



Food Allergies

“Technicians can help clients by following up with them on a regular basis to make sure that they are feeding the pet the elimination diet and no other foods.”

by Amanda Friedeck
BS, VVA

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Dogs and cats with adverse reactions to food have an abnormal response to an ingested food component (usually a protein) or food additive.^{1,2} Proteins that trigger allergic reactions in pets are large enough to bridge two IgE molecules on mast cells, eliciting degranulation and inflammatory mediators.³ These adverse reactions are classified as (1) food allergy or hypersensitivity or (2) food intolerance.⁴ Food allergy or hypersensitivity is an adverse reaction to food caused by an immunologic response (typically IgE-mediated type I hypersensitivity; however, types III and IV are also highly suspected) that is expressed in the skin,⁵ whereas food intolerance is an adverse reaction to any food due to a nonimmunologic cause (e.g., food poisoning, ingestion of garbage that does not contain an allergen, ingestion of a known toxin [e.g., chocolate, onions]); this reaction is typically expressed in the gastrointestinal

(GI) tract as diarrhea. Causes can include any food item for which the animal does not have the enzyme needed to break down the protein (e.g., milk; lactose intolerance is very common in dogs and cats).¹⁻⁵

Although pets may routinely ingest a number of diverse foods, food-related reactions occur relatively infrequently.¹ Adverse food reactions are thought to account for 1% to 6% of all canine and feline dermatoses in general practice and 10% to 20% of all cases in dermatology practices.^{1,6-13} Although some adverse reactions can occur within minutes of exposure to the allergen, delayed responses can take several hours—or even days—to develop.^{1,4}

Signalment

Dogs

No sex or age predilections have been reported for dogs with food allergies⁷; however, several researchers indicate that 33% of dogs that were studied were younger than 1 year when they developed clinical signs of food allergies.¹⁴ Most researchers have not identified a breed disposition,⁷ although some have found that certain canine breeds—soft-coated wheaten terriers, dalmatians, west highland white terriers, collies, shar-peis, lhasa apsos, cocker spaniels, springer spaniels, miniature schnauzers, labrador retrievers, dachshunds, poodles,

german shepherds, golden retrievers, and boxers—are more prone to developing food allergies.^{13–16}

Cats

Food allergies are more common in cats than dogs.¹⁷ No sex predilection has been reported in cats with food allergies.⁷ In addition, no age predilection has been documented; however, the mean age of onset of clinical signs in cats is 4 to 5 years.⁷ Two studies reported that two-thirds of cats with food allergies were siamese or siamese mixed breeds, suggesting that this breed might be at increased risk.^{11,14}

Clinical Signs

In dogs, nonseasonal pruritus (i.e., itching), sometimes accompanied by GI problems, is the most common clinical sign of food allergies.¹¹ Pruritus is usually generalized but may occur on the feet, ears,¹⁸ face (muzzle and chin),² and inguinal region.¹⁴ Perianal pruritus may also be an indication of food allergies.¹⁹ In dogs with adverse reactions to food, several primary and secondary skin lesions can develop. These lesions may include papules, erythroderma, excoriations, hyperpigmentation, epidermal collarettes, pododermatitis (Figure 1), seborrhea sicca, and otitis externa (Figure 2).^{1,20} Dogs with adverse reactions to food may develop recurrent skin infections, often related to *Staphylococcus intermedius* or *Malassezia* spp.¹⁹ In 10% to 15% of dogs with skin infections caused by adverse reactions to food, concurrent GI signs (e.g., vomiting, diarrhea, frequent defecation, colitis)⁵ developed.^{4,11,21} Neurologic signs, such as malaise and seizures, have been reported.^{4,18,20} Although asthma and other respiratory signs have also been reported, these clinical signs are rare.^{3,16,18}

Nonseasonal pruritus is the most common, consistent clinical finding in cats with food allergies; the clinical signs of this condition tend to remain steady year-round because most cats eat the same type of food each day.^{7,22} Affected cats often present with generalized pruritus; pruritus of the head, face, pinnae, or neck; miliary dermatitis; symmetric alopecia; eosinophilic granuloma complex lesions; otitis externa; and/or self-mutilation.^{5,7,20,23–24} In one study, one-third of cats with adverse food reactions developed angioedema, urticaria, or conjunctivitis.^{1,25} GI signs (usually diarrhea, but sometimes vomiting) occur in 10% to 15% of feline

patients with food allergies.^{7,8,26} In one study, 33% of pruritic cats with food allergies also had concurrent GI problems.²⁷

Diagnosis

For patients with suspected food allergies, a thorough patient history, including a detailed dietary history (Diet History Form), should be obtained, and a complete physical examination should be performed. Before the clinician can make a tentative diagnosis of food allergy, other pruritic disorders, such as atopy and flea allergy dermatitis,¹ must be ruled out.^{4,5} Therefore, it may be necessary to obtain skin scrapings, cytology samples, or fungal cultures, depending on physical examination findings as well as the patient's clinical signs and history.⁵

It is often difficult for clinicians to diagnose food allergies in dogs and cats for several reasons:

- Presence of clinical signs of other allergies or conditions²
- Presence of secondary infections²

- Inaccurate history from the client²
- Lack of available diagnostic tests²⁸

Several tests, including intradermal skin testing and serum chemistry allergy testing (e.g., ELISA, radioallergosorbent test), have been described for diagnosing food allergies; however, these tests are generally believed to be inaccurate for this purpose.^{5,29}

New diagnostic methods are always being developed. In human patients with suspected GI-related food allergies, use of the colonoscopic allergen provocation (COLAP) test is being studied. During the COLAP test, the duodenal mucosa is challenged with potential allergen extracts via endoscopy or other noninvasive means. The presence of a mucosal wheal and flare is evaluated to determine the possibility of a reaction. However, the COLAP test is considered controversial in human medicine because not all researchers agree that GI-related food allergies exist.³⁰ The COLAP test has been studied in veteri-



Left: Figure 1. Chronic pododermatitis has been identified in some dogs with food allergies.



Right: Figure 2. Dogs with adverse reactions to food can develop otitis externa.

nary medicine but is currently thought to be unreliable.^{22,27,31}

Currently, the ideal method of diagnosing food allergies in dogs and cats is to initiate dietary elimination and challenge studies.^{1,11,14,23,24} These trials are time consuming; however, they are the most effective way of identifying a particular allergen.

Food Elimination Trials

The goal of a food elimination trial is to feed an affected dog or cat a novel protein to which it has not been previously exposed in order to try to eliminate the offending allergen from the pet's diet. The ideal elimination food must meet the following criteria¹:

- Contain only one novel protein and one carbohydrate source
- Have high protein digestibility (>87%) or contain a protein hydrolysate
- Be free of food additives
- Contain no excessive levels of vasoactive amines (e.g., histamine)
- Be nutritionally adequate for the pet's species, age, and lifestyle

Because there is no "standard" diet—commercial or homemade—for every pet, the clinician must select a diet after carefully investigating all the foods to which a pet has already been exposed.^{7,8} For testing purposes, the owner can choose to feed the pet a homemade diet or a commercially prepared diet.¹

Although the American Academy of Veterinary Dermatology surveyed veterinarians and reported that homemade foods were recommended more frequently,³² homemade diets are labor intensive for the owner and may not provide adequate nutrition for the pet, especially young, growing animals.^{32,33} If the owner decides to feed the pet a homemade diet, a veterinary nutritionist should be consulted to make sure that the diet is nutritionally adequate. Numerous factors must be taken into consideration when making a homemade diet. For example, cats should have taurine (unflavored) added to their diet.⁵ It is important to remember that it can be difficult for owners to consistently make enough food for large-breed dogs and to make diets palatable for cats.⁵

Another option is for the owner to feed the pet a "hypoallergenic" commercial diet. Numerous commercial pet foods with limited and different protein sources are available.¹ Commercial pet foods (1) are convenient, (2) often contain novel protein

sources, and (3) are nutritionally balanced and complete for the intended species.¹ It is important to note, however, that not all commercial foods have been adequately tested in dogs and cats with known food allergies, especially those with dermatologic or GI signs.^{1,14,21,34–37} Hydrolyzed protein diets (typically chicken and soy) have been used in food trials, producing various responses. Many patients tolerate these diets well. A hydrolyzed protein has had its peptide bonds broken to create smaller fragments of amino acid chains to decrease allergenicity and increase digestibility.¹ Studies have shown that a small number of patients react to hydrolyzed diets if they are allergic to the parent protein.^{3,38,39}

Client compliance is crucial to the success of an elimination trial. The owner should be instructed to give the pet only water and the elimination diet—no other foods or flavored substances. The elimination diet should be fed to the pet for 8 to 12 weeks.²⁰ During this time, treats, flavored vitamin supplements, flavored chewable medications, fatty acid supplements, and chew toys should be avoided.¹ If possible, flavored medications should be replaced by equally effective nonflavored preparations.¹⁸ Malt-flavored toothpastes should be used instead of protein-flavored toothpastes.¹⁸ The owner should be instructed to keep a daily dietary log and to record observations regarding the pet's clinical signs.¹ When owners are encouraged to provide detailed daily accounts and bring that information with them during recheck examinations, clinicians are more likely to get a better idea of how the pet is really progressing. If the pet's clinical signs do not improve while the pet is on the diet, another trial using a different commercial diet or a homemade diet should be considered.⁴⁰ There may be no response to the trial because of the following:

- The patient may be allergic to the parent protein of a hydrolyzed diet
- Clinical signs may be associated with a storage-mite allergy
- Additives in commercial food are haptens (small molecules that are only allergenic when coupled with their carrier protein)

After the dog or cat has been on the diet for an adequate amount of time and has shown some response, the pet's diet should be challenged.¹⁷

Glossary

Collarette—A narrow rim of loosened keratin overhanging the periphery of a circumscribed skin lesion and attached to the normal surrounding skin

Dermatosis—Skin disorder usually not characterized by inflammation

Erythroderma—Abnormally red skin covering large areas of the body

Excoriation—Superficial, traumatic abrasion or scratch in which some of the skin is removed

Miliary dermatitis—Skin inflammation characterized by redness, itchiness, and the outbreak of lesions

Otitis externa—Infection of the outer ear that leads into the ear canal

Papule—Small, solid, elevated lesion of the skin

Pinna—The projecting external part of the ear

Pododermatitis—Infection in the footpad that causes swelling and pain

Seborrhea sicca—Dry, scaly skin

Urticaria—A vascular reaction that is often immunologically based; also known as hives

Box 1.

The Most Common Food Allergens

Cats²¹

- Beef
- Fish
- Milk and milk products

Dogs^a

- Beef
- Milk and milk products
- Wheat

^aRoudebush P. Ingredients associated with adverse food reactions in cats and dogs. *Adr Small Anim Med Surg* 2002;15(9):1.

Challenge Diet

After a pet responds to the elimination diet, the pet should be challenged with its previous diet to confirm a diagnosis of food allergy.^{7,40} Clinical signs usually appear within 2 weeks of initiating the pet's regular diet.⁴⁰ At this point, the pet should be fed the elimination diet again and then challenged with the suspected allergens individually.⁴⁰ The allergens should be added to the pet's diet one at a time for 1 to 2 weeks to determine which of the allergens is causing the adverse food reaction⁴⁰ (Box 1). After the offending allergen has been identified, the veterinary staff can help the owner select an appropriate diet. For pets with adverse food reactions, the most effective treatment is to simply avoid feeding the pet a diet that contains the offending food allergen.¹

If the patient does not develop a reaction to the previous diet at the beginning of the challenge diet, a previously given treat should be fed for a week to see if the patient

relapses.³⁹ If clinical signs do not recur, the patient's exacerbation season may have ended, indicating that the allergy does not have a food component.

Role of the Technician

Client compliance is extremely important when a food allergy is suspected in a pet. Veterinary technicians are often the main source of information when the client has questions regarding the clinician's recommended dietary changes. Technicians can help clients by following up with them on a regular basis to make sure that they are feeding the pet the elimination diet and no other foods. In addition, technicians can communicate to pet owners the importance of keeping a food diary during a food elimination trial. Technicians can show owners how to properly fill out the diary^a and then follow up with them during the trial to answer any questions that they may have. They can also question the owner during follow-up to make sure that he or

she is tracking the progression of the pet's clinical signs. Once the offending allergen has been identified, the technician can work with the owner to find an appropriate diet that is palatable to the pet. When choosing a diet for an allergic patient, the technician must be mindful of possible cross reactivity to certain proteins (although this has not been scientifically proven).²² Cross reactivity may occur within the following protein groups:

- Chicken, duck, and possibly eggs
- Beef, venison, and dairy products

Conclusion

It can be very frustrating for owners when their pets develop clinical signs related to food allergies. Conducting food trials and recording observations of clinical signs can be extremely time-consuming for owners. Therefore, technicians must stress the importance of identifying the cause of the food allergy. Once the allergen has been successfully identified, a new diet can be



implemented to help the pet live a comfortable and healthy life.

^aFor a sample food diary, see Roudebush P, Guilford WG, Shanley KJ. Adverse reactions to food. In: Hand MS, Thatcher CD, Remillard RL, Roudebush P, eds. *Small Animal Clinical Nutrition*. 4th ed. Topeka, KS: Mark Morris Institute; 2000:444-445.

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DIET HISTORY FORM

Date: _____

Case Number: _____

Owner Information

Name: _____

Email address: _____

Phone (home): _____

Phone (cell): _____

Best time to call: _____

Pet Information

Name: _____ Age: _____

Species: _____ Breed: _____

Gender: Male Female Neutered/spayed: Yes No

Current weight: _____ Usual weight: _____

Body condition score (1-9): _____

Evidence of muscle wasting None Mild Severe

Reason for Visit

Household Demographics

How many adults are in your household? _____

How many children are in your household, and how old are they?

Where is your pet housed? Indoors Outdoors Both

Do you have other pets? Yes No If so, please list species and specify if they live indoors or outdoors.

Feeding Management

Who typically feeds your pet? _____

When is your pet fed? _____

Stamp clinic information below:

Is food left out for your pet during the day? Yes No

Does your pet have access to other, unmonitored food sources (e.g., treats fed by neighbor, food left for outdoor cats)?

Yes No

If yes, please describe: _____

If you have more than one pet, do they have access to each other's food? Yes No If yes, please describe:

How do you store your pet's food? _____

Activity

How active is your pet?

Hyperactive Very active Average

Not very active Hardly moves

How often is your pet walked?

At least 3 times/day 1-2 times/day Once a day

Seldom Never

Do you have access to a yard? Yes No

Is it difficult to exercise your pet? Yes No

Can exercise be increased? Yes No

Has your pet participated in training? Yes No

Has your pet participated in competition? Yes No