Itchy Dogs & Cats

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What causes dogs, cats (and us!) to scratch an itch?

Scratching is a natural defence mechanism, designed to dislodge an irritating substance or organism from the skin. However, it becomes problematic when persistent, because continuous abrasion alters the integrity of the skin, leading to barrier damage. Broken skin is vulnerable to infection (the warm, moist environment is an ideal environment for the replication of bacteria and yeast), and chronic or repeated episodes of itching can lead to pain and discomfort. The condition of the coat can also suffer greatly.

Irritants on the skin activate sensory cells called C-fibre nerve cells that incite a protective inflammatory response, which can then further excite the nerve fibres and lead to increasing itchiness. This is known as the itch-scratch cycle, and it can be hard to break, especially if the animal is continuously being exposed to substances or organisms to which he or she is sensitive.

Scratching can become habitual because it feels good! Research has shown that it reduces activity in the anterior and posterior cingulated cortices in the brain, causing pleasure (Mochizuki et al, 2015).

What happens when an animal suffers an allergic response?

Allergies cause pruritis (inflammation of the skin) due to the release of histamine, which is secreted by basophils and mast cells as part of a local immune response to the presence of invading bodies. Sometimes the substance that the animal is reacting to may not be inherently harmful, but for reasons unknown, the immune system identifies it as an invader.

Histamine causes the capillaries to become more permeable to white blood cells and antibodies, which proceed to target and attack the allergens in the affected tissue. Histamine release is not limited to the tissues at the site of the allergic response, which is why food allergies can often manifest in skin problems, when you would perhaps expect symptoms to be restricted to the gut.

Pruritis is governed by an “itch threshold”. This is the point at which severe itching and scratching occur, and it is unique to the individual animal. It has a summation effect, so an animal who is mildly allergic to flea bites, mould spores and storage mites for example might not experience a reaction if he or she was only exposed to one of these allergens at any one time, but if all of them were present, this could exceed the threshold and result in
noticeable symptoms. Allergies are the primary cause of pruritis, and secondary factors (e.g. stress, dry skin, bacterial infection, yeast infection) can exacerbate it, and the propensity to itch.

**FLEA ALLERGIES**

One of the most common skin conditions in dogs and cats is flea allergic dermatitis (an allergy to flea saliva that causes intense itchiness following a flea bite). Whilst you might expect to see tell-tale signs in the form of “flea dirt” or the fleas themselves, sometimes there is no indication of their presence. It only takes one flea to trigger the reaction, and it may well have hopped off the dog or cat leaving no evidence at all other than the itchy skin. Flea infestations are easy to treat using a topical preparation on the pet (plus any other dogs and cats in the household). It is also important to treat the environment, as eggs and larvae may lie dormant in carpets and soft furnishings for many years. Even if you don’t think your pet has fleas, it is a very good idea to use a safe, species appropriate preventative treatment if your pet is prone to itching. Neem oil is a natural alternative to chemicals which does have some evidence supporting its efficiency against fleas (and also ticks, intestinal parasites and mange mites) [Joshi, 2012].

**ATOPY**

Historically, atopy was a term that described an adverse immune response to an inhaled allergen, but it now covers both environmental and food allergies [Olivry et al, 2010]. Allergens can come in many shapes and forms including contact (e.g. shampoo), inhaled (e.g. pollens or dust/storage mites) and food (specifically dietary proteins; usually ones the animal has been exposed to for some time, ones eaten at the onset of illness, or ones that are comprised largely of indigestible proteins; e.g. rawhide) [Mueller et al, 2015].

**Food allergies** (adverse immune responses to certain dietary proteins) are diagnosed by means of an exclusion diet, blood test or saliva test. Be wary of cheap saliva tests that are readily available online which are primarily intended for people, because they often include irrelevant tests for ingredients such as avocado and onion that dogs and cats don’t (or shouldn’t) consume! Even veterinary diagnostic testing is not always reliable, so some vets still prefer to trial the animal on a diet that contains novel ingredients (i.e. ones that haven’t been eaten previously) or a hydrolysed veterinary diet. Hydrolysed proteins have been broken down into tiny fractions of a very low molecular weight that are too small to annoy the immune system.

Excluding the ingredients which the animal is reactive to is the solution, but if there is secondary infection, the animal is stuck in an itch-scratch cycle or the gut is affected, medication may also be required. For more information about food allergies, please visit: https://www.ardengrange.com/Factsheets/AGFactSheet-Adverse-Food-Reactions-v3.pdf

**Environmental allergies** are significantly more common than food allergies, and sensitive cats and dogs can experience adverse immune responses to numerous substances (ranging from natural substances such as pollen to artificial ones such as cigarette smoke). Identification of the allergens is via serology (testing the blood serum for antibodies to specific substances) or intradermal skin testing (injections of small amounts of the suspected allergens under the skin to monitor whether or not a hive type reaction occurs). The animal may then be treated with desensitising vaccines specific to the allergens affecting him or her. Therapy is usually long-term (sometimes life-long), and approximately 75% effective. Some owners prefer avoidance tactics where possible because the procedure and vaccines are expensive. One such example would be to avoid long grass if a dog suffers from irritated paws and belly only in the summer which is suspected to be due to a pollen allergy.
Animals suffering from environmental allergies may be more vulnerable to food allergies since the immune system is under duress. This highlights the importance of feeding a highly digestible diet which excludes some of the more common food allergens. Selecting a high-quality hypoallergenic brand such as Arden Grange which includes nutrients to support the skin and the immune system may be of further benefit. For more information about environmental allergies, please visit: https://www.ardengrange.com/Factsheets/Minimising-exposure-to-environmental....pdf

**Drug therapy for allergies**

Medications used to treat or manage allergies include (but are not limited to):

- **Antihistamines** - Anti-histamines may help alleviate symptoms. They disable the protein from telling the brain about the itch, and thus help to break the itch-scratch cycle. Anti-histamines may be very beneficial if the animal is in severe discomfort, and can aid with diagnosis of an allergic response if itching subsides following their administration. However, the limitation is that antihistamines can only suppress the urge to itch, they do not treat the cause. Although confirmation of an allergic response is a good start, identification of specific allergens can be a long process of elimination.

- **Cyclosporine (Atopica)** - Cyclosporine is a potent immunosuppressant drug that results in less cytokine being produced, which subsequently inhibits activation of various inflammatory cells.

- **Oclacitinib (Apoquel)** - Oclacitinib is also an immunosuppressant drug. It works in a different way to cyclosporine; blocking the effects of inflammatory cytokines released from activated lymphocytes and a specific cytokine directly involved in the sensation of itch. It is not licensed for use in cats.

- **Immunotherapy (Artuvetrin®)** - Artuvetrin® is the only licensed canine allergen specific immunotherapy in Europe.

- **Steroids** - Steroids may be administered as a topical treatment (i.e. a cream or spray), via injection or orally. They are potent anti-inflammatories and stabilise the mast cells and B-lymphocytes (white blood cells that carry inflammatory factors) so that they do not disintegrate and release their factors as easily, or not at all. Steroids can have side-effects which may include hunger, thirst, increased urination and loss of energy. Long-term use may be associated with urinary tract infection, thinning of the skin and a predisposition to diabetes mellitus. If your pet has been prescribed a long-term high dose of oral steroids and you want to discuss
an alternative method of treatment with your vet, it is important to bear in mind that the dose is normally tapered down gradually. This is to reduce the risk of Cushing’s disease developing.

- Natural treatments – Natural remedies that may help to soothe and support the skin topically include Dermacton® (a blend of essential oils and herbal extracts), camomile and oatmeal.

OTHER CAUSES OF ITCHY SKIN

Some skin conditions are secondary to other conditions; e.g. Cushing’s disease, which is typically accompanied by hair-loss and thinning of the skin. Pyoderma (usually caused by Staphylococcus pseudintermedius) is very common, and this can be primary in some animals (especially if they have a high skin pH, thin stratum corneum and/or a poorly developed hydrolipid film), or secondary in others (e.g. a patient with undiagnosed/untreated allergies which are compromising the immune system). Zinc responsive dermatosis is rare generally speaking, but common in sled dogs. Although it can be exacerbated by a diet which is low in zinc, the primary cause is decreased ability to absorb zinc from the diet. This highlights the importance of feeding a brand such as Arden Grange with its highly bioavailable mineral sources, especially when feeding Northern breeds. Zinc responsive dermatitis causes skin problems because the skin contains nearly 6% of total body zinc. There are many other nutrient responsive dermatoses which respond to changes in the composition of the diet because the skin is such a metabolically active organ.

There are several different types of mites that can affect our pets, and your vet may need to perform skin-scrapes in order to identify them. Although skin-scrapings are a useful and relatively non-invasive means of diagnosis, it is not unusual for the results to come back clear even if mites are present. Some may be buried deep within the epidermis and may not appear under microscopic examination if the scraping has not been deep enough. Others may dwell in clusters and therefore if they are not present on the part of the body from which the scraping has been made, then they again will not be evident under the microscope. Demodectic mange is sometimes very difficult to diagnose, unlike its more common relation, sarcoptic mange (fox mange). Harvest mites, otodectes (ear mites) and cheyletiella (walking dandruff) can also affect cats and dogs. Treatment may vary depending on the species.

Ivermectin is a broad spectrum parasiticide which is sometimes used to treat mites (and worms, ticks and flies), but certain dog breeds carrying the MDR-1 gene (multidrug resistant gene) cannot be given this treatment because they lack a specific protein allowing the drug to be flushed from the brain. Therefore, a dangerous level of toxicity can occur. These breeds include the Border Collie, Old English Sheepdog, Shetland Sheepdog, Australian Shepherd, German Shepherd, Long-Haired Whippet, Silken Windhound and Skye Terrier. Mixed breeds can also be affected.

Yeast infections such as Malassezia are another common cause of problem skin. Diagnosis is via growing a fungal culture and pets with this condition tend to have a distinctive musky smell. Treatment is usually several applications of an anti-fungal shampoo such as Malaseb. Oral ketoconazole can also be used to treat fungal overgrowth. Yeast infection is often secondary to other itchy conditions because the sore skin is weeping and warm and an ideal habitat for replication.

NUTRITIONAL SUPPORT FOR ITCHY SKIN

Properties of a diet for sensitive skin may include:

- A rich supply of bioavailable protein, an important component of skin cells. Undigested antigenic molecules can annoy the immune system predisposing the animal to food allergies. The amino acids methionine, cysteine (and taurine in cats) are especially important. White fish and egg (as found in the Arden Grange dry Sensitive products are excellent sources of bioavailable protein).
• A rich supply of **high quality fats**, which are incorporated into skin cells as fatty acids. Linoleic acid is an omega-6 essential polyunsaturated fatty acid that forms the lipid component of all cell membranes. Its deficiency can result in symptoms such as hair loss, dry hair, and poor wound healing. The **omega-3 fatty acids EPA and DHA** (the krill in the Arden Grange recipes are an excellent source) may be highly beneficial. They work in the skin to help reduce the amount and effects of histamine and other chemicals that are produced in response to the allergen. It may be several weeks or months before a significant improvement is noted, but they are very safe and are not generally associated with any harmful side-effects. Studies have shown that when omega-3 fatty acids are used in conjunction with other treatments such as anti-histamines, in many cases, the use of steroids may be decreased or even discontinued (under veterinary supervision).

• **Sufficient vitamin A** which is important in the life cycle of epithelial cells. Deficiency can cause scaly skin and dull, brittle hair. Cocker Spaniels are predisposed to retinoid-responsive dermatoses (Maxie et al, 2007).

• **Sufficient vitamin C**, which is essential for the synthesis of collagen.

• **Sufficient vitamin E**, which protects the cell membranes, and ensures the skin remains supple/heals efficiently.

• **Sufficient B vitamins**; lack of riboflavin causes cheilosis in addition to seborrhoea, but this only normally would occur in an un-supplemented vegetarian diet. Biotin (vitamin B7) deficiency produces a characteristic alopecia around the face and eyes and crusting in severe cases.

• **Adequate copper**, which plays an important role in the synthesis of collagen and is involved in the maintenance of hair/skin, helping ensure the skin’s elasticity.

• **Adequate zinc**, which is vital for wound healing. Deficiencies may result in poor hair growth/alopecia.

As a responsible and ethical company, Arden Grange fully appreciates the caution that must be taken when discussing the potential benefits of nutritional supplements. It is against the law to make medical claims. Whilst these ingredients are safe and natural and may be beneficial to some of the cats and dogs fed on Arden Grange, we must highlight that their inclusion is not a substitute for veterinary intervention in the case of a sick animal.

**References**


