



Prescription Treatment[®] brand Pest Management Bulletin

Volume 11



Eggs

(white; 0.5 mm long)

Eggs laid on pet (25-40 eggs per day). Eggs fall off pet and hatch in environment within 2-5 days.



First Instar Larva

(1-2 mm long)



Second Instar Larva

(2-3 mm long)



Third Instar Larva

(3-5 mm long)



Pupa

(2-4 mm long)

Pupa in silk cocoon with debris collected on outside. Adult fleas emerge in 1-2 weeks. Delayed emergence up to 4 months is possible.



Adult

(Female: 4 mm long)

(Male: 2-3 mm long)

Takes several blood meals daily.

Flea Management in Residential Accounts

Anyone who has had fleas in his/her home knows that they are about as intrusive as any pest can be, biting family members, guests and pets. Fleas can be a source of embarrassment and emotional distress, making the home almost uninhabitable until the problem is corrected. This bulletin will cover the Prescription Treatment[®] approach to managing fleas in and around homes including a case study.

Fleas belong to the order of insects known as *Siphonaptera*, which translated literally from Greek means “wingless pipe”. This name is appropriate for this ectoparasite which is well equipped to pierce skin and suck blood. There are more than 2,000 species of fleas worldwide, but by far the most commonly encountered flea in American households is the cat flea, *Ctenocephalides felis*. Don't let its name confuse you. This flea is not exclusive to cats. It is the most common flea to infest domestic dogs and other domestic pets and can be an aggressive human biter. The dog flea, *Ctenocephalides canis*, is also a frequently encountered flea but is more common among feral dogs and cats than it is among domestic pets and is more limited geographically. There are about eight other species commonly encountered in the U.S., each having its preferred hosts and environment. Flea identification can be important in determining the best treatment strategy for any given situation. For example, the Northern Rat Flea, *Nosopsyllus fasciatus*, often associated with the house mouse and Norway rat, may require a significantly different control approach than the cat flea. Dichotomous keys for easy identification of the common fleas can be found in [Mallis' Handbook of Pest Control](#) and other industry reference resources.

Flea Lifecycle

Fleas undergo complete metamorphosis. Flea eggs are white, oval, smooth with rounded ends and about 0.50 mm of an inch long. The mated female lays her eggs on the host animal. The eggs are not attached to the host, though, so they may fall off the animal and hatch just about anywhere the host has been. A single female may lay several dozen eggs per day for a period of 3 months or more, which accounts for rapid population growth. The eggs usually hatch in 1 to 10 days, depending on temperature and humidity. Newly emerged larvae are slender, 1.5 mm long, segmented, sparsely covered with hairs and translucent white. They avoid light and actively burrow deep into fibers of carpet or beneath organic debris. Larvae feed on organic debris found in their micro-environment but must also feed on adult flea feces, which contains partially digested blood. Feces from adult fleas provides nutrients essential to their development. Flea larvae undergo 2 molts over a period of 5 to 11 days or longer. This period can be extended significantly depending on environmental conditions and food availability. During this time, larvae grow to double their original size and appear significantly darker. The larvae remain translucent white and the darker color is due to ingested blood that is visible in their digestive tract. Flea larvae are susceptible to extreme temperatures and low humidity. They require 50% relative humidity or greater for survival. Larvae survive best outdoors in shady, moist areas during the warm months in moderate climates and develop only in areas where they have access to flea feces. Indoors they do best in protected areas such as within carpet fibers, beneath cushions of upholstered furniture,

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Review preparations and treatment strategy with customer.



Identify pet resting spots.



Cats may explore elevated or secluded areas in the home.



Vacuum before treatment then several days later.

cracks in wood floors or pet bedding - where they are likely to have access to flea feces. As the larvae progress through their third instar they spin thin silk cocoons for pupation, incorporating carpet fibers, dirt or other material present in their environment. The cocoons, often covered with dirt, lint and other debris, are hard to detect during inspection and also protect pupae from drying out and from pesticide penetration. The pupal stage lasts about 7 to 14 days on average. However, some pre-emerged adult fleas remain in the protective cocoon for as long as a year, waiting for a stimulus to trigger emergence. Stimuli can include vibrations, warmth, carbon dioxide and pressure - indicating the presence of a host. Emerging adults begin feeding once they have found a host, usually within seconds. They commonly mate while on the host within a matter of hours and the female can begin laying eggs within 48 hours. Adults usually remain on the host and may live for one to four weeks.

Prescription Treatment Pest Management in Action Case Study

Upon returning home from their vacation, a family was inundated by fleas. They will not re-occupy the home until the fleas have been controlled.



Inspect

1) Identify the Flea

Knowing which species you're dealing with is necessary to develop an effective control strategy. If your customer doesn't have a specimen to show you, the white sock method may be helpful. Simply put on a pair of white socks, pulling them up over the cuffs of your pant legs, and walk around the home in areas suspected of harboring fleas. Fleas will quickly jump onto the socks where they can be captured for identification.

2) Determine the Source (Primary Hosts)

It is important to determine the source of infestation (host). The most common scenario of flea infestation within a home is when a house pet becomes infested outdoors and then brings the problem into the home, where the flea population builds. Sometimes homes with no pets experience flea infestation too. Depending on the species of flea, the problem can be caused by pest animals (squirrels, raccoons, mice, etc) living in the home. Sometimes infested animals such as feral cats or dogs drop fleas in areas where they are picked up by humans. In other cases, former occupants had a pet with a flea problem and the fleas remain in the vacant home. Each of these scenarios has different implications about what needs to be done with the primary host. The first requires that the house pet is treated for fleas, the second and third require controlling or removing the pest animals. And the last doesn't require any animal-related actions.

In our case, after discussing the circumstances with the homeowner and doing an inspection, we find that the homeowner has a dog with no flea protection. It likely acquired fleas several weeks ago, prior to their vacation. The dog is, and has been, at the kennel for the past 2 weeks. The fleas matured during the family's absence and now are actively searching for hosts.

3) Identify Larva Development Sites

During the inspection we looked for and asked about the dog's sleeping, resting and activity patterns to identify the most likely larval development sites in and around the home. Note: cats sometimes explore into more elevated areas and more secluded areas, making these places an important part of your treatment strategy. Crawl spaces, soffits over cabinets, inside of box springs, behind clothes in closets are some examples of often overlooked places where cats may rest.

4) Assess Sensitive Situations In and Around the Home

The inspection should also include an assessment of the floor surfaces and fabrics on furniture and rugs that need treatment. Some floor finishes and fabrics are prone to staining or damage and extra care should be taken to treat these areas appropriately.

The inspection should be used to develop a list of things that the homeowner needs to do in order to help solve the problem as well as build an awareness of



Promptly dispose of vacuum bag.



Treat behind and beneath furniture.



Don't forget to treat beneath the cushions.



Treat with a sweeping motion from a distance of 36 inches from the carpet.

everything that relates to the flea problem or treatment so that the appropriate prescription can be developed. Identifying pet bedding, human bedding or other articles that need to be laundered, or preparations such as removing clutter from floors, specific vacuuming instructions, removing pet food bowls, care instructions for birds, fish or other pets are a few examples.



Prescribe

1) Animal Related

When formulating your prescription for a flea problem, start with the host. In this case, the dog is at the kennel and a phone call to the vet can get the dog the appropriate treatment. If the host was a pest animal living in or around the home, control measures aimed toward the host would be appropriate.

2) Non-Chemical Options

Vacuuming plays a very important role in the flea control process. Not only will thorough vacuuming remove many of the eggs, larvae and adults, but the suction and the vibrations from the beater-bar helps to trigger adult emergence from their cocoons, where they otherwise would be protected from insecticide. It will also remove flea feces and bring up the pile of the carpet, which helps insecticides reach deep down inside the carpet where the larvae are found. Vacuuming should include all floor surfaces, all resting areas - including furniture, pet bedding and any other host-associated articles that are not going to be laundered or discarded. Concrete floors in basements or garages where pets spend time should be vacuumed too. These areas are often overlooked. Vacuuming should be done prior to treatment and then again several days following treatment.

3) Chemical Options

Some of the best insecticide product options for fleas are:

- ▶ Ultracide® Pressurized Flea IGR + Adulticide - a ready-to-use adulticide, larvicide and insect growth regulator which offers fast kill and long residual. This product is designed for indoor use.
- ▶ MotherEarth™ D - a naturally derived dust made from diatomaceous earth which acts as a desiccant on fleas and flea larvae.
- ▶ Tri-Die® Silica + Pyrethrum Dust: a fast acting desiccant dust with synergized pyrethrum.
- ▶ P.I.® and 565 Plus XLO® - synergized pyrethrin contact insecticides.
- ▶ Cy-Kick® CS – a microencapsulated formulation providing extended residual control on tough outdoor surfaces.

For this account we have selected Ultracide for the interior of the home. Outdoors we will use Cy-Kick CS beneath the deck, where the dog spends the majority of his time when he is outside.



Treatment

Preparation

Before beginning the treatment, it is always best to do a walk through inspection to confirm that all preparations have been made. Ensure that all floors have been vacuumed, appropriate bedding has been stripped, the fish tank is covered and the pump turned off, dog food dishes are removed and everyone is out of the house. We are now ready to begin the treatment.

Application

We begin at the farthest point from the entrance and gradually make our way room to room so that we don't "paint ourselves into a corner". Ultracide is applied at a rate of one 20 oz. can per 2,625 sq. ft. We have calculated that it will take about 1 full can to treat this home. We apply Ultracide by using a sweeping motion side to side with nozzle facing downward about 36 inches away from carpet and other surfaces. As a reference, it takes 10 seconds of application to properly treat an area of 100 sq. ft.

When treating the couch, one of the dog's favorite places to rest, lift all cushions and treat beneath them. This protected area makes a great larval development site.



Use caution when treating hardwood or other surfaces that may get damaged.

As we progress through the mostly carpeted home, we come to the uncarpeted kitchen. The floor is linoleum and since linoleum floors don't afford any protection to flea larvae, this is usually not a good place to apply pesticide. However, along the baseboard molding there is a small gap where hair, dirt and debris sometimes accumulates. This could be a more worthwhile treatment site. Since there is a wide variety of linoleum, hardwood and other floor types and finishes, it is a good idea to treat a small inconspicuous area before treating the entire surface to be sure the surface won't be damaged by the application. Waxed surfaces and soft finish surfaces are particularly problematic in this regard. Also, some fabrics, especially silk and others that are prone to water staining, should be tested prior to full application.

Once the interior treatment is completed, move outdoors to treat the areas of concern. In this case, beneath the deck is a small shaded gravel area that the dog sleeps on and there is a short pet run with a tether line. The dog's range is clearly marked by a worn patch in the lawn. We treat this area with Cy-Kick CS mixed at a rate of 1 oz. concentrate per 1,000 sq. ft. mixed in water. This treatment is only designed to kill the adult fleas present which may migrate up the deck. The on-animal treatment provided by the vet should break the flea development cycle in this area.



Communication

The role of communication is very important to the process of flea control. It helps the PMP convey to the homeowner an understanding of the big picture situation leading to an effective solution. It also gives the homeowner clear and specific guidance on the necessary preparations prior to treatment and realistic expectations following treatment.

expectations following treatment.

It is an excellent idea to develop a checklist of preparations for your customer to follow with guidance on even simple things like what to do with the vacuum cleaner bag following vacuuming, how long to stay out of the home after treatment, what to do with fish tanks, birds or other pets during treatment, etc. The easier you make it for your customers to follow your directions, the better they will be followed.

Communicating to the customer information about the biology and behavior of fleas is very worthwhile. It will give them an appreciation for the importance of some preparations they need to make and it will help them understand the symptoms they see both before and following the treatment.



Follow-up

Several days to a week or more following the treatment it is common to have some adults emerge from protective cocoons and find their way onto your customer or his pet. This is not cause for alarm, especially if your customer has been properly counseled on this common occurrence. This symptom generally does not

last more than a few days. In some cases, a follow up treatment with a contact insecticide such as P.I. or 565 Plus XLO is appropriate to quickly knock down emerging adult fleas. However, the residual and IGR action of Ultracide should kill these fleas and help to prevent a reoccurrence for many months.