be part Boston terrier, and Bhubo, a mixed breed who may be part boxer.

“They didn’t even need treats,” says Phillips, who monitored the animals during the fMRI sessions and watched their eyes tracking on the video. “It was amusing because it’s serious science, and a lot of time and effort went into it, but it came down to these dogs watching videos of other dogs and humans acting kind of silly.”

Two humans also underwent the same experiment, watching the same 30-minute video in three separate sessions, while lying in an fMRI.

The brain data could be mapped onto the video classifiers using time stamps.

A machine-learning algorithm, a neural net known as Ivis, was applied to the data. A neural net is a method of doing machine learning by having a computer analyze training examples. In this case, the neural net was trained to classify the brain-data content.

The results for the two human subjects found that the model developed using the neural net showed 99% accuracy in mapping the brain data onto both the object- and action-based classifiers.


In the case of decoding video content from the dogs, the model did not work for the object classifiers. It was 75% to 88% accurate, however, at decoding the action classifications for the dogs.

The results suggest major differences in how the brains of humans and dogs work.

“We humans are very object oriented,” Berns says. “There are 10 times as many nouns as there are verbs in the English language because we have a particular obsession with naming objects. Dogs appear to be less concerned with who or what they are seeing and more concerned with the action itself.”

Dogs and humans also have major differences in their visual systems, Berns notes. Dogs see only in shades of blue and yellow but have a slightly higher density of vision receptors designed to detect motion.

“It makes perfect sense that dogs’ brains are going to be highly attuned to actions first and foremost,” he says. “Animals have to be very concerned with things happening in their environment to avoid being eaten or to monitor animals they might want to hunt. Action and movement are paramount.”



Could You Be Struggling With an Eating Disorder?

Asking Yourself the Right Questions

by Shauna Simmons

Eating disorders are very real ailments that directly impact your mental and physical health. The term is used to identify a group of strong psychological conditions that impact your eating habits. It's important to remember that eating disorders know no sex, gender, race, or ethnic identity. Every single person can struggle with these habits, and just the same, everyone can seek professional help when it is necessary.



Where to Start

The first step is asking yourself honest questions about your eating habits. Do you spend much of your time fixating on what you eat, how much you eat, or are you just feeling guilty about your eating habits? These are some simple questions to introduce to yourself the idea that you might be struggling with an eating disorder.

There is a lot of fear surrounding eating habits when it comes to eating disorders. This fear is often crippling and controls your habits more than actual hunger. You might deny yourself a meal because you feel undeserving or have an intense fear of gaining weight. You may also notice that you eat to cope with difficult emotions. This often comes with feelings of depression or anxiety. You may notice that your weight often fluctuates and quite dramatically. This can be due to binge eating or the feeling that you must purge yourself.

Once You Know, You Can Take Steps to Heal

If you are concerned about your mental well-being regarding eating habits, it is okay to approach the subject. Remember to be patient with yourself as you break down the possibility of needing help. Look to friends, family, or mental health professionals who may help you gain perspective and begin the road towards healing.

NEARLY ONE IN 10 IN THE US REPORTS HAVING DEPRESSION

Increases in depression without commensurate increases in treatment are widespread, reports a study conducted at Columbia University Mailman School of Public Health and City University of New York. In 2020, past 12-month depression was prevalent among nearly 1 in 10 Americans and almost 1 in 5 adolescents and young adults. The embargoed findings will be published online in the American Journal of Preventive Medicine.

Data were drawn from the 2015–2020 National Survey on Drug Use and Health, a nationally representative study of U.S. individuals aged 12 years and older. Major depression is the most common mental disorder in the U.S. and is the strongest risk factor for suicide behavior. Previous findings show increases in depression in the U.S. population from 6.6 percent in 2005 to 7.3 percent in 2015.

“Our study updates the depression prevalence estimates for the U.S. population through the year 2020 and confirms escalating increases in depression from 2015 through 2019, reflecting a public health crisis that was intensifying in the U.S. even before the onset of the pandemic,” said Renee D. Goodwin, PhD, an adjunct professor in the Department of Epidemiology at Columbia Mailman School of Public Health and professor of Epidemiology at The City University of New York of New York, and lead author. “The net effect of these trends suggests an accelerating public health crisis and that parity and public-service announcement efforts have not achieved equity in depression treatment.”

In 2020, 9 percent of Americans aged 12 or older experienced a past-year major depressive episode. Depression was more common among young adults aged 18 to 25 years at slightly more than percent, and adolescents aged 12 to 17 years

(16.9 percent). Depression increased most rapidly among adolescents and young adults and increased among nearly all gender, racial/ethnic, income, and education groups. However, depression prevalence did not change among adults aged 35 and over. Overall, prevalence of help seeking remained consistently low.

“Our results showed most adolescents with depression neither told or talked with a healthcare professional about depression symptoms nor received pharmacologic treatment from 2015 through 2020,” noted Goodwin.

The prevalence of depression among non-Hispanic white individuals exceeded that of all other race/ethnic groups. Depression also was consistently higher among women compared to men, and among adults who were not currently or previously married. While there was an increase in depression from 2015 to 2019 among those in each income group, the highest prevalence of depression was evident among those with the lowest household income.

“The elevated level and concentration of untreated depression among adolescents and young adults are especially problematic because untreated depression early in life is predictive of an increased risk of subsequent additional mental health problems,” said Goodwin. “The short- and long-term consequences of the pandemic on depression are not yet clear, but these estimates are a requisite starting point for quantifying the mental health impact of the pandemic. Expanding evidence-based, community-based, public-facing campaigns that promote help-seeking, early intervention, prevention, and education about depression are urgently needed.”

BUST THE STRESS

With these tips

AM KUSKA

Stress is always around the corner especially for those who have frenetic and chaotic lives, like most veterinary professionals.

Fighting enemy number one of mental-physical well-being is possible, just as it is possible to defeat. The benefits of sports and exercise on body and mind health are scientifically proven to help combat stress.

Emerging data shows the beneficial effects of physical activity on the symptoms of anxiety and depression.

Some disciplines are particularly effective thanks to the ability to produce endorphins, the wellness molecules that combat the stress hormone- cortisol.

Besides having a series of positive repercussions on the our body, on weight control, on the cardiovascular system, and on the immune system, sports and exercise can also make it easier to us to relax.



Stretching >

More than a real sport, stretching is a pre and post workout, aimed at stretching and relaxing muscles.

In addition to being fundamental for anyone practicing sports, both at a professional and amateur level, it can be an alternative solution for those who want to relax without sweating and working hard.

The advice is to transform stretching into a daily habit, to be practiced especially in those moments of the day when physical tension is felt.

Benefits include greater flexibility / elasticity of the muscles and a general improvement in the ability to move.

Stretching loosens contractures, eliminates muscular / articular tensions, calms the mind and consequently facilitates stress management.

Outdoor sports >

It is well known that sports activities in contact with nature amplify the benefits on body and mind.

Trees, flowers, rivers, sand and the sea are natural elements that contribute to reducing anxiety. In addition, the sun has beneficial effects on mood through the production of serotonin, the happiness hormone.

Let's start with a great classic, a run in a park or near the sea (or lake) allows you to eliminate stress and tension more quickly.

The runner who chooses as the context in which to run the pine forest or the beach moves away from the city chaos, notoriously synonymous with traffic and frenetic pace.

Fast walk >

For those who do not like running we suggest a brisk walk.

What is identified as fast walking, if performed regularly and with the correct posture, brings benefits at various levels, both physical and mental.

Cycling >

As well as running and fast walking, even cycling, as an outdoor sport, if practiced in the green, ensures better oxygenation. This clearly contributes to relieving stress and achieving a pleasant feeling of relaxation.

Indoor sports >

Notwithstanding that any type of physical activity, aerobic or not, can be carried out both outdoors and within gyms and sports centers, there are some disciplines that are commonly practiced in covered facilities.

Pool Sports >

Among the most relaxing sports is exercising in a pool.

The opposite resistance from water to movement involves intense physical work, both cardiovascular and muscular.

Water allows the muscles to relax and at the same time release tension.



Pilates >

In this section we will explain how to relax the muscles, and consequently how to release tension and stress, through the practice of pilates.

We are in the field of holistic disciplines, which notoriously tend to achieve a balance between body and mind.

The method is based on some guiding principles from Eastern disciplines, such as awareness, concentration and breathing.

Pivotal points around which the pilates exercises rotate, the relaxation of the muscles and the maintenance of the correct posture.

The benefits are identifiable, even from the first training sessions, in an improvement in the ability to control oneself, both physically and mentally.

Pilates relieves stress and tension; at the same time it keeps the mind awake, active and receptive.

On a physical level it favors the elasticity of the spine and in general of all the joints; improves control and fluidity of movements.

For those who are not particularly experienced and approach for the first time the practice of the activity, the advice is to start with a course and with exercises carried out under the supervision of a professional; it is important to perform the movements correctly in order to avoid the risk of physical damage.



Yoga



In this section we will talk about yoga, a thousand-year-old Indian discipline that is also important in our country.

We have chosen to analyze this particular practice simply because, over the last few decades, it has been so successful that it has become almost a "fashion"; in fact there is to say that all the meditative activities, which combine physical and mental work, have beneficial effects on the reduction of stress, anxiety and nervous states.

Yoga is based on breathing and the accuracy of positions and exercises.

There are numerous beneficial effects, both physically and mentally; let's find out some.

As for the body, the discipline allows to improve the posture and to acquire more elasticity and mobility; it tones the muscles, increases the flexibility of joints and muscles, relieves back and neck pain, facilitates digestion and weight loss.

A regular practice:

- improves the functioning of the cardiovascular system, as it lowers the heart rate and blood pressure;
- improves the respiratory system and the functioning of the lungs through slow and deep breathing;
- strengthens the immune system through the stimulation of the parasympathetic system.

On the psychic level yoga is considered a powerful rebalancer with important antidepressant potential. In general, through constant practice it is concretely possible to combat, reduce and eliminate stress and anxiety.

Meditation promotes relaxation by lowering cortisol levels, heart rate and blood pressure.

A further benefit, which can be particularly useful for those who, like the student, need to stay concentrated for hours, can be identified in the increase in concentration and in the development of the ability to focus thought.

Unless you have chosen to attend a course, carefully choose the environment in which to practice your daily yoga session; whether external or internal, try to identify a location in which you feel peaceful and that does not present elements of distraction.

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 <p>SMART MONEY MOVES</p> <p>With Tatiana Rogers</p>		 <p>NEGOTIATION STRATEGIES</p> <p>With Omar Lopez</p>

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How does pet ownership during pregnancy affect mental health?

Researchers obtained data from 80,814 mothers during the second/third trimester of pregnancy in an ongoing nationwide birth cohort study.

Dog ownership was associated with reduced risk of depressive symptoms at 1 month and 6 months postpartum and with psychological distress at 12 months postpartum. In contrast, cat ownership was associated with increased risk of depressive symptoms at 6 months postpartum and psychological distress in the second/third trimester. Ownership of both cats and dogs was associated with increased risk of psychological distress in the second/third trimester.

Results suggest that dog ownership was a protective factor for maternal mental health problems, whereas cat ownership was a risk factor.

Read more by clicking on the link below:

Pet ownership during pregnancy and mothers' mental health conditions up to 1 year postpartum: A nationwide birth cohort





New approach predicts disease transmission among wildlife & humans

The rate that emerging wildlife diseases infect humans has steadily increased over the last three decades. Viruses, such as the global coronavirus pandemic and recent monkeypox outbreak, have heightened the urgent need for disease ecology tools to forecast when and where disease outbreaks are likely.

A University of South Florida assistant professor helped develop a methodology that will do just that – predict disease transmission from wildlife to humans, from one wildlife species to another and determine who is at risk of infection.

The methodology is a machine-learning approach that identifies the influence of variables, such as location and climate, on known pathogens. Using only small amounts of information, the system is able to identify community hot spots at risk of infection on both global and local scales.

“Our main goal is to develop this tool for preventive measures,” said co-principal investigator Diego Santiago-Alarcon, a USF assistant professor of integrative biology. “It’s difficult to have an all-purpose methodology that can be used to predict infections across all the diverse parasite systems, but with this research, we contribute to achieving that goal.”

With help from researchers at the Universidad Veracruzana and Instituto de Ecología, located in Mexico, Santiago-Alarcon examined three host-pathogen systems – avian malaria, birds with West Nile virus and bats with coronavirus – to test the reliability and accuracy of the models generated by the methodology. The team found that for the three systems, the species most frequently infected was not necessarily the most susceptible to the disease. To better pinpoint hosts with higher risk of infection, it was important to identify relevant factors, such as climate and evolutionary relationships.



By integrating geographic, environmental and evolutionary development variables, the researchers identified host species that have previously not been recorded as infected by the parasite under study, providing a way to identify susceptible species and eventually mitigate pathogen risk.

“We feel confident that the methodology is successful, and it can be applied widely to many host-pathogen systems,” Santiago-Alarcon said. “We now enter into a phase of improvement and refinement.”

The results, published in the Proceedings of the National Academy of Sciences, prove the methodology is able to provide reliable global predictions for the studied host-pathogen systems, even when using a small amount of information. This new approach will help direct infectious disease surveillance and field efforts, providing a cost-effective strategy to better determine where to invest limited disease resources.

Predicting what kind of pathogen will produce the next medical or veterinary infection is challenging, but necessary. As the rate of human impact on natural environments increases, opportunity for novel diseases will continue to rise.

“Humanity, and indeed biodiversity in general, are experiencing more and more infectious disease challenges as a result of our incursion and destruction of the natural order worldwide through things like deforestation, global trade and climate change,” said Andrés Lira-Noriega, research fellow at the Instituto de Ecología. “This imposes the need of having tools like the one we are publishing to help us predict where new threats in terms of new pathogens and their reservoirs may occur or arise.”

The team plans to continue their research to further test the methodology on additional host-pathogen systems and extend the study of disease transmission to predict future outbreaks. The goal is to make the tool easily accessible through an app for the scientific community by the end of 2022.

wildlife & humans

WANT TO CHANGE YOUR HABITS?

#JUST DO IT!



We all have big goals in life that aren't so easy to achieve. Many of us are hoping to lose weight and adopt a healthier diet, but this isn't as easy as it sounds. We all end up backsliding by skipping the day at the gym, munching on a twinkie in the middle of the night, or failing to show up for the classes we hoped would improve us.

While you may dream of waking up refreshed and ready to hit the gym, you can't change your mindset that way. It's actually the reverse. When you force yourself to do a specific thing repeatedly, eventually the mindset occurs and you'll do it out of habit.

Just show up

Don't feel like going to the gym today? Go there anyway, even if you're not planning to work out. If you simply go, you'll often find yourself ready to work out anyway. Eventually, you'll find getting up and not going to the gym odd, and go even when you don't have to or need to.

Don't tell yourself you can't

Many of us have aspirational goals that we have to reach for if we're going to succeed. It's possible these goals may be greatly out of reach, such as being first place in a marathon, or going into space. When you tell yourself you can't do these things, you're reinforcing a negative mindset.

In order to change your mindset, you need to have control over your thoughts. Meditation can help with this, but also avoid telling yourself you can't do something. You can. You simply need to think of a way.

Control what you can

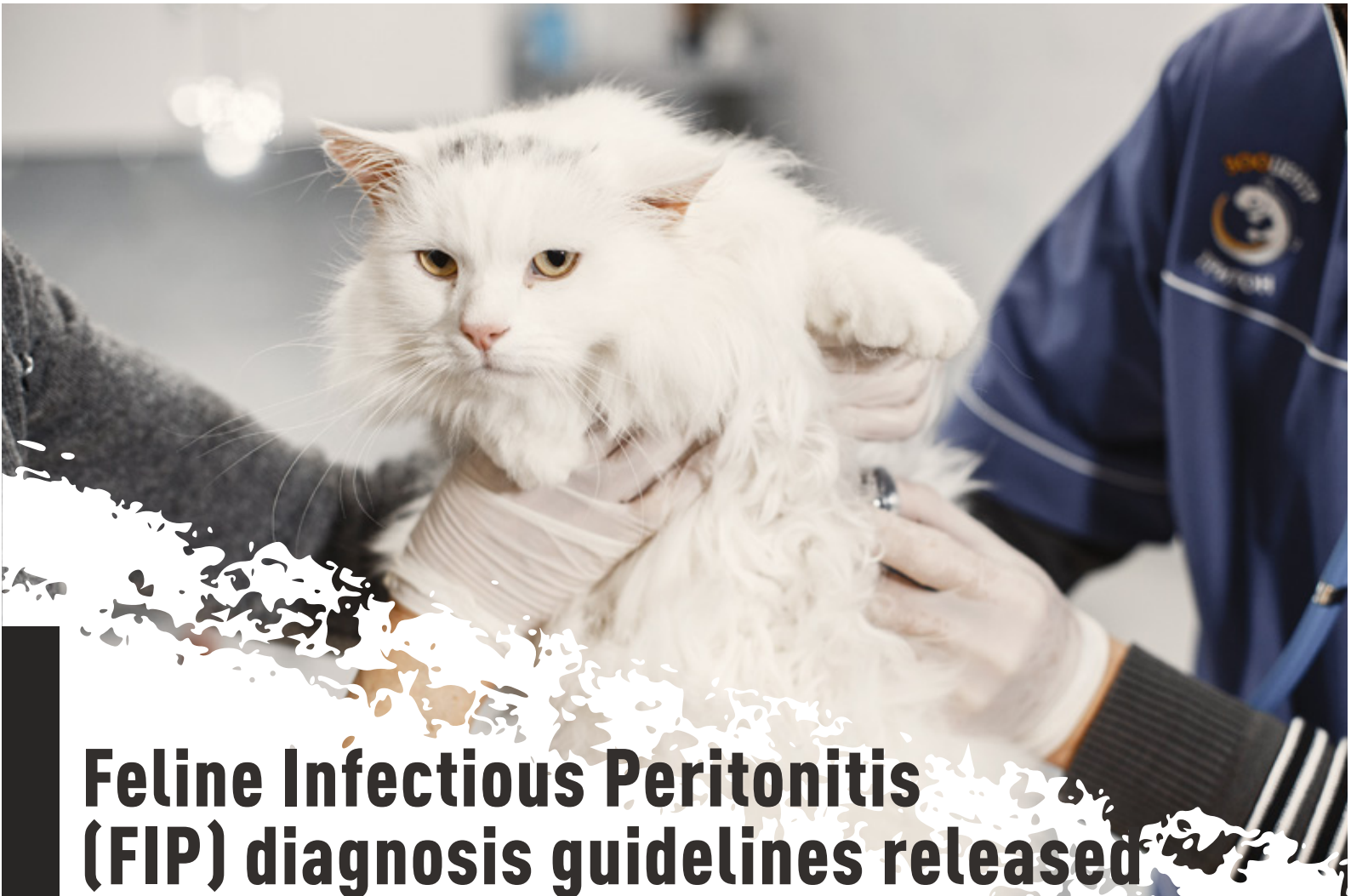
You can't control your mindset. That's something that develops from what you can control. You can control your thoughts, you can control what you physically do. You can't control how you feel. Work on showing up, and monitoring your mind flow for negative thoughts. The mindset will follow.

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Feline Infectious Peritonitis (FIP) diagnosis guidelines released

The American Association of Feline Practitioners (AAFP) have released the 2022 Infectious Peritonitis Diagnosis Guidelines. These landmark Guidelines are published in the Journal of Feline Medicine and Surgery and will provide veterinarians with the essential information necessary to provide a FIP diagnosis in cats. FIP is a viral disease that can affect any organ in the body and is caused by a feline coronavirus (FCoV).

“First recognized over 50 years ago, feline infectious peritonitis has been one of the most important infectious diseases and causes of death in cats, especially affecting young cats less than two years old,” said Vicki Thayer, DVM, DABVP (Feline), Task Force Co-chair. “Further, FIP can be challenging to diagnose in some cases and is often considered an enigma by the veterinary profession.”

Given the fact that FIP is fatal when untreated and nearly every small animal veterinary practitioner will see FIP cases, the ability to obtain a correct diagnosis is critical. FIP can be challenging to diagnose due to the lack of clinical signs or laboratory changes, especially when no physical symptoms are present. These Guidelines will provide veterinarians with essential information to assist their ability to recognize cats presenting with FIP.

The 2022 Guidelines were developed by a Task Force of experts in feline clinical medicine. Helpful tips, images and tables, and algorithms are included throughout the document. In addition, the Guidelines feature 16 valuable supplemental resources that appear online such as videos, figures, instructions, and a questionnaire. Download the FIP Diagnosis Guidelines at the AAFP website.

[CLICK HERE](#)

MALE CONTRACEPTION PILL MAY BE POSSIBLE SOON, *thanks to a veterinarian*

BY DAVID NUTT;

Cornell is pioneering an innovative alternative to the oral contraceptive pill: male contraception that targets a mechanism in the early stage of sperm cell production.

One of the most common forms of birth control is the oral contraceptive pill. Yet for all its popularity, it hasn't changed much since it was first introduced in the 1950s, according to Dr. Paula Cohen, professor of genetics at the Cornell University College of Veterinary Medicine. It is still hormone-driven, and can still induce a host of physiological problems, from blood clots and cardiovascular issues to increased breast cancer rates. It also still places the responsibility of family planning solely on women.

"Male contraception is not an area that's been investigated much," said Cohen, director of the Cornell Reproductive Sciences Center and associate vice provost for life sciences at Cornell.

The specific biological process Cohen has targeted for a potential male contraceptive is meiosis, a stage in early spermatogenesis in which a cell undergoes two rounds of division, resulting in four non-identical sperm cells, each of which contains half the number of chromosomes of the original "mom and pop" cell. Should the sperm fertilize an egg, this halved DNA content would pair up with an egg containing an equal amount of DNA to create an embryo with a full set of chromosomes.

This is a fraught process: for human men, about 1 in a 100 of their sperm have the wrong number of chromosomes, and the numbers are exponentially worse for women. "If you look in women, about 1 out of every 2 of their eggs has a wrong number of chromosomes," Cohen said.



Dr. Paula Cohen, professor of genetics at the Cornell University College of Veterinary Medicine

The reason female meiosis is so much more error prone than male meiosis is that men have a built-in “monitoring system” that eradicates any erroneous cell, so those sperm never get produced. Cohen and her lab intend to use that knowledge to identify genes that control meiosis in mouse models, so the researchers can install “a big on/off switch” on the mice genes via genome-editing technology, and then control spermatogenesis. The insights they gain into that mechanism could ultimately inform the development of a form of contraception for human males that is not only reliable, but also reversible.

A second, and equally crucial, step is finding a way to experiment with spermatogenesis in a culture system. That’s necessary because meiosis is too complicated to study in vivo, i.e., in multicellular organisms, where there’s so many other ongoing biological processes that get in the way. Until now, a robust culture system for spermatogenesis has been impossible to create.

“The conditions for each stage are very specific,” Cohen said. “But I just want to culture them from spermatogonia into meiosis, a small fraction of the overall process. And if I could get that happening robustly, again and again and again, then I can look for genes, and from genes I can find targets. And from targets, I can develop drugs.”

Written by David Nutt; the full version [of this article appears on the Cornell Chronicle website.](#)

CLICK HERE



Leah Sauerwein's secret to being unstoppable

By Jen Boon

The only thing constant is change, and there are big changes at the helm of veterinary medicine!

Without a doubt, the veterinarian landscape is transforming (in a good way). As time goes on, we are seeing great improvements in areas such as mental health, diversity, equity, and inclusion, mentorship, and so on. And it's not just practicing veterinarians having an impact. Oftentimes, vet med students are the ones at the forefront of these positive changes.

Leah Sauerwein is one such DVM candidate who is leading the pack!

Originally from St. Louis, Missouri, Leah has already accomplished a lot. She holds degrees in Neuroscience and Psychology obtained from the University of Colorado Boulder. Currently, Ms. Sauerwein is also attending Colorado State University's College of Veterinary Medicine and Biomedical Sciences.

With a graduation date of 2023, this ambitious young student is almost ready to dive into full-time practice...but not quite yet! She still has more goals to crush.

Vet Candy sat down with Leah Sauerwein to discuss her time with SAVMA and hear her thoughts on the power of student advocacy in the profession.

Elevating Voices and Ideas with SAVMA

Created in 1969, the Student American Veterinary Medical Association (SAVMA) now represents 17,000 veterinary student members and associate members all across the U.S., Canada, UK, and Caribbean.

For Leah, being a SAVMA Chapter President was an honor.

She says, "During my term, our board hosted over 20 events focused on wellbeing, leadership, professional development, and community outreach. Some of the highlights included a college-wide comedy event with Dr. Kevin Fitzgerald, our Spring wellness picnic, VetFest to highlight our club organizations, a salary negotiation workshop, a coffee truck visiting the teaching hospital, and many fitness classes."

Between studying and classes, Leah understands there is always room for fun!

But that's not all.

Recently, SAVMA made the official addition of the Chapter President Representative to the National Executive board. This means more open communication, sharing of opinions, and stronger potential

to connect grassroots ideas to national implementation.

Indeed, students are powerful advocates.

In fact, Sauerwein once organized a letter-writing campaign regarding the alteration of surgical curriculum at CSU.

She shares, "Students wrote letters to our administration, and ultimately our concerns and suggestions were heard. Since then, students have had avenues to express their opinions on the new veterinary curriculum and new buildings."

Ultimately, Leah hopes to encourage other classmates and students to step out of their comfort zones and grasp unique opportunities while in veterinary school – like joining their local SAVMA chapter!



"You Can Do Anything for One Year." Until You Can't

When asked what the biggest problem facing the veterinary field today is, Leah explained:

"Personally, I believe the biggest issue plaguing veterinary medicine from a student perspective is the dichotomy of the desire to increase wellbeing initiatives and the simultaneous contradiction with statements like, 'You can do anything for one year' when referring to programs that often overwork and underappreciate new graduates. The reality is that not everyone can do anything for one year, nor should we be expected to. We must also continue being transparent about the importance of mental health and addressing wellbeing in the workplace."

Leah's final words of advice?

"Don't get caught up in what you are supposed to be doing. The key isn't to always do more, more, and more but to do less so that you can do more of what you care most about."

A fabulous reminder from a young leader with a bright future.

Long-term relationship with owner reduces *horses' stress reactions* in new situations



A new study shows that horses can be more reluctant in new situations if they have multiple riders, have had several owners or the horse has been with its current owner only for a short period of time. The results of the international research group that studied the interaction between horses and humans also indicate that it takes time to build a good interactive relationship with a horse.

Horses have been living with humans for thousands of years. Following this long co-evolution, horses today demonstrate impressive social skills during their interactions with humans: they are receptive to human emotions and are very good at understanding human demands.

“Domestic horses may spend several hours daily in close contact with humans, which can affect horse welfare, physiology, and behaviour. Therefore, it is important to understand which factors can influence the horses’ emotions during interactions with humans and what shapes their relationship – particularly in novel situations that can be very stressful to the animals”, says the lead author of the study, Doctoral Researcher Océane Liehrmann from the Department of Biology at the University of Turku, Finland.

An international research team from the University of Turku and the University of Helsinki in Finland, and the INRAE of Nouzilly in France, studied interaction between horses and humans as well as how horses react in new situations. The researchers recruited 76 privately owned leisure horses from the Turku area (Finland) to perform two behavioural tests.

In these tests, the researchers observed and analysed the horses’ reactions to novel objects. In addition, the researchers studied whether the horse reacted differently when it faces the new object with a familiar owner or with a stranger, i.e. the researcher.

In the research situation, the horses were led to walk on two surfaces that were new to them, a white tarp, and a fluffy blanket. They were led to one of the surfaces by their owner and to the other one by an unfamiliar researcher. Second, the horses were presented with a fluffy stuffed toy either by their owner or by an unfamiliar researcher. The horse had one minute to freely come and interact with the toy and then the person approached the horse and tried to touch its neck with the toy.



“Interestingly, horses with an exclusive relationship with their owner were the calmest when approaching the novel surfaces and easily agreed to be touched with the toy. Horses that are regularly ridden or trained by different persons showed more stress behaviours in the test situations,” describes Océane Liehrmann.

Horses that had spent their whole life with their owner agreed more often to be touched with the new toy than horses that had had several owners during their life. These horses presented more stress behaviours and refused more often to be touched with the toy.

“Horses often have to change ownership, which restricts their ability to make a long-term bond with specific humans. We were particularly interested in studying how the length of the relationship between the horse and the owner affects the horse’s behaviour in new, potentially stressful situations,” says Océane Liehrmann.

The results showed that horses with shorter relationships with their owner were more reluctant in novel situations and presented more stress behaviours when asked to interact with novel objects and surfaces. On the contrary, horses that had at least 6 to 8 years of relationship with their owner, were mostly very calm when introduced to the surfaces or the stuffed toy.

Horses older than 17 years old refused more often to step on the tarp or the blanket when they were led by a stranger, while they almost all agreed to do it when they were led by their owner.

“Geriatric horses often suffer from poorer eyesight, and it has been shown that they may feel more anxiety towards new situations than younger horses. Therefore, older horses may perceive someone familiar as a secure base, feeling safer to walk over an unknown material when led by a familiar person.”

The study shows that having a shorter relationship with the owner, multiple handlers and numerous owner-changes can increase the horse’s reluctance to novel objects and surfaces and therefore may negatively impact the horse-human interactions in new situations.

“Our findings suggest that a positive horse-human relationship may take time to develop as it is shaped by multiple factors, such as the horse’s previous interactions with humans. Overall, the results show that animals’ relationships with their human caretakers should be better considered in animal welfare and its research,” Liehrmann concludes.



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Healed by nature

BY LAUREN REDUZZI



Whether it be laying in the sunshine or venturing out on a hike, many people who struggle with anxiety and depression often overlook the positive benefits of stepping outside and connecting with nature. Being in nature has the ability to increase our moods and enhance our creativity. Ecotherapy or nature therapy involves the practice of being in nature to boost growth and healing. GoodTherapy states that this form of therapy is based on the idea that people are connected to and impacted by the natural environment, drawing on the greater system of interaction between personal and planetary well-being.

According to the National Alliance on Mental Illness (NAMI), access to nature has been found to improve sleep and reduce stress, increase happiness and reduce negative emotions, promote positive social interactions and even help generate a sense of meaning to life. In many instances, nature permits a calmer state of mind in individuals as the cognitive and mental processes decrease blood pressure and reduce stress- as long as the individual feels safe.

Evenmore, the colors that individuals are exposed to in nature can generate a multitude of positive emotions. Research in color psychology reveals that the color green has strong associations with nature and is often described as a “refreshing” and “tranquil” color to the mind. Additionally, exposure to bright plants and flowers can stimulate the mind and improve the mental, physical, and spiritual wellbeing of individuals.

Ways to connect with one's natural environment can include:

- Going on a nature walk or hike
- Going on a picnic or planning meals outside
- Exploring a new landscape
- Creating a nature scavenger hunt
- Doing yoga/meditation outside
- Going bird or cloud watching
- Going for a drive through a stress-free environment

Feeling grounded and connecting with the natural world can overall improve one's mood and create life-long hobbies. However, we all experience the world differently and have varying reasons for wanting to get outside. Hence, connecting with nature in one particular way is not a one size fits all situation. One might find an activity beneficial that someone else may find challenging or stressful. Therefore, discovering one's own personal niche takes trial and error, but the benefits of implementing nature into our lives are well worth it.

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AMINO ACID SUPPLEMENT KEY TO REPRODUCTIVE HEALTH *in dairy cows*



Lysine is an essential amino acid for dairy cows, helping boost milk production when added to the diet at adequate levels. But could lysine benefit cows in other ways? A new University of Illinois study shows rumen-protected lysine can improve uterine health if fed during the transition period.

“Right after calving, the uterus is undergoing a lot of changes. The cow had 100 pounds of calf, placenta, and fluids in there, but by 30-40 days after calving, the uterus has to shrink back down and get ready for the next pregnancy. There are a lot of cells regenerating, and the cow is potentially vulnerable to infection and inflammation at that time,” says Phil Cardoso, associate professor and faculty Extension specialist in the Department of Animal Sciences at U of I.

Cardoso and his team added a rumen-protected lysine product to total mixed ration (TMR) at 0.54% for 28 days pre-calving. After calving, the lysine was added at 0.4% for an additional 28 days. Cows got the lysine additive before or after calving, or both, with an additional control group consuming no supplemental lysine in either time period.

“We found genes involved with producing inflammatory proteins in the uterus were reduced with rumen-protected lysine, especially in cows that consumed the amino acid before and after calving. And genes involved in keeping the uterus clean were more active. Altogether, our results indicate less inflammation in these cows, meaning they can spend less energy defending against infection,” Cardoso says. “It’s just more efficient.”

Along with characterizing gene expression in the uterus, the team looked for evidence of metritis, a uterine infection affecting 30% of U.S. dairy cows after calving. While the overall inflammation status of the uterus improved with lysine supplementation, the researchers didn’t detect a statistical difference in metritis in cows that consumed lysine and those that didn’t.

“Metritis is the clinical presentation of uterine inflammation. It requires a larger degree of challenge from the environment to show up. Perhaps our farm does not present real stress in that regard. We did find a difference in the sub-clinical form, also called subclinical endometritis. When we counted the number of inflammatory cells (PMN) in the uterus, cows receiving rumen-protected lysine had a lower number of cells, indicating less inflammation,” Cardoso says.

The team also tracked the first postpartum follicular growth cycle in the ovaries. Lysine didn't affect time to first ovulation – that averaged 18 days in milk for all groups – nor the follicular diameter at ovulation.

Cardoso is neither surprised nor disappointed that lysine didn't affect ovulation. He says the health of the uterus right after calving is more important than producers think.

“When you ask farmers how they assess reproductive progress and fertility, the answer is always pregnancy. Usually farmers are breeding cows around 60 to 70 days after calving, but if it is unsuccessful, it's often because of events like metritis or subclinical endometritis that happen prior to breeding, earlier in the cycle. This research shows rumen-protected lysine can set your cow up for success right after calving so she can achieve a favorable pregnancy later.”

The effects of lysine line up with Cardoso's earlier work looking at rumen-protected methionine, another limiting amino acid in dairy cows. He showed methionine affected genes related to inflammation and estrogen production, and increased embryo survival.

“Our recommendation is to use both rumen-protected methionine and lysine,” Cardoso says. “We know both amino acids are limiting in dairy cows, but it's not clear that standard dietary sources – corn or bloodmeal – make it through the rumen to supply cows with the amount they need.”

Although rumen-protected lysine and methionine products aren't widely integrated in commercial feeds, Cardoso says nutritionists are starting to recognize their importance in the industry.

“Nutritionists are the ones that come up with what's needed to get results, and they're becoming aware of rumen-protected amino acid products. But we want to educate farmers, too, so they'll be able to start the conversation with nutritionists. Asking, ‘Hey, is this something that could help me?’”



Genetic discovery could lead to better treatments for common tumor in dogs

Newly discovered genetic commonalities and differences among the most prevalent types of canine soft tissue sarcomas, a common and potentially deadly tumor, could pave the way for more accurate diagnosis and better treatments in the future.

Using next-generation sequencing techniques and computation approaches, a team of researchers and veterinarians at Washington State University examined the genetic makeup of the three most common subtypes of the tumor and identified several therapeutic targets that might form the basis of new treatments. They detailed their findings in a study published in the journal PLoS One.

“The different subtypes of soft tissue sarcomas can look so similar even trained pathologists have trouble distinguishing one from another. Yet it turns out they are not all the same – they are a very diverse group of cancers,” said Eric Shelden, an associate professor in WSU’s School of Molecular Biosciences and the study’s corresponding author.

As many as 95,000 dogs in the United States are diagnosed with this cancer every year, and 20% to 30% die from the disease. There are several subtypes of sarcomas, however, because they present similar characteristics and are difficult to diagnose, they are treated similarly and often unsuccessfully.



Rance Sellon, a veterinary oncologist at WSU and a co-author of the study, said the study's findings suggest a "one-size-fits-all" treatment approach may no longer be appropriate for patients, and clinicians may need to work more closely with veterinary pathologists to identify tumor subtypes for more accurate diagnosis and to investigate and identify more effective treatment options.

"From a clinical standpoint, the findings of this study hint that perhaps our view of this tumor type should change, and we should be looking to make better distinctions among the various subtypes, ultimately with the goal of better defining treatment and prognosis," he said.

Previous studies have examined the potential causes of soft tissue sarcomas and looked at the genetic markers to identify soft tissue sarcoma subtypes. The WSU study, though, was the first to examine gene expression patterns in canine soft tissue sarcomas using RNA-sequence analysis of tumor samples to differentiate between the tumors, understand the biology that drives their behavior and identify candidates for drug therapies.

"We looked at thousands of genes and their expression patterns at once, and then we tried to unravel computationally whether there are differences between the different tumor types, and there are," Shelden said. "While it will probably take some years before

the effect of this study is actually felt in a clinical setting, the hope is that this will make people realize that you shouldn't just treat these tumors similarly because they are in fact biologically different."

Shelden said follow-up studies are needed to validate the findings and identify drugs better suited to treat the different tumors.

Sellon estimated WSU's Veterinary Teaching Hospital sees one or two dogs a week with soft tissue sarcomas. He noted the tumors can be difficult to treat, and the prognosis varies based on a number of variables, such as the size and grade of the tumor. Treatment typically involves surgical removal of the tumor followed by radiation therapy.

"A surgical cure can be difficult, or impossible, depending on tumor size and location as these tumors are notorious for locally invasive behavior that can make it difficult for acquisition of 'clean' surgical margins – margins with an adequate amount of normal tissue surrounding the edges of the tumor," Sellon said. "Radiation therapy can be effective to treat residual disease, but for some dogs, recurrence still can be seen after surgery and radiation therapy."

