Serum Immunoglobulin E Cross-Reactivity Between Fish & Chicken Meats in Dogs

Alison Diesel, DVM, DACVD
Texas A&M University

Shared allergenic proteins may be found in seemingly unrelated food sources.

In the Literature

Bexley J, Kingswell N, Olivry T. Serum IgE cross-reactivity between fish and chicken meats in dogs. *Vet Dermatol*. 2019;30(1):25-e8.

FROM THE PAGE ...

Although they can be broken into immunologic and nonimmunologic responses, most adverse food reactions in dogs are suspected to be true immunologic food allergies involving immunoglobulin E (IgE)-mediated reactions. Cross-reactivity between seemingly unrelated food allergens has been shown to impact disease diagnosis and management in humans.

This study* aimed to evaluate whether cross-reactive canine serum IgE-binding proteins could be identified in chicken and fish. Several methods (ELISA, inhibition ELISA, sodium dodecyl sulfate–polyacrylamide gel electrophoresis, immunoblotting inhibition) were used to assess the presence of cross-reactive proteins from chicken, white fish, and salmon in a large pool ($n = 53$ dogs) of canine serum. Results indicated the presence of at least 9 different cross-reactive canine serum IgE-binding allergens in whole extracts of chicken, white fish, and salmon; proteins identified included pyruvate kinase, creatine kinase, α actin, glyceraldehyde-3-phosphate dehydrogenase, enolase, aldolase, malate dehydrogenase, lactate dehydrogenase, and triosephosphate isomerase 1. Each of these proteins has been reported as a food component allergen in humans. This identification of IgE binding in canine serum supports the finding that shared allergenic proteins may be found in seemingly unrelated food sources. Clinical implications of this, however, have not yet been evaluated in dogs with documented food allergy.

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. . . TO YOUR PATIENTS

Key pearls to put into practice:

1. Of note, the findings in this study were obtained from sera samples of dogs without a diagnosis of food allergy, highlighting that these serum-based allergen tests should not be used to determine whether a patient has allergies. These tests—both for food and environmental allergies (ie, atopic dermatitis)—may be "positive" in dogs that do not have any signs of allergy. They are not diagnostic; rather, they serve as a guide when formulating allergen-specific immunotherapy for patients with atopic dermatitis and to help confirm the clinical diagnosis.

2. The gold standard for diagnosing food allergy in dogs and cats remains a strict elimination diet trial. A recent literature review evaluated current information on in vitro and in vivo tests for food allergies in veterinary species. Results identified very low repeatability and low-/high-variable accuracy for various food allergy tests, confirming the importance of elimination diet trials in diagnosing food allergies.[1]

3. Because these currently available tests use whole-allergen extracts with unknown concentrations of potentially relevant allergenic proteins, the clinical implication and accuracy of results may be impacted. Further evaluation of relevant IgE reactivity to more specific allergen components (eg, at the protein level) in food may eventually lead to more accurate diagnostic developments. At this time, an elimination diet trial is recommended.

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Reference

1. 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*. 2017;13(1):275.

Suggested Reading

Mueller RS, Olivry T, Prélaud P. Critically appraised topic on adverse food reactions of companion animals (2): common food allergen sources in dogs and cats. *BMC Vet Res*. 2016;12:9.

Olivry T, Mueller RS, Prélaud P. Critically appraised topic on adverse food reactions of companion animals (1): duration of elimination diets. *BMC Vet Res*. 2015;11:225.