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DIAGNOSING FOOD ALLERGY: DIFFICULTIES AND TOOLS



Fig. 1: Dogs eating

Picture credits: Carmen Lorente

Food allergy in dogs and cats manifests in skin inflammation and pruritus (pruritic dermatitis). Digestive signs appear in only 10 – 30 % of food allergies.

The clinical picture of food-induced allergic dermatitis (FIAD) is impossible to differentiate from atopic dermatitis. Its diagnosis should be made by subjecting the patient to a diet that does not induce an allergic reaction for a minimum time of approximately two months. In general, more than 90 % of food-allergic patients will respond to a strict elimination diet for two months.



Fig. 2: Otitis is very common in dogs with food allergy

Picture credits: Carmen Lorente

Doing an elimination diet to diagnose a food allergy is not straightforward because of the difficulty in selecting the diet and the understanding and cooperation of the owners in the diet.

One of the significant difficulties is selecting a non-allergenic diet for the individual patient. Not all patients are allergic to the same ingredients. Therefore, there are no diets that can generally be called hypoallergenic, except those whose protein component consists exclusively of amino acids or peptides of such small size that they cannot induce an allergic response in any individual (this is the basis for hydrolysed and ultra-hydrolysed diets).

Novel protein diets for the diagnosis and treatment of food allergy are based on the fact that no allergic reaction is induced without prior exposure to an allergen. However, these diets are not hypoallergenic for the general population but for the animal that has not previously ingested the protein. The selection of ingredients for a novel protein diet should be made based on previous feeding history or the results of a food allergen test.

An important problem is that the labelling of diets does not reflect all the protein sources contained in the food. Several studies have identified that more than 80 % of commercial diets labelled as "limited protein", "single protein", "restricted protein", "hydrolysed", or "hypoallergenic" diets contain undeclared proteins which could be considered allergens. It is due to two factors:

1. Legally, the label only has to reflect the origin of the ingredients that represent more than 20 % of the diet.
2. Contamination of the feed with other protein sources. Contamination can occur during the manufacture, processing or handling of the feed. "Hypoallergenic" commercial diets must be manufactured on production lines exclusively for that feed or after complete machinery cleaning to avoid cross-contamination. These diets must have strict quality controls of ingredients, production line and final product, including PCR control for possible contamination, to ensure the diet's suitability for the intended purpose.

There is a proliferation of self-described and promoted hypoallergenic diets on the market that make difficult the diagnosis of food allergies and confuse the owner. When selecting a restriction diet for a food allergy trial, the veterinarian must be sure of the diet's suitability and the manufacturer's reliability. The WASAVA feeding guidelines assist the veterinarian in identifying reliable commercial feed manufacturers (see references).

How to perform the elimination diet

The diet should be strict, with only the selected feed and water. No other ingredients can be given, as even a tiny amount of the (unknown) allergen will trigger the allergic reaction. In general, it should be maintained for a minimum of 8 weeks.



Fig. 3: Dogs eating dry food

Picture credits: Carmen Lorente

Ensure the owner understands the need for the diet as a diagnostic test and can perform it strictly.

All factors that could lead to error must be controlled: ingestion of food from other animals living with the patient, ingestion of food found on the floor, children or people supplying food to the animal openly or covertly. It is a test performed at home and can lead to many errors that should be limited. If it is impossible to complete it strictly, it is better not to do it, as it will lead to errors in the results and their interpretation.

During the diet period, clinical signs should be treated with antipruritic/anti-inflammatory treatment. If it is a food allergy, treatment can be discontinued after 8 weeks of dieting. Otherwise, clinical signs will appear after discontinuation of medical treatment.

Once the clinical signs have been controlled with the diet, the animal should be exposed to the previous food to confirm the food allergy. Identifying the ingredients that cause the allergy and those the animal can tolerate is also complicated.



Fig. 4: No treats for dogs

Picture credits: Carmen Lorente

Usefulness of food allergen testing.

Food allergen tests evaluate IgE and IgG against each food component. They are not sensitive tests, i.e. they can be positive in allergic and non-allergic animals. But they are highly specific, if the results are negative for IgE and IgG, it is improbable that the animal is sensitised to that food. These tests are not useful for diagnosing the disease, but they can greatly help the veterinarian, the owner and, of course, the patient:

1. In the case of owners who are reluctant to go on the diet: positive results can help them decide to do an elimination diet.

2. If a homemade diet is chosen, allergen testing will help select the dietary ingredients: a single source of protein and carbohydrate that tested negative for IgE and IgG. Remind the owner to take extreme precautions during diet elaboration to avoid contamination with other ingredients (working on surfaces and using cooking utensils that are clean of other foods).
3. If commercial diets are used, protein hydrolysate diets are recommended. If novel protein diets are used, select diets with a protein and carbohydrate source that are IgE and IgG negative. **Remember the importance of the reliability of the brand name and labelling.**
4. After the diagnosis of food allergy, serological food testing helps broaden the ingredients of the diet. Those components negative for IgE and IgG can be incorporated into the diet one at a time for a minimum of 15 days. Tolerance of the animal to an ingredient administered daily for 15 days indicates that the animal is not allergic to the ingredient. Once the pure ingredient is tolerated, it can be fed in a commercial diet (treats, feed or canned) and checked for tolerance.

Conclusion

Diagnosis of food allergy is highly complicated, it is based on a restricted diet that must be carried out at home with all the failures that this entails, making it also difficult to interpret. Food allergen testing does not diagnose the disease, but it helps the owner and the veterinarian to perform the test, limit the error and select ingredients for both the elimination diet and the maintenance diet that the animal will be able to follow in the future.

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Ricci R, Conficoni D, Morelli G, Losasso C, Alberghini L, VGiaccone V, Ricci A and IAndrighetto I. Undeclared animal species in dry and wet novel and hydrolyzed protein diets for dogs and cats detected by microarray analysis. *BMC Veterinary Research* (2018) 14:209. <https://bmcvetres.biomedcentral.com/articles/10.1186/s12917-018-1528-7>

Okuma TA, Hellberg RS. Identification of meat species in pet foods using a real-time polymerase chain reaction (PCR) assay. *Food Control Elsevier Ltd.* 2015;50:9-17

Ricci R, Granato A, Vascellari M, Boscarato M, Palagiano C, Andrighetto I, et al. Identification of undeclared sources of animal origin in canine dry foods used in dietary elimination trials. *J Anim Physiol Anim Nutr (Berl)*. 2013;97(1):32-8.

Horvath-Ungerboeck C, Widmann K, Handl S. Detection of DNA from undeclared animal species in commercial elimination diets for dogs using PCR. *Vet Dermatol.* 2017;28:1-6

Mueller RS, Olivry T. Critically appraised topic on adverse food reactions of companion animals (4): can we diagnose adverse food reactions in dogs and cats with in vivo or in vitro tests? *BMC vet res. BioMed Central.* 2017;13:275.

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