

CBD for Cats

What research is there about the use of CBD for cats?

There is a significant gap in the literature on the therapeutic use of CBD in cats. There are some studies on the safety profile of CBD in cats. Only HEALTHY cats have been studied thus far. There are no clinical studies on the use of CBD in cats for anxiety, pain (acute and chronic) or inflammation management.

For further information regarding the mode of action of CBD, the uses of CBD, and scientific evidence in this area, see the following review papers:

- Lima TM, Santiago NR Alves ECR, Chaves DSA & Visacri MB 2022, 'Use of cannabis in the treatment of animals: a systematic review of randomized clinical trials', *Animal Health Research Reviews*, vol. 23, pp. 25–38.
- Yu CHJ, Rupasinghe HPV 2021, 'Cannabidiol-based natural health products for companion animals: Recent advances in the management of anxiety, pain, and inflammation', *Research in Veterinary Science*, vol. 140, pp.38-46
- Silver RJ 2019, 'The Endocannabinoid System of Animals', *Animals (Basel)*, vol. 16, no. 9, pp. 686
- Hill, KP, Palastro, MD, Johnson, B & Ditre, JW 2017, 'Cannabis and pain: a clinical review', *Cannabis Cannabinoid Research*, vol. 2, pp. 96–104.

Tolerance for CBD in cats

- The studies report overall good tolerances of CBD oil in cats, with only mild and rare adverse effects such as hypersalivation, emesis, excessive licking and headshaking during administration.
- The majority of studies have found normal liver markers in cats treated with CBD.

The pharmacokinetics of CBD are different in dogs and cats

- Cats appear to absorb or eliminate CBD differently than dogs, showing lower serum concentrations, i.e. may need a higher dose than dogs. [1]

What is the dose rate for cats?

- Study in 2021 - 2 mg/kg of CBD given twice daily [2]
- Cats have a wide tolerated dose range:
 - In a 2019 study, CBD was dosed from 2.8 – 30.5 mg/kg CBD (+ 0.1 – 1.1 mg/kg THC).[1]

Both studies reported overall good tolerances of CBD oil in cats, with only mild and rare adverse effects.

What studies have been conducted?

Deabold et al. 2019 [1]

Aim: 12 week dose of full spectrum CBD to show short pharmacokinetic half-lives in dogs and cats

Sample: 8 Beagle dogs + 8 DSH cats

Method: Dosed with 2 mg/kg of full spectrum CBD orally BID for 12 weeks.

Findings:

- Cats do appear to absorb or eliminate CBD differently than dogs, showing lower serum concentrations.
- ADVERSE EVENTS - main adverse effects noted included licking (35.4%) and head shaking (25.2%), respectively. Other adverse events noted were pacing (11.1%), chomping/chewing (6.5%), gagging (2.1%), vomiting food, bile, or hairballs (1.1%), salivating, drooling, or foaming (1.2%), jumping (0.45%), being uncooperative (0.4%), and grimacing (0.4%). Loose stool was not observed in any of the cats during the study.
- Serum chemistry and CBC results showed no clinically significant alterations (no values exceeded the reference ranges)
- EXCEPT one cat showed a persistent rise in ALT above the reference range for the duration of the trial.

Kulpa et al. 2021 [2]

Design: Placebo-controlled, blinded study

Sample: 20 healthy adult cats

Method:

Cats were randomly allocated (n = 4 per group):

- (1) placebo group (sunflower oil)
- (2) placebo group (medium-chain triglyceride oil)
- (3) CBD in MCT oil
- (4) THC in MCT oil
- (5) CBD/THC [1.5:1] in sunflower oil.

- Doses titrated over 6 to 7 week period
 - o CBD-predominant oil (2.8 – 30.5 mg/kg CBD + 0.1 – 1.1 mg/kg THC)
 - o THC-predominant oil (3.8 – 41.5 mg/kg THC)
 - o CBD/THC-predominant oil (1.2 – 13 mg/kg CBD + 0.88.4 mg/kg THC)
- Safety and tolerability were determined from: clinical observations, complete blood counts (CBCs) and clinical chemistry. Plasma cannabinoids (CBD, THC) and metabolites (7-COOH-CBD, 11-OH-THC) were assessed.

Findings:

- Titration to maximum doses of all products were generally well tolerated by healthy cats, leading only to mild adverse effects, which resolved without medical intervention.
- Gastrointestinal effects were more common with formulations containing MCT.
- Constitutional effects (lethargy, hypothermia), neurologic (ataxia) and ocular (3rd eyelid protrusion) were more common with oils containing THC (CBD/THC and THC oils).
- There were no clinically significant changes in CBC or clinical chemistry across treatment groups.
- There were higher plasma levels of the cannabinoids and their metabolites following administration of the CBD/THC combination.

Future feline medicine: areas of potential interest re-CBD use

(1) cats with chronic gingivostomatitis

Polidara et al. 2021 [3]

Aim: To characterise the expression pattern of the cannabinoid receptors (CB1R and CB2R), and three cannabinoid-related receptors (GPR55; TRPA1; 5-HT1aR) in the caudal oral mucosa of healthy cats and cats with Feline chronic gingivostomatitis

Sample: 16 cats, 8 control cats, 8 cats with feline chronic gingivostomatitis

Method: Samples of caudal oral mucosa were collected from cats, processed using an immunofluorescence assay

Findings:

- CB1 receptor is distributed in the healthy oral mucosa epithelium of cats
- Stomatitis cats - marked upregulation of CB1 receptors throughout the mucosal epithelium + numerous CB1 receptors immunoreactive inflammatory cells.
- CB2 receptors were generally not found
- Stomatitis cats - a substantial change in the degree of expression and distribution of CB2 receptor immunoreactive cells which was distributed through all the epithelial layers.
- Healthy cats - cannabinoid-related receptor (5-HT1a receptor) immunoreactivity was observed in the mucosal epithelial cells and immunocytes.
- Stomatitis cats - upregulation of cannabinoid-related receptor (5-HT1a receptor) immunoreactivity.

(2) for treatment of cats with hypersensitivity dermatitis

Miragliotta et al. 2018 [4]

Aim: to characterise the expression pattern of the cannabinoid receptors (CB1R and CB2R), and three cannabinoid-related receptors (GPR55; TRPA1; 5-HT1aR) in the caudal oral mucosa of healthy cats and cats with Feline chronic gingivostomatitis

Sample: 12 cats (5 cats with no skin lesions, 7 cats clinically diagnosed with hypersensitivity dermatitis)

Method: Skin samples taken, examined for histopathological changes.

Findings:

- Skin samples from cats with hypersensitivity dermatitis were all histopathologically diagnosed with eosinophilic dermatitis.
- CB receptors and peroxisome proliferator-activated receptor-alpha (PPAR- α) were distributed throughout the skin in both healthy and allergic cats.
- In normal feline skin, these receptors were mainly distributed in the epithelial compartment.
- Abnormal skin - increased expression of cannabinoid receptors in the skin of cats with hypersensitivity dermatitis. The main distribution changes were suprabasal for CBR1, dermal for CBR2 and marked expression of PPAR- α in hyperplastic epidermis and perivascular infiltrate

(3) Cats as a spontaneous model for Alzheimer's disease in humans, due to similarities in neuropathy

Zadik-Weiss, L., Ritter, S., Hermush, V. et al. 2020, "Feline cognitive dysfunction as a model for Alzheimer's disease in the research of CBD as a potential treatment—a narrative review", *Journal of Cannabis Research*, vol 2, pp. 43. **Sample:** 12 cats (5 cats with no skin lesions, 7 cats clinically diagnosed with hypersensitivity dermatitis)

References:

[1] Deabold, KA, Schwark, WS, Wolf, L & Wakshlag, JJ 2019, 'Single-dose pharmacokinetics and preliminary safety assessment with use of CBD-rich hemp nutraceutical in healthy dogs and cats', *Animals*, vol. 9, pp 832

[2] Kulpa, JE, Paulionis, LJ, Eglit, GM & Vaughn, DM 2021, 'Safety and tolerability of escalating cannabinoid doses in healthy cats', *Journal of Feline Medicine and Surgery*, vol. 23, no. 12, pp. 1162-1175.

[3] Polidoro G, Galiazzo G, Giancola F, Papadimitriou S, Kouki M, Sabbatini S, Rigillo A, Chiocchetti R 2021, "Expression of cannabinoid and cannabinoid-related receptors in the oral mucosa of healthy cats and cats with chronic gingivostomatitis", *Journal of Feline Medicine and Surgery*, vol. 23, no. 8, pp. 679-691.

[4] Miragliotta V, Ricci PL, Albanese F, et al. 2018, "Cannabinoid receptor types 1 and 2 and peroxisome proliferator-activated receptor- α : distribution in the skin of clinically healthy cats and cats with hypersensitivity dermatitis", *Veterinary Dermatology*, vol. 29, pp. 316–e111.