

Least-toxic Control of Fleas

Fleas feed on warm-blooded animals. The most common species is the cat flea, which will bite humans, dogs, rats, chickens, and raccoons as well as cats.

The flea will lay eggs on its animal host. When the eggs hatch, the larvae drop off the fur onto furniture, blankets or the carpet and live by feeding on adult flea droppings. This larval stage can last from seven days to over a year. Larvae emerge as adults when a host is present.

Fleas can become a problem regardless of whether or not there are pets in the building. They can be brought in on the clothing of staff, students or visitors, or become problems from urban wildlife lining in unused parts of the buildings, such as rats, feral cats, raccoons, opossums, chipmunks, squirrels, or birds.

Flea bites cause irritation and serious allergies in animals and humans. Cat fleas, less commonly, can carry and transmit organisms causing the bubonic plague, murine typhus and the double-pored dog tapeworm, which can live in dogs, cats and humans.

Adult fleas are about 1/16 to 1/8-inch long, dark reddish-brown, wingless, hard-bodied (difficult to crush between fingers), have three pairs of legs, with enlarged hind legs for jumping, and are flattened side to side allowing easy movement between the hair, fur or feathers of the host. Fleas are excellent jumpers, leaping vertically up to seven inches and horizontally thirteen inches. (An equivalent hop for a human would be 250 feet vertically and 450 feet horizontally.) They have piercing-sucking mouthparts, spines on the body projecting backward and a row of spines on the face. Eggs are smooth, oval and white. Larvae are 1/4-inch long, slender, straw-colored, brown headed, wormlike, bristly-haired creatures. They are legless, have chewing mouthparts, are active, and avoid light.

Fleas rarely bite humans unless the population is high. Bites will occur mid-calf and below, and usually appear as small red bumps, about 3-4 in a row.

Prevention

- Seal up cracks and crevices both in and outside of buildings that may harbor flea larvae.
- Block off all entrance points in buildings that may invite wildlife inhabitation. Be sure all wildlife is out of the area before sealing.
- Vacuum daily with a strong vacuum cleaner, changing the collection bag often.

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- Groom pets daily with a flea comb. After each stroke, check for fleas caught in the comb, picking off and dumping any in soapy water.
- Bathe pets frequently with soap and water.
- Restrict pets to a single bed, washing the bedding frequently to kill larvae and adults.

Monitoring

Detection can be as simple as seeing fleas or noticing bites around the ankles of people in the building. Flea dirt, the adult flea feces that dries and falls off the host to serve as food for larvae, may also be visible.

Monitor in and around the cages of pets, the pets themselves for signs of fleas, and places where animals may find shelter, such as basements, crawl spaces, attics, eaves, roof top structures, and secluded shrubbery near buildings.

Traps can also be used to detect flea populations.

- Flea Sock Traps are homemade, knee-high, white flannel booties that fit over the shoes and lower pant legs, as well as make a fashion statement. When walking through flea-infested areas, fleas will jump onto the flannel and become tangled in the nap. You can easily see and count them to determine the degree of infestation. In a pinch, long, white athletic socks worn over shoes and pant legs will work, as will wide strips of sticky-backed paper wrapped sticky-side-out around the lower legs.
- Light Traps are compact traps composed of a small electric light and a sheet of sticky paper. Adult cat fleas may be attracted to the warmth and light of the trap, hop over, and get stuck on the paper. Fleas are more sensitive to green light, and are more attracted to light traps if the light is turned off for 10 seconds every 5 or 10 minutes.

The light trap should be checked once a week. If no fleas are caught by the second week, move the trap to another location or remove it. If only a few fleas are caught, the infestation is very small and can probably be controlled by the traps alone, and the traps should be left in place until no additional fleas have been caught for a week. If 20 or more fleas are caught in a week, there is probably a more serious infestation, and it is time to find the source.

If there are persistent flea problems buildings where there are no pets, it may be an indicator of the presence of rodents or other wildlife. Have the fleas identified,

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which can help determine the host animal and where to search to find the animal and its nest.

Control

- **Vacuum** on a regular basis throughout the year, picking up adult and egg-stage fleas. Vacuum up a tablespoon of cornstarch to ensure the fleas' demise, and dispose of the bag immediately. Be sure to clean cracks and crevices, and permanently seal these openings. Vacuum vibrations will also stimulate new adult fleas to emerge from their pupal sacs, to be captured in the next vacuuming. Vacuum daily, if the area is badly infested, until the infestation is controlled. You will not capture the flea larvae in carpeting, because they are coiled around the fibers, but you will remove the dried blood on which they feed.
- **Steam cleaning** may be needed as a supplement to vacuuming in cases of severe infestation. It kills adult and larval fleas, as well as some eggs. The warmth and humidity of the steam may also stimulate remaining flea eggs to hatch a day or two after the cleaning, so some fleas may reappear. The few fleas that hatch after the steam cleaning should be the last of the flea population, and can be caught with a vacuum.
- **Wash removable floor coverings** located in areas where there are known infestations, as well as any bedding for pets.
- **Restrict pets to a single bed**, and wash this frequently. Also try sprinkling the bed with pine needles, rosemary, fennel or rye.
- **Groom pet with a flea comb** daily. Pick off any fleas from the comb and dump into soapy water. Also bathe your pet frequently.
- **Give pets vitamin B1**, shown to reduce flea bite frequency. A small dose of brewer's yeast should do. A better option might be to go to the veterinarian for a B-complex vitamin supplement.
- The same **light traps** mentioned above are effective for flea control, using either sticky paper or a small tub of soapy water to catch attracted fleas.
- **Heat treatment** is also effective to control cat flea infestations. Cat flea larvae die after exposure to 103°F for one hour. The heating process uses a common heating unit modified to include special blowers and flexible ducts.
- **Drying or saturating** infested areas, such as outdoor areas temporarily harboring flea larvae, will kill eggs and larvae.

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- **Nematodes** applied to the lawn as a spray enter the fleas' bodies, feeding on tissue and releasing harmful bacteria. They do not affect people, pets or plants, and occur naturally in soil, so they will not adversely affect beneficial soil organisms. Use the number of nematodes recommended by the manufacturer; treat areas where you have found evidence of flea infestation, animals sleeping, or regular travel routes for animals; and water the area before and after the application.
- **Diatomaceous earth or silica aerogel** is effective flea control when applied in a light dusting to upholstered furniture that is suspected of harboring fleas (especially in cracks and crevices), rugs or pet bedding; applied to infested carpets, left for a couple of days and then vacuumed up; and sprinkled in crawl spaces, wall voids, attics and other spaces where animals may be nesting or sleeping. Do not use in moist environments. Choose a desiccating dust that it is not combined with a pyrethrin. Diatomaceous earth must be garden/food grade, as swimming pool grade is associated with lung disease. Desiccating dusts abrade the outer shell of the termites, causing them to dry out and die. Avoid breathing in desiccating dusts, as they can cause lung irritation, and always wear a mask and goggles when applying.
- **Boric acid** worked into the nap of carpet can be used to control fleas. It works as a "stomach poison" for fleas and will remain viable for up to a year. Exercise caution when using products containing boric acid, and do not use it in areas where children or pets will come in direct contact with the chemical.
- **D-limonene and linalool** are citrus extracts that have proven effective for flea control. Products containing d-limonene kill larval and adult fleas, while those containing both ingredients kill eggs as well. There are EPA-registered shampoos containing these ingredients, but read the label carefully, as some are too strong for cats or young animals. Limonene is listed as a volatile organic compound (VOC) by the EPA, which can be associated with irritation, odors and other health and comfort concerns. Those with existing sensitivities should be extremely careful when using a product containing limonene, or consider using another alternative.

References

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