THE "OTHER" CANNABINOID...
DOES THC HAVE A ROLE IN VETERINARY MEDICINE?
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In the last issue, we looked at veterinary indications for CBD and the complex regulatory picture affecting its use. We now explore questions surrounding THC, the "other" cannabinoid.

While CBD products for both humans and animals have already taken over your local farmer's market, coffee shop and feed store, the "other" cannabinoid, THC (trans-Δ⁹-tetrahydrocannabinol), is another can of worms altogether. Many federal, state and local cannabis regulations conflict with each other and are in flux, so if you are confused, join the club! Here are the big questions most vets are wondering about:

1. Does THC have useful indications in veterinary medicine?
2. Is it safe for pets?
3. Is it legal for veterinarians to recommend or dispense THC-containing products?

This article will help provide answers to these questions.

1. IS THC A USEFUL MEDICINE FOR PETS?
There is considerable overlap in the effects of THC and CBD, the principle compounds found in the Cannabis sativa plant (see chart on page 39).

THC-rich compounds can be an important clinical adjunct to treating severe pain and neurologic disorders, in the treatment of cancer, and in complex gastrointestinal imbalances. Because of the decades-old prohibition of cannabis research, we are only just learning the many roles of the endocannabinoid system (ECS), which includes CB1 and CB2 receptors as well as their endocannabinoid ligands and the ligands' synthesizing/degrading enzymes. Broadly speaking, the ECS is the mechanism through which the nervous system
and immune system (inflammatory reactions) communicate and balance each other.

It is probable that many chronic neurologic syndromes, such as multiple sclerosis, refractory epilepsy, brain tumors, Parkinson’s disease, Alzheimer’s disease, traumatic brain injury/chronic traumatic encephalopathy, amyotrophic lateral sclerosis (ALS) and its canine analogue, degenerative myelopathy, have their origins in ECS dysfunction. THC is a partial agonist of both CB1 and CB2 receptors in the CNS, and is a phyto-mimetic for the neurotransmitter AEA (anandamide, also known as N-arachidonoylthanolamine).

While the psychoactive properties of THC are legendary, its analgesic properties are in large part mediated outside the endocannabinoid system: THC is a positive allosteric modulator of mu and delta opioid receptors, so it enhances the endogenous enkephalin response and potentiates any exogenous opioid medications. Because of this phenomenon, compassionate “medical marijuana” use has long been approved for severe chronic pain conditions.

In human medicine, THC has been used to alleviate the side effects of oncology treatments in addition to pain management, and as an anti-emetic and appetite stimulant to address cancer cachexia. However, growing research indicates that phytocannabinoids, both CBD and THC, also have direct anti-tumor effects. The National Cancer Institute website (cancer.gov/about-cancer/treatment/cam/hp/cannabis-pdq) states as follows:

“Cannabinoids may cause antitumor effects by various mechanisms, including induction of cell death, inhibition of cell growth, and inhibition of tumor angiogenesis invasion and metastasis. Two reviews summarize the molecular mechanisms of action of cannabinoids as antitumor agents. Cannabinoids appear to kill tumor cells but do not affect their non-transformed counterparts and may even protect them from cell death.”

Some of the more exciting recent research trends concern the role of the ECS in the gastrointestinal tract, leading to applications for phytocannabinoids in managing chronic disorders like inflammatory bowel disease. Cannabinoid receptors are fundamentally involved in all aspects of intestinal physiology, such as motility, secretion, and epithelial barrier function. The ECS has a strong impact on the pathophysiology of the gastrointestinal tract, and is believed to maintain homeostasis in the gut by controlling hypercontractility and promoting regeneration after injury.

Continued on page 38.
2. IS THC SAFE?

THC is not toxic to dogs — researchers were unable to establish an LD50 with doses higher than 3,000 mg/kg.14 THC exhibits a surprising lack of respiratory depression for a substance with such profound psychoactive properties. However, the effects of accidental high dose THC ingestion in canines can be alarming and include ataxia, obtundation, urinary incontinence, hyperesthesia and tremors.15 These incidents most commonly happen when dogs steal and ingest their humans’ recreational high dose THC edibles, whether commercial or homemade, such as baked goods made with THC “butter”. “Static ataxia” has long been recognized as a characteristic of canine THC ingestion, and is due to the unusually high concentration of CB1 receptors in the canine cerebellum.16 Despite many medical reports on canine cannabis toxicosis, fatalities are very rare and arise from indirect causes.

Veterinarians in states with early adoption of legal cannabis have found that with careful habituation, dogs can access the medical benefits of THC. It is usually recommended to build tolerance slowly over the course of several weeks, after which the psychoactive effects are no longer present. At professional CE events given by cannabinoid experts, dosage has been suggested as equal parts THC:CBD, ranging from 1 mg/kg to 5 mg/kg, or even products with a higher THC to CBD ratio. At this point, the evidence is primarily anecdotal. This veterinarian’s anecdotal experience includes a cat with an advanced facial tumor that completely resolved within six weeks of the owner feeding him homemade “bud butter” from a recipe found online. Cats do not seem to share the canine sensitivity to THC’s psychoactive effects.

3. IS IT LEGAL FOR YOU TO PRESCRIBE OR EVEN DISCUSS CANNABIS FOR PETS?

In my previous article, I wrote: “If you don’t like the cannabis regulations in your state, wait ten minutes,” thereby reflecting the rapidly changing regulatory picture (IVC Journal Fall 2019). This is an oversimplification, of course. The regulatory picture is confusing because it is conflicting at every level. We have the US federal government, whose Farm Bill of 2018 declared (industrial) hemp to be treated as any other agricultural product (USDA regulation); but down the street at the FDA, they claim that CBD is a drug, citing the recent approval of Epidiolex to treat pediatric refractory epilepsy. The FDA, on paper, still considers all cannabis products to be Schedule 1 drugs under the Controlled Substance Act. Meanwhile, the state governments of AK, CA, CO, ME, MA, MI, NV, OR and WA have made all forms of cannabis legal for both medical and recreational use. Other states’ regulations range from medical and decriminalized, to medical only, decriminalized only, and fully illegal. But this is just the beginning — once a state (or a nation, such as Canada) legalizes cannabis, there are endless decisions required on how to regulate cannabis products for safety, accountability, taxation and distribution.

This has resulted in some awkward transitional situations for veterinary use in the US. For instance, in California, any adult can buy hemp CBD products at any grocery store, and THC products at both medical and recreational dispensaries; but veterinarians are forbidden to talk about either cannabis product with their clients. So Californian pet guardians who think (rightly or wrongly) that cannabis can help their animals have full access to the substance, but zero access to professional veterinary medical guidance. Legislation to address this problem has been held up in the state capital by lobbying from a manufacturer of OTC pet cannabinoids who wants to sell in recreational dispensaries, while vets advise that veterinary therapeutic cannabinoids should be restricted to medical dispensaries, like their human equivalents. The bill calls for vets to be able to “discuss” cannabinoid use, but has yet to define what that term means.
There is a sense of profound frustration among veterinarians who have studied the potential medical benefits of CBD and THC for their most vulnerable patients. Most vets do not join the profession to become paper-pushers or business magnates. We put up with the educational investment and hard (often thankless) work because we are dedicated to the well-being of animals and the power of the human-animal bond. Phyto-cannabinoid therapies offer enormous potential to ameliorate the pain and ravages of serious chronic disease in animals. How can we justify not using them when we have taken an oath to help prevent avoidable suffering? Many veterinarians are carefully walking this line, risking their licenses and livelihoods to do so. It’s about time that veterinary medical professionals, researchers and regulators — both state and federal — put their heads together and figure out how to quickly and safely navigate this profound cultural transition to therapeutic cannabis use.

Editor’s Note: IVC Journal is closely following advancements in this rapidly-changing industry, and will continue to update readers on the latest research and applications regarding cannabinoid use in animal patients.

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Silver R. Veterinary Medical Cannabis: Part One. NYS Veterinary Conference, Cornell University, October 2018.


Richter G, DVM. Personal communication.