

At Home Flea Population Control via Store Bought Products for both the Environment and Host

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Abstract: Flea associated domestic issues are a common problem associated with urban pest control, and understanding of the flea life cycle is vital to development of effective management protocol of flea infestation. For the purposes of this experiment, evaluation of assorted over the counter chemical products were compared to determine the most effective method of controlling a domestic *Ctenocephalides felis* infestation. To determine comparative control ability, several over the counter treatment options were purchased and applied such that effects on flea population present in a select household could be measured over the span of a month. It was determined that all products tested appeared to have immediate and short term results of killing off approximately 75% of the domestic flea population, but when the Trifexis was applied to the canine host extermination was slower but dramatically more effective overall. Findings support the use of directly applied flea control medication as opposed to in home pesticide treatments.

Keywords: *Ctenocephalides felis*, pest control, shampoo, spray, powder

When establishing a method of control of a pest species, interruption of the reproductive cycle is imperative to pest control. Domestic flea infestations most commonly establish themselves in homes with a common flea host species. Adults detect a host via chemical and vibrational stimulation and attach themselves to the host (Coles and Dryden, 2014). Host species bring adult parasites into the home in the fur. The basis of this experiment involves the process of flea control by means of over the counter commercial product. Although commercial chemicals served as the primary subject of experimentation in this instance, control of variables including avoidance of

carpet, climate control, and control of surrounding exterior environment, i.e. surrounding shrubbery and landscaping (Eckstein, 2014). The protocol involved in this study included a three step procedure, characterized by extensive vacuuming of fabric and carpeted surfaces, treatment of all areas of the internal environment with test chemicals, and treatment of host with flea shampoo until adults are no longer noticeable (DeAnglis 2007). Control and elimination of fleas within the home environment can be costly and time consuming, so evaluation of commercially advertised domestic solutions such as flea shampoos and sprays as viable options is of commercial and consumer

relevance. The rationale behind how the products were chosen was that the least expensive and topical means were chosen to test first, progressing onto the more costly products until having to in the end resort to medication ingestion by the host for the results desired.

Materials and Methods: The host studied was a male breed Brittany Spaniel. Feeding and living patterns were maintained constant, and experimental procedure was carried out in the apartment where the dog resided through the months of September and October. The changing variables tested were the treatment products used, which were used in order for two weeks each. Products evaluated included Hartz Rid Flea and Tick Shampoo (Hartz Mountain Corp., Secaucus, NJ) on the host which was applied on Monday of each week and Sentry Home Household Flea and Tick Spray (Senoret Chemical Co, Inc., Lititz, PA) in common areas. BioSpot Active Care Carpet and Upholstery Powder (Biological Solutions, LLC, Bishopville, SC) was applied throughout the host's environment and vacuumed away after being allowed to sit for several hours. Kirkland Signature Water Resistant Flea and Tick Control (topical) (Kimberly-Clark Corp., Neenah, WI) was then applied to the host's coat as directed by the manufacturer for a two week period. Lastly oral Trifexis (Triad Chemical Co., Orlando FL) was applied to host food during a normal feeding periods and results were observed for another two week period. The data was quantitatively analyzed by counting the number of fleas per square area on both the host and the area of the apartment with which host housing was kept, which was logically assessed to house the greatest flea

population in the apartment. The success of each product was determined based the successful elimination of flea population.

Results The initial two week test period consisted of the Hartz shampoo use on the host and the Sentry Home spray for the apartment. When beginning, the hind area and upper left leg were chosen as the sample space to gather flea population data on the dog, which was originally 12 fleas. The area where the cage was stored yielded 10 fleas upon collection. At the end of the first week, after having used the products, the numbers decreased to six collected fleas on host and 8 present in the tested carpet area. After the second week, ten fleas were collected 10 on host and 9 in the dogs living area. When control product was changed to the Kirkland medication applied o host and Biospot on the carpet, baseline flea population on host was 13 fleas and 8 fleas in the carpeted area and at the end of the test period 12 fleas were collected from the dog and 6 from the carpeted area. In the last two week trial period Trifexis was given orally, flea numbers started at 13 on host and 6 in the carpeted area, and at the end of the trial period there were 2 fleas on host and 1 in the carpeted area after this two week period. Refer to Table 1.

Discussion Based on collected data, it was determined that the most effective results were achieved when Trifexis was administered orally to the host. Although the other products did show varying degrees of positive change, it was concluded through extended survey results that po pul atio n co ntr o l thr o ug h accomplished through these means were not effective on a long term scale and were therefore concluded to be

inadequate for treatment of an existing flea infestation. Trifexis was both the most effective in immediate eradication efforts as well as in long term population reduction of flea infestation, and it is with this information in mind that Trifexis is recommended as an effective method of control for domestic canine pets. Follow up experimental protocol should entail domestic

flea population surveyed over an extended period time such that an average window of effectiveness could be established. Overall, this study is of importance to pet owners in that prevention and control of potentially costly flea pests could be avoided through implementation of data collected in this experiment.

Product Used	Week Number	Number of fleas on day 1 on host	Number of fleas on day 7 on host	Number of fleas on day 1 on tested area	Number of fleas on day 7 on tested area
Hartz and Sentry Home	1	12	6	10	8
	2	8	10	7	9
Kirkland and Biospot	3	13	7	8	4
	4	10	12	7	6
Trifexis	5	13	8	6	5
	6	6	2	3	1

Fig. 1: Chart detailing flea collection from test areas

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References

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