SHY TIGER
ESSENTIAL OIL SAFETY – LITERATURE REVIEW

General safety guidelines:

- Diffuse on an intermittent setting in a well-ventilated space. Ensure there is an option for the pet to leave the room if they wish to.
- If animals have medical conditions or concerns, consult veterinarian before use.
- Do not use with pregnant or lactating animals.
- Do not apply products topically to cats.
- If the cat is sensitive, consider using the diffuser every second day. Use the low dilution rate of 1-2 drops per 100ml.
- If the pet experiences any negative changes in their behaviour, such as panting, drooling, vomiting, laboured breathing, trembling, or changes in gait, discontinue use and seek veterinary guidance.

Toxicity studies:

To date, three formal articles on toxicity of essential oils have been published. Two discuss the clinical aspects of toxic overdose of tea tree essential oil. (Knight, et.al.) (Bischoff & Guale) The other describes the clinical presentation and post-mortem examination of a dog who had been doused by her owner with a large quantity of undiluted pennyroyal essential oil. (Sudekum, et al). The Journal of the American Veterinary Association found hundreds of incidents of tea tree oil toxicity in a case study review of the ASPCA Animal Poison Control Center Database over a period of 10 years.

Most documentation regarding harmful side effects and cats has to do with essential oils not being used properly and/or used in excessive amounts topically. Some veterinary aromatherapist practitioners prefer to avoid essential oils that are high in phenols around cats. For example: thyme, oregano, basil, laurus nobilis, wintergreen, cinnamon bark, and tea tree.

It should be noted that the essential oils used in the Shy Tiger range have had no formal studies of toxicity in companion pets.

Bischoff. K, & Guale. F, (1998) 'Australian Tea Tree (Melaleuca Alternifolia) Oil Poisoning in Three Purebred Cats', *Journal of Veterinary Diagnostic Investigation*, 10(2), pp. 208–210. Available at: https://doi.org/10.1177/104063879801000223.

Khan et al. (2014), 'Concentrated tea tree oil toxicosis in dogs and cats: 443 cases (2002–2012)', *Journal of the American Veterinary Medical Association*, 244 (1), 95-99.

Knight. MJ, Hansen. SR, Buck. WB, Villar. D, (1994) 'Toxicity of Melaleuca oil and related essential oils applied topically on dogs and cats', *Vet Hum Toxicol* 36:139–142.

Sudekum. MJ, et al. (1992) 'Pennyroyal oil toxicosis in a dog.', *J Am Vet Med Assoc*. 200(6), pp. 817–8.

Literature where essential oils have been used on dogs or cats with no negative effects documented:

Amaya, V. et al. (2020) 'Effects of Olfactory and Auditory Enrichment on Heart Rate Variability in Shelter Dogs', *Animals*, 10(8), p. 1385. Available at: https://doi.org/10.3390/ani10081385.

> Dogs received either a dermal application of lavender or a placebo during four 3.5 h periods while monitoring HRV. The results suggest that topical exposure to lavender oil had some effect on vagal activity. The lavender was administered through diffusers. Adverse effects were not observed.

Bampidis. V, et. al. (2022), 'Safety and efficacy of a feed additive consisting of an essential oil from the flowers of *Cananga odorata* (Lam.) Hook.f. & Thomson (ylang ylang oil) for use in all animal species (FEFANA asbl)', *EFSA Panel on Additives, Products or Substances used in Animal Feed (FEEDAP)*, Available at: https://doi.org/10.2903/j.efsa.2022.7159

> Following a request from the European Commission, the EFSA Panel on Additives and Products or Substances used in Animal Feed (FEEDAP) was asked to deliver a scientific opinion on the safety and efficacy of an essential oil from the flowers of Cananga odorata (Lam.) Hook.f. & Thomson (ylang ylang oil), when used as a sensory additive in feed and water for drinking for all animal species. The FEEDAP Panel concluded that the essential oil under assessment is safe up to the maximum proposed use levels in complete feed of 5 mg/kg for dogs and 1 mg/kg feed for cats.

Bensignor, E. & Bordeau, W. (2005) "The use of spot-on composed of unsaturated fatty acids & essential oils on domestic carnivores: open study," *Informations Veterinary Dermatology*, vol. 10, pp. 24-28.

> In this open study, 10 obese cats under hypocaloric diet presenting a dorsal scaling and a seborrhea have been treated by a weekly spot-on application containing polyunsaturated fatty acids and essential oils (Dermoscent®, Laboratoire LDCA). Various criteria have been scored (coat quality, scale quantity, veterinarian, and pet owner subjective appreciations) during the inclusion visit and during the follow-up visit after a one-month treatment. All cats, except one, have shown an improvement of cutaneous lesions, with a good to very good global appreciation from pet owners and from the veterinarian investigator. Adverse effects were not observed.
>
> Dermoscent® contains the following ingredients: Hemp seed oil, rosemary essential oil, lavandin essential oil, clove essential oil, tea tree essential oil, ravintsara essential oil, peppermint essential oil, cedar essential oil, turmeric essential oil, oregano essential oil, gaultheria essential oil, bio-diffusing agent.

Bensignor, E. & Vidémont, E. (2017) 'Use of a Topical Spray Made of Essential Oils and Essential Fatty Acids from Plant Extracts for the Treatment of Microbial Infections in Dogs: An Opened Multicentric Study of 47 Cases', *International Journal of Veterinary Health Science & Research*, pp. 161–164. Available at: https://doi.org/10.19070/2332-2748-1700033.

> This study describes the value of a topical spray, Dermoscent® PYOclean® Spray, made of essential fatty acids and essential oils from plant origin to help treating antimicrobial infections in dogs. 47 dogs suffering from skin infection diagnosed on the basis of clinical and cytological signs were included and treated with a twice daily application of the spray. Follow-up visits were performed after 10 and 21 days. The rate of satisfaction was 90% for veterinarians and 89% for owners. Extent of lesions decreased by 23% and 37% after respectively 10 and 21 days. Severity of lesions decreased by 42% and 61% after respectively 10 and 21 days. Few side effects were reported. Only few side effects (burning sensation, pruritus, erythema) at the site of application were reported during the study, most of them being benign and spontaneously regressing after treatment withdrawal (5/47 dogs).
>
> Dermoscent® PYOclean® Spray ingredients: Hemp seed oil, manuka essential oil, lavandin essential oil, N-acetylcysteine, prebiotic.

Bensignor, E., Fabriès, L. & Bailleux, L. (2016) 'A split-body, randomized, blinded study to evaluate the efficacy of a topical spray composed of essential oils and essential fatty acids from plant extracts with antimicrobial properties', *Veterinary Dermatology,* 27(6), pp. 464-e123. Available at: https://doi.org/10.1111/vde.12374.

> In this controlled and blinded study, twelve dogs were treated with oral cefalexin and a topical spray (PYOClean Spray) for 4 weeks. The spray was applied to one half of each dog's body, whereas a placebo spray was applied to the other half. All dogs completed the study. The results demonstrate that the use of a topical spray which contains plant-derived essential oils and fatty acids, and compounds with antimicrobial properties (Manuka oil and N-acetyl cysteine) may help to speed resolution of pyoderma and may allow for shorter antimicrobial treatment time. Adverse effects were not observed.
>
> Dermoscent® PYOclean® Spray ingredients: Hemp seed oil, manuka essential oil, lavandin essential oil, N-acetylcysteine, prebiotic.

Binks, J. et al. (2018) 'The behavioural effects of olfactory stimulation on dogs at a rescue shelter', *Applied Animal Behaviour Science*, 202, pp. 69–76. Available at: https://doi.org/10.1016/j.applanim.2018.01.009.

> This study aimed to investigate the effects of olfactory stimulation via vanilla, coconut, ginger, and valerian upon the behaviour of 15 dogs at a rescue shelter. The dogs were simultaneously exposed to six olfactory conditions using scented cloths following a fixed order (cloth control, coconut, vanilla, valerian, ginger, and odour control) for 2 h a day for 3 days with an intervening period of 2 days between conditions. The dogs' behaviour was recorded every

10 min throughout the 2 h olfactory conditions using instantaneous scan-sampling. Exposure to ginger, coconut, vanilla, and valerian resulted in significantly lower levels of vocalisations and movement compared to the control conditions, while coconut and ginger additionally increased levels of sleeping behaviour. Adverse effects were not observed.

Blaskovic, M. et al. (2014) 'The effect of a spot-on formulation containing polyunsaturated fatty acids and essential oils on dogs with atopic dermatitis', *The Veterinary Journal*, 199(1), pp. 39–43. Available at: https://doi.org/10.1016/j.tvjl.2013.10.024.

The aim of this study was to evaluate the effects of a spot-on formulation containing PUFAs and essential oils on pruritus and lesions caused by CAD. Forty-eight privately owned dogs of different breeds, ages and genders diagnosed with atopic dermatitis were included in a randomized, double-blinded, placebo-controlled, multicentre clinical trial. Dogs were treated with a spot-on formulation containing PUFAs and essential oils or placebo on the dorsal neck once weekly for 8 weeks. The topical preparation containing PUFAs and essential oils was a safe treatment and beneficial in ameliorating the clinical signs of CAD. Adverse effects were not observed.

Dermoscent® contains the following ingredients: Hemp seed oil, rosemary essential oil, lavandin essential oil, clove essential oil, tea tree essential oil, ravintsara essential oil, peppermint essential oil, cedar essential oil, turmeric essential oil, oregano essential oil, gaultheria essential oil, bio-diffusing agent.

Campigotto, G. et al. (2021) 'Microencapsulated phytogenic in dog feed modulates immune responses, oxidative status and reduces bacterial (*Salmonella* and *Escherichia coli*) counts in feces', *Microbial Pathogenesis*, 159, p. 105113. Available at: https://doi.org/10.1016/j.micpath.2021.105113.

The objective of this study was to produce a dog feed containing a microencapsulated phytogenic blend, as well as determine the impact of the additive on animal health and its intestinal microbiota. The composition included microencapsulated thymol, carvacrol, and cinnamaldehyde, at 300 mg/kg of feed. Ten male beagle dogs were divided into two groups, identified as follows: the control group (C; ingested the feed without the additive) and the treated group (T; consumed feed containing the phytogenic blend). The dogs received 300 g of feed/day divided into two meals. We found less bacterial contamination in the feces of dogs in group T, i.e., total bacterial count, total coliform counts, and counts of Salmonella and Escherichia coli were lower on days 30 and 45. Phytogenic blend intake reduces bacterial counts in stool and improves antioxidant/oxidative status and immune responses. Adverse effects were not observed.

Cannas, S. et al. (2018) 'Effect of a nepeta cataria oil diffusor on cat behaviour', *Veterinaria*. 32. 43-49.

> This study aims to examine the effects of nepeta cataria oil diffusor (Felisept®) on signs of stress related behaviour in the household environment. 20 cats, divided in two groups, one with Felisept® diffusor plugged in the household and one with a diffusor containing a placebo, took part in this study. Even though not all parameters showed statistical changes, there was a general tendency for a decrease in behaviours associated with stress/anxiety/aggression showed by cats after the administration of Felisept® diffusor. Adverse effects were not observed.

De, S., SilvaS. and Almeida, W. (2020) 'Essential oils : bioactive compounds, new perspectives and applications.' London: *Intechopen.* Pp. 45-46. Available at: DOI http://dx.doi.org/10.5772/intechopen.91363.

> The chapter "Safety profiles of essential oils" discusses essential oils that are a potential irritant to the skin. None of the oils used in Shy Tiger are listed.

Duangkaew, L. et al. (2017) 'Effect of a mixture of essential oils and a plant-based extract for the management of localized superficial pyoderma in dogs: An open-label clinical trial', *The Thai Journal of Veterinary Medicine*, 47(4), pp. 513–522. Available at: https://digital.car.chula.ac.th/tjvm/vol47/iss4/10/.

> A mixture of essential oils and a plant-based extract in the form of shampoo and spot-on were shown to have in vitro antimicrobial activity against *Staphylococcus pseudintermedius*. The purpose of this open-label clinical trial was to evaluate the efficacy of these two products for the management of canine localized superficial pyoderma. Twenty dogs diagnosed with 3-4 localized pyoderma lesions were enrolled. The dogs were bathed weekly for 8 weeks with shampoo and 48 hours later, spot-on was applied near the lesions. Sixteen dogs completed the study and four discontinued prematurely due to worsening of clinical signs. In conclusion, the weekly bath with shampoo and topical spot-on may be an option to manage localized superficial pyoderma. Adverse effects were not observed.
>
> Dermoscent® PYOclean® Spray ingredients: Hemp seed oil, manuka essential oil, lavandin essential oil, N-acetylcysteine, prebiotic.
>
> Dermoscent® PYOclean® Shampoo ingredients: Hemp seed oil, propolis, honey, oregano essential oil, rosemary essential oil, manuka essential oil, soap-free cleansing agent

Ellis, S.L.H. and Wells, D.L. (2010) 'The influence of olfactory stimulation on the behaviour of cats housed in a rescue shelter', *Applied Animal Behaviour Science,* 123(1-2), pp. 56–62. Available at: https://doi.org/10.1016/j.applanim.2009.12.011.

> This study thus explored the influence of olfactory stimulation on cats housed in a rescue shelter to determine whether it holds any value as a method of enrichment for this species. One hundred and fifty cats were randomly assigned to one of five conditions of olfactory stimulation (control [an odourless cloth]; biologically relevant odour [a cloth impregnated with the scent of rabbit]; biologically non-relevant odours, [a cloth impregnated with lavender, a renowned relaxant, or the scent of catnip, a well-known stimulant]). Cats were exposed to the relevant olfactory stimuli for 3h a day for five consecutive days. Overall, the results suggest that certain odours, notably catnip, may hold potential as environmental enrichment for captive domestic cats. Adverse effects were not observed.

Graham, L., Wells, D.L. and Hepper, P.G. (2005) 'The influence of olfactory stimulation on the behaviour of dogs housed in a rescue shelter', *Applied Animal Behaviour Science*, 91(1-2), pp. 143–153. Available at: https://doi.org/10.1016/j.applanim.2004.08.024.

> This study explored the influence of five types of olfactory stimulation (control, lavender, chamomile, rosemary and peppermint) on the behaviour of 55 dogs housed in a rescue shelter. The dogs were exposed to each type of olfactory stimulation, through the diffusion of essential oils, for 4 h a day for 5 days, with an intervening period of 2 days between conditions. Dogs spent more time resting and less time moving upon exposure to lavender and chamomile than any of the other olfactory stimuli. These odourants also encouraged less vocalisation than other types of aroma. The diffusion of rosemary and peppermint into the dogs' environment encouraged significantly more standing, moving and vocalising than other types of odour. It is suggested that the welfare of sheltered dogs may be enhanced through exposure to appropriate forms of olfactory stimulation. Lavender and chamomile appear particularly beneficial, resulting in activities suggestive of relaxation and behaviours that are considered desirable by potential adopters. These types of olfactory stimulation may also appeal to visitors, resulting in enhanced perceptions of the rescue shelter and an increased desire to adopt a dog from such an environment. Adverse effects were not observed.

Haverbeke, A. et al. (2019) 'A Pilot Study on Behavioural Responses of Shelter Dogs to Olfactory Enrichment', *Veterinary Science Research*, 1(1). Available at: https://doi.org/10.30564/vsr.v1i1.1147.

> In this study, shelter dogs (n=23) were exposed to olfactory stimulation through diffusion of 9 anxiolytic essential oils in one blend (olfactory enrichment) for 8 weeks in order to check long-term effects on behaviour. The essential oil blend consisted of May Chang (*Litsea citrate*), Mediterranean Cypress (*Cupressus sempervirens*), Bitter Orange (*Citrus aurantium*), Rose Geranium (*Pelargonium graveolens*), Lavender (*Lavandula angustifolia*), Ylang-Ylang (*Cananga odorata*), Juniper (*Juniperus communisvar. Montana*), Gum Rock Rose (*Cistus ladaniferus*) and Bay Laurel (*Laurus nobilis*). The blend was diffused by a specific instrument

(diffuser) manufactured by Voith©, able to diffuse up to 300m². A concentration of 3 ml was gradually diffused each day over 21 hours. Our results indicate that olfactory enrichment with this blend of EOs is related to less time spent by dogs in high posture. Adverse effects were not observed.

Kokocińska, A. et al. (2022) 'Canine Smell Preferences—Do Dogs Have Their Favorite Scents?', *Animals*, 12(12), p. 1488. Available at: https://doi.org/10.3390/ani12121488.

The purpose of this study was to verify the canine response to selected odors that may also be preferred by humans. The experiment was performed using 14 adult dogs (10 female and 4 male) of different breeds, body size, and age (1-14 years). During the experiment, dogs were exposed to 33 odor samples: a neutral sample containing pure dipropylene glycol (control) and 32 samples containing dipropylene glycol and fragrance oils. Our study shows that dogs interacted more frequently with the scents of blueberries, blackberries, mint, rose, lavender, and linalol. Adverse effects were not observed.

Komiya, M. et al. (2009) 'Evaluation of the effect of topical application of lavender oil on autonomic nerve activity in dogs', *American Journal of Veterinary Research*, 70(6), pp. 764–769. Available at: https://doi.org/10.2460/ajvr.70.6.764.

Lavender oil (0.18 mL) or saline (0.9% NaCl) solution (0.18 mL) was topically applied to the inner pinnas of both ears of all dogs at 8:30, 12:00, 15:30, and 19:00 on day 2. Each trial was duplicated in each dog, with an interval of 3 to 4 days between trials. Spectral indices of heart rate variability, power in the high-frequency range, and the ratio of low-frequency to high-frequency power were calculated as an indirect estimate of autonomic nerve activity. When dogs were treated with lavender oil, the mean heart rate was significantly lower during the period of 19:00 to 22:30 on day 2, compared with the mean heart rate during the same period when dogs were treated with saline solution. On the other hand, high-frequency power during the period of 15:30 to 19:00 was significantly higher when dogs were treated with lavender oil, compared with the high-frequency power during the same period when dogs were treated with saline solution. The study revealed some evidence that topical application of lavender oil affected vagal activity in dogs. Prior to the experiment, all dogs were tested for sensitivity to the lavender oil (patch test). One drop of oil was applied to skin on the abdomen, and for 36 hours, the site of application was repeatedly examined for evidence of irritation. Ten to 14 days afterward, the test was repeated on the same area. Evaluation of dogs for sensitivity to lavender oil applied to the abdomen revealed no signs of irritation. In addition, successive applications of the lavender oil to the inner pinna of each ear did not result in any gross dermatologic lesions. Therefore, adverse effects were not observed.

McCaskill, L.D (DVM) (2021), "The Use of Essential Oils in Traditional Chinese Veterinary Medicine: Small Animal Practice", *American Journal of Traditional Chinese Veterinary Medicine,* 16:2, Available at: https://acuvetpet.com/wp-content/uploads/2021/08/2021_8_AJTCVM_Vol_16_No_2_Issue_Final_Reduced.pdf#page=73

This chapter contains 4 case studies where EO's were used on dogs by a veterinarian aromatherapist, this can be seen on pages 74-77.

Page 74:
Essential oils are safe to use with dogs and cats but knowledge of the different types of EO's and their medicinal properties along with species differences are important. For example, it is recommended due to potential toxicity in dogs and cats to avoid tea tree, birch, and wintergreen EO's. Additionally, cats should avoid peppermint and spearmint. If these oils, however, are mixed in a blend, diluted with FCO or diffused, they are safe to use for both species. Stimulating EO's (e.g., rosemary) should be used with caution in animals with low seizure thresholds and EO's that produce a warming sensation when applied topically (e.g., cassia, cinnamon, clove) should always be diluted prior to topical application to dogs and are not recommended for cats. Cats metabolize medications, fragrances, and chemicals differently from canines and humans, and are more sensitive to certain essential oils (e.g., tea tree). Due to their sensitivity, the use of topical essential oils in felines will require a higher dilution as compared to canines (Table 6).

Page 77:

In animals, attention to species differences, routes of administration, purity of the product (CPTG oils) and concentration are important factors for safe administration. It is also important to note that the greater the purity of the oil, the greater the therapeutic effects and that contamination of oils can lead to adverse effects.

Meason-Smith, C. et al. (2018) 'Novel association of *Psychrobacter* and *Pseudomonas* with malodour in bloodhound dogs, and the effects of a topical product composed of essential oils and plant-derived essential fatty acids in a randomized, blinded, placebo-controlled study', *Veterinary Dermatology*, 29(6), pp. 465-e158. Available at: https://doi.org/10.1111/vde.12689.

Twenty-seven bloodhound dogs from a south Texas boarding facility were enrolled in this study. Skin swabs were taken from the axilla and dorsum of 27 dogs at initiation of the study. The malodourous dogs were randomly assigned to a treatment or placebo group, received four weekly topical applications of the spot-on or placebo, and samples were recollected. The topical treatment significantly reduced malodour. Adverse effects were not observed.

Dermoscent® contains the following ingredients: Hemp seed oil, rosemary essential oil, lavandin essential oil, clove essential oil, tea tree essential oil, ravintsara essential oil, peppermint essential oil, cedar essential oil, turmeric essential oil, oregano essential oil, gaultheria essential oil, bio-diffusing agent.

Mugnaini, L. et al. (2012) 'In vitro and in vivo antifungal activity of some essential oils against feline isolates of *Microsporum canis'*, 22(2), pp. 179–184. Available at: https://doi.org/10.1016/j.mycmed.2012.04.003.

> The anti-*Microsporum canis* activity of some EOs chemically characterized was evaluated both in vitro and in vivo. Eleven feline isolates of *M. canis* were tested by microdilution against EOs extracted from Wild Thyme (*Thymus serpillum*), Oregano (*Origanum vulgare*), Rosemary (*Rosmarinus officinalis*), Star Anise (*Illicium verum*) and Lemon (*Citrus limon*). A mixture composed by 5% *O. vulgare*, 5% *R. officinalis* and 2% *T. serpillum*, in sweet almond oil was administered to seven infected, symptomatic cats. *T. serpillum* and *O. vulgare* showed the lowest MICs, followed by *I. verum*, *R. officinalis* and *C. limon*. Four out of seven treated cats recovered both clinically and culturally. *T. serpillum* and O*. vulgare* EOs showed a strong antifungal activity. Preliminary data suggest a possible application in managing feline microsporiasis. Adverse effects were not observed.

Nardoni, S. et al. (2017) 'Traditional Mediterranean plants: characterization and use of an essential oils mixture to treat Malassezia otitis externa in atopic dogs', *Natural Product Research,* 31(16), pp. 1891–1894. Available at: https://doi.org/10.1080/14786419.2016.1263853.

> Five mixtures of essential oils obtained from Mediterranean plants Grapefruit (*Citrus paradisi*), Clary Sage (*Salvia sclarea*), Basil (*Ocimum basilicum*), Rosemary (*Rosmarinus officinalis*), Lemon (*Citrus limon*), Roman Chamomile (*Anthemis nobilis*), Lavandin (*Lavandula hybrida*), and Thyme (*Thymus vulgaris*) provided with antifungal and/or anti-inflammatory action assayed in vitro, were tested in vivo versus *M. pachydermatis* for treatment once daily for 2 weeks on 25 atopic dogs with *Malassezia* otitis externa. Mixture composed by *C. limon* 1%, *S. sclarea* 0,5%, *R. officinalis* 1%, *A. nobilis* 0,5% yielded excellent results in all treated dogs. This study confirms recent findings suggesting a multifactorial alternative approach for the management of canine Malassezia otitis. Adverse effects were not observed.

Nardoni, S. et al. (2016) 'Open-field study comparing an essential oil-based shampoo with miconazole/chlorhexidine for haircoat disinfection in cats with spontaneous microsporiasis', *Journal of Feline Medicine and Surgery*, 19(6), pp. 697–701. Available at: https://doi.org/10.1177/1098612x15625709.

> The goal of the study was to compare the antifungal efficacy of an essential oil (EO) shampoo proven to be effective against *Microsporum canis* with miconazole/chlorhexidine for topical haircoat disinfection in cats treated concurrently with oral itraconazole. Methods Cats received treatment with oral itraconazole (Itrafungol) at a dose of 5 mg/kg/day pulse administration for 1 week, every 2 weeks for at least 6 weeks and were washed twice a week with a neutral shampoo with added EOs of Wild Thyme (*Thymus serpyllum*) at 2%, Oregano (*Origanum vulgare*) and Rosemary (*Rosmarinus officinalis*) at 5% each, for the period of systemic treatment. The treatment was well tolerated, and adverse effects were not recorded. All cats were clinically negative at week 11. There was no significant difference

between the number of weeks to obtain mycological cure for cats treated with EOs and animals treated conventionally.

Nardoni S., et. al. (2014) 'Clinical and mycological evaluation of an herbal antifungal formulation in canine Malassezia dermatitis', *J. Mycol. Med.* 24:234–240. doi: 10.1016/j.mycmed.2014.02.005.

The treatment of 20 dogs affected by dermatitis due to M. pachydermatis, with Malacalm®, a commercially available mixture consisting of essential oils Bitter Orange (*Citrus aurantium*) 1%, Lavender (*Lavandula officinalis*) 1%, Oregano (*Origanum vulgare*) 0.5%, Marjoram (*Origanum majorana*) 0.5%, Peppermint (*Mentha piperita*) 0.5% and Curry Plant (*Helichrysum italicum*) 0.5%, suspended in sweet almond oil and coconut oil, is reported. The effectiveness of the whole mixture, of component essential oils and of their more represented compounds against clinical isolates was evaluated by a microdilution test. Twenty animals were topically administered the mixture twice daily for 1 month. Ten animals were treated with a conventional therapy based on ketoconazole 10 mg/kg/day and chlorhexidine 2% twice a week for 3 weeks. At the end of both treatments animals significantly improved their clinical status. Adverse effects were not observed.

Official Journal of the European Union (2004) 'Commission: List of the authorised additives in feeding stuffs (1) published in application of Article 9t (b) of Council Directive 70/524/EEC concerning additives in feeding stuffs', Available at: https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ%3AC%3A2004%3A050%3A0001%3A0144%3AEN%3APDF&fbclid=IwAR1M3tbbankjPm4TKdImbCxSpNOj3hngXWMt1QH7CRt8qnICDbX_iTfBehw

All the essential oils used in Shy Tiger products are listed in this document as authorised additives in animal feed.

Pickup, C.H. (2018) 'The use of scented cloths as environmental enrichment and their effects on frequency of behaviour and behavioural diversity of domestic cats (*Felis catus*) housed in a rehoming shelter.', *Manchester Metropolitan University*. Available at: DOI:10.13140/RG.2.2.33400.39680

This project aimed to explore the effects of four scents, lavender, cinnamon, catnip and rabbit, as environmental enrichment to increase the frequency of natural behaviours and the behavioural diversity of behaviours shown by cats housed at the Society For Abandoned Animals rescue centre. Cats' behavioural states while exposed to five different conditions, one control and four olfactory, were recorded at regular intervals during thirty-minute periods. Olfactory enrichment increased frequency of positive maintenance behaviours, scratching and litter tray use, in all conditions excluding the rabbit condition. Catnip and cinnamon significantly increasing the frequency of these behaviours. Olfactory enrichment also increased behavioural diversity, supporting the initial aims of the study. Adverse effects were not observed.

Sang Hoon Kim et al. (2009) 'Efficacy of aromatherapy for the treatment of otitis externa in dogs', 49(1), pp. 85–89. Available at: https://www.kjvr.org/upload/pdf/kjvr-49-1-85.pdf

> This study examined the therapeutic effects of aromatherapy for the treatment of otitis externa in dogs. Eleven dogs with otitis externa were examined. The control group (5 dogs) was treated with susceptible antibiotics, and the experimental group (6 dogs) was treated with aroma-oil applied topically to the ear canal. The aroma-oil contained 10 ml sweet almond oil, 0.3 ml bergamot oil, 0.2 ml lavender oil, 0.1 ml tea tree oil and 0.1 ml roman chamomile oil. The blended aroma-oil (0.1 ml) was applied to the ear canal twice daily for 2 weeks. The bacterial cell counts in the experimental group were significantly lower at one ($p < 0.01$) and two weeks ($p < 0.05$) after treatment than the control group. These results suggest that aromatherapy is an effective and practical treatment for otitis externa in dogs. Adverse effects were not observed.

Stanghellini, A.L. (2019) 'Effect of lavender (Lavandula angustifolia) essential oils on sheltered dog behavior: preliminary results', *Dog behavior*, 5(3), pp. 19–22. Available at: https://doi.org/10.4454/db.v5i3.111.

> The aim of the study was to assess whether olfactory enrichment through lavender essential oils influences the behavior of sheltered dogs. 11 dogs (7 males and 4 females, castrated), aged between 18 months and 13 years were involved. Animals were divided into two groups: G1 (Experimental group and G2 (Control group).
>
> G1 dogs wore a collar with a gauze on which 5 drops of lavender (Lavandula angustifolia) essential oil were laid once a week. The dogs of G2 wore a collar identical to those of G1 but without aromatization with lavender. The dogs under- went a 10-minute isolation period (T0) in an unknown environment, then they were brought back to their own box and their behavior was videotaped for 5 minutes. The same procedure was repeated after one (T1) and two (T2) months. A significant difference among the data of stress behaviors recorded at the different times is observable in dogs G2 ($\chi 2 = 6.00$; $p=0.05$), while no difference was observed in experimental dog G1 ($\chi 2 = 0.857$; n. s.).
>
> Preliminary results of this study seem to indicate that the application of a collar impregnated with lavender essence can have a positive effect on the stress of the animal in the kennel, avoiding an increase in stress behaviors, as happens instead in the control group. Adverse effects were not observed.

Tretter, S. and Mueller, R.S. (2011) 'The Influence of Topical Unsaturated Fatty Acids and Essential Oils on Normal and Atopic Dogs', *Journal of the American Animal Hospital Association*, 47(4), pp. 236–240. Available at: https://doi.org/10.5326/jaaha-ms-5607.

> Seven dogs with atopic dermatitis and six normal dogs were treated with a spot-on product containing essential oils and unsaturated fatty acids q 7 days for 8 wk. Seven additional atopic dogs received a daily spray containing similar ingredients to the spot-on. Adverse effects were

not observed. The results of this pilot study indicate that topical fatty acids and essential oils are a useful treatment option for canine atopic dermatitis.

Dermoscent® contains the following ingredients: Hemp seed oil, rosemary essential oil, lavandin essential oil, clove essential oil, tea tree essential oil, ravintsara essential oil, peppermint essential oil, cedar essential oil, turmeric essential oil, oregano essential oil, gaultheria essential oil, bio-diffusing agent.

Uccheddu, S, et al. "Behavioural and Cortisol Responses of Shelter Dogs to a Cognitive Bias Test after Olfactory Enrichment with Essential Oils." *Dog Behaviour*, vol. 4, no. 2, 2018, Available at: https://doi.org/10.4454/db.v4i2.87.

The olfactory effects of the following 9 essential oils were studied: Ylang-Ylang (*Cananga odorata*), Gum Rock Rose (*Cistus ladaniferus*), Bitter Orange (*Citrus aurantium*), Mediterranean Cypress (*Cupressus sempervirens*), Juniper (*Juniperus communis var. montana*), Lavender (*Lavandula angustifolia*), Bay Laurel (*Laurus nobilis*), May Chang (*Litsea citrata*), Rose Geranium (*Pelargonium graveolens*). A blend of these oils were explored on a cognitive bias test, cortisol levels and the behaviors of 110 shelter dogs (n = 10 dogs within each group). A blend of 9 essential oils and each separate oil of the blend were tested, for a total of 10 treatments and a control group. Essential oils were diffused through a cotton collar worn by the dogs for 3 hours before starting the second cognitive test procedure. The collar, just before being applied to the dog, had 1 drop of an individual oil or of the blend added to it. The control group, as the experimental groups, wore a cotton collar for 3 hours but without any oils or other addition. Olfactory enrichment with the blend resulted in a reduced latency to the ambiguous cue, indicating a more optimistic bias and improved welfare. The results of this study suggest that olfactory enrichment with essential oils can have specific effects on the affective states and behaviors of shelter dogs and could therefore be useful for shelter management. Adverse effects were not observed.

Vaghela, V. (2022) 'Can the use of Pet Remedy's Calming Spray elicit a calming response in domestic cats (*Felis catus*)?' *Brooksby Melton College*. Available at: https://doi.org/10.21203/rs.3.rs-1318478/v1.

This article will explore the effectiveness of Pet Remedy's Calming spray and the behaviours cat's exhibit. Methodology Furthering the existing research, which was initially undertaken, Pet Remedy's Calming Spray was tested on 44 domestic cats to observe their responses. Pet Remedy's spray contains; predominantly Valerian root absolute oil base (80%), small inclusions of vetiver 10%, basil 5% and clary sage 5% essential oils, which are all ingredients with individual properties to provide a calming response. All cats were blindly offered exposure to Pet Remedy and a control sample at random. The number of interactions were recorded onto behavioural ethograms. All cats had 30 minutes to acclimatise to the researcher and had at least a four-hour washout period between both exposures. This study

suggests that olfactory enrichment using Pet Remedy's Calming Spray corresponds an effective means to induce a calming response. Adverse effects were not observed.

Vercelli, C. et al. (2021) 'In vitro and in vivo evaluation of a new phytotherapic blend to treat acute externa otitis in dogs', *J Vet Pharmacol Ther.,* 44(6), pp. 910–918. Available at: https://doi.org/10.1111/jvp.13000.

The present study aimed to investigate the efficacy of a new phytotherapic blend containing essential oils with a double approach: first an *in vitro* evaluation on the most frequently diagnosticated microorganisms in case of canine otitis externa was performed. Then an *in vivo* trial was organized, evaluating the efficacy the same phytotherapic blend in dogs presenting with spontaneous acute otitis externa. The commercially available Otogen® formulation was provided by the producing company (Nutrigen s.r.l., Prato, Italy). The commercial product includes essential oils of Tea Tree (*Melaleuca alternifolia)*, Wild Thyme (*Thymus serpillum)*, Sage (*Salvia officinalis)*, Eucalyptus (*Eucalyptus officinalis*), Rosemary (*Rosmarinus officinalis*), Macadamia (*Macadamia alternifolia*), Lavender (*Lavandula officinalis*), and Sunflower (*Helianthus annuus*), as active compounds, and helianthus seed oil (HSO), isopropile miristate, isopropile adipate and a mixture of triglycerides as excipients. All the clinical signs of otitis externa were improved after a daily administration in most dogs, and owner's compliance was high and mainly because they appreciated the pleasant scent, able to immediately reduce the unpleasant odor frequently occurring in course of otitis. No adverse effects were recorded and none of the cases was withdrawn.

Wells, D.L. (2006) 'Aromatherapy for travel-induced excitement in dogs', *Journal of the American Veterinary Medical Association*, 229(6), pp. 964–967. Available at: https://doi.org/10.2460/javma.229.6.964.

The objective of this study was to evaluate the efficacy of the ambient odor of lavender as a treatment for travel-induced excitement in dogs. 32 dogs with a history of travel-induced excitement in owners' cars. Each dog was studied during travel in the owner's car to a familiar walking site during 2 conditions of olfactory stimulation. The first condition was a control condition, during which dogs were exposed to no odor other than that arising naturally from the environment. The second condition was an experimental condition, during which dogs were exposed to the ambient odor of lavender (*Lavandula angustifolia*). For olfactory stimulation with lavender, 5 mL of lavender oil was sprayed evenly (approx 0.001 mL/cm^2) with a new aerosol diffuser onto both sides of a sterilized 0.5 ×0.5-m flannel cloth. Dogs' behavior was recorded during the car journey for 3 consecutive days under the control condition and for 3 consecutive days under the experimental condition. The percentage of time spent moving, standing, sitting, resting, and vocalizing in each condition of olfactory stimulation was quantified for each dog. Dogs spent significantly more time resting and sitting and less time moving and vocalizing during the experimental condition with diffused lavender. There was no significant relationship between dogs' behavior and sex, castration status, day, or the order of exposure to each olfactory condition. Aromatherapy in the form of diffused

lavender odor may offer a practical alternative treatment for travel-induced excitement in this species. Adverse effects were not observed.

Wynn, S.G. and Fougère, B.J. (2007) 'Veterinary Herbal Medicine', *Elsevier eBooks*. Elsevier BV. Available at: https://doi.org/10.1016/b978-0-323-02998-8.x5001-x.

Chapter 12: Herbal Medicine - Potential for Intoxication and Interactions with Conventional Drugs pp. 190-191:

This chapter discusses the use of essential oils in veterinary medicine and has two tables labelled "Table 12-2: Potentially Toxic Essential Oils" and "Table 12-3: Most Toxic Essential Oils". These tables describe the oil, the genus/species, the oral lethal dose g/kg, and the toxic component. None of the essential oils used in the Shy Tiger products are listed here.

Yalçin Ülger, Ebru. (2021). 'Neurophysiological Effects of Transcutaneous Electrical Neuron Stimulation and Aromatherapy Treatments in Dogs After Cesarean Section', *International Graduate Studies Congress - IGSCONG 2021*, Faculty of Veterinary Medicine Bursa Uludag University, Turkey. ORCID: 0000-0003-1756-128

The research will be carried out with private pet veterinary clinics. Cesarean section will be carried out by the responsible veterinarian in the clinic. Non-invasive TENS and/or aromatherapy will be applied by the researcher in the first hour of the patient's recovery from anaesthesia, and physiological values will be recorded during this period. The study is planned research on 20 female dogs. The study will be divided into 4 groups: Control, TENS, aromatherapy, and TENS + aromatherapy. For each group, n = 5 animals will be analysed.

In the aromatherapy group, 30% lavender oil solution prepared with propylene glycol will be filled into the diffuser as 15 ml. The diffuser will be placed at a distance of 10cm to the animal taken to the resting room after the cesarean section. 2 sets of 20 minutes of breathing and 20 minutes of rest will be applied. Saliva samples will be taken for cortisol and oxytocin measurement at the 0th hour immediately after the cesarean and at the end of the aromatherapy treatment at the 1st hour. In the TENS + aromatherapy group, both applications will be performed together in combination. TENS and aromatherapy will be applied together in 2 sets of 20 minutes. Saliva samples will be taken for cortisol and oxytocin measurement at the 0th hour and the 1st hour just after the cesarean.

TENS and aromatherapy applied to dogs with postoperative pain after cesarean section increased salivary cortisol level and decreased salivary oxytocin level. In addition, changes occurred in physiological data regulated by the central nervous system, such as blood pressure, body temperature, saturation, respiration, and heart rate, compared to the control groups. Adverse effects were not observed.

Literature reviews regarding EO in companion animals:

Ebani, V.V. and Mancianti, F. (2020) 'Use of Essential Oils in Veterinary Medicine to Combat Bacterial and Fungal Infections', *Veterinary Sciences*, 7(4), p. 193. Available at: https://doi.org/10.3390/vetsci7040193.

> EOs have been associated with hepatotoxicity, nephrotoxicity, changes in the blood vessels, reproductive toxicity, and oxidative stress that occur as a result of acute intoxication. However, this information is based on in vivo studies carried out mainly in rats and mice, whereas information about toxicity in domestic animals has not been elucidated.
>
> The most frequently reported adverse effect is dermatitis. Lavender, peppermint, tea tree oil, and ylang-ylang are the most common essential oils responsible for dermatitis side effects in human patients, so the **EOs should be administered following the guidelines drawn up by an aromatherapist vet.**

Filip ŠTRBAC et al. (2021) 'POSSIBILITIES AND LIMITATIONS OF THE USE OF ESSENTIAL OILS IN DOGS AND CATS', 21(1-2). Available at: https://doi.org/10.7251/vetjen2101238s.

> The causes of the potential toxicity of certain essential oils in dogs and cats could be related to some specifics of their metabolism. Namely, in cats, a deficiency of UDP-glucuronosyltransferase enzymes such as *UGT1A6* and *UGT1A9*, which are important for glucuronidation processes, is known. Therefore, active substances that are biotransformed and then eliminated in this way can accumulate in the body and cause symptoms of toxicity. This also applies to certain drugs such as paracetamol, propofol, carprofen or aspirin. Since phenolic compounds are metabolized in this way, essential oils containing them can also lead to symptoms of toxicity, so they should be avoided or used with great caution in cats. On the other hand, metabolism in dogs also has its specifics such as N-acetyltransferase enzyme deficiency, although cats are generally considered more sensitive to drug metabolism compared to dogs. **In any case, any drug can be toxic if used incorrectly, which is also true for essential oils, which are very different from each other**. **In that sense, the correct selection of plant species with adequate use in terms of dosage, concentration and method of application can contribute to the efficient and safe use of essential oils.**

Keith. ER, (2010) 'Essential Oil Use in Canine Veterinary Medicine', *South Dakota State University ProQuest Dissertations Publishing*, UMI: 3430478. Available at: https://www.proquest.com/openview/dd3bcc2a4ce545eee7ac165c16aedfca/1?pq-origsite=gscholar&cbl=18750

> The purpose of this research is to assess and relate essential oil use with canine patients in veterinary practices within the United States. In order to develop the most comprehensive understanding possible, a qualitative, ethnographic style of research was employed to assess

the scope, methods, purpose, and philosophy of essential oil use with canine patients among holistic veterinarians throughout the United States.

Ruiz-Cano, D. et al. (2022) 'Essential Oils and Melatonin as Functional Ingredients in Dogs', *Animals*, 12(16), p. 2089. Available at: https://doi.org/10.3390/ani12162089.

This review points to the combination of EOs and melatonin in food supplements and in the topical application as an innovative product and shows excellent perspectives aimed at addressing dysfunctions in pets, such as the treatment of stress and anxiety, sleep disorders, alopecia, and hair growth problems, among others.

The use of EOs in animal/pet food requires, as in humans, some precautions and recommendations. According to the FDA, "GRAS" is an acronym for **"Generally Recognized As Safe". This term is applied to EOs.** Most EOs and their components are classified as GRAS. FEMA, through its Food Additives Committee, has been publishing since 1960 multiple reports providing valuable information on EOs, giving their average dose of application and their maximum limits of use in various foods. In short, a Panel's evaluation of an EOs or other substance performs a toxicity study observation, its relevance to observed effects on human/animal health is evaluated, and the dose at which no adverse effects (NOAEL) are observed is determined. Therefore, the added EOs can be considered a sensory additive if it exerts an improvement in the smell or palatability of the feed and also as a zootechnical additive, improving feed digestibility and/or gut microflora, but also as physiological stabilizers because the EOs can favorably affect animal health, for example by improving stress tolerance or safeguarding against possible infections. EOs have been widely studied in animal nutrition, especially since restrictions on the use of antibiotics appeared.

Table 5 shows some examples of the use of EOs in dogs, indicating the dosage and possible beneficial effect. Generally, EOs have been used in dogs to improve their general health and immunological response, but also in specific therapies such as those aimed at improving liver, renal, cardiovascular, gastrointestinal, muscular-joint, and skin health, among others.

Our preliminary data show that topical melatonin plus EOs application in dogs with Leishmaniosis showed a significant improvement in the affectation, decreasing the area of dermatitis, skin itching, and therefore, erosion wounds gradually improved in treatments with melatonin + EOs cream every 2 days, for 4–5 weeks (Figure 3).

Veterinary Products containing EO's:

The Dermoscent® brand has a range of topical treatments for dogs and cats. They are a blend of omega fatty acids and essential oils. Some of the articles listed in this document have used these products in their trials. https://www.dermoscent.com/accueil/en/