PURINA Institute
Advancing Science for Pet Health

Demystifying Adverse Food Reactions

Creating Collaborative Care Through Nutrition Conversations

A PANEL DISCUSSION

A pet with an adverse food reaction may present with dermatological and/or gastrointestinal clinical signs. The following discussion,[1] moderated by feline internal medicine specialist, Dr. Andy Sparkes features veterinary dermatologist Dr. Domenico Santoro and internal medicine specialist, Dr. Frédéric Gaschen, reviewing the importance of elimination diet trials for pets with suspected adverse food reactions, the types of elimination diets, and how to address challenges pet owners may face during a dietary trial.

AN INTRODUCTION TO ADVERSE FOOD REACTIONS

Andrew Sparkes, BVetMed, PhD, Dipl. ECVIM, MANZCVS, MRCVS (Chair/Moderator)

Dr. Andy Sparkes: Dr. Santoro, what are adverse food reactions (AFR)?

Dr. Domenico Santoro: Adverse food reactions typically involve the skin and/or the gastrointestinal system. There are two types:

- An immunological response to an element in the food, which is a food allergy or food hypersensitivity. Food allergies may involve an IgE-mediated response or a non-IgE-mediated response. It can be difficult to define which type of reaction is the major one involved in a particular patient.

Hypersensitivity reactions	Mediated by
Type I	IgE antibodies and mast cells
Type II	IgG and/or IgM antibodies and complement
Type III	Immune complexes, complement, and neutrophils
Type IV	T lymphocytes

- A non-immunological response to an element, which is a food intolerance. Most of the time, the food intolerances do not have major skin-related signs. We see primarily the gastrointestinal issues in these patients.

As a dermatologist, I mainly see food allergy.

Dr. Sparkes: How common are food allergies, and what is the typical signalment?

Dr. Santoro: Epidemiologically, food allergies are not the most common allergies that we see in practice. Of all diagnoses in dogs, food allergy is only involved in 1–2% of cases. Of skin diseases, food allergy comprises 6%. Of dogs that present with atopic dermatitis-like disease, incidence of food allergy is 30%. From a clinical standpoint, atopic dermatitis and food allergy look extremely similar.

Food allergy has been reported in dogs from 6 months up to 14 years of age. However, almost 40% of the cases of food allergy develop in dogs under 1 year of age. Predisposed breeds include German Shepherds, Retrievers, and West Highland White Terriers.

Dr. Sparkes: What are the common clinical signs of food allergy?

Dr. Santoro: From a dermatological perspective, the primary clinical sign is a non-seasonal pruritus. Severity varies among affected dogs.

Lesions, such as alopecia, erythema, and crusting, may be limited to one or a few areas or may be generalized. Common locations include the face, ear tips, paws, axillary regions, perianal area, and forelegs. Dogs may present with otitis.

From a gastrointestinal perspective, chronic diarrhea is common. It is important to ask the owner about the pet's stool quality even if the owner does not mention it. Some owners may perceive their pet's loose stool as "normal." Having the owner indicate their pet's stool quality on the Purina fecal scoring chart[2] can be very useful in detecting chronic diarrhea in cases where owners are unaware it exists.

"Almost 40% of the cases of food allergy develop in dogs under 1 year of age."
Domenico Santoro, DVM, MS, DrSc, PhD, DACVD, DECVD, DACVM

Dr. Sparkes: Dr. Gaschen, in the past, the diagnosis of inflammatory bowel disease was often given to dogs presenting with chronic diarrhea for which other causes, such as parasites, had been eliminated. How do we now refer to these cases?

Dr. Frédéric Gaschen: We now use the term chronic inflammatory enteropathy or chronic enteropathy. The chronic inflammatory enteropathies that respond to a new diet are called food responsive. Depending on the study, between 50 and 75% of dogs presenting with chronic diarrhea will respond to a dietary elimination trial.

Then there are immunosuppressant-responsive enteropathies and non-responsive enteropathies. In each of these categories are pets with protein-losing enteropathies.

Dr. Sparkes: Could you explain the pathogenesis of chronic inflammatory enteropathies?

Dr. Gaschen: In affected dogs, and the same would be true for cats, we look at the pathogenesis as multifactorial. There may be a genetic predisposition, of which a few have been identified in pets, although more so in people. There is an immune component.

Environmental factors also play a role. A big environmental factor is the intestinal microbiota. The diet is an environmental factor that is relatively easy to influence.

"Between 50 and 75% of dogs presenting with chronic diarrhea will respond to a dietary elimination trial."
Frédéric Gaschen, Dr.med.vet., Dr.habil., DACVIM (SAIM), Dipl. ECVIM-CA, AGAF

Ultimately these issues lead to an abnormal permeability of the intestinal mucosa, which allows substances—whatever they may be, for example, microbiota or food components—to traverse the mucosa to be exposed and trigger an immunological response.

Dr. Sparkes: How do you grade the severity of as well as monitor response to management of chronic enteropathies in dogs?

Dr. Gaschen: We use a clinical scoring index of which two have been validated in dogs: the Canine Inflammatory Bowel Disease Activity Index, or CIBDAI, and the Canine Chronic Enteropathy Clinical Activity Index, or CCECAI. These scoring indices allow us to follow a case objectively over time.

Components of the patient's historical data and physical exam data are scored from 0 (normal) to 3 (severely changed). Both CIBDAI and CCECAI assign a grade to attitude/activity, appetite, vomiting, fecal consistency, defecation frequency, and weight loss. CCECAI additionally grades albumin levels, ascites and peripheral edema, and pruritus.

The individual scores are then totaled. A total score up to 3 is insignificant, and 4 or 5 is mild.[3]

Even the presence of mild disease can impact the human-animal bond. For example, a dog with mild disease may defecate inside or wake the owner to be let out in the middle of the night.

DIAGNOSIS

Dr. Sparkes: In a pet with dermatological ± gastrointestinal clinical signs suggestive of a food allergy, how do you confirm the diagnosis, Dr. Santoro?

Dr. Santoro: To diagnose a food allergy, we must conduct a full elimination trial. Other available tests, including patch, saliva, serology, and hair testing, are unfortunately not reliable in dogs or cats.

Dr. Sparkes: Dr. Gaschen, in a dog presenting with chronic diarrhea, when do you proceed with an elimination diet trial on the first visit rather than pursuing other diagnostics?

Dr. Gaschen: If we have ruled out parasites, the diarrhea only has minimal to mild systemic repercussions, and the CIBDAI or CCECAI scoring is mild to moderate, there is a strong indication to initiate an elimination trial and not pursue other testing. This is particularly true if the dog is younger, medium to large sized, and has large bowel diarrhea.[4]

"To diagnose a food allergy, we must conduct a full elimination trial."
Dr. Santoro

ELIMINATION DIETS

Dr. Sparkes: What are the types of elimination diets?

Dr. Santoro: Options include novel protein, partially hydrolyzed, extensively hydrolyzed, and amino acid-based diets. The difference between a partially hydrolyzed and extensively hydrolyzed diet is essentially the size of the protein. There is not a precise distinction. However, generally, a protein between 6–10 kilodaltons in size is considered partially hydrolyzed. A protein below 6 kilodaltons is considered extensively hydrolyzed. Even smaller are the amino acid-based (elemental) diets, which do not contain any peptides.

Pets may react to very small amounts or sizes of protein. The size is not consistent for every allergen. Every ingredient, every allergen has a specific size that a pet will react to. There may be a variation of a few kilodaltons.

Dr. Sparkes: What type of elimination diet do you typically choose for your patients, Dr. Santoro?

Dr. Santoro: I usually use an extensively hydrolyzed or amino acid-based diet. Dogs with a type I hypersensitivity may respond to a novel protein or partially hydrolyzed diet. However, dogs with a type IV hypersensitivity may not. Dogs with type IV hypersensitivity comprise about 20–25% of cases.

So while many dogs respond to a novel protein or partially hydrolyzed diet, the dogs that are being referred to me are often the ones that have not. They have likely already been fed and not responded to a

novel protein or partially hydrolyzed diet. Thus, we go straight to the extensively hydrolyzed or amino acid-based diet because we would like to eliminate all types of immunological reactions.

Dr. Sparkes: If you are using an extensively hydrolyzed or amino acid-based diet, is obtaining a full dietary history still important?

Dr. Santoro: Yes, because I need to know everything that the pet is being fed—everything that is entering the pet's mouth—in a day, including treats; flavored medications (e.g., flea/tick and heartworm prevention), supplements, or toothpaste; and/or table scraps. Having the pet owner complete a diet history form[5] is a helpful way to obtain this information. While feeding the elimination diet, anything that is currently being fed should be avoided.

Dr. Sparkes: In pets that respond to an elimination diet, how quickly is improvement seen?

Dr. Santoro: Dermatological improvement may not be seen for as long as 8–10 weeks. However, improvement in gastrointestinal signs is usually faster—as soon as 1–2 weeks.

Dr. Sparkes: For a pet that does not respond to the first diet, what is the next step?

Dr. Gaschen: If the diarrhea has persisted but the pet is still in good general condition with no real systemic effects, I would recommend a second dietary trial. However, if the pet's condition has deteriorated, then more in-depth investigation and diagnostics would be appropriate.

Dr. Santoro: I would also proceed with a second elimination trial in a pet whose dermatological signs do not improve.

Dr. Sparkes: Do you give antibiotics to these patients either initially or if the pet does not respond to the first diet?

Dr. Gaschen: No. Antibiotics are rarely indicated. We know that antibiotics may adversely affect the pet's gut microbiome and contribute to antimicrobial resistance. I think in the past we decided that dogs did not respond to diet changes much too early, and we gave them antibiotics or steroids when they did not need them and perhaps did not even respond to them.

We should not underestimate the value of conducting elimination trials in dogs with chronic diarrhea. If the first trial is not successful, and the dog is still in good general condition with no real systemic effects, then we need to try a second trial and perhaps a third.

> "Antibiotics are rarely indicated. We know that antibiotics may adversely affect the pet's gut microbiome and contribute to antimicrobial resistance. We should not underestimate the value of conducting elimination trials in dogs with chronic diarrhea."
> **Dr. Gaschen**

Dr. Sparkes: For chronic enteropathy cases, what other dietary modifications are you making?

Dr. Gaschen: Since many of these dogs have large bowel diarrhea, we often supplement the diet with a soluble fiber, such as psyllium. Psyllium provides the gut with a good source of short-chain fatty acids, among other benefits.

There is clearly inflammation occurring in these dogs with chronic enteropathy. Due to the anti-inflammatory benefits of the long-chain omega-3 fatty acids, I also target a diet with an optimal omega-3 to omega-6 fatty acid ratio. A highly digestible diet is also beneficial.

THE VALUE OF COMMUNICATION

Dr. Sparkes: How important is communication with the pet owner?

Dr. Santoro: Transparent communication with the pet owner is essential. Owners should be made aware that an elimination trial will not be an easy or quick process, particularly with pets presenting with dermatological signs. However, owners need to persevere. The possibility that multiple food trials may be required to see a response should also be raised at the beginning.

The owner should inform the entire family and anyone else (e.g., the next-door neighbor or the postal carrier) who might feed the pet that the pet is undergoing a diet trial. The owner is investing money and time in the diet trial, and you do not want the trial compromised because the pet is receiving food elsewhere.

> "Transparent communication with the pet owner is essential."
> **Dr. Santoro**

CHALLENGES IN FEEDING ELIMINATION DIETS

Dr. Sparkes: What obstacles do owners face in complying with an elimination dietary trial for their pet?

Dr. Santoro: The major challenge that I see for the owner is their inability to feed their pet their usual treats. Feeding treats is often an important component of the human-animal bond in a household. The owner may not be willing to stop feeding treats and so may not be compliant with the elimination diet.

Instead of advising the owner to stop feeding all treats, we should provide options for what owners can feed instead of the current treats. Examples are ice chips, pumpkin, and other vegetables. If feeding a dry elimination diet, the owner can set aside some of the kibble to use as treats.

We have thus far been focusing on dogs. For cats, there are commercially available treats made out of very unusual proteins,

such as kangaroo, that a cat would be unlikely to react to. There are also treats made with oats or pumpkin.

If a neighbor likes to give treats to a pet, the owner should provide the neighbor with the approved options.

Dr. Gaschen: Another obstacle is cost, especially for the extensively hydrolyzed diets, which are more expensive to manufacture.

Dr. Santoro: The novel protein and partially hydrolyzed diets may be more affordable. However, the problem is when you try one of these diets and the pet does not respond. That is when you move to a trial with an extensively hydrolyzed or amino acid-based diet to determine whether the clinical signs are truly due to an adverse food reaction. Or you could use the extensively hydrolyzed or amino acid-based diet in the first trial.

Indoor/outdoor or strictly outdoor cats also present a challenge. Since the owner cannot control what the cat eats outside, the cat will need to be confined. To allow the cat to still experience the outdoors, some owners may opt to confine the cat to an enclosed patio. However, this is not possible for everyone. Some cats will not tolerate being confined, which could affect the human-animal bond.

Dr. Sparkes: How can a pet owner feed an elimination diet in a multi-pet household?

Dr. Santoro: This depends on the household. One option is to feed the pets separately. The issue is making sure the pet with the clinical signs is not consuming any other pet's diet.

In general, it is not a problem if the other pets (if all dogs or all cats) eat the elimination diet. So, another option is to feed all of the dogs or all of the cats in the household the elimination diet. However, the second option may not be practical especially if large dogs are involved.

Dr. Sparkes: Can dogs that respond to an elimination diet be switched to another diet for long-term feeding?

Dr. Gaschen: Owners may want to try a high-quality, non-therapeutic diet as a long-term option, while avoiding proteins from the previous diet. A study years ago suggested that this may be a viable option for a large percentage of dogs.

If owners try this, we watch for recurrence of clinical signs. Typically if a pet that initially had both gastrointestinal and dermatological clinical signs relapses once starting the non-elimination diet, the gastrointestinal signs return first.

Dr. Sparkes: What do you consider the primary take-home message from this discussion for practitioners?

Dr. Gaschen: We should appreciate the value of an elimination diet and realize, in some cases, multiple elimination trials may be needed.

Dr. Santoro: We must establish good communication and build trust with pet owners. Setting reasonable expectations can help avoid poor compliance with elimination diets.

CHAIR/MODERATOR:

Andrew Sparkes, BVetMed, PhD, Dipl. ECVIM, MANZCVS, MRCVS, is an independent consultant. Previously, he served as Veterinary Director of International Cat Care and the International Society of Feline Medicine (ISFM). Dr. Sparkes has published widely and is the founding and current co-editor of the Journal of Feline Medicine and Surgery.

PANELISTS

Frédéric Gaschen, Dr.med.vet., Dr.habil., DACVIM (SAIM), Dipl. ECVIM-CA, AGAF, is currently a Professor of Small Animal Medicine and Service Chief at Louisiana State University. His research centers on chronic enteropathies, digestive motility, and the impact of antibiotics on the gut microbiome in dogs and cats.

Domenico Santoro, DVM, MS, DrSc, PhD, DACVD, DECVD, DACVM, is currently an Associate Professor in Dermatology at the University of Florida – College of Veterinary Medicine. His research focuses mainly on the evaluation of host-defense peptides and host-microbe interaction in atopic dermatitis and canine leishmaniosis.

FOOTNOTES

[1] **Adapted from the live broadcast of Demystifying Adverse Food Reactions, a Purina Institute Creating Collaborative Care Through Nutrition Conversations webinar, which is available on demand at Demystifying Adverse Food Reactions (purinainstitute.com).**

[2] **See Purina fecal scoring chart at PurinaInstitute.com/fecal-scoring-chart.pdf.**

[3] **For full scoring and interpretation using these indices, see Scoring sheet for chronic diarrhea in dogs.pdf from the Louisiana State University School of Veterinary Medicine.**

[4] **See Distinguishing-characteristics-of-small-and-large-bowel-diarrhea.pdf from the Purina Institute.**

[5] **See Diet-history-screening-evaluation.pdf from the Purina Institute.**