

Adverse Food Reaction in a Dog

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THE CASE

A 9-year-old intact male golden retriever was presented to his primary veterinarian for a year-long history of nonseasonal pruritus and recurrent pyoderma. Physical examination showed erythema, abrasions, and alopecia in the skin but was otherwise unremarkable. Blood work (ie, CBC, serum chemistry profile, total thyroxine) results were within normal limits.

Dietary History

A comprehensive nutritional evaluation¹ was pursued. The patient (71.7 lb [32.5 kg]) had a BCS of 5/9. The nutritional history noted the patient was eating an adult canine maintenance diet. After ruling out flea allergy, the veterinarian suspected food allergy and sent a serum sample for ELISA antibody testing. Rice, soy, and corn were identified as potential antigens.

Treatment Plan

The nutritional history uncovered potential sources of food allergens, prompting the veterinarian to change the current diet to one based on ingredients to which the patient had no known prior exposure (ie, fish and potato). This recommendation resulted in good control of pruritus, and the patient was diagnosed with suspected adverse food reaction (AFR). The patient ate this diet for 6 years without further issues.

DIAGNOSIS: ADVERSE FOOD REACTION

Follow Up

After 6 years, the dog was presented for acute vomiting and diarrhea. He was hospitalized and underwent supportive care. He was presumptively diagnosed with pancreatitis based on clinical signs and altered specific canine pancreatic lipase (cPLI) of 415 µg/L (range, 0-200 µg/L). His current fish and potato diet provided 35% fat calories; to prevent pancreatitis recurrence, the veterinarian changed the dog's diet to a weight-loss formula providing 20% fat calories and with main ingredients

of wheat, chicken, and turkey. The patient recovered from the presumptive pancreatitis episode, but his skin signs and pruritus returned 2 months later.

After consultation with a dermatologist, the diet was changed to a hydrolyzed protein diet (based on chicken liver; 30% fat calories) to address the pruritus. The patient's pruritus, however, did not decrease, and there was a recurrence of pancreatitis. Hydrolyzed diets are formulated to reduce the allergenicity of the protein source, but they do not completely eliminate it. Thus, a small percentage of patients intolerant to the original intact protein can also react to the hydrolyzate, which could have occurred in this case. The patient was offered a home-cooked diet based only on horsemeat and potato (no other ingredients or supplements), which provided 17% fat calories. Both his skin and GI signs resolved.

Nutritional Consultation

A nutritional consultation was conducted to find a long-term dietary plan. The owners were willing to home cook if necessary but preferred a commercial diet. Thus, after a careful diet history, the goal was to use a veterinary elimination diet that was not chicken based (because the patient had been exposed to chicken and the hydrolyzed chicken diet had not managed the pruritus) and had <30% fat calories. Two options were identified, one based on hydrolyzed soy protein (22% fat calories) and one based on duck and tapioca (24% fat calories). The owners elected the duck-based diet. After >1 year of follow up, the patient had no recurrence of skin or intestinal disease and his cPLI remained within limits.

Parting Thought

This case underlines the importance of a good nutritional evaluation, especially a careful and accurate diet history, in the diagnosis and successful long-term management of suspected AFR.

AFR = adverse food reaction

cPLI = canine pancreatic lipase

ASK YOURSELF ...

QUESTION 1

What is the gold standard for diagnosing adverse food reaction (AFR)?

- A. Serologic allergy testing
- B. Intradermal allergy testing
- C. GI allergy testing (via colonoscopy)
- D. Elimination and challenge diet trial

MOST ACCURATE ANSWER: D

Serum, skin, or colon allergy testing have low sensitivity and specificity, rendering them inadequate for diagnosis.² The only reliable method to diagnose AFR is an elimination diet followed by a food challenge test. The elimination trial consists of feeding a diet with ingredients novel to the patient (or with a hydrolyzed protein source) until signs resolve. The novel diet should be chosen to avoid commonly described food antigens,³⁻⁵ although this is more a reflection of common pet food ingredients than inherent properties of some ingredients. The nutritional history should help determine which protein and carbohydrates the patient has been exposed to. The patient is then challenged with different ingredients until the clinical signs return in order to confirm ingredients that trigger the cutaneous reaction. In the present case, only serum allergy testing, which is unreliable, was performed.⁶ Afterward, an elimination diet was fed with a positive response, but the challenge phase was not performed—thus the diagnosis of AFR is only presumptive.

QUESTION 2

How long should an elimination trial last in cases of cutaneous AFR?

- A. 2 weeks
- B. 8 weeks
- C. 6 weeks
- D. 4 weeks

MOST ACCURATE ANSWER: B

According to a recent study⁷ assessing all published literature, extending the elimination trial from 6 to 8 weeks resulted in a higher percentage of dogs and cats that responded positively to the trial. Stopping the trial earlier can result in incorrectly ruling out cutaneous AFR in some patients.

QUESTION 3

What is the best nutritional plan for this patient?

- A. Return to the original uncommon ingredient diet (fish and potato [35% fat calories]).
- B. Continue the home-cooked diet (horsemeat and potato [17% fat calories]).
- C. Find an elimination diet (with uncommon ingredients or hydrolyzed protein) with a tolerated fat level (<30% fat calories).
- D. Use a commercial intestinal low-fat diet (16%-20% fat calories) and control pruritus with medication.

MOST ACCURATE ANSWER: C

Returning to the original diet may be risky, as presumptive pancreatitis developed with that diet and the fat level is likely too high. In this case, the original diet was reattempted (because the owners were not happy cooking for the pet), but the dog showed GI distress and increased cPLI. Continuing with the home-cooked diet as is is not adequate long term, as a diet based only on horsemeat and potato is not complete and balanced for adult dogs and has several deficiencies in vitamins, minerals, and essential fatty acids. An intestinal low-fat commercial diet will not control skin signs, and long-term medication for pruritus is not ideal.

Thus, finding an elimination diet with a fat level <30% calories is most promising for finding a diet that adequately addresses both issues. Contacting a specialist to balance the home-cooked diet for long-term use would be an alternative plan if none of the commercial elimination diets are low enough in fat.

AFR = adverse food reaction
CPLI = canine pancreatic lipase

QUESTION 4

Which of the following sentences is true for patients with AFR?

- A. It is best to use veterinary elimination diets rather than over-the-counter diets.
- B. Over-the-counter elimination diets are better than veterinary diets because they promote compliance (ie, lower cost).
- C. Both veterinary and over-the-counter elimination diets are equally effective in diagnosing and treating AFR.
- D. Home-cooked diets are always preferable to commercial diets in dogs with AFR.

MOST ACCURATE ANSWER: A

Veterinary elimination diets, especially for diagnosis and long-term management of AFR, are preferred to over-the-counter options. It is important to avoid cross-contamination by thoroughly cleaning the production line; avoidance is more difficult in over-the-counter diets. One study⁸ found that 4 over-the-counter venison-based diets marketed for AFR had nondeclared antigens, and their ingredient list included multiple sources of potential antigens. Home-cooked diets, although a good option in many cases, are costlier (especially with exotic ingredients and the cost of supplements) and more time consuming, all of which complicate compliance.

QUESTION 5

What is the best way to calculate the amount of energy needed for this patient?

- A. Estimate the current energy intake that results in body weight stability.
- B. Use a daily energy requirements formula for active young dogs ($130 \times \text{BW} [\text{kg}]^{0.75}$ Kcal/day).
- C. Use a daily energy requirements formula for inactive dogs ($95 \times \text{BW} [\text{kg}]^{0.75}$ Kcal/day).
- D. Use a daily energy requirements formula for obese dogs ($70 \times \text{BW} [\text{kg}]^{0.75}$ Kcal/day).

MOST ACCURATE ANSWER: A

Energy requirements are best determined by estimating current energy intake. To do so, the patient has to be weight stable. In addition, a very detailed and accurate diet history is needed although not always easy to acquire. In this case, the exact amounts of horsemeat and potato needed for a few weeks were on hand, and the patient's body weight was stable; thus, his energy intake could be estimated at 1310 Kcal/day. Formulas B, C, and D are good starting points but have errors of +/- 50%.⁹ In this case, the second best answer is C, as this is an older patient of a breed known to have low energy requirements, so a formula for inactive dogs¹⁰ is adequate. For his body weight of 32.5 kg, the formula would give an energy requirement value of 1293 Kcal/day, quite similar to the estimated energy intake. The daily energy requirements have to be divided by the energy density of the chosen diet to obtain the grams per day to feed. ■

See page 124 for references.

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