

Behavioural Impact of Feeding a Calming Herbal Blend to English Foxhounds.

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Introduction Chronic anxiety and stress can negatively impact an animal's welfare and quality of life, therefore there is value in exploring the efficacy of supplements which may support or improve these states. Research presented here was a continuation of promising preliminary work carried out by Wiltshire (2013), which investigated the efficacy of a calming herbal blend (CHB) (*Matricaria chamomilla*, *Melissa officinalis*, *Verbena officinalis*, *Scutellaria lateriflora*) as a nutraceutical for reducing companion animal anxiety. Here, a nutraceutical is defined as any food or ingredient that has a positive impact on an individual's health, physical performance, or state of mind, in addition to its nutritive value (Hardy, 2000). The aim of this research was to assess whether the same CHB (table 1) had a behaviourally calming impact on dogs, *Canis lupus familiaris*. Nutraceuticals designed to promote calming in pets are often promoted using testimonial rather than scientific evidence due to the non-essential requirement for sale. This means there is often little to no evidence of efficacy in species the product is intended to target and as such this risks owners not seeking further support for their pet.

Methods Figure 1 explains the methodology used for the first part of the feeding trial and overnight behavioural analysis.

Behavioural observations between the control week and test week (the fourth week of the feeding trial) were compared using an ethogram adapted from Dalla Villa *et al.* (2013), Tod *et al.* (2005), Flannigan and Dodman (2001), and Lund and Jorgenson (1999).

Stranger approach tests adapted from Tod *et al.*, (2005) were also carried out within the control week and trial week to compare the groups' behavioural responses during the day. The stranger (the researcher) approached and stood next to the front bars of the outdoor kennel area, adopting a face on stance (shoulders parallel to bars). Eye contact was not made with the subjects and any attempt by subjects to seek interaction with the researcher were ignored. From video footage, subject behaviours were recorded for one minute using the same ethogram as above (starting from when the stranger took their stance at the kennel front). Continuous one-zero sampling at 5 second intervals was used to record behaviours for one minute. Tests took place outside at approximately 11am each day and were repeated three times during the control week and three times during the trial week on separate days. The nonparametric Mann-Whitney U and Wilcoxon sign-rank tests were used for behavioural to analyse of the results (Petrie and Watson, 1999) in SPSS (version 22: IBM, 2018).

Probability values of 0.05 or less were considered statistically significant in both experiments.

Table 1. Analytical composition and feeding guidelines for the calming herbal blend (CHB).

Analytical Constituents	Composition (1:1:1:1)	Feeding Guidelines	
		Size of Dog	Daily feeding guideline
Crude Protein 11.6%	Chamomile, lemon balm, vervain, skullcap	Small	1/2 scoop
Crude Fibre 20.7%		Small-Medium	1 level scoop
Crude Fat 2.3%		Medium-Large	1-2 scoops
Crude Ash 8.1%		Giant	2-3 scoops

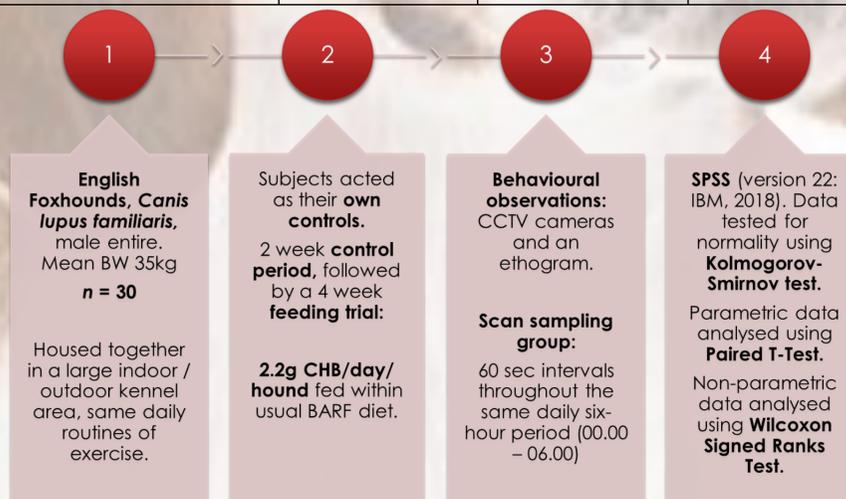


Figure 1. Details of the feeding trial and methodology used for the study.

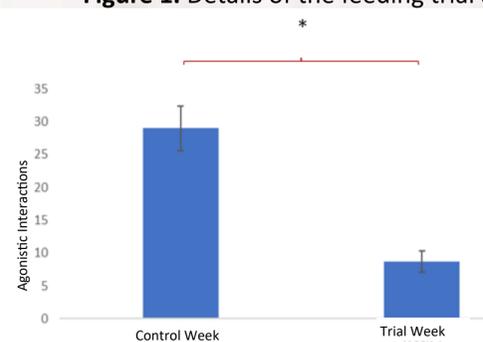


Figure 2. Comparison of agonistic interaction frequency within the pack during the control week and trial week of the feeding trial.

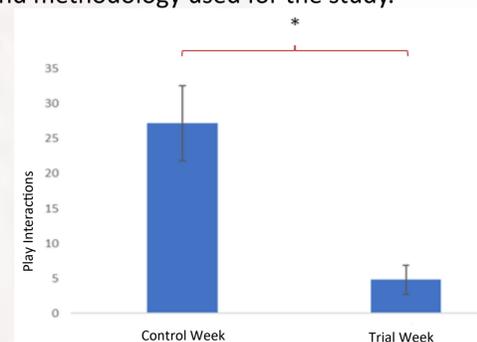


Figure 3. Comparison of play interaction frequency within the pack during the control week and trial week of the feeding trial.

Results Behavioural Analysis: Paired t-test results indicated a significant decline in agonistic interactions (Figure 2) and playful interactions (Figure 3) within the pack between the control and trial periods. The Wilcoxon signed ranks test also indicated a significant decline in grooming behaviours ($Z=-2.201$, $p=0.028$). There were observed declines in allogrooming, contact between hounds, mounting, and instances of hounds noted indoors, however these were not statistically significant and neither were increases in rest behaviours seen.

Stranger Approach Tests: Episodic barking events were absent altogether in the control week tests, but increased to a mean occurrence of 25 ($SD\pm 11$) per test in the trial week. The number of hounds outside when the tests began varied; there were significant increases in the number of hounds outside during the trial week ($Z=-2.606$, $p=0.009$). Statistically significant increases in instances of subjects approaching ($Z=-2.838$, $p=0.005$), moving away ($Z=-2.325$, $p=0.02$), lying ($Z=-2.588$, $p=0.01$), standing ($Z=-3.063$, $p=0.002$), and sitting during the trial week ($Z=-2.616$, $p=0.009$) were seen, alongside a significant decrease in instances of hounds resting during the trial week ($Z=-2.739$, $p=0.006$). Instances of hounds jumping up at the fence near the stranger decreased in the trial week, while instances of hounds standing or sitting whilst looking at the stranger increased, however these results were not statistically significant ($p>0.05$).

Discussion A statistically significant reduction in agonistic behaviours within the group during the fourth week of daily herbal feeding indicated a 'calmer' group than that of the control week. Aggression and agonistic behaviours can be closely associated with stress physiology, which links with social stress and coping, dominance, and determining hierarchical structure (Zayan, 1991; Veenema and Neumann, 2007). In addition, there was also a significant reduction in play, which often fell into the category of "rough and tumble" (R&T) play (Gordon *et al.*, 2002). Motivation for this type of play is thought to be related to the development of dominance hierarchies (after multiple play bouts) (Auger and Olesen, 2009; Bauer and Smuts, 2007). Studies suggest aggression and play stimulate closely linked neural networks in the brain (Gordon *et al.*, 2002; Toth *et al.*, 2012), which is why both behaviours may have seen a significant decline in the trial week. The stranger test results also indicated a change in overall group response to a stranger between the control week and trial week. However, the results from the trial week tests did not necessarily suggest increased calm within the group when approached by a stranger, rather the opposite. Vocalisations and an increase in behaviours such as approaching, standing, and looking at the stranger, alongside less resting, indicated more alertness to the approach of a stranger. This might have been linked to increased rest behaviours observed overnight possibly leading to more alert hounds during the day. Factors such as weather and temperature may have also affected the number of hounds outdoors to notice of the stranger's approach. The results from the stranger approach test did not indicate a lack of awareness or reaction to a stranger's approach as might be expected if hounds were sedated. It could also be argued that the changes in reactions could have come from the hounds feeling more confident and less fearful/nervous during the trial week.

Limitations Whether calming nutraceuticals have a greater impact on anxious dogs than non-anxious dogs remains unknown but should be factored into future studies. Due to the quality of video footage obtained, it was not possible carry out focal sampling therefore it remains uncertain as to whether behavioural changes were seen in just a few 'key' group members (perhaps more commonly involved in play and agonistic behaviours) or whether the supplement impacted every individual in the group equally. Collecting physiological data alongside behavioural data would be beneficial to future investigations.

Conclusion The addition of the CHB into the diets of English Foxhounds appeared to have an impact on their behaviours. However, more research is needed to fully understand the mechanisms underlying these behavioural changes and whether they impact all individuals equally.

Background Image:
American Kennel Club
(2019)

