Flea Control

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Fleas are a major nuisance for pets and pet owners alike during the summer months. This parasite is a constant source of irritation for your pet, and can be the source of allergic dermati-tis and intestinal tapeworms. In addition, this pesky pest can be quite costly to control for pet owners. Pet owners typically spend more to control fleas and flea-related problems than any other health problem in pets.

To understand why fleas are so challenging to control, a review of the flea's life cycle and habits is helpful. Fleas actually undergo four developmental stages. The adult flea lives almost exclusively on its host by feeding on its blood. The adult female flea will start laying eggs ap-proximately 24 hours to 48 hours after consuming a blood meal. Eggs are deposited on the host and drop into the pet's environment. Eggs will hatch into larvae anywhere from one day to 10 days later. Eggs will hatch better in an environment that is warm (75 F to 85 F) and humid (50 percent to 90 percent). The larvae that hatch are very small (2 mm to 5 mm) and look like a white worm with a darker head (until they feed, at which time they will appear brown due to flea feces and organic material ingested). These larvae are considered "free living" (they can move around) and are usually found at the base of the carpet and at ground level in the yard away from light, where they can find organic material and flea feces needed to survive. These larvae also need moisture and warmth to live.

After the larvae complete their development (usually 5 days to 12 days), they will spin a co-coon and start the pupae stage of their life cycle. After the pupae have finished changing in-side the cocoon to an adult flea, any movement, pressure or heat close by will stimulate them to emerge from the cocoon. Adult fleas will emerge from the cocoon, on average one week to four weeks, after the pupae stage begins. If not stimulated, the pre-emerged fleas can survive in a dormant state up to approximately 140 days to 170 days. The adult fleas live approxi-mately 100 days. After emerging from the cocoon, the adult flea begins feeding within seconds after landing on a host. At the initial time of a bite, the flea will inject saliva into the wound, which may serve to soften the skin and help the flea penetrate the skin and more effectively access blood. Also, the saliva contains a substance that prevents the blood from clotting, which further facilitates the blood consumption. While fleas are taking a blood meal, they will defecate partially digested blood, which is often seen on the host as "flea dirt." This flea dirt will fall into the host environment and be a source of nutrition for the flea larvae. Once the adult flea starts feeding, it will spend its entire life on that host, unless removed (e.g., by grooming). The female flea will usually start laying eggs a couple of days after feeding starts and lay eggs only on the host. An adult female flea can produce approximately 2,000 eggs during its life-time. The eggs produced by the flea will drop into the environment. Less than one percent of eggs that are laid will survive. Only eggs that drop into an environment with the proper humid-ity and temperature will develop into adult fleas.

Cat or Dog Flea—The adult fleas are dark brown, strongly flattened from side to side, with many spines on legs and bodies, approximately 1/16 inch to 1/10 inch in length.

Examples of areas in your home that are likely to provide the proper environment for com-plete flea development are pet bedding, furniture cushions and thick carpeting (basically pro-tected areas where the pet spends its time). Wood or tile floors are not likely to be suitable for flea development. Likewise, open areas of the lawn exposed to continuous sunlight won't sup-port flea development, but shady, moist areas will. Outdoor examples of "hot spots" for fleas are dog houses, flower beds, gardens, and under decks or porches. Any location not in direct sunlight where the pet spends time can become flea infested and a source point for reinfection. For every six fleas you see, there are 300 in the environment or on the pet.

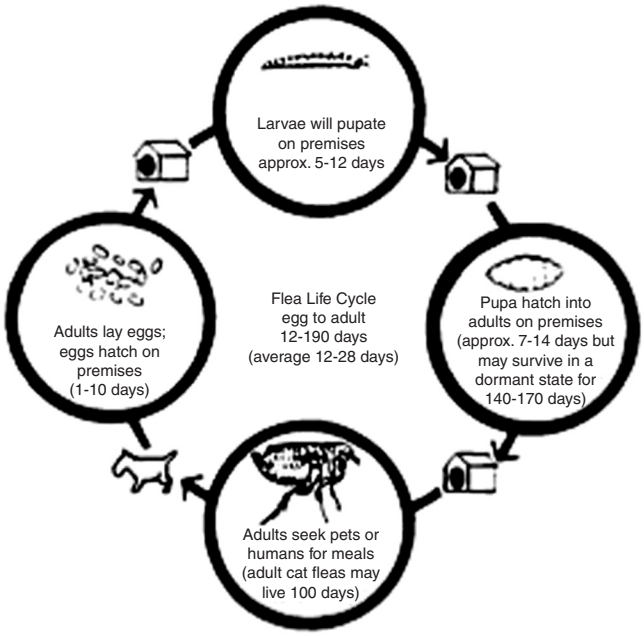
To check your pet for fleas, vigorously brush their hair coat over a white surface such as paper. If you see dark brown specks on the white surface this could be flea feces, or flea dirt. Place a sample of the brown specks on a moist sheet of paper, and if you see a rusty red color appear shortly then these specks are flea feces containing blood.

Owners are often quite dissatisfied with their efforts to treat and control a flea infestation. One of the problems encountered is related to the pupae stage of the life cycle, which is not killed by any insecticides. This stage can lay dormant 140

days to 170 days, allowing flea populations to survive through the winter. A problem scenario that can occur is the owner treats for fleas then in a couple of weeks the flea infestation returns because adults are emerg-ing from the insecticide-resistant pupae cocoon. Another control problem is missing or insuffi-ciently treating source points. Source points are areas either indoors or outdoors that are highly infested with fleas and heavily used by pets. In most circumstances, 95 percent of the flea infestation is in five percent of the house or yard. Most of the flea infestation is in these source point areas. Therefore, in heavy infestations these points must be adequately treated and usually retreated in a couple weeks after the initial application of insecticide.

Before applying any flea insecticide, it is important to consider the complete scope of the flea problem. The most important principle in a total flea control program, especially in a heavy infestation, is that the pet's environment (indoors and outdoors) as well as the pet and all other furred pets (dogs, cats ferrets and rabbits) should be treated simultaneously. Before using any insecticides, the environment should be thoroughly cleaned to remove as many of the adult fleas and immature stages (eggs, larvae and pupae) as possible.

Vacuuming with a beater-bar brush is extremely effective in removing adult fleas and other immature stages. Vacuuming raises the carpet fibers which makes the immature stages of fleas accessible to insecticides, in addition to aerating and drying the carpet. The vacuum also will stimulate pre-emerged adults to emerge from the pupae, allowing them to be sucked up by the vacuum or as adults they will be susceptible to insecticides. Be sure to thoroughly vacuum the source points, which are where the pet spends most of it's time. If that is a chair or bed, be sure to vacuum and treat under the furniture, because the eggs and larvae will actually drop to the floor and larvae will move under the furniture away from the light. In addition, dispose of the vacuum bag immediately. Don't use a flea collar in the vacuum bag because it is not ap-proved



Simplified Life Cycle of the Cat Flea—Optimum temperatures for the flea's life cycle are 75 F (or 75 F to 85 F), and optimum humidity is 78 percent (or 70 percent to 80 percent).

to be used in such a manner and may pose a threat to your health. You also may want to steam clean your carpet at this time, which will further help in the mechanical removal of fleas. Bedding, blankets or rugs routinely occupied by your pet should be washed in hot water, and repeated on a weekly basis. Non-carpeted floors should be mopped because fleas may develop in cracks and crevices.

Clean up of an outdoor environment will involve mowing and raking the yard thoroughly, including removal of any organic material from flowerbeds and under bushes. This also will in-crease the exposure of the fleas to the insecticides. Additionally, clean any areas where your pet spends time, such as the garage, basement, pet carrier and automobile.

The next step in flea control is the application of insecticides to all pets as well as the in-door and outdoor environment simultaneously. All pets--such as dogs, cats and ferrets--should be treated at the same time. There are many flea products on the market today that make a lot of claims, which can be confusing to the consumer trying to select a flea control product. Currently there are several once a month topical or oral flea control products on the market. Some products contain insect growth regulators (IGRs), which interrupt the life cycle and prevent immature forms, such as egg and larvae of the flea, from developing into adults. Consult with your veterinarian before applying or giving your pet a flea control product--especially young, geriatric or sick pets, as well as pregnant or nursing animals. Read and fol-low label instructions carefully and completely. Some flea control insecticide products are safe for dogs only and are toxic to cats. Be careful when shampooing, spraying or applying a topi-cal insecticide to avoid the pet's eyes, ears and genital area.

Sometimes insecticide foggers and premise sprays (which also may contain IGRS) are recommended to treat environmental flea infestations. Several precautions should be considered when using foggers, which broadcast insecticides into the air, including:

- All people and pets, including fish and birds, must be removed before treatment.
- Utensils and all surfaces in which food is prepared must be covered.
- The home must be thoroughly ventilated and chemicals dried before people and pets return.

Areas that cannot be reached by the foggers, such as closets or under furniture, and heavily infested source points should be sprayed by hand with the insecticide. Often, the heavily in-fested source points in the home or yard need to be retreated in a couple of weeks, because the pre-emerged adults inside the pupae or cocoons are protected from the initial application of chemicals. Retreat the areas where you see fleas. In most cases, these will be the source points or hot spots.

Treatment and control of fleas in an outdoor environment should be concentrated in the ar-eas protected from direct sunlight and where the soil is moist, especially where the pet spends its time since these are the places where flea development will occur. There are many com-monly used insecticide compounds that are highly effective. It is imperative that free-roaming animals, including wildlife, are excluded from your pet's environment for any flea control pro-gram to be successful. Retreatment may be necessary, depending on the environmental con-ditions and how well you spot treat the source points in the yard and the home.

Pet owners should consult a veterinarian before attempting flea control treatment. Each in-festation is unique, a veterinarian can design a control program that is comprehensive and fits your pet's problem. Remember these insecticides can be toxic if used improperly, so it is im-perative to use them only as your veterinarian has prescribed and read and follow all package instructions. Repeated use of any insecticide, including flea control products, over time may lead to selection of populations of fleas that are resistant to the chemical. Your veterinarian can provide the best advice about which insecticides are most likely to be effective for your pets.

A successful flea program typically involves a thorough cleaning to remove the fleas in the pet's environment and a complete and proper application of flea insecticides. All pets and their indoor and outdoor environments, especially source points, may need to be retreated. Also, stray animals must be excluded from the pet's environment and the pet should not be allowed to roam. Remember, if you take your pets on vacation, be sure to check them closely for fleas and ticks before returning to their home environment, or you may infest or re-infest your home and yard with these pesky pests.

Information Sources

Dryden, M. W. Biology of the Cat Flea. *Ctenocephalides felis felis.* Companion Animal Prac-tice. March 1989, 19(3):23-27.

Companion Animal Parasite Council, www.petsandparasites.org.

American Animal Hospital Association, www.healthypet.com.

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