



Flea Control

Elisabeth J. Giedt, D.V.M.

Director of Continuing Education, Extension and Outreach
Center for Veterinary Health Sciences

Oklahoma Cooperative Extension Fact Sheets
are also available on our website at:
facts.okstate.edu

Fleas are a major nuisance for pets and pet owners alike. They thrive when the weather is warm and humid. Many pets reside indoors and fleas have become a year-round problem with contamination of both the yard and home. Fleas are a constant source of irritation for your pet and can be the source of FAD (flea allergy dermatitis), with itching and hair loss. Fleas are also a source of intestinal tapeworms. They are capable of transmitting several diseases, some of which are transmissible to humans. Heavy infestations can cause iron deficiency anemia. Flea infestation of homes and areas around a home may result in humans being bitten by newly emerging fleas, inciting an allergic response. The resulting rash can be mild to extensive, depending on numbers of fleas and individual hypersensitivity reactions.

U.S. consumers spend millions of dollars annually on flea control. This includes flea treatments for their pets and over-the-counter and professional treatments for the house and yard. Flea-related health problems, such as allergic dermatitis may require the expertise of a veterinarian.

To understand why fleas are so difficult to control, a review of the flea 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. Eggs are deposited on the host and readily fall off the pet into the environment of both your home and yard.

Eggs will hatch into larvae anywhere from one to 10 days later. Egg hatch is better in an environment that is warm (75 to 85 F) and humid (50 to 90 percent). These larvae are considered "free living" because they can crawl about and are usually found at the base of the carpet and at dirt level away from light, where they can find organic material and flea feces needed to survive. These larvae also need moisture and warmth to thrive.

After the larvae complete their development (usually five to 12 days), they will spin a cocoon to form the pupal stage of their life cycle. After the pupa has matured to an adult flea inside the cocoon, movement, pressure or heat will stimulate them to emerge from the cocoon. Adult fleas will emerge from the cocoon on average one to four weeks after the pupal stage begins.

If not stimulated, the pupal/cocoon stage can survive in a dormant state for approximately six months. The adult fleas live approximately 100 days. After emerging from the cocoon, the adult flea begins feeding within 10 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



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.

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 uptake.

While fleas are taking a blood meal, they will pass 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 two days after feeding starts, and lay eggs only on the host. An adult female flea can produce approximately 2,000 eggs during her lifetime. The eggs produced by the flea will fall off into the environment. A flea-infested pet is like a living salt shaker of flea eggs!

Examples of areas of the home that are likely to support the proper environment for complete flea development are the pet's bedding, furniture cushions and thick carpeting—protected areas and where the pet spends most of its time. Cracks and grooves in wood and tile floors as well as spaces in baseboards can also harbor fleas. Open areas of the lawn exposed to continuous sunlight won't support 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. Door mats, crawl spaces and outdoor sheds can also support a flea population. Any location out of 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 control flea infestation, fleas must be removed from the pet, the home and the yard. The most important principle in a total flea control program is that the pet's environment (indoors and outdoors) as well as the pet and all other pets

(dogs, cats and ferrets) should be treated simultaneously. An integrated flea control program includes good sanitation and treatment of the pet and the environment along with follow-up treatments.

Owners are often frustrated with their efforts to treat a flea infestation. The pupal or cocoon stage of the life cycle is resistant to any and all insecticides leading to failure to regulate the population of the fleas. The pupal stage can lay dormant for 140 to 170 days. Thus, in some areas of the country, fleas can actually survive through the winter. The common failure scenario is that the owner treats for fleas, then one to two weeks later, the flea infestation returns because the "new" adults are emerging from the insecticide-resistant cocoon.

Another cause of failure is missing or insufficiently treating source points. Indoor and outdoor source points are areas 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 points. Therefore, these points must be adequately treated and usually retreated one to two weeks after the initial application of insecticide.

Environmental Sanitation

Along with using insecticides on your pet, the environment must be thoroughly cleaned to remove as many of the adult fleas, eggs, larvae and pupae as possible. Vacuuming with a beater-bar brush is extremely effective in removing adult fleas and other immature forms. Vacuuming raises the carpet fibers, which makes the immature forms of fleas accessible to insecticides, in addition to aerating and drying out the carpet. Even if the vacuum fails to remove the cocoon because of its sticky nature, it will stimulate pre-emerged adults to emerge from the pupae, allowing them to be sucked up by the vacuum or exposing them to the insecticides. Be sure to thoroughly vacuum the "source points" where the pet spends most of its time. If that is a chair or bed, be sure to vacuum and treat under the furniture, because the eggs and larvae will actually fall off and the larvae will crawl under the furniture away from the light. Be sure to dispose of the vacuum bag immediately. Don't use a flea collar in the vacuum bag because it is not approved for use in such a manner and may pose a threat to your health. Steam cleaning the carpet at this time will further help in the mechanical removal of fleas. Be sure your pet's bedding and blankets or rugs routinely occupied by your pet are washed in hot water. This is something that should be repeated on a weekly basis.

Outdoor cleanup will involve mowing and raking the yard thoroughly, including removal of any organic debris from flower beds and under bushes and any other favorite spots of your pet. This will also increase the exposure of the fleas to the insecticides. Be sure to clean any areas where your pet spends time, such as the garage, basement, pet carrier and automobile. Non-carpeted floors should be vacuumed and mopped because fleas may develop in cracks and crevices.

Pet Treatment

Grooming pets by combing them with a flea comb to reduce the number of adult fleas and is enjoyed by many pets. Dip the comb in soapy water to kill any fleas removed from your pet. Bathing will rinse off flea dirt and may control itching BUT consult with a veterinarian about the use of baths

in conjunction with topical flea treatment. You don't want to wash off the topical flea protection.

The next step in flea control is the application of insecticides to all pets and the indoor and outdoor environment simultaneously. All pets, such as dogs, cats and ferrets, should be treated at the same time. Do what you can to keep free-roaming animals out of the environment. In addition to wandering cats and dogs, possums and raccoons can carry fleas. Repeat treatments will be necessary to successfully eliminate fleas in the environment.

There is no one chemical or chemical combination of insecticides that will fit every flea infestation problem or fulfill the needs and desires of every pet owner. One approach in killing and controlling fleas on the pet and in the environment is to use a product with a pyrethrin and an insect growth regulator IGR or insect development inhibitor IDI.

The pyrethrin will provide the quick kill of the adult flea. Synthetic pyrethrins in use for dogs include cyphenothrin, deltamethrin, flumethrin and permethrin. Some formulations are registered for use on cats (e.g. flumethrin), while others may be toxic to cats.

The IGR and IDI will prevent eggs and larvae from developing into the pupae. These agents, which include lufenuron, methoprene and pyriproxyfen, prevent flea eggs from hatching and kill larvae or early pupae. These products do not kill the adult flea.

There are several formulations available from your veterinarian that can be administered as a monthly or daily pill or topical spot treatment to control fleas in dogs and cats. These products provide prolonged residual activity for your pet. There are also collars that have proven effective for flea control. Consult a veterinarian for the ideal method for your pet.

It is important to note that ultrasonic flea collars do not repel fleas. Fleas cannot perceive sound waves, but pets can. These collars have resulted in temporary hearing loss in some pets. There are several products that are commonly used, such as B vitamins, brewer's yeast and sulfur products, which have not been scientifically proven to be effective as flea repellents.

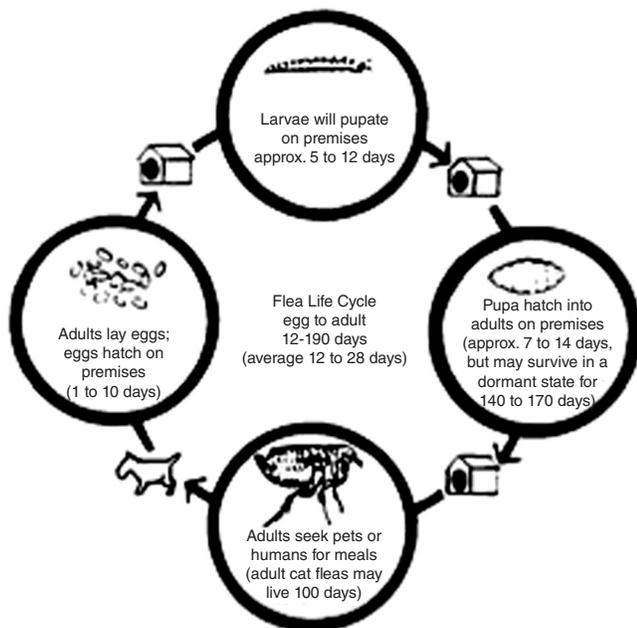
Premise Treatments

Modern insecticides and drug technology have reduced the need for environmental flea control. Currently there are many treatments that reliably stay on your pet for 30 days or more. As a result, our dependence on premise treatments has decreased. The pet "wears" the premise treatment and when the pet is exposed to adult fleas, eggs and larvae the compounds are present to destroy these stages of the fleas.

Premise treatment products are available to use as foggers and sprays. Often, these products contain IGRs and IDIs along with the quick kill pyrethrins.

Please consider these precautions when using foggers and premise sprays:

- Foggers should be placed in each room to be treated — they don't effectively go around corners.
- Fogger spray does not go under furniture.
- 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.



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).

- The home must be thoroughly ventilated and chemicals dried before people and pets return.

It is important to reduce the flea population by the environmental sanitation procedures recommended above, even when your pet is wearing a flea control product. It is important to remember to repeat the animal flea treatments as recommended by your veterinarian to provide the long lasting protection.

A pet owner with a flea infestation problem should consult a veterinarian before attempting flea control treatment. Veterinarians can design a flea control program that is comprehensive and fits your flea infestation problem. Each flea infestation is unique; therefore, no one flea program is effective for every flea problem, regardless of what a commercial company claims. Also, these insecticides can be toxic if used improperly, so be sure to use them only as your veterinarian has prescribed. Read and follow all package instructions.

For a flea program to be successful, it must involve a thorough cleaning to remove the eggs, larvae and pupae in the pet’s environment and a complete and proper application of flea control products that may include an IGR or IDI, as prescribed by your veterinarian. Owners must be mindful of the need for follow-up treatments for their pets. Flea problems will not be solved with a one treatment approach.

For more information

For more information on the latest in flea control safety issues, see the Protecting Pets page sponsored by the U.S. Environmental Protection Agency <http://www2epa.gov/pets>. The Companion Animal Parasite Control website (<http://www.capcvet.org>) is an industry sponsored site with information on all kinds of parasites affecting pets.

Insecticide labels are subject to change and changes may have occurred since this publication was printed. The USER is always responsible for the effects of pesticides on their own plants, animals or household items as wells as problems cause by pesticides drifting onto other properties. Always read and carefully follow the instruction on the label.

References

Paul Demars, DVM, ABVP, Assistant Professor, Community Practice, Center for Veterinary Health Sciences, Oklahoma State University, Personal Communication, 2013

Dryden, M. Personal communication. Concepts of Flea Control Short Course, Tulsa & Oklahoma City, June 15-16, 1992.

Dryden, M., J. Blakemore, J. Georgi, M. Song, and R. Young. Dispelling the Myths. Round table discussion sponsored by Vetkem. *Veterinary Medicine*.

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

Dryden, M. W., J. J. Neal, and G. W. Bennett. Concepts of Flea Control. *Companion Animal Practice*. April/May 1989, 19(4-5):11-21.

Trisha and I discussed this sentence and decided it sounds better like this. Let me know if you want something different.

The Oklahoma Cooperative Extension Service

Bringing the University to You!

The Cooperative Extension Service is the largest, most successful informal educational organization in the world. It is a nationwide system funded and guided by a partnership of federal, state, and local governments that delivers information to help people help themselves through the land-grant university system.

Extension carries out programs in the broad categories of agriculture, natural resources and environment; family and consumer sciences; 4-H and other youth; and community resource development. Extension staff members live and work among the people they serve to help stimulate and educate Americans to plan ahead and cope with their problems.

Some characteristics of the Cooperative Extension system are:

- The federal, state, and local governments cooperatively share in its financial support and program direction.
- It is administered by the land-grant university as designated by the state legislature through an Extension director.
- Extension programs are nonpolitical, objective, and research-based information.
- It provides practical, problem-oriented education for people of all ages. It is designated to take the knowledge of the university to those persons who do not or cannot participate in the formal classroom instruction of the university.
- It utilizes research from university, government, and other sources to help people make their own decisions.
- More than a million volunteers help multiply the impact of the Extension professional staff.
- It dispenses no funds to the public.
- It is not a regulatory agency, but it does inform people of regulations and of their options in meeting them.
- Local programs are developed and carried out in full recognition of national problems and goals.
- The Extension staff educates people through personal contacts, meetings, demonstrations, and the mass media.
- Extension has the built-in flexibility to adjust its programs and subject matter to meet new needs. Activities shift from year to year as citizen groups and Extension workers close to the problems advise changes.

Oklahoma State University, in compliance with Title VI and VII of the Civil Rights Act of 1964, Executive Order 11246 as amended, and Title IX of the Education Amendments of 1972 (Higher Education Act), the Americans with Disabilities Act of 1990, and other federal and state laws and regulations, does not discriminate on the basis of race, color, national origin, genetic information, sex, age, sexual orientation, gender identity, religion, disability, or status as a veteran, in any of its policies, practices or procedures. This provision includes, but is not limited to admissions, employment, financial aid, and educational services. The Director of Equal Opportunity, 408 Whitehurst, OSU, Stillwater, OK 74078-1035; Phone 405-744-5371; email: eeo@okstate.edu has been designated to handle inquiries regarding non-discrimination policies; Director of Equal Opportunity. Any person (student, faculty, or staff) who believes that discriminatory practices have been engaged in based on gender may discuss his or her concerns and file informal or formal complaints of possible violations of Title IX with OSU's Title IX Coordinator 405-744-9154.

Issued in furtherance of Cooperative Extension work, acts of May 8 and June 30, 1914, in cooperation with the U.S. Department of Agriculture, Director of Oklahoma Cooperative Extension Service, Oklahoma State University, Stillwater, Oklahoma. This publication is printed and issued by Oklahoma State University as authorized by the Vice President for Agricultural Programs and has been prepared and distributed at a cost of 20 cents per copy. Revised 0618 GH.