

How Your Dog's Food Influences Her Skin Health

If your dog suffers with dermatitis or itchy skin, it's important to discover the underlying cause and take a close look at the food you're feeding. This type of food activates the skin's immune defense system and the expression of genes that can help calm inflammation.

Analysis by Dr. Karen Shaw Becker

STORY AT-A-GLANCE

- Two recently published studies point to the very significant influence of diet on skin gene expression in adult dogs
- Specifically, when pregnant mothers are fed non-heat-processed, meat-based diets and their puppies are fed the same diet as their first solid food, it provides a protective effect against atopic dermatitis (itchy skin and other skin conditions) in adulthood
- Additional protective effects may be achieved by exposing young puppies to sunlight each day and allowing them to spend time on a dirt floor or lawn before six months of age
- In a study of Staffordshire Bull Terriers, the effect of diet on skin gene expression was found to be associated with the immune system, antioxidants and inflammatory processes
- A significant finding of the studies is that the immune defense is activated in puppies who are raw fed

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Fascinating study results from my friends in the DogRisk research group at the University of Helsinki suggest that certain novel early-life risk factors impact the prevalence of atopic dermatitis (itchy skin) when dogs reach adulthood.¹

The risk factors the team identified include some that can and some that cannot be modified, both before and after dogs are born. This new information "empowers dog owners, opens up research on processed foods, and advances primary atopy preventive strategies," according to a university news release.²

Early-Life Diet Plays Major Role in Adult Atopic Dermatitis

The DogRisk researchers used an internet-based "food frequency" questionnaire as a data gathering tool that allows them to link several non-modifiable and modifiable risk factors with the prevalence of canine atopic dermatitis. So far, over 12,000 dog owners have completed the survey.

It has already been established that atopy in adult dogs is significantly linked to belonging to an allergy-prone breed, having a mother with a history of atopy, and having an over 50% white coat. Most significant for pet parents, however, are modifiable risk factors, the most impactful of which is a dog's diet in early life.

DogRisk study results suggest that a non-heat-processed (raw), meat-based maternal diet during pregnancy and as a puppy's first solid-food diet at 1 to 2 months of age, offer a significant protective effect against atopic dermatitis in adulthood. The same diet fed at 2 to 6 months of age is also protective, but not significantly so.

The study results also suggest that an ultra-processed carbohydrate-based maternal diet (i.e., commercially available kibble) during pregnancy and as a puppy's first solid diet at 1 to 2 months increased the likelihood of atopy in adulthood.

According to lead study author Dr. Manal Hemida, Postdoctoral Researcher with the DogRisk research group:

"As the differently processed diets also have a very different macro-nutrient profile it is, at this stage, impossible to say whether it is the lack of 'cooking', the minimal amount of carbohydrates, preservatives and coloring agents, the different quality and quantity of animal proteins and fats, the non-sterility of the food, or something else, that made raw foods come out as superior for atopy health in our data."

Study co-author and Adjunct Professor Anna Hielm-Björkman, leader of the DogRisk research group, makes the point that these study results only suggest a cause-and-effect relationship, and further research is needed to confirm their findings.

Additional Modifiable Risk Factors

The researchers uncovered several additional factors associated with a significant decrease in the risk of atopic dermatitis in adult dogs, including:

- Deworming the mother during pregnancy
- Exposing young puppies to sunlight for at least an hour each day
- Allowing them to spend time on a dirt floor or lawn before six months of age
- Keeping them at a normal body weight
- Arranging for them to continue to live in the same family where they were born

Raw Diets Prompt Beneficial Skin Gene Expression

The study I discussed above was published in May of this year; a subsequent study published in October, conducted by some of the same DogRisk researchers, provides additional evidence that diet makes a pronounced difference in the health of dogs' skin.³

The research team examined 48 Staffordshire Bull Terriers and selected four healthy dogs and four with atopic dermatitis for RNA sequencing. Their skin gene expression was compared between both atopic and healthy dogs, as well as between kibble and raw fed dogs.

"Before the dietary intervention comparing atopic and healthy dogs, only a total of eight genes functioning in a range of ways in the skin were found, but the intervention increased this figure manifold," said lead study author Johanna Anturaniemi. "In other words, dietary intervention is extremely important for actual differences in gene expression to emerge."⁴

The effect of diet on skin gene expression was primarily linked with the immune system, antioxidants and inflammatory processes. The results indicate that raw food activates the immune defense system of the skin and also the expression of genes that increase antioxidant production or that have anti-inflammatory effects.

According to Anturaniemi, an earlier study also showed that raw meat-based diets produce an anti-inflammatory effect on blood gene expression.

Raw Diets Enhance the Skin's Immune Function in Puppies

A particularly important finding, according to the researchers, is that the immune defense is activated in puppies who are raw fed. We know from research into human atopic dermatitis that the development of immunity has been inhibited and that broad exposure to microbes in childhood reduces the risk of allergic conditions.

The differences in skin gene expression observed in healthy vs. atopic dogs suggest that in the latter group, there may be deficiencies in lipid metabolism and keratinocyte proliferation, both of which play an important role in the healthy functioning of the skin barrier.

These results support earlier findings that in atopic dogs, the expression of genes that encourage the formation of new blood vessels — a process linked to inflammation of the skin — is amplified.

"We identified several genes whose link with canine atopic dermatitis had not been reported earlier," Anturaniemi said. "Some of them are associated with previously known disturbed metabolic pathways, while the role of others in atopic dermatitis requires further investigation. Since the number of dogs involved in the study was small, the results can be considered preliminary."

My Approach to Treating Dogs With Atopic Dermatitis

If your dog is dealing with atopic dermatitis, it's important to try to discover the triggers that cause flare-ups. It's also important a veterinarian diagnoses your pet with atopy, as there are many other conditions that cause intense itching that need to be ruled out.

Many integrative veterinarians see tremendous improvement in symptoms by eliminating pro-inflammatory and GMO sources of grains, unnecessary preservatives, synthetic vitamins and toxic processing techniques, in addition to adding omega-3 essential fats to the diet. In my experience, adding supplements to ultra-processed foods offers little to no improvement.

Food is either healing or harmful. Research such as the studies I discussed above show that a fresh food diet modulates the immune system positively, leading to changes in gene expression (called nutrigenomics) compared to an ultra-processed diet (kibble). Transitioning itchy pets to an ultra-low carb fresh food diet means you'll be feeding an anti-inflammatory diet as well (that's the "itis" in dermatitis).

In the meantime, for symptom relief, I always opt for safe, natural remedies rather than immuno-suppressant drugs unless the animal's quality of life is terrible. In some cases, drugs with major side effects are prescribed for a short period of time or intermittently, giving the vet time to work on your pet's overactive immune response.

Fecal transplants and other all-natural treatments can significantly reduce how frequently your dog has flare ups of atopy. Because the condition is characterized by an overabundance of opportunistic bacteria and yeast, I've long advocated topical therapy in place of oral antibiotics for this condition.

Bathing dogs with naturally anti-bacterial shampoo or using skin ozone treatments, followed by a probiotic shampoo and microbiome-restoring rinses, sprays or powders can often offer the same benefits as oral antibiotics (which destroy gut flora along with skin bacteria) without any negative side effects. Here's a quick DIY probiotic rinse recipe I've used with good success:

Dr. Becker's Restore Skin Rinse

In a large container mix:

- 🐾 1 quart (32 ounces) cooled green or peppermint tea (I use 4 tea bags and let steep in the refrigerator until cool)
- 🐾 8 ounces plain kombucha tea
- 🐾 8 ounces witch hazel
- 🐾 1 tablespoon colostrum powder
- 🐾 10 capsules Dr. Mercola's Complete Spore Restore (or spore-forming probiotic of your choice) — open the capsules and add the powder to the solution (discard empty capsules)

Mix the solution well.

Directions:

1. Towel dry your dog after a therapeutic bath.
2. Pour Restore Skin Rinse over your dog's body from collar to tail (do not pour solution on the head or face).
3. Massage solution into skin and coat, making sure to focus on the "armpits," belly and groin area (or wherever your dog is most itchy).
4. Towel dry.

I use therapeutic baths and rinses for these patients with great success, in terms of avoiding the repeated use of oral antibiotics. Research shows the hair follicle microbiome plays a role in skin health,⁵ so finding a way to restore microbial balance without lifelong oral antibiotics is a must for these patients.

I believe disinfecting and microbiome-restorative baths are one of the most underutilized therapies in veterinary dermatology. An integrative veterinarian will be able to customize a protocol specifically for your pet.

Sources and References

¹ [Hemida, M. et al. PLOS ONE, May 29, 2020](#)

² [University of Helsinki News Release, November 11, 2020](#)

³ [Anturaniemi, J. et al. Front. Vet. Sci., 16 October 2020](#)

⁴ [ScienceDaily, November 13, 2020](#)

⁵ [Polak-Witka, K. et al. Exp Dermatol. 2020; 29: 286– 294](#)