

**Dermatological Disorders**

ATOPY (ATOPIC DERMATITIS)

In dogs, atopic dermatitis, or simply “atopy” is a heritable, inflammatory and pruritic, Ig-E mediated allergic skin disease triggered by environmental allergens.¹ The disease’s complex etiology in dogs is likely to also involve a defective skin barrier resulting in increased transepidermal water loss.² The role genetics, IgE, or a defective skin barrier plays in the disease in cats is less understood.^{2,3}



The reported prevalence in pets varies, at least in part, due to different populations studied, methods of diagnosis, and geography (i.e., due to different types and levels of allergens present in the environment).⁴ Prevalence was reported at 12.5% of cats presented for dermatological signs to a university specialty clinic⁵ versus just over 1% of cats presented for skin conditions in general practice.⁶ In dogs prevalence has been estimated at 3–15%.⁴

The age of onset is typically under 3 years in both dogs and cats.^{2,7} Atopy is a chronic disease in which clinical signs appear seasonally or year-round (typically with acute flare-ups), depending on the environmental allergen(s) involved. A clinically significant percentage of atopic dogs and cats also have food allergy or intolerance. Management of atopy in pets utilizes a multimodal approach, including nutrition.

Key Messages

- Atopic pets are frequently pruritic. Erythema and secondary skin infections are common in dogs, and affected cats often have miliary dermatitis or eosinophilic granuloma complex. Pets may have alopecia, excoriations due to scratching, or otitis externa, which can be the only manifestation in some dogs.^{2,7}
- In dogs, dermatological signs due to atopy appear the same as those due to food allergies or intolerances.⁸⁻¹¹ Dogs with both dermatological and gastrointestinal signs are more likely to be food sensitive rather than atopic, while dogs with seasonal signs are more likely to be atopic.^{9,10} Feline atopy can appear clinically identical to either food allergies or intolerances or to flea allergy.²
- Diagnosis of atopy is one of exclusion. Pets presenting with year-round clinical signs should undergo a diet elimination trial to rule out a food allergy or intolerance.² Adequate protection against fleas and other ectoparasites should be ensured.
- Pets may be affected with more than one condition.^{5,7,12} Among dogs and cats diagnosed with atopy, nearly 17% of dogs and approximately 13% of cats were diagnosed with concurrent food allergy or intolerance.^{5,12} Partial response to a diet elimination trial may indicate a pet has both food allergy or intolerance and atopy.

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Key Messages (continued)

- Targeted nutrition can be used as part of a multimodal management strategy in pets with atopy:
 - Increased dietary levels of linoleic acid (LA), an 18-carbon omega-6 fatty acid, improved skin and coat quality in healthy dogs.^{13,14} Since LA supports the skin barrier and may help to lessen transepidermal water loss, its supplementation may be beneficial in pets with atopy.² In addition, supplementation of eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), long chain omega-3 fatty acids, decreased pruritus and/or skin lesions in atopic dogs,^{15–18} with one study noting a cyclosporine-sparing effect.¹⁸ A combination of LA, gamma-linolenic acid (an omega-6 fatty acid), EPA, and DHA reduced the need for steroid therapy in dogs with atopy.¹⁹
 - Supplementation with vitamin D or E reduced CADESI (Canine Atopic and Dermatitis Extent and Severity Index) scores in atopic dogs.²⁰
 - Vitamin D's benefits may be due to its immune-modulating effects.²⁰ Vitamin E may help reduce oxidative stress in the skin of atopic dogs.²¹
 - One study showed that a *Lactobacillus* probiotic reduced CADESI and pruritus scores in atopic dogs, likely by moderating the immune response.²² Additional research exploring the gut-skin axis and the potential influence of probiotics is needed.
 - In pets shown to have both atopy and food allergy or intolerance, avoiding dietary allergens remains an important component of management. Due to allergen cross-reactivity, signs of atopy/allergy often flare in house dust mite-sensitive dogs that eat pet food contaminated with storage mites. Pet food bags should be kept sealed and stored inside to reduce the possibility of contamination.²³

References

1. Halliwell, R. (2006). Revised nomenclature for veterinary allergy. *Veterinary Immunology and Immunopathology*, 114, 207–208. doi: 10.1016/j.vetimm.2006.08.013
2. Gedon, N. K. Y., & Mueller, R. S. (2018). Atopic dermatitis in cats and dogs: A difficult disease for animals and owners. *Clinical and Translational Allergy*, 8, 41. doi: 10.1186/s13601-018-0228-5
3. Halliwell, R., Pucheu-Haston, C. M., Olivry, T., Prost, C., Jackson, H., Banovic, F., Nuttall, T., Santoro, D., Bizikova, P., & Mueller, R. S. (2021). Feline allergic diseases: Introduction and proposed nomenclature. *Veterinary Dermatology*, 32, 8–e2. doi: 10.1111/vde.12899
4. Hillier, A., & Griffin, C. E. (2001). The ACVD task force on canine atopic dermatitis (1): Incidence and prevalence. *Veterinary Immunology and Immunopathology*, 81, 147–151.
5. Ravens, P. A., Xu, B. J., & Vogelneust, L. J. (2014). Feline atopic dermatitis: A retrospective study of 45 cases (2001–2012). *Veterinary Dermatology*, 25(2), 95–102, e27–e28. doi: 10.1111/vde.12109
6. Hill, P. B., Lo, A., Eden, C. A. N., Huntley, S., Morey, V., Ramsey, S., Richardson, C., Smith, D. J., Sutton, C., Taylor, M. D., Thorpe, E., Tidmarsh, R., & Williams, V. (2006). Survey of the prevalence, diagnosis and treatment of dermatological conditions in small animals in general practice. *Veterinary Record*, 158(16), 533–539. doi: 10.1136/vr.158.16.533
7. Bajwa, J. (2018). Atopic dermatitis in cats. *Canadian Veterinary Journal*, 59(3), 311–313.
8. Mueller, R. S., & Unterer, S. (2018). Adverse food reactions: Pathogenesis, clinical signs, diagnosis and alternatives to elimination diets. *The Veterinary Journal*, 236, 89–95. doi: 10.1016/j.tvjl.2018.04.014
9. Hobi, S., Linek, M., Marignac, G., Olivry, T., Beco, L., Nett, C., Fontaine, J., Roosje, P., Bergvall, K., Belova, S., Koebrick, S., Pin, D., Kovalik, M., Meury, S., Wilhelm, S., & Favrot, C. (2011). Clinical characteristics and causes of pruritus in cats: A multicentre study on feline hypersensitivity-associated dermatoses. *Veterinary Dermatology*, 22(5), 406–413. doi: 10.1111/j.1365-3164.2011.00962.x
10. Picco, F., Zini, E., Nett, C., Naegeli, C., Bigler, B., Rüfenacht, S., Roosje, P., Ricklin Gutzwiller, M. E., Wilhelm, S., Pfister, J., Meng, E., & Favrot, C., (2008). A prospective study on canine atopic dermatitis and food-induced allergic dermatitis in Switzerland. *Veterinary Dermatology*, 19(3), 150–155. doi: 10.1111/j.1365-3164.2008.00669.x
11. Favrot, C., Steffan, J., Seewald, W., & Picco, F. (2010). A prospective study on the clinical features of chronic canine atopic dermatitis and its diagnosis. *Veterinary Dermatology*, 21(1), 23–31. doi: 10.1111/j.1365-3164.2009.00758.x
12. Proverbio, D., Perego, R., Spada, E., & Ferro, E. (2010). Prevalence of adverse food reactions in 130 dogs in Italy with dermatological signs: A retrospective study. *Journal of Small Animal Practice*, 51, 370–374. doi: 10.1111/j.1748-5827.2010.00951.x
13. Kirby, N. A., Hester, S. L., Rees, C. A., Kennis, R. A., Zoran, D. L., & Bauer, J. E. (2009). Skin surface lipids and skin and hair coat condition in dogs fed increased total fat diets containing polyunsaturated fatty acids. *Journal of Animal Physiology and Animal Nutrition*, 93(4), 505–511. doi: 10.1111/j.1439-0396.2008.00832.x
14. Rees, C. A., Bauer, J. E., Burkholder, W. J., Kennis, R. A., Dunbar, B. L., & Bigley, K. E. (2001). Effects of dietary flax seed and sunflower seed supplementation on normal canine serum polyunsaturated fatty acids and skin and hair coat condition scores. *Veterinary Dermatology*, 12(2), 111–117. doi: 10.1046/j.1365-3164.2001.00234.x
15. Logas, D., & Kunkle, G. A. (1994). Double-blinded crossover study with marine oil supplementation containing high dose eicosapentaenoic acid for the treatment of canine pruritic skin disease. *Veterinary Dermatology*, 5, 99–104.
16. Mueller, R. S., Fieseler, K. V., Fettman, M. J., Zabel, S., Rosychuk, R. A. W., Ogilvie, G. K., & Greenwalt, T. L. (2004). Effect of omega-3 fatty acids on canine atopic dermatitis. *Journal of Small Animal Practice*, 45(6), 293–297. doi: 10.1111/j.1748-5827.2004.tb00238.x
17. Bensignor, E., Morgan, D. M., & Nuttall, T. (2008). Efficacy of an essential fatty acid-enriched diet in managing canine atopic dermatitis: A randomized single-blinded, cross-over study. *Veterinary Dermatology*, 19(3), 156–162. doi: 10.1111/j.1365-3164.2008.00670.x
18. Müller, M. R., Linek, M., Lowenstein, C., Rothig, A., Doucette, K., Thorstensen, K., & Mueller, R. S. (2016). Evaluation of cyclosporine-sparing effects of polyunsaturated fatty acids in the treatment of canine atopic dermatitis. *Veterinary Journal*, 210, 77–81. doi: 10.1016/j.tvjl.2015.11.012
19. Saevik, B. K., Bergvall, K., Holm, B. R., Saijonmaa-Koulumies, L. E., Hedhammar, A., Larsen, S., & Kristensen, F. (2004). A randomized, controlled study to evaluate the steroid sparing effect of essential fatty acid supplementation in the treatment of canine atopic dermatitis. *Veterinary Dermatology*, 15(3), 137–45.
20. Klinger, C. J., Hobi, S., Johansen, C., Koch, H.-J., Weber, K., & Mueller, R. S. (2018). Vitamin D shows in vivo efficacy in a placebo-controlled, double-blinded, randomised clinical trial on canine atopic dermatitis. *Veterinary Record*, 182(14), 406. doi: 10.1136/vr.104492
21. Plevnik Kapun, A., Salobir, J., Levart, A., Tavčar Kalcher, G., Nemec Svete, A., & Kotnik, T. (2014). Vitamin E supplementation in canine atopic dermatitis: Improvement of clinical signs and effects on oxidative stress markers. *Veterinary Record*, 175(22), 560. doi: 10.1136/vr.102547
22. Ohshima-Terada, Y., Higuchi, Y., Kumagai, T., Hagihara, A., & Nagata, M. (2015). Complementary effect of oral administration of *Lactobacillus paracasei* K71 on canine atopic dermatitis. *Veterinary Dermatology*, 26(5), 350–e75. doi: 10.1111/vde.12224
23. Olivry, T., & Mueller, R. S. (2019). Critically appraised topic on adverse food reactions in companion animals (8): Storage mites in commercial pet foods. *BMC Veterinary Research*, 15, 385. doi: 10.1186/s12917-019-2102-7

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