

EVALUATION of the TICK REPELLENT FIXODIDA Z_xTM

Axia study

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Background

The incidence of tick-borne diseases (TBDs) in domestic animals has increased significantly in veterinary practices in the Nordics and central Europe^{1,2,3}.

Ticks are parasitic arachnids, which bite and suck blood from their host animals. They feed on birds and mammals, including domestic animals. Ticks are commonly found in shadowy and moist habitats, particularly in areas that are also the natural habitats of wild animals. In Sweden the tick season typically extends from March to October, but can vary significantly depending on the temperature. Ticks have been shown to be active at temperatures above +5 to +7 °C².

Ticks transmit disease as they move from hosts bearing TBDs to healthy animals. They may also transfer diseases directly to their offspring (a transovarial transmission)². There are several diseases connected to tick-bites in pets: Lyme borreliosis, Anaplasmosis, tick-borne encephalitis virus (TBE), and the Crimean-Congo hemorrhagic fever (CCHF) virus. Borreliosis is the most prevalent TBD for which no vaccine is available. It can be treated with antibiotics in both humans and domestic animals. However, the disease can affect the nervous system, with around 10% of human cases developing central nervous system disorders such as paralysis². A vaccine against TBE is available for humans, but not for pets⁴. In pets TBE infections generally quickly lead to high fever, impaired consciousness, paralysis and death within seven to ten days from the first symptoms.

Tick-borne diseases (TBD) are a growing problem in humans and domestic animals. The incidence of TBD has steadily grown since the early 90's². Climate changes along with global mobility, amongst humans and domestic animals, have resulted in new tick species in the Nordic countries carrying new diseases³. TBE or Lyme disease may be devastating for any human or pet. Treatment of any TBD is costly and largely ineffective, especially in veterinary medicine⁴. Several public health institutes have stated that prophylactic measures are the most effective way to reduce the risk of a TBD infection.²⁻⁴ Prevention of tick bites and the prompt detection and removal of attached ticks can reduce the risk of tick-associated disease. The general recommendations are therefore to simply avoid tick bites, and the best way to protect oneself and one's pets from these zoonotic TBDs is to utilize insect repellents and protective clothing^{2,4}.

Study Objectives

The objective of this study was to evaluate the effect of Fixodida Zx™ on the frequency of tick infestation in domestic furred animals. Fixodida Zx™ is a natural biocide, fulvic acid, which acts as an environmentally friendly insect repellent. Here we show that Fixodida Zx™ is an effective tick repellent.

¹ Jenson T., Tälleklint L., Lundqvist L., Olsen B., Chirico J., and Mejlon H. *Geographical Distribution, Host Associations, and Vector Roles of Ticks*. J Med Entomol (1994) 31 (2): 240-256.

² The Public Health Agency of Sweden <http://www.folkhalsomyndigheten.se>

³ European Centre for Disease Prevention and Control; <http://ecdc.europa.eu>

⁴ The Swedish National Veterinary Institute; http://www.sva.se/globalassets/redesign2011/pdf/antibiotika/antibiotikapolicy_2009.pdf

Methods

Compound

Fixodida Zx™ is an environmentally friendly insect repellent. As a natural biocide product which acts as an insect repellent, it does not harm nature, humans or animals. Its active ingredient is fulvic acid, which is a naturally occurring substance that will boost the animal's own defence mechanism against tick infestation. Fixodida Zx™ is a natural and non-toxic tick repellent of product type 19, Swedish Chemicals Agency (KIFS 2010:2). Reg. SJV 2007-04-12.

Study population

The study population consisted of 42 animals, 39 domestic dogs and 3 cats. None of the participating kennels or breeders had previous engagements with Axia KB or its representatives. All kennels were carefully selected based on their geographical location to cover Sweden from Skåne in the South up to Jämtland in the North. The nine different geographical locations represent coastal areas as well as inland forest and farmland, covering low- to high-risk areas of TBDs².

Experimental design

Each animal received Fixodida Zx™ as a supplement to their ordinary diet according to dosage recommendations⁵ over a trial period of 30 days. No alterations of the individual diets were allowed during the trial period of Fixodida Zx™.

All kennels received food supplements to cover a 30-day trial period for each individual animal along with a two-page test form. Before the trial period each individual was evaluated on several parameters: breed, weight, breath odour, daily supplement of Fixodida Zx™, along with its general health status before and after the test period. The forms carried unique identifiers for each animal, tracked on breed, name and weight.

The normal tick season starts when temperatures are above +5 to +7 °C.² The trials therefore took place between June and August to ensure a steady temperature and tick activity. All dogs were routinely exercised outdoors in a rural environment in their geographical location.

The animals were subjected to a daily inspection of fur and skin. Ticks were counted and registered for each dog and cat during the entire test period. The tick frequency is based on daily inspections and numbers of ticks found on each animal.

The study was performed during the summer of 2010.

Data analysis

The response rate was 100%. All numbers presented in this report is based on the entire population, and the results are relative to each evaluated parameter.

Results

Tick frequency – skin attached:

Day 1-6: During the first six days of the trial period 0.45 ticks per day were counted, corresponding to approximately **1 tick every second day**.

Day 24-30: During the last six days of the trial period 0.17 ticks per day were found, or **1 tick every 5 days**.

Tick frequency – found in fur:

Day 1-6: During the first six days of the test period, the frequency was 0.56 ticks per day, corresponding to approximately **1 tick every second day**.

⁵ Dosage recommendations; http://www.notixs.com/fixodida/#tab_3

Day 24-30: During the last six days of the trial period 0.17 ticks per day were found, or **1 tick every 5 days**.

Tick frequency depending on breed:

35% of the test population became completely tick-free during day 7 to 30. The following dog breeds were in this part of the population: Cocker Spaniel, Border Terrier, Flat Coated Retriever, Golden Retriever and German Shepherd.

The following breeds made up the **53% of the test population which contracted a maximum of 5 ticks throughout the trial period:** Cocker Spaniel, Cavalier King Charles Spaniel, Border Terrier, Russian Tsvetnaya Bolonka, Flat Coated Retriever, Golden Retriever and German Shepherd.

One of the parameters evaluated before and after the Fixodida Zx™ study was the breath odour of each individual animal. As seen in Table 1, the breath odour had improved after the trial period, with the incidence of the highest grades increasing from 35% to 67%, and a concomitant drop of the two lowest grades from 31% to 6% after the trial period.

Table 1. Estimation of breath odour on a scale of 1 to 5, where 1 represents a fresh breath and 5 corresponds to really bad odour.

Odour evaluated before the Fixodida ZX™ trial (percentage of the entire population)				
1	2	3	4	5
27%	8%	34%	14%	17%
Odour evaluated after the Fixodida ZX™ trial (percentage of the entire population)				
1	2	3	4	5
50%	17%	27%	3%	3%

All animals' general health was unaffected.

Conclusion

By supplementing the food daily with Fixodida Zx™ the pet may be completely free from ticks within a week, or showing a lower tick frequency that in turn reduces the risk of a TBD infection.

- The study shows that a daily supplementation of Fixodida Zx™ generates a **significant reduction of ticks**.
- **35 %** of the animals were **completely free of ticks** after 6 days.
- **52 %** of the animals contracted a **maximum of 5 ticks** during the entire trial period.

The statistical results of our study show a clear improvement not only in tick frequency, but also of the experienced odour of the test animals' oral cavities. At least 50% of the animals were considered to have a fresh breath after 30 days, compared to 27% before the study was initiated. The group of animals that were considered to have a completely fresh breath odour nearly doubled throughout the test period. The somewhat unexpected improvement of breath odour was highly valued by the breeders that participated in the study.