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Vectra 3D®

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Vectra 3D® contains 3 active ingredients: Dinotefuran, Pyriproxyfen & Permethrin

The Importance of Compliance for Effective Flea Control

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"Compliant use of ectoparasiticides, both on the pet and in the pet's environment, is critical for controlling fleas"

Key Findings

- ✓ Year round treatment is the most effective method of eliminating ectoparasites from dogs and preventing re-infestations.
- ✓ Using ectoparasite products that contain an Insect Growth Regulator (IGR) will help with positive control of infestation and re-infestation.
- ✓ Pyriproxyfen is an IGR that is effective even after exposure to sunlight and after bathing or swimming.

INTRODUCTION

The introduction of new ectoparasite products over the past decade or so has revolutionized flea control. The days of repeated dipping and spraying of pets in order to combat fleas has been replaced by the use of convenient topical spot-on and oral treatments. These products have shown remarkable results. However, as veterinarians have come to rely on these products there has been a corresponding decrease in client education on flea biology and control. Unfortunate consequences are the development of unrealistic expectations, lack of compliance, inappropriate use, and ultimately, perceived product failures.

COMPLIANCE

Compliance is the willingness to follow a prescribed course of treatment. For effective flea control this means not only adhering to a product's label directions, but also following recommendations for treating environmental infestations. Product label recommendations are derived from laboratory studies to ensure the safest administration with the greatest efficacy. Labels provide information on species, dosing, administration technique, and retreatment. Deviations from label recommendations can compromise safety and reduce efficacy. A firm understanding of the flea life cycle contributes to success in treatment. Because every pet's situation is different, flea control must be tailored to the pet, its surroundings, and its daily activities. Compliant use of ectoparasiticides, both on the pet and in the pet's environment, is critical for controlling fleas.

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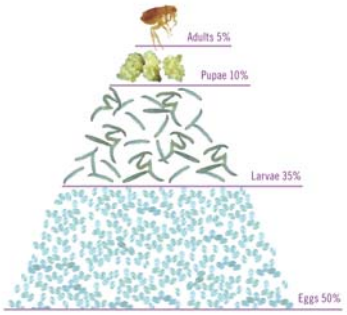
Flea Life Cycle Facts Essential to Eradication



Adult fleas feed, mate, and lay eggs on the pet. The adult flea takes a blood meal within seconds to minutes of landing on a host.[1] The flea begins to lay eggs within 24–48 hours of feeding.[1] The adult stage is the stage that irritates the pet, contaminates the environment with eggs, and is the stage that is most recognizable to owners. However, this stage likely accounts for 5% of the overall flea population. The other 95% of the flea population exists in the pet's environment as eggs, larvae, and pupae.

The eggs that are laid on the pet are not sticky and thus do not remain on the pet, but roll off and accumulate in areas where the pet frequents indoors (carpet, floor, dog beds, sofas, etc) or outdoors (under bushes, porches, crawl spaces etc.). Female fleas can produce 40–50 eggs per day at peak reproduction levels. Egg laying can continue for 100 days.[1] The eggs hatch into larvae from 1.5-6 days, depending on temperature.[2]

The rate of larval development is also temperature and humidity dependent. Warm, humid conditions favor larval survival and maturation. Larvae feed on organic debris in the environment, including flea feces (partially digested host blood) and sloughed skin cells from the pet. Outdoors, moist shaded microhabitats, such as under porches, bushes or leaf litter provide protection and allow for maturation of the larval stage. The larval stage ends with the construction of the cocoon.

The larvae spin a cocoon in preparation for pupation. A pupa is an insect in the non-feeding stage of development between the larva and adult, during which it typically undergoes a complete transformation within a protective cocoon or hardened case. In the case of fleas, the cocoon is composed of loosely woven silk-like fibers. The larvae in the early stage of cocoon formation are termed pharate pupae (pre-pupae). All immature stages (eggs and larvae) excluding the pupae are susceptible to the insect growth regulator (IGR) methoprene. The IGR pyriproxyfen eradicates eggs, larvae, and the pharate pupae, but it does not affect pupae or pharate adults. The fully cocooned pupae are remarkably resistant to drying, insecticides and IGRs. Interestingly it has been shown that the cocoon itself plays virtually no role with this protection.[3] Pupae are protected from drying simply because they are less susceptible to desiccation than all other life stages. Pupae are protected from insecticides because larvae frequently spin cocoons at the base of the carpet, where the carpet fibers protect from insecticide exposure by absorbing the insecticide before it ever reaches the pupae. Pupae are minimally affected by IGRs because they have developed beyond the stage where these juvenile hormone analogs play much of a physiological role.[4,5] It is for this very reason that flea infestations can seem so resistant. Emergence of new adults from the cocoons occurs as early as 8–13 days following cocoon formation, but can be delayed for 4–6 months or longer depending on environmental conditions.[1] Thus, there may be perceived product failure as new fleas emerge weeks or months following the institution of regular treatment, when in fact it is to be expected. This phenomenon of continued emergence following insecticide or IGR use is known as the development window effect.[1] Mechanical pressure and heat stimulate emergence of fully formed adults from the cocoon. Adult fleas emerge from the cocoon, look for a host, and begin feeding. Fleas feed from capillaries.[2] Feeding for 24 hours is required for egg production.[2]

Topically and orally administered products that provide both adulticidal and ovicidal properties can affect both adult fleas and flea eggs. Products containing both adulticides and IGRs applied into the premises can affect already deposited eggs, larvae and for pyriproxyfen the pharate pupae. The most effective products contain combinations of adulticides and ovicides that act against both adults and immature stages.

Common Areas of Non-Compliance

Flea control products should be applied according to the dosage range on the label as products are developed to insure accurate dosing for the size of the animal. Splitting large size doses to treat multiple smaller animals likely results in inadequate administration and reduced efficacy. All animals on a premise should be treated, both indoor and outdoor, as the untreated animals will be a constant source of re-infestation. Topical products should be reapplied according to the label, usually every thirty days. Waiting until fleas are seen only promotes ongoing environmental infestation, making overall flea control more difficult. Fleas begin laying eggs within 24–48 hours of taking a blood meal on the host (which occurs almost immediately after landing). The eggs roll off the pet and ultimately develop into mature fleas in the environment. Therefore any lapse in treatment allows for the production and maturation of the eggs, and a new flea crop to infest the pet. For this same reason, flea treatment should continue year round, including the winter months, thereby depriving fleas the opportunity to reestablish during gaps in treatment. Flea life stages may survive in homes during colder months. Because of this it can be said that it is always flea season!

Excessive bathing or swimming often reduces the amount of a topically applied product on the skin surface. It is recommended to avoid unnecessary bathing of treated pets, as well as restricting swimming (i.e., in ponds or creeks). If bathing is necessary, a mild, non-detergent shampoo should be used. Typically these products can be applied to the pet as soon as the animal is dry following bathing. There is usually no need to wait 48 hours, and doing so only allows fleas a chance to re-infest the pet.

Fleas that are present on the pet prior to treatment have already contaminated the pet's environment with eggs. It is a common unrealistic expectation to think that one application of a topical flea control product will eliminate all fleas from the pet and environment. In fact it often takes a minimum of 3 to 4 repeated monthly applications. In some cases, you may even observe an increase in adult fleas 7–21 days following application. This is due to the rapid and often simultaneous emergence of newly matured adult fleas from their protective cocoons that have been developing in the pet's environment (pupal window effect) before you initiated treatment. Remember the fleas emerging today came from flea eggs laid 3 to 8 weeks previously.

Even though these veterinary recommended topical and oral flea products are very effective, there is still a need in some flea problems for environmental control. Environmental control includes cleaning and treating all areas where flea eggs, larvae and pupae can mature undisturbed. Outdoors this can include leaf litter, under brush or porches, straw and other bedding inside dog kennels, and any other dark, moist areas conducive to flea development. Indoors attention should focus on any areas where the pet spends time such as pet bedding, window sills, carpeting, throw rugs, pillow cushions, stuffed animals, rails of sliding glass doors, door mats, porches, and inside vehicles. Articles that can be washed should be placed in the washing machine and washed with detergent. Carpets should be vacuumed frequently (every 2-3 days). The home or other enclosed area should be sprayed or fogged with a product containing an IGR such as methoprene or pyriproxyfen. If homes are fogged, care must be taken to elevate beds, sofas and other such furniture to

allow the fog to disperse into the tight areas. Hiring a professional exterminator with expertise in flea control to treat the home and yard at regular intervals should be considered and is an economical choice for stubborn or severe flea infestations.

In summary, realistic expectations must accompany the use of any flea control product. One application of any topical is unlikely to permanently eradicate an infestation. Although undertaking overall flea control measures may seem overwhelming, knowledge of the flea life cycle facilitates the process. Compliance with label and professional guidelines for treatment of the pet and its environment ensures the most rewarding and successful outcome to combating the tenacious flea pest.

Top Ten Misunderstandings Regarding Flea Control

1. One or two topical treatments will eradicate a flea infestation.
2. Treatment is only needed when fleas are visible on the pet.
3. Not all pets, but only those with visible fleas need to be treated.
4. Treatment is only necessary in the warmer months.
5. All topical flea control products are the same.
6. Pets can be bathed as often as you want without losing efficacy of topically applied products.
7. Splitting large size doses to treat multiple smaller pets is as good as using the appropriate smaller sizes.
8. Treating the home or yard is not necessary if the pet is being treated.
9. A waiting period of 48 hours after bathing before applying the topical is necessary.
10. The appearance of more fleas 1-3 weeks after starting treatment means the product is not working.

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