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## Allergies in Dogs

By Catherine Barnette, DVM; Ernest Ward, DVM | Medical Conditions, Pet Services

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### What is an allergy?

An allergy is a state of over-reactivity or hypersensitivity of the immune system to a particular substance called an **allergen**. Most allergens are proteins from plants, insects, animals, or foods.

*"With allergies, the immune response can actually be harmful to the body."*

Exposure to the allergen, usually on multiple occasions spanning months to years, sensitizes the immune system, and a subsequent exposure to the same or related allergen causes an over-reaction. Normally the immune system protects the dog against infection and disease, but with allergies, the immune response can actually be harmful to the body. Allergies may be thought of as an unnecessary normal immune response to a benign foreign substance.

The immune reactions involved in allergies are quite complex. Most reactions involve allergen protein molecules combining with antibodies in the blood, then attaching to a type of cell called a **mast cell**. Mast cells are found in many tissues throughout the body. When the antigen and antibody react with mast cells, the mast cells release potent chemicals, such as **histamines**, that cause local inflammation such as redness, swelling, and itching. This inflammation causes the various signs associated with an

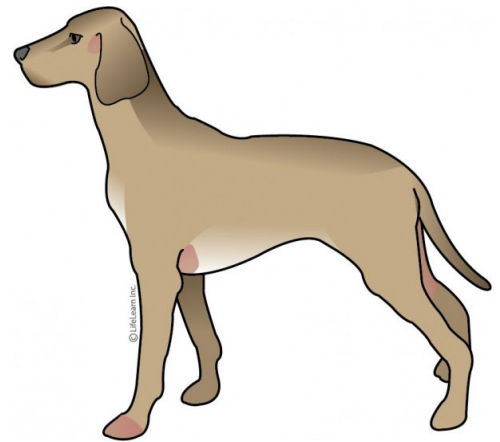
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In the dog, the most common symptom associated with allergies is itching of the skin, either localized (in one area) or generalized (all over the body). In some cases, the symptoms involve the respiratory system, with coughing, sneezing, and/or wheezing. Sometimes, there may be runny discharge from the eyes or nose. In other cases, the allergic symptoms affect the digestive system resulting in vomiting and diarrhea.



### **How common are allergies in dogs?**

Unfortunately, allergies are quite common in dogs of all breeds and backgrounds. Most allergies appear after the pet is six months of age, with the majority of affected dogs over age one or two.

### **Are allergies inherited?**

Some allergies are thought to be inherited. An inherited allergy is atopy or allergies to pollens and plants (see "What is inhalant allergy (atopy) and how is it treated?" below).

### **What are the common allergy-causing substances (allergens)?**

A very large number of substances can act as allergens. Most are proteins of insect, plant, or animal origin, but small chemical molecules can also cause allergy. Examples of common allergens are pollens, mold spores, dust mites, shed skin cells (similar to pet allergies in humans), insect proteins such as flea saliva, and some medications.

### **What are the different types of allergy?**

There are several ways of classifying allergies. Some examples of classifications include:

- Allergen - flea allergy, food allergy
- Route the allergen takes into the body - inhalant allergy, skin contact allergy, or food allergy
- Time it takes for the immune reaction - immediate-type hypersensitivity, also called anaphylaxis or shock, and delayed-type hypersensitivity
- Clinical signs - allergic dermatitis or allergic bronchitis

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Insect bite allergy is the exaggerated inflammatory response to the bite or sting of an insect. Arachnids such as spiders and ticks, and insects including fleas, blackflies, deerflies, horseflies, mosquitoes, ants, bees, hornets and wasps, can cause an allergic reaction in sensitive dogs.

Flea saliva is by far the most common insect allergen in dogs, causing flea allergy dermatitis (FAD). Most dogs experience minor local irritation from flea bites. The FAD dog will react to a single bite with severe local itching. A dog with FAD will bite and scratch itself and may remove large amounts of hair, especially in the tail-base region. A secondary bacterial infection may develop in the areas of broken skin.

*"Because one flea can be a problem for a dog with FAD, strict flea control is essential."*

Because one flea can be a problem for a dog with FAD, strict flea control is essential. This is difficult considering the life cycle of fleas, but modern monthly flea preventives and home treatment options allow you to provide a flea-free environment for your dog (see handout "Flea Control in Dogs" for additional information). Your veterinarian can give you tips on protecting your dog and other pets from fleas. When strict flea control is not possible, or in cases of severe itching, your veterinarian may prescribe antihistamines or corticosteroids (steroids) to block the acute allergic reaction and give immediate relief. If a secondary bacterial infection is present, an appropriate antibiotic will be prescribed. See handout on "Flea Allergy Dermatitis in Dogs" for more information about this type of allergy.

### **What is inhalant allergy (atopy) and how is it treated?**

The term **inhalant allergy** in the dog is often used as a synonym for **atopy**. The main inhalant allergens are tree pollens (cedar, ash, oak, etc.), grass pollens, weed pollens (ragweed), molds, mildew, and house dust mites. Many of these allergies occur seasonally, such as ragweed, cedar, and grass pollens. However, others such as molds, mildew, and house dust mites occur year-round. When humans inhale these allergens, the resulting allergy primarily manifests with upper respiratory signs: runny eyes, runny nose, and sneezing (hay fever). Although sometimes the symptoms of allergies include allergic rhinitis or bronchitis, in most dogs, inhalant allergy manifests with itchy skin (pruritus). Due to these clinical signs, the condition is also called

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*"Symptoms of atopy can be controlled but a permanent cure is not usually possible."*

Most dogs that have inhalant allergy start showing signs between one and three years of age. Affected dogs will often react to several allergens and often experience concurrent flea or food allergies. If the offending allergens can be identified by intradermal skin tests (skin testing) or blood tests, the dog should be protected from exposure to them as much as possible. Because most of these allergens are environmental, this is difficult and recurrent bouts are likely. Symptoms of atopy can be controlled but a permanent cure is not usually possible.

Treatment depends largely on the length of the specific allergy season. It may involve one or more of the following three therapies:

**Anti-inflammatory therapy.** Treatment with anti-inflammatory drugs such as corticosteroids, or with antihistamines, will quickly block the allergic reaction in most cases. Fatty acid supplementation of the diet can improve the response to steroids and antihistamines in some cases. Newer alternatives exist to block specific chemical signals associated with itch in dogs. These drugs include daily oral medications, such as oclacitinib (brand name: Apoquel®), and long-acting injections, such as Cytopoint®. Your veterinarian can help you determine whether these medications may be appropriate for your dog.

**Shampoo therapy.** Frequent bathing with a hypoallergenic shampoo can be soothing to itchy, inflamed skin. Bathing also rinses out allergens in and on the coat that can be absorbed through the skin. Some therapeutic shampoos also contain anti-inflammatory ingredients that may further benefit your pet.

**Hyposensitization or desensitization therapy.** If the specific offending antigens are identified by allergy testing, an allergy injection serum or allergy shots can be given to the patient. With this treatment, very small amounts of the antigen are injected weekly. This repeated dosing has the objective of reprogramming or desensitizing the immune system. Success rates vary with this treatment. Approximately 50% of treated dogs will see significant improvement in their clinical signs, while approximately 25% more will see a decrease in the amount or frequency of corticosteroid usage.

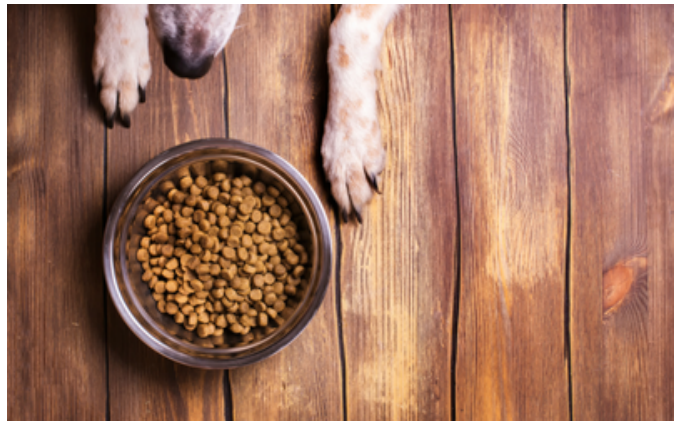
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Food allergy or food hypersensitivity can develop to almost any protein or carbohydrate component of food. It most commonly develops in response to protein of the food; dairy products, beef, wheat gluten, chicken, chicken eggs, lamb, and soy are commonly associated with food allergies in dogs. Food allergy can develop at almost any age. Food allergy may produce any of the clinical signs previously discussed including itching, digestive disorders, and respiratory distress. A dog may have multiple types of allergy, such as both food allergy and atopy making the exact diagnosis of a dog's itching quite challenging.



*"Food allergy typically does not respond well to corticosteroids or other medical treatments."*

Food allergy typically does not respond well to corticosteroids or other medical treatments. Treatment requires identifying the offending component(s) of the diet and eliminating them. The most accurate way of testing for food allergies is with an elimination diet trial using a hypoallergenic diet. Because it takes at least eight weeks for all other food products to be eliminated from the body, the dog must eat the special diet exclusively for eight to twelve weeks. If a positive response and improvement of your pet's clinical signs occurs, your veterinarian will advise you on how to proceed.

*"If the diet is not fed exclusively, it will not be a valid test."*

**It must be emphasized that if the diet is not fed exclusively, a food trial will not be a valid test.** All table food, treats, and flavored vitamins must be discontinued during the testing period. There may be problems with certain types of chewable tablets or medications such as heartworm preventive. Your veterinarian will discuss the specific diet and restrictions recommended for your dog. See handout on "Food

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Contact allergy is the least common type of allergy in dogs. It results from direct contact to allergens, such as pyrethrins found in flea collars, pesticides used on the lawn, grasses, materials such as wool or synthetics used in carpets or bedding, etc. Contact allergies can develop to practically anything and at any age.



*"...there will be skin irritation and itching at the points of contact..."*

If the dog is allergic to any of these substances, there will be skin irritation and itching at the points of contact, usually the feet and stomach. Removal of the allergen (once it can be identified) often solves the problem.

**Caution: The symptoms of allergies can be confused with other disorders, or occur concurrently with them.** Therefore, do not attempt to diagnose your dog without veterinary professional assistance. Be prepared for your pet to receive a full diagnostic evaluation to rule out other causes of itching and skin problems. If an allergy is diagnosed, your whole family must follow your veterinarian's advice very closely in order to successfully relieve your pet's discomfort.

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