

Allergic Dermatitis – Canine

Stephen D. White, DVM, DACVD

Definition

Allergic dermatitis refers to any hypersensitivity disorder that causes an inflammatory condition of the skin. The most common of these disorders affecting dogs are **flea allergy**, **atopic dermatitis**, and **food allergy** (also known as adverse food reactions).

Key Diagnostic Tools and Measures

The history, including seasonality and diet or diet changes, is the first step in diagnosis of the cause of allergic dermatitis. During physical examination, the location of lesions can provide important diagnostic information: if the cause is flea allergy, lesions are likely to be found on the caudal half of body; with atopic dermatitis, lesions are found on the paws, axilla, face, and ears; and with food allergy, lesions may be similar to those seen in atopic dermatitis. Skin cytology is needed to check for secondary bacterial and *Malassezia* infections.

Pathophysiology

Atopic dermatitis is mediated by allergen-specific immunoglobulin E (IgE). Allergens, via the percutaneous route, bind to IgE antibodies bound to mast cells, which then release inflammatory substances. Recent work suggests that 1) some atopic dogs have a defect in filaggrin (a component of the stratum corneum), and 2) in normal dogs, the stratum corneum barrier function (against infection) may be helped by niacinamide supplementation.

The etiology of food allergy is not well understood, but both cell-mediated and antibody-mediated processes are probably involved. In flea allergy dermatitis, the allergens are proteins in the saliva of the flea.

Signalment

Golden retrievers, Labrador retrievers, terriers, Dalmatians, and Shar-Peis are predisposed breeds. In the UK, atopic retrievers were reported likely to have atopic offspring, especially atopic sires. Signs usually are observed in atopic dogs between 1 and 7 years of age (median 1.7). There are no known gender predilections.

Thirty percent of food-allergic dogs show signs by one year of age or earlier. Breed predilections are controversial; there are no known gender predilections. There are no age, breed, or gender predilections for flea allergy.

Key Nutrient Modifications

In dogs with atopic dermatitis, essential fatty acids (EFAs) may be used as antipruritics.¹ A difference in efficacy between EFA supplements of omega-3 fatty acids versus those containing a mixture of omega-3 and omega-6 is controversial. In dogs, EFAs may have as high as a 25% chance of reducing pruritus, particularly when combined with antihistamine treatment. When EFA supplements are included in the dog food, the success rate in one open trial was 42% (good to excellent control of pruritus); in another trial it was 44%. A recent article noted that improvement seen in atopic dogs with EFA supplementation did not always correlate with total fatty acid intake or with the ratio of omega 6:3 fatty acids. Another report documented the steroid-sparing effect of EFAs in some atopic dogs.²

Recommended Ranges of Key Nutrients

| Nutrient | % DM | mg/100 kcal | % DM | mg/100 kcal |
|--------------------------|---------------------------|-------------|------------------------------|-------------|
| | Recommended dietary level | | Minimum dietary requirement* | |
| Total n3 (from fish oil) | 0.4–0.8 | 81–156 | n/a | n/a |
| EPA | 0.24–50 | 50–94 | n/a | n/a |

Modified intake of these nutrients may help address metabolic alterations induced by disease states. The recommended dietary composition is shown as percent of dietary dry matter (DM) and as g or mg per 100 kcal metabolizable energy. All other essential nutrients should meet normal requirements adjusted for life stage, lifestyle, and energy intake.

*Nutrient requirement for adult animals as determined by the Association of American Feed Control Officials

If supplements are used, an anecdotal recommendation is to use at least 36–44 mg/kg body weight/day of eicosapentaenoic acid (EPA) from fish oil, or approximately 1 g fish oil/5 kg body weight.

Therapeutic Feeding Principles

Food Allergy: Diagnosis and therapy is feeding an elimination (“hypoallergenic”) diet.³ The elimination diet is based on previous exposure to various food stuffs, and may be either home-made or commercial elimination (limited antigen) diets.

Other than fresh water, nothing else should be fed during the elimination diet trial: no vitamins, chewing toys, flavored medications, or toothpaste. Because a home-made elimination diet is not a balanced one, owners should be warned that the dog may lose weight, develop a “dull” hair coat or scaling, or be hungrier than usual.

The length of the elimination diet is usually from 8 to 12 weeks. Persistence of some pruritus at 12 weeks may indicate the presence of other concurrent hypersensitivities. In cases in which antibiotics are given to treat secondary infections, or oral corticosteroids for severe pruritus, the diet should continue 2 weeks past when these treatments are discontinued in order to properly judge its efficacy.

Upon resolution of clinical signs, the dog is challenged with its regular diet to confirm the diagnosis. Recurrence of clinical signs is usually noted within 2 weeks. The dog is then fed its elimination diet again, and the owner may challenge with suspected allergens, each being given 1 to 2 weeks at a time. The most common proven allergens in dogs are beef, chicken, milk, eggs, corn, wheat, and soy. Once the offending allergens are identified, commercial dog foods without them or a hydrolyzed protein diet may be fed. When the owners refuse to do provocative testing, a limited-antigen dog food may be used.

■ **Treats** – No treats except for those containing the same ingredients as the elimination diet can be used during the diet trial. Canned or dry commercial elimination diets may be baked (the latter mixed with water) in the form of dog biscuits. After a diagnosis of food allergy is made and an appropriate maintenance diet found, treats may be introduced on a weekly basis to evaluate any recurrence of clinical signs.

■ **Tips for Increasing Palatability** – Occasionally, heating the diet before feeding will improve palatability. If the dog refuses to eat an elimination diet after 2 to 3 days, it is best to try a diet with another protein.

■ **Diet Recommendations** – Elimination diets should avoid foodstuffs fed previously. For home-made diets, “novel” proteins such as pork, pinto beans, rabbit, duck, and tuna and carbohydrates such as potatoes, sweet potatoes, and rice are options. Commercial diets should specifically be marketed as limited-allergen. These may consist of “novel” proteins or

hydrolyzed proteins that are too small a molecular weight to trigger the dog's immune system.

Client Education Points

- **Atopic Dermatitis** – Clients should recognize that this disease needs to be controlled and managed throughout the dog's life; if EFAs are helpful in controlling pruritus, they will need to be given life-long.
- **Food Allergy** – Clients need to be very strict throughout the elimination diet trial. They should keep a daily record, noting pruritus, anything eaten that is not in the diet, and, ideally, any change in feces (e.g., consistency, odor).
- **Flea Allergy** – The role of the flea, and the various insecticides available to protect the dog from the flea's bite, should be explained. While the efficacy of EFAs as an aid in managing the pruritus of flea allergy has not been extensively investigated, the use of EFAs as an adjunct to parasitocidal treatment may be attempted.

Common Comorbidities

Atopic dermatitis and flea allergy often exist in the same dog. All three allergic dermatoses may have secondary bacterial (usually *Staphylococcus* spp) and/or *Malassezia* spp (yeast) infections. These will need to be treated, as well as the allergic dermatitis, as the infections in and of themselves may cause pruritus. Food allergy also may cause gastrointestinal signs. While frank diarrhea and/or vomiting probably only occur in 10% of dogs with food allergy-caused dermatitis, soft or poorly formed stools are noted more often; their occurrence should be specifically asked about in taking the patient's history.⁴ Rarely, idiopathic epilepsy has been noted to be caused by food allergy.⁵

Interacting Medical Management Strategies

As noted above, antibiotics and anti-yeast medications (usually azoles) will need to be given to treat secondary infections. Such medications are usually administered for 4 to 8 weeks. Topical medications such as shampoos or dips (rinses) may also be used to control secondary infections, as well as an aid to treat pruritus. Corticosteroids may be needed to control pruritus, although their use should be limited to oral products with short acting effect, such as prednisone or prednisolone. The lowest possible every-other-day dosage should be the goal when corticosteroids are deemed necessary. Cyclosporine is often helpful in controlling clinical signs of atopic dermatitis; its efficacy in other allergic dermatoses has not been evaluated. Also relevant to atopic dermatitis is hyposensitization (immunotherapy, or "allergy shots") based on intradermal or serologic testing. Hyposensitization is not recommended for the treatment of food allergy; its role in the management of flea allergy needs further investigation.

Monitoring

Dogs with allergic dermatitis should be rechecked at least twice yearly following elimination of clinical signs; more frequent rechecks are indicated dependent upon the potential adverse effects of treatment (such as those seen with cyclosporine or corticosteroids). Dogs should also be evaluated if pruritus recurs, as this may mean either a relapse in the treatment of the allergic dermatitis (e.g., eating a "forbidden" allergen or a lapse in flea control), the recurrence of a secondary infection, or the emergence of another hypersensitivity (e.g., the food-allergic dog that develops atopic dermatitis).

Algorithm – Nutritional Management of Canine Allergic Dermatitis

