



## Dermatology

Analysis of the alopecia  
problem in dogs as a syndrome  
of dermatological diseases  
- causes, treatment, case studies

Nutrition for Cats and Dogs  
with Skin Conditions

FAS - feline atopic syndrome  
- a case study

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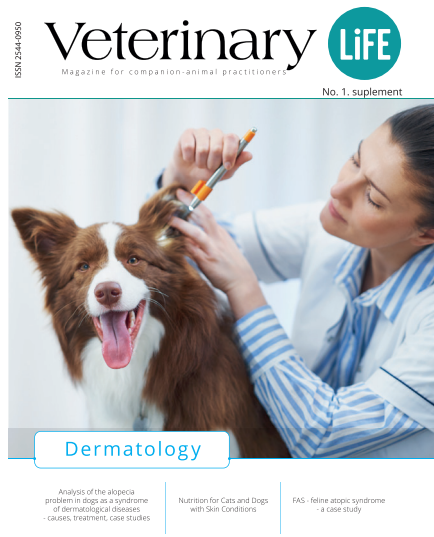
As we continue to strive for excellence, we decided to look into our veterinary journal and provide an in-depth knowledge of what is happening in dermatology in pets. This supplement of our 1st edition of „Veterinary Life” is therefore a refreshed collection of articles and publications on skin problems, allergies and food intolerance in dogs and cats. This issue, as well as new editions coming soon, will constitute a compendium of knowledge starting from individual problems of daily practice, to medical curiosities and market interest. Our magazine is addressed to a wide range of readers related to the veterinary industry not only in Poland, but also in different regions of the world.

Creating and publishing „Veterinary Life” would not have been possible without the involvement of many people. I would like to thank all of them for their hard work and kindness.

Editor-in-chief



**Anna Rutkowska**  
Editor-in-chief



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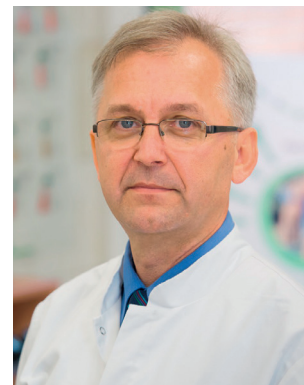
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# Therapy of fungal and bacterial dermatoses

**Jarosław Popiel**, DVM, PhD, Prof. UPWr., Department of Internal Medicine and Clinic of Diseases of Horses, Dogs and Cats. Wrocław University of Environmental and Life Sciences



**Skin diseases caused by the proliferation of pathogenic bacteria or fungi are one of the most frequent dermatoses in dogs encountered by a veterinary surgeon.**

The therapeutic approach should be varied in these diseases. Pyoderma usually is a secondary pathology resulting from excessive proliferation of commensal bacteria. Dog's skin is a perfect place for microorganisms. *Staphylococcus Pseudointermedius* is a bacteria that colonises almost the whole skin of a puppy from the eighth hour of age, and its domination remains throughout the whole lifetime of a dog. In healthy dogs, their immune system and tightness of epidermal barrier help keep homeostasis. Each breaking of the barrier, being mechanic or caused by immune deficiencies (other diseases, for instance allergies), causes excessive proliferation of bacteria on the surface of the skin, or – worse – allows microorganisms to penetrate the structures of epidermis and results in pyoderma, sometimes involving subcutis.

Correct treatment always depends on precise diagnostics and specifying whether the problem is external only (bacterial proliferation on the surface of the skin) or is it a superficial or a deep pyoderma. Auxiliary tests, usually cytology (for example Diff-Quick staining), will tell us if the problem is caused by bacterial proliferation, pyoderma or, for instance, candidiasis. This test does not specify precisely the pathogen, but tells us whether the problematic bacteria are cocci (usually staphylococci), or rods (*Pseudomonas spp.*, *Proteus spp.*, or others).

Further therapeutic decisions must depend on a few factors: how advanced is the inflammation (acute or chronic), how widespread are the lesions (local or generalised pyoderma), what is the location of lesions (superficial or deep pyoderma), and what is the tendency for recurrence (recurrent pyoderma, often deep).

Whenever rods are found, or a generalised, deep or recurring pyoderma is diagnosed, a sample should be taken for culture and antibiotics should be selected based on an antibiogram.

A crucial element of treatment of pyoderma is shampoo therapy, namely prescribing a correctly selected medicinal product in the form of a shampoo or a foam. In cases of



photo: Jarosław Popiel

Fig. 1 Dermatophytosis: a 3-year-old male Husky; scales and crusts around the eye. Culture results: *Trichophyton mentagrophytes*



photo: Jarosław Popiel

Fig. 2 Impetigo: male dog with symptoms of impetigo: superficial pustular pyoderma in the skin of abdomen inguinal area. Numerous pustules on the skin of abdomen.



local or superficial bacterial inflammations such treatment might replace the use of antibiotics. The most frequently used antibacterial substance is chlorhexidine, present in a variety of products in different concentrations (from 0.5% up to 4%). 0.5% solutions can be successfully used in treatment of pyoderma. Higher concentrations are efficient against yeast as well. Other substances used in liquids, shampoos or foams for treatment of pyoderma are: benzoyl peroxide, metabolised in the skin to benzoic acid with strong antibacterial action based on lowering of pH of the skin; ethyl lactate with antibacterial action (hydrolysed by bacterial lipase to lactic acid and ethanol) or lactic acid. It is crucial that the shampoo maintains skin pH on the level normal for dogs' skin. One should remember that – unlike human skin – dogs' skin is not acidic, on the contrary: its pH is alkaline. Application of the shampoo also helps to moisten the skin and remove keratinised and dead epidermal cells, thus improving skin condition and regulating naturally growing colonies of skin resident bacteria. Because the therapy of pyoderma must be efficient, the shampoo should be used as often as every week until the effect is achieved, and then continued to maintain the homeostasis, for instance every 3 to 4 weeks.

The next stage in treatment of pyoderma is introduction of antibiotics. Recently, attention has been devoted to the growing number of cases with the resistant staphylococci strains isolated from dogs (MRSA and MRSP). As it has a direct impact on human health, use of antibiotics in animals in a careful and responsible manner is frequently recommended. A generalised or recurrent form of pyoderma that is not responding well enough to therapeutic baths forces us to use these drugs. Of course correct doses and timing should be applied. Frequently, antibiotics used to treat purulent conditions of the skin have to be administered in doses higher than normally accepted. The most frequently used chemotherapeutic is cephalexin in the minimum dose of 20 mg/kg or amoxicillin in the dose of 10 mg/kg. If G-rods are found, the drug of choice seems to be marbofloxacin in the dose of at least 4 mg/kg.

Sometimes the antibiogram forces us to use drugs that do not have their veterinary counterparts. In such cases we should remember about the legally binding prescribing cascade (see Table 1: List of doses for antibiotics and bactericidal/bacteriostatic chemotherapeutics). Another equally important element of antibacterial therapy is appropriately long duration of the therapy. The general principle is using the drug until the lesions disappear, and then continuing the drug for about 7 to 10 days longer. In reality, duration of antibiotic therapy depends on how advanced and widespread the pathology is.



photo: Jarosław Popiel

Fig. 3 Deep pyoderma: male French Bulldog with widespread lesions suggesting deep pyoderma.

Tab.1 Antibiotics and bactericidal/bacteriostatic chemotherapeutics used in the treatment of pyoderma in dogs.

Name	Dosage mg/kg	Administration
Oxacillin	22	Every 8 hours
Amoxicillin-clavulanate	12,5	Every 12 hours
Enrofloxacin	10	Every 24 hours
Marbofloxacin	2-4	Every 24 hours
Cephalexin	20-30	Every 12 hours
Rifampicin	5-10	Every 24 hours
CEFOVECIN	8	Every 14 DAYS
Erythromycin	15	Every 8 hours
Clindamycin	5,5-11	Every 12 hours
Lincomycin	22	Every 12 hours

In superficial pyodermas, such as purulent and traumatic skin inflammation (hot spot) or impetigo, the treatment usually lasts 7 to 14 days. In the case of folliculitis, therapy may last up to 4 weeks. In cases of deep generalised pyoderma or cellulitis, therapy lasts 56 to 84 days. Such long therapy requires very strict monitoring of dosing, and the use of adjuvant therapies, such as shampoo therapy or stimulation of the immune system with products like beta glucan.

The therapeutic effect always depends on all of these factors and on correct diagnosis pinpointing the primary disease that caused the secondary proliferation of bacteria on the skin. In the case of cellulitis or deep pyoderma, when purulent fistulas are clinically

visible on the skin surface, scarification may occur as an effect of connective tissue proliferation. Treatment of surface and superficial pyodermas is usually successful without any side effects. Hyperpigmentation after formation of pustules usually disappears after desquamation of epidermal stratum corneum, which means after about 3 to 4 weeks.

Superficial mycoses or dermatophytoses caused by *Microsporum fungi* (*M. canis* or *M.s gypseum*), *Trichophyton* (usually *T. mentagrophytes*) or *Malassezia spp* yeasts may present with characteristic clinical symptoms in dogs. Focal lesions are frequently found, typically round in the form of alopecic patches, scales and crusts. Sometimes parafollicular papulae and pustules are found. In some cases the symptoms are



similar to the symptoms of autoimmune diseases and may be localised in facial and nasal area, symmetrical, in the form of folliculitis and furunculosis (especially after infection with *T. mentagrophytes*). Infections caused by *Trichophyton* in dogs may cause folliculitis and furunculosis of foot pads.

In some cases the symptoms resemble lesions characteristic for seborrhoea, with oily scales. Kerion is a rare form of mycosis – it is a kind of nodular form of furunculosis, characterised with a lot of exudate. The lesions are present predominantly on the face and distal parts of legs. In cases of skin candidiasis, erythematous dermatitis, lichenification and oily seborrhoea are observed. Candidiasis is frequently accompanied by severe pruritus.

Diagnosis of dermatophytosis is based mostly on culture results. The sample containing hair and epidermis taken from hanged areas is a material for fungal culture. Wood's lamp can be helpful in diagnosing microsporiasis, as fluorescence of keratine visible in the lamp light indicates the infection. However, sensitivity of this test only reaches 50%, and only works in respect to one type of the fungus: *Microsporum canis*.

Analysis of hair under a microscope with chlorolactophenol shows the presence of arthrospores organised as chains along the hair (in up to 40 to 70% of infected animals). Other recommended tests are skin biopsy and histopathological test that can show the presence of spores in the stratum corneum of the epidermis.

The perfect test for diagnosing skin candidiasis is cytology (Diff Quick staining of skin impression on a slide or tape).

Therapy of mycoses should take into account both topical and systemic drugs.

Hair around lesions should be completely removed; long haired animals should be shaved. Treatment of topical local lesions is possible with creams and lotions only. In case of the generalised lesions bath should be applied.

The drugs of choice in the treatment of skin mycoses in dogs are drugs from the azole group (Imidazole). Azole derivatives replaced the typical anti-fungal antibiotics (for example griseofulvin) on the pharmaceutical market, owing to adverse effects of the latter (hepatotoxicity, carcinogenic action, and so on). Therefore, products available on the veterinary market contain first, second or third generation azole derivatives. First generation imidazoles are in the form of external use products: clotrimazole, miconazole or enilconazole. A representative of the second generation is ketoconazole, available on the veterinary market as a shampoo, and in human medicine as a systemic oral drug. Third generation includes itraconazole and fluconazole –systemic oral drugs, not registered for animals in Poland.



photo: Jarosław Popiel

Fig. 4 Deep pyoderma and fistulas: close-up of lesions from phot. 3. Purulent fistulas visible.



photo: Jarosław Popiel

Fig. 5 Deep pyoderma after treatment: dog from phot. 3 after 3 months of treatment with cephalexin and baths in shampoo with chlorhexidine. Scars present in the areas of deep purulent lesions.

Likewise, terbinafine (allylamine derivative frequently used in humans) is not registered for animals.

Other drugs, with the local non-specific antifungal action, can also have a therapeutic effect in cases of dermatophytoses:

- acids: undecylenic, benzoic and salicylic
- dyes: gentian violet, brilliant green, crystal violet, Pigmentum Castellani,
- other chemical compounds, for example 8-hydroxyquinoline or 4% solution of chlorhexidine.

All these products are efficient in treatment of all types of skin mycoses, including candidiasis.

Vaccinations can be helpful in the treatment of mycoses. It has been found that products containing antigens of pathogenic fungi can stimulate the innate cellular immunity, which considerably speeds up the time and effectiveness of treatment. Vaccinations used for therapy should be administered along with the targeted therapy, for instance with imidazoles in the form of a shampoo and/or administered orally. Treatment of mycoses should last at least three weeks, after two further weeks a control culture should be performed to verify the efficiency of therapy.



# Treatment of recurrent otitis externa in dogs – the expert's approach.

Joanna Karaś-Tęcza, DVM, Dermawet, Dermatological clinic for dogs and cats in Warsaw



**Inflammation of external ear canal in dogs is a common problem in every veterinary practice for pets. However, referrals of patients with otitis externa to specialists remain on the same level, with a slight tendency to increase, which shows that diagnosing and treatment of otitis externa in dogs remains a challenge.**

First and foremost, in case of a patient with otitis one should absolutely avoid any shortcuts, instead hold on to specific procedures; avoid reaching for a ready-made

otologic product after a brief glance at the ear canal, make sure to perform a thorough otologic exam. This check-up provides a set of answers to questions that will help us arrive at an initial diagnosis, but definitely not the final one.

- Is there erythema at the entrance of the ear canal?
- Is the wall of the ear canal inflamed, with clearly visible blood vessels and oedema?
- Is tympanic membrane visible?

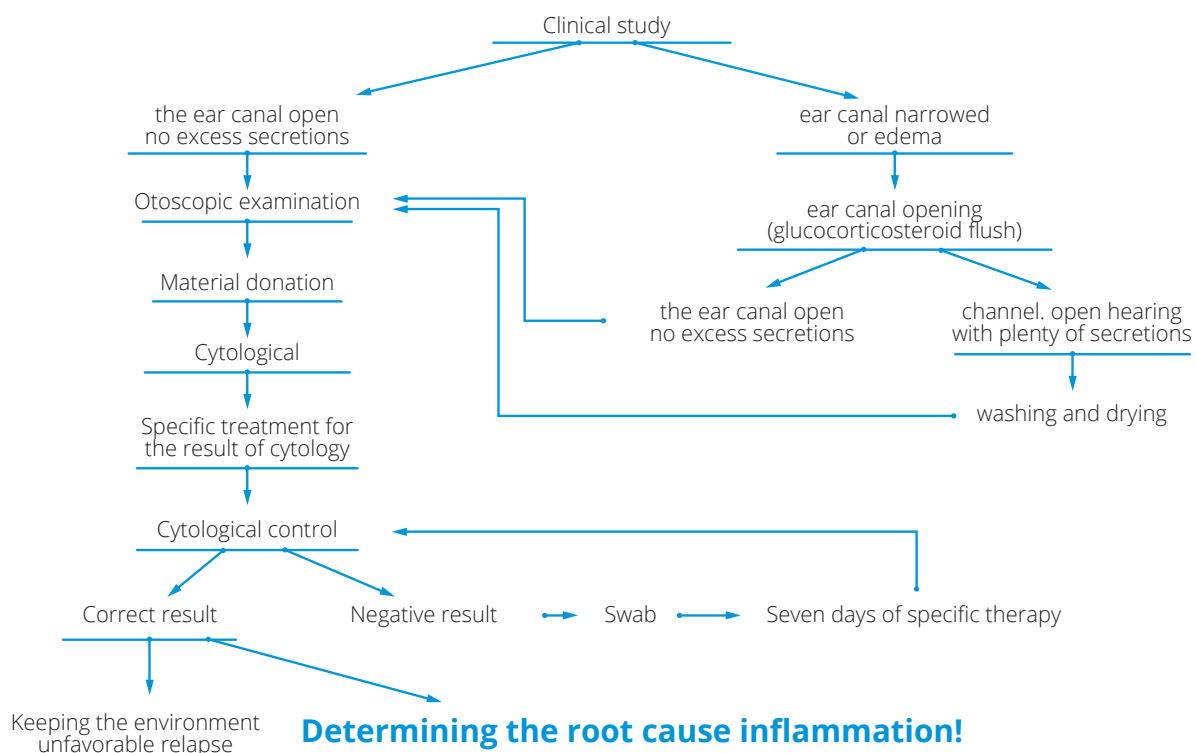
After a thorough otologic exam, the next step is to run a cytology of the material collected from left and right ear canals. Sometimes, however, a thorough otologic exam is not possible during the first visit, because the ear canal needs to be prepared for such procedure: the oedema and pain should be reduced, and/or excessive cerumen should

be dissolved. In case of seborrhoeic otitis, a trichogram should be performed.

These tests will make an initial diagnosis and initial therapeutic recommendations possible. Nevertheless, one should be aware that only a final diagnosis allows us to recommend a longer term therapy and be successful in complete treatment of the ear canals.

The success in treatment of otitis externa might be achieved despite several factors predisposing for inflammations or other factors encouraging the development of this pathology. It is worth discussing the differences between the two types of factors, as they are the essence of pathogenesis of otitis externa, and still they tend to be omitted by practitioners. The predisposing factors include environment. Frequent contact

## Therapeutic scheme in the case of inflammation of dogs external ear canals



with water macerates the epidermis leading to imbalance within the ear canal wall and dysfunction of immune system of the skin in this area. Other predisposing factors are anatomical obstacles, such as excessive hair growth in the ear canal, recesses, stenosis of ear canal or heavy, hanging pinnae.

From a practical point of view, the reasons behind the inflammation of the ear canals should be divided into primary and secondary. Interestingly, patients with primary causes usually remain the patients of general practices, while patients with secondary causes become patients of referral clinics. According to the research, primary cause frequently go undiagnosed. Recommending a medication without finding the primary cause does not lead to the treatment, therefore the referral clinics usually see patients with inflammation caused by secondary reasons. This could mean that a general practitioner seeing a patient with otitis either does not thoroughly examine the ear canal, or in his therapeutic recommendations refers only to the present status and considers the visit completed without running an otologic interview. This is a gross mistake.

Secondary causes of the inflammation do not bring about pathologic lesions in a healthy ear; they only bring havoc in a sick ear canal. The secondary causes are easier to be eliminated after their identification, and if they are chronic or recurrent it means that primary reasons or perpetuating factors have not been eliminated.

Previously, secondary causes used to be treated as primary. In my opinion the situation in Poland still remains the same. This is why in the patient's history we might see for example *Malassezia* otitis as a final diagnosis. *Malassezia* yeast, *Pseudomonas aeruginosa* or staphylococci are secondary causes for the inflammation, not primary ones.

Secondary causes are easier to be eliminated after having them identified with a cytology test, and if they are chronic or recurrent it means that the primary reason have not been eliminated, or that there are other factors perpetuating the inflammation.

Majority of practitioners concentrate their efforts on diagnosing and treating secondary causes. This is a mistake. It is true that treating them is vital, though not always necessary. For example: in the case of *Malassezia* infection, instead of fighting the yeast it is better to eliminate the predisposing factors for this infection, or remove primary reasons. Then fighting yeast might not be necessary at all.

In order to eliminate primary reasons, a final diagnosis is needed. To arrive at the

final diagnosis, it is necessary to perform a thorough otologic exam and to run a detailed otologic interview.



photo: J. Karaś-Tęcza

Purulent inflammation of the ear canal

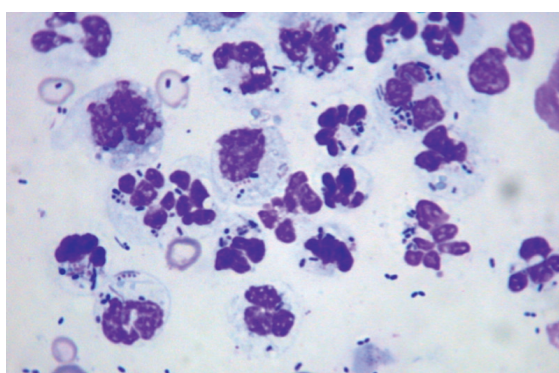


photo: J. Karaś-Tęcza

Cytology of the ear canal

The question whether inflammatory process includes one or both ear canals is of key significance, which seems rather obvious. Questions about the patient's lifestyle are vital for the interview as well. For instance, a question about swimming in water reservoirs. Perhaps it is just a case of a swimming dog syndrome?

It is worth remembering that in the case of unilateral otitis, one should take into consideration a foreign body, polyp and/or neoplastic process.

Interestingly, primary causes for ear canal inflammation may go unnoticed during a visit in a veterinary practice. A classic example is a patient with atopic dermatitis: if a veterinarian focuses on treating the ear canal inflammation and fails to consider this generalised disease, they would always fail, and the recurrent otitis would be returning more and more frequently.

Therefore, the correct treatment should not be completed after dealing with secondary causes for otitis; instead we should aim at finding the primary causes. After diagnosing it, the first thing to do is to remove the complicating infection, and then adjust our therapeutic plan to the primary causes.

Infections within external ear canals are usually of mixed origin, which means it is necessary to start therapy against both yeast and gram positive bacteria, and in certain cases also against gram-negative bacteria. The selection of the drug should depend on the result of cytology test and antibiogram. We are aware that in cases of patients with bacterial or endocrinological primary causes, relapses of inflammation are highly probable. Therefore, after elimination of pathogenic flora within the ear canal, one should create environment preventing further proliferation of the pathogen. The perfect solution is to maintain such an environment constantly. In the case of the common pathogens like *Malassezia* yeast or staphylococci (*Staphylococcus intermedius* or *Staphylococcus pseudointermedius*), it is very easy to create in the ear canal an environment unfavourable for the development of these pathogens by obtaining a proper pH level around 4.5.

Of course, the environment itself is not enough. Products having unfavourable effect on the cellular wall of bacteria residing in the ear canal should be used on a regular basis, which does not mean every day. External ear canals should be regularly cleaned in cases of patients with a tendency for recurrent otitis. A very frequent mistake made by veterinarians and the owners is cleaning ear canals with a cotton swab rolled on forceps. Too much manoeuvring within the ear canal might result in an inflammation of an otherwise healthy ear canal! This is caused by the irritation of the ear canal wall and dilation of capillaries in this area. Thus, the basic care should consist of flushing ear canals and administering drops there, regularly, depending on the needs. Such simple procedures in cases of the patients prone to inflammation of ear canals - with a simultaneous control of the basic reason for otitis - are the key to therapeutic success and seeing the patient in our practice healthy throughout their whole lifetime. This is what I wish for every practitioner.



Product description in VetPharmacy



# Feline atopic syndrome: a case study

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The paper presents a case study of a cat with recurrent pruritus and the latest information concerning feline atopic syndrome (FAS) diagnostics and treatment.

**Key words:** cat, pruritus, allergy

## Case study

**Patient:** European shorthair cat, spayed female, 2 years old.

A cat presented skin problems exacerbating for one year. Skin lesions with pruritus were located on the head, including the ears and neck. In the past, the cat received symptomatic treatment for dermatophytosis (antifungal vaccines and itraconazole), bacterial dermatitis (various types of systemic antibiotic therapy in injections, including amoxicillin with clavulanic acid), and antipruritic medications (systemic glucocorticoids in injections, e.g., dexamethasone). The therapy did not result in any significant improvement of skin lesions or pruritus. The patient was referred for dermatological consultation.

During the consultation, the general condition of the patient was considered good. The skin lesions were located on the neck, particularly severe in the dorsal area and on the inner aspect of the left rear limb. During the visit, the patient was presenting pruritus, such as scratching and compulsive licking of the affected areas. There was an extensive wound on the neck due to self-mutilation, and the lesion was hyperaemic and covered with small crusts (Fig. 1). The wound seemed to be painless; however, there was slight hyperesthesia causing bouts of scratching. A typical manifestation of eosinophilic plaque was observed on the inner surface of the thigh (Fig. 2).

Differential diagnostics principally include:

- Allergic diseases (flea allergy dermatitis, atopic skin syndrome, food allergy).
- Infestations with ectoparasites (fleas, insect bites).
- Dermatophytosis and bacterial infection (as complication).



Fig. 1 An extensive wound on the dorsal part of the neck associated with self-mutilation.



Fig. 2 Eosinophilic plaque on the inner surface of the lower part of the left rear limb.

- Behavioural aetiology (stress related to frequent absence of the owners). The following ancillary skin tests were performed:
- The Wood's lamp examination: no fluorescence was detected.
- Brushing-based test: no parasites or their eggs were found.
- Trichogram: no parasites or their eggs were noticed.
- Scraping: no parasites or their eggs were spotted.
- A cytological examination revealed numerous eosinophils and neutrophils (Fig. 3).
- A sample for mycological examination was collected (fungal culture).

Allergic aetiology was suspected due to the medical history and the results of ancillary tests. It was recommended to implement an elimination diet based on protein hydrolysate for 12 weeks and then to perform a food challenge to confirm the association with food and determine allergy triggers. The culture excluded dermatophytosis. Symptomatic treatment was started to reduce allergic reactions as soon as possible and to eliminate complications. Therefore, cefovecin at a dose of 0.1 ml/kg body weight (BW) was injected subcutaneously twice (at a 14-day interval), and therapy with prednisolone at a dose of 1 mg/kg BW P.O. BID was initiated but the dose and frequency were progressively tapered. Rivanol solution was used to disinfect and clean the wounds. The treatment with glucocorticoids and topical antibiotics proved unsuccessful; the application of cream and ointment attracted

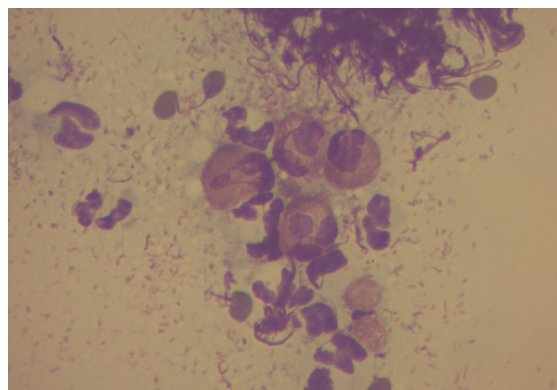


Fig 3 Mixed type inflammation – with neutrophils and eosinophils (indicated with an arrow).

even more attention from the cat and triggered scratching. A spray with hydrocortisone aceponate was applied on the intact epidermis, which enabled an intermittent use of prednisolone: on days without the oral medication, the spray was administered once a day over pruritic areas. Unfortunately, it was impossible to perform the elimination diet properly, but exposure to the other proteins (food for cats) triggered pruritus and caused dermatological symptoms. The next stage of management involved an initial attempt to discontinue corticosteroids and implement a protocol with chlorpheniramine, oclacitinib, and cyclosporine; however, these drugs proved ineffective in the patient.

The cat's owners did not agree to allergy tests or allergen-specific immunotherapy. Nevertheless, it was possible to administer a prednisolone maintenance dose (1 mg/kg BW) twice a week or less often. Remission

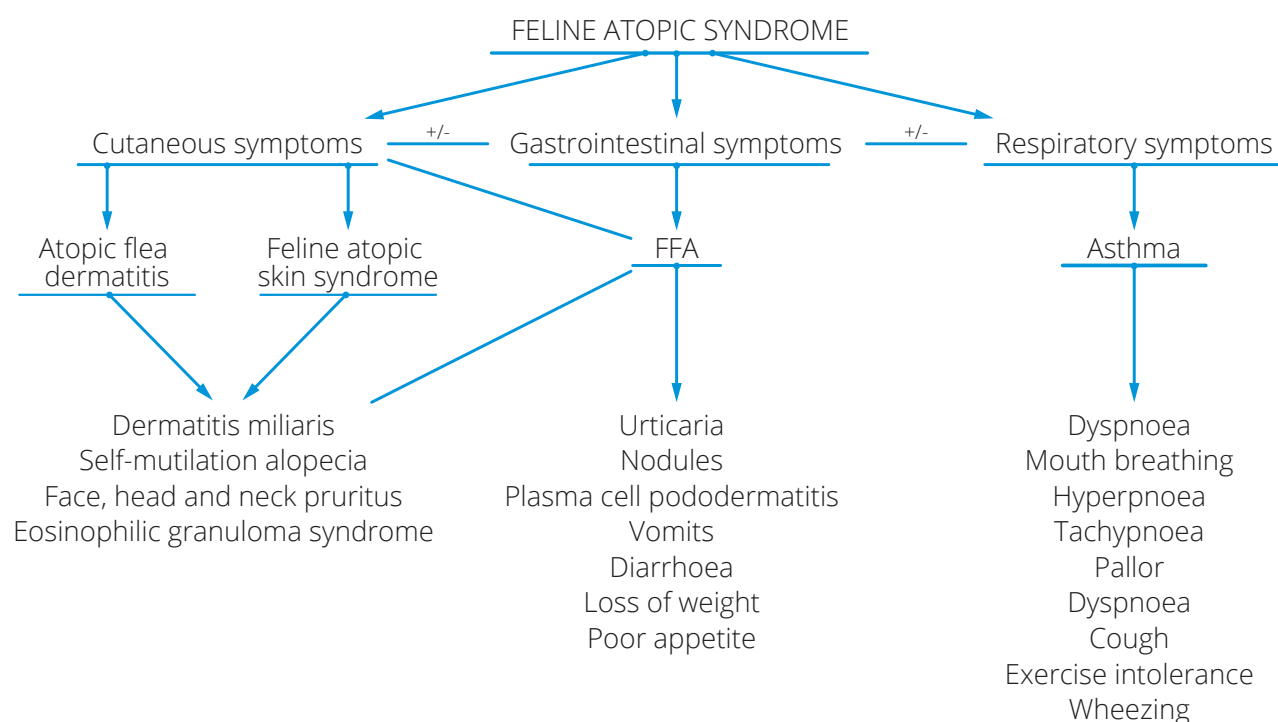
periods of a few months were also achieved without any medications. Considering the evidence altogether, concomitant (feline) atopic skin syndrome and food allergy were diagnosed.

## Summary

In 2021, a group of specialists belonging to ICADA (International Committee on Allergic Diseases of Animals) released a series of papers, published in Veterinary Dermatology, discussing new nomenclature, pathogenesis, clinical symptoms, appropriate diagnostics of allergy, and the current recommended methods of treatment (1, 2, 3, 4). The following division and terminology of feline allergic diseases were proposed (1):

- Feline atopic syndrome (FAS): allergic dermatitis associated with environmental, and food allergens and with asthma, which is related to Ig E antibodies.
- Feline atopic skin syndrome (FASS): a cutaneous syndrome accompanied by dermatitis and skin pruritus; the presentation varies and features different clusters of symptom, however, none is specific of FAAS, and the presentation can be associated with IgE antibodies related to environmental antigens.
- Feline asthma: eosinophilic bronchitis leads to spontaneous bronchospasm and remodelling of the respiratory system, which may be associated with IgE antibodies related to inhaled allergens.
- Variants of external (with IgE increase) and internal allergic diseases (without IgE

Tab. 1. Diagnostic pathway and FAS-related clinical symptoms.





increase); concerning FASS, the internal variant is similar to atopic-like dermatitis in dogs.

- Feline food allergy (FFA): each clinical symptom, also related to FASS, is associated with an immune reaction to ingested food.

Atopic feline syndrome may present as dermatological symptoms deriving from the gastrointestinal and respiratory tract (Table 1). All these diseases have one thing in common, namely clinical symptoms, and these include miliary dermatitis, self-mutilation alopecia, head and neck pruritus, and eosinophilic granuloma syndrome (3). Moreover, food allergy may cause other skin symptoms, such as urticaria, non-pruritic nodules, plasma cell pododermatitis, and gastrointestinal symptoms including vomiting, diarrhoea, loss of body weight, and lack of appetite (3).

The diagnosis of FAS is based on a detailed medical history, clinical examination, and elimination of other causes since clusters of dermatological symptoms can develop in various dermatological conditions, and they may coincide (3) (Table 2).

The discussed papers feature the following recommendations concerning the medications for FAS management (4):

- Systemic glucocorticoids: effective in most cats; they may be used to prevent sudden and severe dermatological symptoms.
  - Triamcinolone at a dose of 0.18 mg/kg SID,
  - Methylprednisolone at a dose of 1.4-1.5 mg/kg SID or 0.77 mg/kg BID,
  - Prednisolone at a dose of 1 mg/kg SID.
- Topical glucocorticoids: effective in local dermatological lesions and when used in combination with medications from the other therapeutic groups.
  - 0.0584% hydrocortisone aceponate (off-label use, OLU).
- Cyclosporine: effective in chronic skin lesions; due to a delayed effect, it should not be used in the management of acute lesions; it may cause gastrointestinal problems.
  - Cyclosporine at a dose of 7 mg/kg SID.
- Oclacitinib: effective in acute and chronic lesions without associated severe skin inflammation.
  - Oclacitinib at a dose of 1 mg/kg SID (OLU).
- Oral antihistamines: depending on the active substance, their efficacy varies between 40 and 70%; they may be used to treat chronic or uncomplicated acute lesions.
  - Chlorpheniramine at a dose of 2 mg/cat BID (OLU),
  - Clemastine at a dose of 0.34 mg/cat SID or in 2 divided doses (OLU).
- Unsaturated fatty acids: during treatments with antiallergic and antipruritic medications, they can be used as an adjunctive therapy; insufficient efficacy data.
- Maropitant: it is not recommended, insufficient efficacy data.

Tab. 2. A list of dermatological symptoms and their possible causes.

Type of symptom	Possible causes
Dermatitis miliaris	<ul style="list-style-type: none"> <li>• Fleas</li> <li>• Atopic allergic dermatitis</li> <li>• Food allergy</li> <li>• Dermatophytosis</li> <li>• Bacterial folliculitis</li> <li>• Otodectes cynotis</li> <li>• Cheyletiella sp.</li> <li>• Pemphigus foliaceus</li> <li>• Drug-induced reactions</li> </ul>
Self-induced alopecia	<ul style="list-style-type: none"> <li>• Fleas</li> <li>• Atopic allergic dermatitis</li> <li>• Food allergy</li> <li>• Demodex gatoi</li> <li>• Dermatophytosis</li> <li>• Cutaneous candidiasis</li> <li>• Behavioural disorders</li> <li>• FLUTD</li> </ul>
Head and neck pruritus	<ul style="list-style-type: none"> <li>• Fleas</li> <li>• Atopic allergic dermatitis</li> <li>• Food allergy</li> <li>• Demodex gatoi</li> <li>• Notoedres cati</li> <li>• Otodectes cynotis</li> <li>• Dermatophytosis</li> <li>• Pyoderma</li> <li>• Cutaneous candidiasis</li> <li>• Viral diseases</li> <li>• Skin tumours</li> <li>• Skin reactions induced by spot-on formulations</li> <li>• Drug-induced reactions</li> <li>• Pemphigus foliaceus</li> <li>• Primary hyperthyroidism</li> </ul>
Eosinophylic granulomatous complex	<ul style="list-style-type: none"> <li>• Fleas</li> <li>• Allergic flea dermatitis</li> <li>• Food allergy</li> <li>• Mycobacteriosis</li> <li>• Nocardiosis</li> <li>• Sporotrichosis</li> <li>• Viral diseases</li> <li>• Skin tumours</li> <li>• Deep pyodermas</li> <li>• Sterile granulomatous dermatitis</li> </ul>

- Allergen-specific immunotherapy: diversified efficacy data in cats when used as the only therapeutic option; to be considered in combination with medications or as maintenance treatment.

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*All the original articles are available on the website of Veterinary dermatology periodic in a form of open access.*



Product description in VetPharmacy

# Nutrition for Cats and Dogs with Skin Conditions

**Michał Jank** DVM, PhD, Prof., Department of Preclinical Sciences, Institute of Veterinary Medicine, Warsaw



For most owners, skin conditions that affect their pets are a serious problem of a medical, but also aesthetic, concern. They expect the pet to get better quickly, which is not always possible. Skin conditions in animals can have a genetic background (genetic dermatoses) or be related to allergies and food deficiencies. The article discusses conditions in which beneficial effects can be achieved by modifying the diet of the sick pet.

## Genetic dermatoses

### 1. Impaired zinc absorption

The most serious condition related to zinc metabolism is the lethal inflammation of the skin of distal extremities (Lethal Acrodermatitis, LAD) in bull terriers. The condition has a genetic background and is inherited as an autosomal recessive trait. In bull terriers, it makes the body completely unable to absorb zinc, causing impaired cellular immunity, hampered growth, and serious skin lesions that affect dogs under 10 weeks of age. Compromised immunity further increases the risk of pyoderma, and behavioural changes, such as idiopathic aggression, may also be linked to impaired zinc absorption. In other breeds (Alaskan Malamute, Siberian Husky, Great Dane, Doberman Pinscher), the condition is not fatal, but may lead to dwarfism in Alaskan Malamutes. The symptoms most frequently appear in puberty and periods of stress; they manifest as skin lesions: scales, pustules, and ulcers on the arms, scrotum, face, vulva, and prepuce. Recommended treatment includes the administration of zinc, which causes skin lesions to subside within 7-10 days. The recommended dose is 100 mg of zinc sulfate twice a day (as it may have an emetic effect, it should be administered together with food).

### 2. Vitamin A-responsive dermatoses

Another condition with a genetic background is the idiopathic seborrhoea found in Cocker Spaniels, Labradors and Miniature Schnauzers. Symptoms include dry and flaking skin that alternates with oily seborrhoea, large patches of excessively calloused skin on the abdomen and the chest, hair loss, and secondary folliculitis. The condition is treated by administering large doses of vitamin A (6 to 10 times greater

than the dog's daily intake). The dose of 10 000 J.M./day is taken for 2 to 6 months, and sometimes throughout a lifetime.

Impaired vitamin A absorption may also be linked to sebaceous adenitis in Poodles, Akitas, Chow Chows and Hungarian Pointers. So far, the genetic background for the condition has been confirmed for poodles, where it is inherited as an autosomal recessive trait. Treatment involves administering vitamin A at a dose of 10 000 J.M./day for at least 2 months, but topical treatment with anti-sebum shampoos, propylene glycol, and the necessary unsaturated fatty acids is also important.

### 3. Vitamin E-reactive dermatoses

The most important dermatosis that reacts to vitamin E is the primary *acanthosis nigricans*

in dachshunds. Its symptoms include hair loss, hyper-pigmentation, skin thickening, and secondary bacterial infections. Treatment involves the administration of vitamin E at the dose of 200 J.M. of alpha-tocopherol per day. This is an extremely high dose, amounting to 10 times the daily intake of vitamin E, and 20 times higher than what the animal needs. Improvement can be expected after around 60 days of systematic treatment.

## Food allergy

In cats and dogs, allergies are relatively rare; allergic dermatitis only accounts for 1% of all skin conditions, but food allergy is the third most frequent after airborne allergies and flea allergy. It is the cause behind 23% of instances of non-seasonal dermatitis. Discussions have been underway for years to determine whether it is a separate diagnostic unit, or a symptom of a broader clinical issue. It is universally accepted that cats and dogs develop allergies to "well-

known" food ingredients, i.e. ingredients they have had contact with for an extended period of time. In dogs, as many as 68% instances of food hypersensitivities are allergies to beef, dairy products and wheat, i.e. the staple ingredients of their daily diet. For cats, 89% are allergies to beef, dairy products and fish.



photo: JP

No pruritus and microorganisms pathogenic change in dogs skin may suggest deficiency nutrient affecting the metabolism of the skin

## Causes of food allergies

It is universally accepted that an immunological reaction is caused by temporary contact with an antigen repeated over time, and not by its constant presence in food. Specific causes, however, can vary and at least several hypotheses have been raised to account for food allergies in cats and dogs. These include:

1. Early weaning. In this case, a predisposition to allergy may develop due to the inadequate formation of the intestinal barrier that prevents food macromolecules from entering the bloodstream; instead, the molecules enter the lymphatic tissue and are recognized as antigens.



2. Conditions that damage the immunological barrier of the intestine and expose immunological cells to pathogens and food antigens.
3. Chronic parasitic invasions that increase the number of IgE antibodies and effector cells. The body fights against parasite antigens and, in the process, mistakes food proteins for antigens.
4. Prophylactic vaccinations – live vaccines may cause the body to develop allergies to food proteins, as the organism induces an immunological response to vaccine antigens and, in the process, reacts to the foreign food protein as well.

### Food allergies – treatment

The most important principle in treating food allergies is allergen avoidance. In practice, this can be done in two ways: by providing allergen-free food or making sure that allergens are sufficiently broken down so that they can no longer cause symptoms. Since the most frequent sources of protein in dog and cat feed include chicken, beef, eggs, soy, milk, corn, rice and wheat, followed by mutton, turkey, oat, barley and linseed, it has been proposed that feeds for cats and dogs with food allergies should be based on ingredients to which the animals have had relatively little (or no) exposure or that are not likely to cause allergies in

better; they cannot bear the thought of it scratching again. In most cases, this approach makes it impossible to identify the allergen with any degree of certainty. As a result, the market overflows with various feeds based on untypical sources of protein (duck, venison, fish, rabbit, and recently even kangaroo and alligator), known as elimination diets, which are fed to hypersensitive dogs as a standard feed. It should be kept in mind, however, that the proteins in most of these products also come from plants (pea, corn gluten); they contain both animal and plant protein. In theory, they can provide an ideal alternative, as long as the allergen has been identified. If it hasn't,

Tab. 1. Nutrients that affect skin and hair in cats and dogs

Ingredient	Function
Polyunsaturated fatty acids from the n-6 family	Part of the hydrophilic barrier of the skin
Polyunsaturated fatty acids from the n-3 family	Anti-inflammatory properties
Vitamin A	Keratinocyte maturation
Vitamin C	Building the keratin barrier
Biotin	Polyunsaturated fatty acid metabolism
Zinc	Prevents water loss
Vitamin B complex	Polyunsaturated fatty acid metabolism
Vitamin E	Excreted with sebum, prevents the oxidation of fatty acids
Tyrosine, phenylalanine	Dark hair pigmentation
Methionine, cystine	Hair growth, keratin generation

### Food allergies – symptoms

The most frequent symptom is itching which develops within 4-24 hours after the allergen has been ingested (especially on paws, jaw and inguinal area). With time, the skin is further damaged by scratching and licking, and a chronic dermatitis develops with papules, hair loss, skin redness, and secondary bacterial infections. Some authors argue that bilateral otitis externa is also a characteristic symptom of food allergy. In cats, typical symptoms include itching, miliary dermatitis, otitis externa, and the eosinophilic syndrome, accompanied by peripheral eosinophilia in 20-50% of all cases.

the first place (such as rabbit, duck, fish, venison, potatoes, sorghum or tapioca). When selecting such ingredients, however, it is worth remembering that dogs can also exhibit cross-sensitivity; the phenomenon has already been attested for beef and milk casein, as well as for lamb and beef.

Introducing a diet therapy in allergies should be based on several principles. Food hypersensitivity can be suspected when pruritus is reduced by half after the animal is given a new feed. If itching decreases, one should go back to the old diet to confirm food hypersensitivity and identify the responsible ingredient. However, most pet owners are reluctant to look for the underlying cause of the disease. For them, it is more than enough that the pet gets

it is often necessary to test several different feeds, and in the meantime the pet continues to suffer from symptoms. The market also offers products that contain hydrolysed protein. They have been introduced because proteins must have a specific size and spatial structure to be recognized as actual allergens. If their molecules are smaller or of untypical shape, they will be unlikely to cause symptoms. One way to change the size and structure of proteins is to break their molecules down into smaller subunits, which then become “invisible” to the immune system. Typical allergens that cause hypersensitivity in animals range from 40 to 70 kDa in size; hydrolysis, on the other hand, eliminates the need to change the source of protein in the diet as a hy-

drolysed molecule never exceeds 10 kDa. As a consequence, special feeds have been introduced, in which the standard source of protein (e.g. chicken) has been hydrolysed, i.e. broken down into smaller molecules consisting of several or several dozen amino acids, and sometimes even single amino acids. Hydrolysis can bring about a hundredfold decrease in hypersensitivity. In theory, the only drawback of hydrolysed feeds is their flavour, as hydrolysed protein is not as tasty as its normal equivalent. In addition, the hydrolysis process as such is quite costly, which means that the products are a little more expensive than feeds with an alternative protein source.

## Skin conditions related to nutritional deficiencies

Inappropriate food dosage or unbalanced nutrition can cause cats and dogs to develop dermatological symptoms. Skin symptoms associated with nutritional deficiencies include, above all, the deteriorated condition of skin and hair (lacklustre, brittle hair, hair loss, dry skin, etc.), usually not accompanied by itching. It is universally accepted that skin is the first organ to be affected when the pet has been exposed to inappropriate feed for an extended period of time. If skin changes are not accompanied by itching or the presence of microorganisms, it is likely that the pet's diet is deficient in one or more nutrients that affect skin metabolism.

### Protein

Food protein is extremely important for the functioning of skin and hair in thick-haired dogs (such as Spitz and Shih-Tzu), which use up 30-35% of their daily protein intake for skin and hair maintenance and regeneration. These breeds should never be fed products that are low in protein. An important role in the diet of black or dark-coated dogs is also played by phenylalanine and tyrosine, which are used to synthesize dark pigments. Deficiencies in these amino acids cause the skin to turn red, creating a ruddy glow on black hair. It seems that a similar mechanism can be observed in black-coated cats as well. For this reason, they should receive twice the minimum recommended dietary intake of these amino acids.

### Polyunsaturated fatty acids

Polyunsaturated fatty acids from the omega-6 family are one of the most important nutrients involved in maintaining healthy skin and hair. They include linoleic acid and gamma-linoleic acid (found at particularly high concentrations in borage oil), which play a major role in maintaining the integrity of the skin's water barrier. These acids build special molecules that connect skin cells, i.e. the ceramides, special intercellular lipid lamellae that

prevent water from penetrating between cells. As a result, the skin maintains an adequate level of water, remains supple and elastic, does not become dry or flake off. In contrast, a deficiency in n-6 fatty acids causes the skin to flake off and crack, and leads to hair loss and decreased elasticity. Thus, they play a key role in maintaining skin integrity. Since they are not produced by the body, they need to be supplied in food, mainly in the form of plant oils (borage, primrose, rape), but also as animal fat. Omega-6 acids are commonly used in clinical diets for dogs with skin conditions (Bauer, 1994).

Precursors of eicosanoids with anti-inflammatory properties, polyunsaturated omega-6 acids have an anti-inflammatory and anti-oedematous effect. Increasing their dietary intake may help lower the required dose of non-steroid anti-inflammatory medication or eliminate the need for it altogether. In skin conditions, omega-3 fatty acids may help limit the inflammation in diseased areas and reduce itching (Bauer, 1994).

Omega-3 and omega-6 fatty acids have been used as dietary supplements in many studies on dogs and have been shown to improve the skin condition in dogs with atopic dermatitis (Abba et al., 2005). Skin cells are exchanged very rapidly, which is why skin is particularly sensitive to fatty acid deficiencies that cause dry and lacklustre coat, hair loss, and itching, and increase the risk of secondary infections. Recommended treatment doses for skin conditions range from 0.6% to 2% of the daily calorie dose for n-3 acids and up to 4% of the daily calorie intake for n-6 acids.

### Zinc

Zinc is a microelement that plays an important role in the proliferation of skin cells and contributes to the skin healing process. Zinc deficiencies in canine diet lead to various dermatoses. Symptoms include characteristic skin lesions: scales, pustules, and ulcers. In cases of zinc-related conditions, zinc is administered in different forms and at various doses (zinc sulphate – 10 mg/kg; zinc gluconate 10 mg/kg) (Hensel, 2010).

### Vitamin B complex

The vitamin B complex (B1, B2, B6, B12) plays a key role in the metabolism of unsaturated fatty acids from the omega-6 and omega-3 family. Fatty acid supplementation may not be effective since the substances are co-enzymes of many different enzymes that participate in the metabolic processes of polyunsaturated fatty acids. One of B vitamins is biotin. Administered orally, it is transported to sebaceous glands and is subsequently excreted to the surface of the skin. Its presence in the glands partially limits the secretion of sebum and de-

creases skin oiliness, which is particularly beneficial in dogs with seborrhoea (Watson, 1998).

## Conclusion

The nutrition of animals with skin conditions requires administering feed that contains a single source of a rare (elimination diet) or broken down protein (hydrolysed diet), and substances that positively affect skin metabolism (high concentration of n-6 fatty acids, zinc, and the vitamin B complex). However, when deciding to implement such a diet, the owner should also keep one thing in mind: its results may not appear before a few weeks have passed, which requires a lot of patience.

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Product description in VetPharmacy



# Alopecia as a manifestation of skin diseases in dogs: causes, treatments, and analysis of the case studies.

Joanna Karaś-Tęcza, DVM, Dermawet, Dermatological clinic for dogs and cats in Warsaw



Alopecia in dogs is defined as the loss of hair on the skin regions where hair grows. The condition should not be confused with hair thinning (hypotrichosis), which is about a 30% reduction in the physiological number of hairs.

Alopecia and/or hypotrichosis is considered a clinical symptom of many genetic and congenital skin diseases.

As for genetic skin conditions, two factors may induce alopecia: an abnormal formation of hair follicles or a disturbed formation of hair in hair follicles. The pathology begins as early as in the foetal life or after birth; in the latter case, the animal may develop the symptoms up to 3 years of age. In the case of genetic-related hair loss, i.e. after birth, the owner usually cannot identify the problem in the first weeks of life. The manifestation of alopecia occurs later in life, and only then it becomes a concern for the owner. The canine genetic diseases with delayed alopecia include:

- Breed-related dysplasia of hair follicles: for instance, dysplasia of hair follicles in the Lagotto Romagnolo,
- Alopecia X: nowadays, a common problem in the Pomeranian,
- Seasonal flank alopecia: diagnosed, for example, in English bulldogs, Boxers or Salt and Pepper Schnauzers,
- Canine pattern alopecia, typical for dachshunds.

Treatment for genetic alopecia is difficult and can be ineffective. Over the last few years, new therapeutic solutions have emerged, such as melatonin implants, trilostane or fractional puncturing with hyaluronic acid; however, even these therapies are sometimes unsuccessful.

## Acquired alopecia and acquired hypotrichosis

Acquired alopecia or acquired hypotrichosis often involves the destruction of hair follicle structure or disturbance of the hair growth cycle. These conditions are associated with skin diseases of various aetiology. For acquired alopecia, performing a full diagnostic examination and developing a management protocol is necessary to eliminate the underlying cause and restore the normal hair growth cycle. If an incurable disease

(e.g., atopic dermatitis) is diagnosed, the goal is to control the underlying cause. Taking a history from the dog owner is extremely important; collecting information serves to determine the onset of skin lesions and define the presence and nature of pruritus.

Efficacy of dermo-cosmetic products in the management of alopecia: presentation of the trial and results.

The efficacy of Vet Expert's Stimuderm Ultra product line (Stimuderm Ultra shampoo for short-haired dogs, Stimuderm Ultra shampoo for long-haired dogs, and Serum Stimuderm Ultra) was evaluated at Dermawet Dermatology Referral Service for Dogs and Cats. These products contain the ACTIVE NTM™ molecule.

The objective of the trial with the Stimuderm Ultra dermo-cosmetic products was to evaluate the efficacy of the products in patients with alopecia or hypotrichosis secondary to or related to comorbidities.

The time and frequency of baths were the same for all dogs included in the trial, and the serum was applied over the affected areas (alopecia or hypotrichosis) according to the same protocol:

1. The first and second baths at a 5-day interval.
2. Subsequent baths once a week until regrowth of hair was reported; if no improvement was seen, bathing was continued for a maximum of 6 weeks.
3. Application of the serum every 24 hours for 14 days and then every 48 hours for another 14 days; next, the product was applied twice a week to complete the treatment period of 6 weeks in total.

The bathing instruction was simple: after soaking the whole skin and coat with water, the shampoo was applied over the skin until it foamed; then, the haircoat and skin were massaged for at least 5 minutes (recommendation: up to 15 minutes).

It is worth mentioning that the word 'shampoo' comes from Hindu and means 'massage', which highlights how important the application method is for administering local treatments.

The serum was applied over hypotrichosis- or alopecia-affected areas by homogeneous spraying. The study was carried out with 75 patients that were divided into five groups according to the final diagnosis or during a differential diagnostic process.

- Group no. 1: 24 dogs with atopic dermatitis diagnosed according to the 2021-2023 diagnostic specifications. The procedures were performed on patients in remission and with reported excessive hair loss and/or visible alopecia and excoriations.
- Group no. 2: 14 dogs with excoriations and intensive hair loss following completed antibiotic treatment for *Staphylococcus* skin infection.
- Group no. 3: 15 dogs during a differential diagnostic process, with suspected food allergy and clinical alopecia related to pruritus; itchiness in combination with the other clinical symptoms suggested food allergy. Shampoo therapy and a diet with protein hydrolysate were administered for six weeks.
- Group no. 4: 14 dogs with hypothyroidism were diagnosed based on the clinical symptoms and a thyroid profile (TSH, fT4, and T4). Topical therapy was administered together with thyroid hormone supplementation.
- Group no. 5: 8 dogs with diagnosed alopecia X (AX) based on histopathological examination and/or ACTH-stimulated 17-hydroxyprogesterone values (one Chihuahua with oestrogen-dependent progressive skin alopecia was included in the group; the disease was diagnosed based on histopathological examination and medical history).

Test results are provided in the following tables:

Table with Group 1 results

24 dogs – that group involved: Short-haired brachycephalic dogs (12 subjects: pugs and French bulldogs) and long-haired dogs of various breeds (12 subjects).

	Improvement after 2 baths	Improvement only after 4 baths	Improvement only after 6 baths	Improvement only after 8 baths	No improvement
Group 1	1	3	4	1	3
Group 2	0	2	5	1	4

#### Group 2 table

14 dogs of various breeds divided into the following subsets, according to hair length: 1 – short-haired dogs, 2 – long-haired dogs

	Improvement after 2 baths	Improvement only after 4 baths	Improvement only after 6 baths	Improvement only after 8 baths	No improvement
Group 1	2	1	2	1	1
Group 2	0	2	3	0	2

#### Group 3 table

15 dogs of various breeds: eight short-haired dogs, seven long-haired dogs.

	Improvement after 2 baths	Improvement only after 4 baths	Improvement only after 6 baths	Improvement only after 8 baths	No improvement
Group 1	1	3	1	1	2
Group 2	0	1	1	2	3

#### Group 4 table

A group of 14 dogs divided into the following subgroups: Seven short-haired dogs (two Rhodesian ridgebacks, two dachshunds, two American Staffordshire terriers, and one mixed-breed dog), Seven long-haired dogs (including two Gordon setters, two Irish setters, and three mixed-breed dogs).

	Improvement after 2 baths	Improvement only after 4 baths	Improvement only after 6 baths	Improvement only after 8 baths	No improvement
Group 1	0	1	3	2	1
Group 2	0	0	2	2	3

#### Group 5 table

A group of eight dogs including: seven dogs of miniature Spitz, one chihuahua breed dog

	Improvement after 2 baths	Improvement only after 4 baths	Improvement only after 6 baths	Improvement only after 8 baths	No improvement
Group 1	0	0	0	0	0

What kind of ancillary tests have been performed during follow-up visits after subsequent baths to assess the products' efficacy?

1. A trichogram.
2. An assessment involving rolling and stretching the skin under Wood's lamp.
3. A visual clinical examination.

In the case of primary inflammatory alopecia, a veterinarian should take into consideration infectious and immunological skin diseases since, in both cases, hair follicles and/or hair are severely damaged. In both pyoderma and dermatophytosis, severe destruction of hair follicles is also reported; a similar process involves the follicles in alopecia areata or pseudo alopecia areata, i.e., immune-mediated skin diseases.

From the practical point of view, the making of a diagnosis of primary non-inflammatory alopecia reveals that apart from genetic conditions, patients with diseases leading to dysregulation of the hair cycle are most consulted. A group of these diseases includes common endocrinological diseases such as:

- hyperadrenocorticism,
- hypothyroidism,
- hypogonadism.

The mechanisms regulating the hair cycle are disturbed in all of them.

Apart from endocrine diseases, an acquired dysregulation of the hair cycle is also reported in oncological patients with anagen effluvium or telogen effluvium; in these disorders, there are many causes of alopecia (such as stress or diseases accompanied by high body temperature above 40°C).

Moreover, it is worth mentioning the whole group of dermatopathies, e.g., dermatomyositis or post-vaccination dermatopathies, because these diseases are associated with non-inflammatory alopecia and acquired dysregulation of the hair growth cycle. Additionally, the latter phenomenon is also observed in diseases associated with secondary alopecia, which is a result of inflammation and pruritus due to such allergic skin reactions as:

- atopic dermatitis,
- food allergy,
- contact allergy,
- canine allergic dermatitis.

In dogs, hair loss is an effect of many distinct conditions with diverse aetiologies, and therefore, as pruritus is, also alopecia is certainly one of the most common canine conditions referred for dermatological appointments.

Normal regulation of the hair growth cycle depends on the physiological and undisturbed progress of all hair growth phases. In this cycle, anagen is the most active phase. However, the follicle enters this stage provided that there is an active exogen phase, namely active hair loss called moulting when a signal is transmitted to the hair

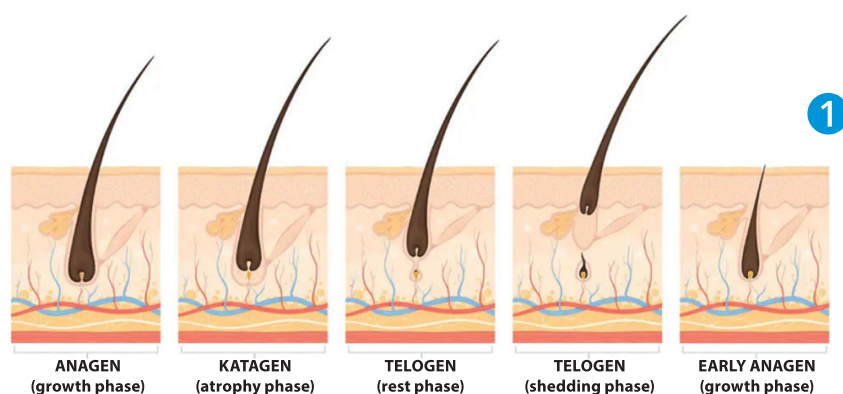


Fig. 1 A simplified diagram – hair growth cycle.



Fig. 2-4 Microscopic image of a dog's hair



follicle via a neurogenic pathway, and the anagen phase is induced.

The normal growth cycle is influenced by many factors, such as oxygen access since the demand for blood supply is extremely high in the hair follicles. Oxygen itself is not sufficient as a high level of the following elements is also required:

- provitamins B3 and zinc,
- unsaturated omega-3 and omega-6 fatty acids.

Apart from treating the underlying cause of the disease associated with alopecia, stimulating the regrowth of beautiful and healthy haircoat requires inducing and prolonging the anagen phase, improving microcirculation in the hair follicles and dermis, and it is also essential to use anti-inflammatory products and formulations which strengthen the hair follicles. To achieve these effects, it is worth including the innovative Active NTM™ molecules in the topical treatment; these molecules perfectly fit into the requirements and management, being a carrier of provitamin B3 at the same time.

### Feedback from the dog owners (excluding group 5)

As early as after two baths and with no visible hair growth over alopecic areas, the owners of the short-haired dogs emphasized that hair was better embedded in the hairy skin.

Regardless of the treatment effects at alopecic sites, the owners of the long-haired dogs pointed out better hair quality and reduced hair loss at home. During the treatment with the shampoo and serum, the following tests were performed on the investigated patients while they were participating in the clinical study:

- trichogram,
- brushing test
- a comparative analysis of hair embedment at the border of alopecia and the area with hair regrowth,
- a comparison of the size of alopecia in correlation with the number of baths.

Trichogram was performed before the treatment and after 14 and 21 days. The objective of rolling and stretching the skin under the Wood's lamp was to assess hair embedment before the treatment and after 14 and 21 days.

Then, a visual clinical examination with complete photographic documentation was performed.

The paper features marketing content.

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## Summary and conclusions

While assessing the efficacy of the Stimuderm Ultra dermo-cosmetics line, it is worth emphasizing that the serum or shampoo therapy is implemented when the complications have been successfully treated and pruritus management has been started in atopic dermatitis, a superficial skin fungal infection has been eliminated or after treating various forms of pyoderma, regardless of managing the primary disease.

It is worth considering implementing the Stimuderm product line in atopy management since each form of hydrotherapy favourably affects the skin and hair follicles (but not every shampoo stimulates hair growth).

In patients with hypothyroidism and resulting issues with disturbed hair growth cycle (the so-called "follicular arrest"), the ACTIVE NTM™ molecule in the Stimuderm Ultra range may turn out to be a perfect choice for topical therapy.

An innovative line of Stimuderm Ultra dermo-cosmetics will probably be a more common choice for topical treatment not only in patients with atopy, pyoderma, or hypothyroidism but also for managing less frequent diseases which negatively impact the hair growth cycle and are discussed by the author in the paper.

### EFFICACY OF STIMUDERM ULTRA SKIN THERAPY CONFIRMED IN VETERINARY STUDIES

After eight baths with the shampoo and a regular application of the serum, a visible improvement of hair regrowth has been confirmed respectively in:

71% of dogs – TREATMENT GROUP: alopecia caused by atopic dermatitis.

79% of dogs – TREATMENT GROUP: excoriations caused by *Staphylococcus*.

67% of dogs - TREATMENT GROUP: alopecia caused by hypothyroidism.

71% of dogs - TREATMENT GROUP: alopecia caused by food allergy.

0% of dogs - TREATMENT GROUP: with diagnosed alopecia X.

The study was performed with 75 dogs by J. Karaś-Tęcza, DVM.



Fig. 5-10 The photographs were taken as a part of the studies performed by J. Karaś-Tęcza, DVM, with the selected patients (with atopic dermatitis, food intolerance, and hormonal disturbances). The images show the condition of the haircoat before, during and upon completion of skin therapy with the STIMUDERM ULTRA product line.

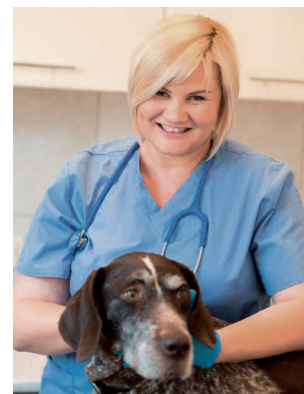


Product description in VetPharmacy



# Field study on the application of Veterinary Diet Dermatitis Dog as an elimination diet in dogs with food allergy

**Dorota Pomorska-Handwerker**, DVM, PhD; **Aneta Birszel**, DVM; **Katarzyna Sikora**, DVM, Lublin  
Veterinary Polyclinic SC



## Introduction

Food allergy and food intolerance is an adverse reaction of the organism against food or food additives. Food allergy is responsible for about 1 to 6% of total dermatology cases and about 10 to 15% of allergic dermatitis cases in dogs and cats (1, 2, 3). The characteristic feature of food allergy is the phenomenon of sensitisation to allergens contained in food (trophoallergens). Food allergic dogs might show extra oversensitivity to environmental allergens (atopic dermatitis) and other allergens (flea allergy dermatitis, FAD) (12, 13). The disease usually becomes symptomatic between 6th month and 4th year of age, although it can affect animals of all ages, from puppies to old dogs, being fed the same food for a long time (4, 5). About 30% of patients diagnosed with food oversensitivity were less than one year old (5). There are no sexual or breed predilections (5, 8). Food allergy is constant, which means that clinical symptoms are present all year round, with flares and remission periods. The symptom of the disease is a non-seasonal pruritus that may not respond to the glucocorticosteroids. The pruritus might be local or generalised. The clinical symptoms are usually present in the facial area, internal side of pinnae and external auditory canal, neck, interdigital spaces, axillae, groins and perineal area (14, 15). The first visible symptoms are erythema and papules, but the presence of pruritus quickly leads to self-mutilation in the form of alopecia, excoriations, crusts and lichenification. Complications set in very quickly, usually pyoderma or Malassezia dermatitis. In some patients the pruritus is milder, and the only symptoms are recurring superficial pyoderma and/or recurring otitis externa. The pruritus always becomes stronger in secondary infections (1, 2, 3). About 20% of patients might have gastrointestinal symptoms like frequent defecation, gases, diarrhoea and occasional vomiting (8, 9, 10).

The obligatory item on the differential diagnosis list is atopic dermatitis. It is worth stressing that presently many dogs show oversensitivity to both environmental and food allergens (12, 13). Therefore, in the case of any dog diagnosed with atopic dermatitis,

food allergy has to be confirmed or excluded by a proper elimination diet (6, 7). Other items on the differential diagnosis list are diseases accompanied by pruritus: scabies, cheyletiellosis, lice, louse, folliculitis (mycosis, demodecosis) and other oversensitivities (contact allergy, flea allergy) (5,6).



photo: Dorota Pomorska-Handwerker

The diagnosis of food allergy is based on history, results of clinical examination and the results of the prior treatment (1, 2, 3).

Intradermal tests and serological tests for food oversensitivity are frequently non-diagnostic and are rarely recommended because of their unreliable results. This is why the only gold standard in food allergy diagnostics is a food test with an elimination diet (6, 10, 11). Such test consists in feeding the animal suspected of a food allergy with new foods, ones the animal has not eaten before. The diet of such animal should not contain food previously fed to the animal or treats, leftovers of the owners' food, flavoured dewormers (and other flavoured pills), flavoured drugs, food supplements or chewing treats. The most common food allergens in Poland are chicken, beef, eggs, dairy and wheat. The elimination diet can be prepared at home by the owner, but there are also commercially available ready diets with one protein and one carbohydrate source, or diets based on hydrolysed protein. Such diet should be observed for at least eight weeks, or as long as 12 weeks (8, 9, 10)

## The aim of the study

The aim of the study was to evaluate the efficiency of Veterinary Diet Dermatitis Dog with salmon as the only protein source as an elimination diet in diagnostics and treatment of dogs with food allergy or intolerance.

## Materials and methods

12 dogs of different breeds, both sexes (six females, six males), between one and four years of age, with bodyweight from 4 to 38 kg, were qualified for the study. The qualified patients are characterised in Table No. 1. All dogs showed allergy symptoms. The diagnosis was based on history, typical clinical symptoms and exclusion of other skin diseases and their complications. All dogs had intradermal skin tests performed against environmental allergens, and the results of the tests were negative. Before the beginning of the study, other skin diseases were excluded (parasitic diseases, mycosis, etc.); complications of food allergy, such as pyoderma or Malassezia dermatitis have been treated as well. In the course of the study (eight weeks) the dogs were fed with Veterinary Diet Dermatitis Dog elimination date only, in doses appropriate for bodyweight of individual dogs. The owners of the animals received the diet free of charge in the amount sufficient for a given dog for eight weeks. The diet was given to the owners every two weeks during follow-up dermatology tests. The owners were notified by phone about the date of a next follow-up visit. During the study the dogs were not receiving any drugs and/or supplements. Topical treatment or therapeutic baths were not performed. The only allowed treatment was flea and tick prevention. The study lasted eight weeks.

The dogs were dermatologically tested five times: on day 0 (before the start of the study) and on days 14, 28, 42 and 56. During every dermatology test, a survey was filled in (patient's file, one for each patient, covering all of the tests) to evaluate skin lesions according to CADESI 04 (Canine Atopic Dermatitis Extent and Severity Index). CADESI is an index used to evaluate skin lesions in



a topic dermatitis/food allergy. The following dermatological symptoms were evaluated: erythema, lichenification, rubs and alopecia patches in particular body areas. The evaluated body areas were: lip area, pinnae, elbow area, digits of front and back limbs, metacarpal and palmar area, the eye of the elbow, flanks, inguinal area, abdomen, perineum and ventral part of the tail. The severity of each lesion in each area was evaluated according to the following scale: 0 – no lesions, 1 – mild lesions, 2 – moderate lesions, 3 – severe lesions. The final step was to sum up the points for every test day.



photo: Dorota Pomorska-Handwerker

## Results of the study

At the beginning of the study (day 0), CADESI in the tested dogs ranged between 37 to 131 (mean value: 83.08). After 14 days, CADESI ranged from 28 to 104 (mean value: 75.00). After four weeks of feeding the dogs with the diet (day 28), CADESI ranged from 18 to 102 (mean value: 60.08). On day 42 the index value was from 23 to 102 (mean value: 54.42), and continued to drop to reach the values from 21 to 102 (mean value: 49.83) on the last day of the study (day 56). The standard deviation on particular test days was: 32.95; 25.95; 29.38; 27.14 and 24.55, respectively. The CADESI values on particular test days are presented in Table 2. Table 3 shows the mean values and standard deviations on particular test days.

## Discussion and conclusions.

The present study evaluated the effectiveness of Veterinary Diet Dermatitis Dog in dogs with mild and moderate skin lesions. Dogs with severe lesions resulting from pruritic complications require a topical and systemic treatment. In such cases the treatment limited to diet only would not give any clinical results. On day 0 of the study, the CADESI value in the studied dogs ranged from 37 (mild lesions) to 131 (moderate lesions). The maximum number of points that can be reached in CADESI index is 180. The symptoms observed in dogs included in this study were limited to erythema and rubs, without lichenification or alopecia that are a result of chronic lesions. On particular test days, the mean value of the CADESI index decreased from 83.08 on the first day to 49.83 on the last day of the study. Figure 1 shows a graphic representation of mean CADESI values on particular test days. The gradual decrease of CADESI value on particular test days was found in 10 dogs. The same dogs showed a considerable clinical improvement. In two dogs (dog number 3: golden retriever, and dog number 7: German Shepherd), the CADESI value remained constant, the lesions in these dogs did not disappear, but did not worsen either. In 10 dogs on the 56th day of the study the only lesions that were found were mild or moderate erythema; in two dogs, moderate erythema and mild excoriations were found. In the case of 10 dogs that reacted well to the diet, the CADESI value on day zero was 81.20; day 14 – 70.12, on day 28 – 52.60; on day 42 – 45.40, and on day 56 – 43.00. It is worth stressing that the differences between day zero and 42 and between day zero and 56 were statistically significant.

The recommendations of the International Committee on Allergic Diseases of



photo: Dorota Pomorska-Handwerker

Animals (ICADA) published in 2010 and updated, point to the fact that food allergy (known also as adverse food reaction) is a purely aetiological diagnosis. The most frequently described dermatological symptoms in dogs include a localised, multifocal or generalised pruritus, otitis externa, seborrhoea, superficial dermatitis and, in some cases, atopic dermatitis. These symptoms can be accompanied by gastrointestinal ones (12). Atopic dermatitis, being also an aetiological diagnosis, might be flared after exposure to environmental allergens and food allergens. ICADA presented an idea that food allergies might manifest as atopic dermatitis; in other words, food components might cause the recurrence and flaring up of atopic dermatitis in dogs sensitive to such allergens. In clinical practice, food allergy in some dogs might have the same cause as atopic dermatitis; however, not every dog with food allergy would suffer from AD. ICADA recommends to run one or more elimination diets in every dog with non-seasonal pruritus and/or atopic dermatitis, in order to evaluate which food components might cause the lesions to recur (13).

Tab. 1. Dogs qualified for the study

No.	breed	age	sex	body weight
1	German Shepherd	3	female	38
2	Labrador	2	male	34
3	Golden retriever	1	female	29
4	WHWT	3	female	10
5	Labrador	2	male	35
6	Yorkshire terrier	3	male	4
7	German Shepherd	4	male	34
8	Yorkshire terrier	1	female	3
9	Beagle	2	male	17
10	Beagle	2	male	16
11	Shar-pei	3	female	21
12	WHWT	3	female	9

Based on the above-mentioned results of the field study on the application of Veterinary Diet Dermatitis Dog, it can be concluded that this diet, with salmon as the only protein source, might be successfully used in diagnosing treatment and prevention of recurrent food allergies and atopic dermatitis in dogs.



photo: Dorota Pomorska-Handwerker

An article in the Polish version has been published in issue 4/2016 of "Veterinary Practice"

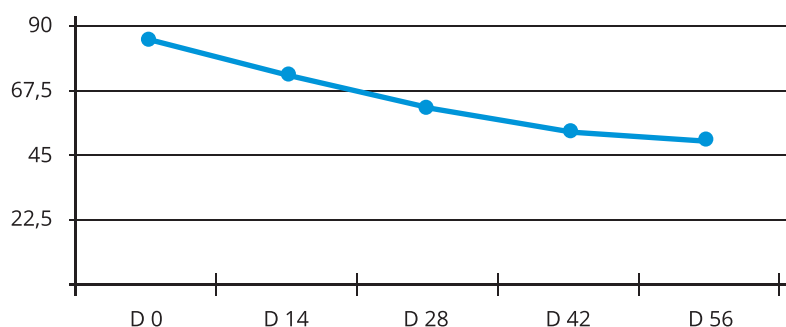
Table 2. CADESI values on particular test days (0, 14, 28, 42, 56)

No.	breed	D 0	D 14	D 28	D 42	D 56
1	ON	131	104	102	68	73
2	LABR	62	62	41	33	35
3	GR	92	94	95	102	102
4	WHWT	81	71	60	52	48
5	LABR	153	114	85	76	70
6	YORK	76	53	46	34	28
7	ON	93	105	100	97	94
8	YORK	90	89	64	66	66
9	BEAGLE	37	28	18	23	17
10	BEAGLE	52	60	29	29	29
11	SHAR P	77	65	51	43	43
12	WHWT	53	55	30	30	21

Table 3. Mean value and standard deviation result on particular test days.

No.	D 0	D 14	D 28	D 42	D 56
Mean value	83,08	75,00	60,08	54,42	49,83
Standard deviation	32,95	25,95	29,38	27,14	24,55
Error	9,511	7,498	8,480	7,835	7,087

### CADESI



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Product description in VetPharmacy



# The effect of an ear powder on clinical signs in canine with otitis externa.

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Conflict of Interest

Omnidea AB provided partial funding for the research project to EVIDENSIA, Djursjukhuset Karlstad, Sweden.

## ABSTRACT

**Background:** Antibiotic resistance is a serious and growing problem, in particular when it comes to pathogenic organisms. One of the most common ailments affecting the canine population is otitis externa and the main bacterium implicated in otitis externa is *Staphylococcus Pseudintermedius*, which has been shown to be resistant to antibiotics. It has also been reported that *Pseudintermedius* is zoonotic, which may pose public health concerns. It would therefore be desirable to find a prophylaxis for otitis externa that both the dog and owner finds convenient and easy to use. What we wanted to investigate in this study was whether there is a way to inhibit the overgrowth of microorganisms without pharmaceutical compounds and by doing so limit the risk of future ear problems.

**Objectives:** The hypothesis assumed that by administering a powder in canine ears, consisting of an organic acid, absorbents of moisture and fat, and specific sugars, clinical signs of otitis externa will decrease. This would implicate that there has been an inhibition of microbial overgrowth. Additionally, we investigated the convenience of using a powder in regard to dogs and their owners.

**Methods:** 17 privately owned dogs with clear clinical signs of otitis externa of different severity were randomized into two groups and were treated with an ear powder for 14 days. Clinical signs were determined before and after treatment on day one and 14 by two veterinarians.

**Results:** A significant decrease in overall clinical signs was observed in the study ( $p < 0.05$ ). Out of the 17 dogs participating in the study 76% showed an overall improvement. Foul odor, pruritus, head shaking and excessive accumulation of lipid/wax were significantly reduced ( $p < 0.05$ ). The powder was well tolerated and well accepted by the dogs and their owners. No adverse side effects were observed. All dogs enrolled completed the study.

**Results:** The use of the powder is a safe and an effective measure to reduce clinical signs of otitis externa. No buildup of powder in the ear canal was reported and all dogs enrolled completed the study. The administration of the powder was well accepted by the dogs and the compliance was 100 percent. This powder may provide an alternative therapeutical and prophylactic approach to lower the risk of overgrowth of microorganisms that can cause ear infection.

## INTRODUCTION

Ear problems in dogs are a common ailment that affects an estimated 15-20 percent of total canine population.<sup>1</sup> Clinical signs of otitis externa are foul odor, pruritus, head shaking, lipid/wax depositions and erythema. Clinicians must consider the underlying mechanism responsible for otitis externa when examining dogs with ear problems. There are primary causes, perpetuating and predisposing factors that will decide the therapy for ear disease.<sup>1</sup> Primary causes of otitis externa could be parasites, hypersensitivity, keratinization disorders and autoimmune diseases. These conditions are responsible for altering the environment in the ear canal to allow for abnormal colonization of microorganisms.

Perpetuating factors include bacteria (primarily *Staphylococcus* spp. and *Pseudomonas* spp.), yeasts (primarily *Malassezia* spp.) and pathologic changes, such as glandular hyperplasia, epithelial folds, neoplasia, edema, mineralization, and fibrosis. Predisposing factors are pendulous pinnae, excessive wax production, high humidity, stenosis and hair in the ears. Alterations in normal microflora in the ear and skin may play a role as predisposing factors in allowing the overgrowth of *Malassezia* organisms.<sup>2</sup> *Malassezia Pachydermatis* is a common commensal lipophilic yeast of the anal sacs, anus, auditory canal, and skin of dogs.

*Malassezia* may be found on the skin in as many as 50 percent of healthy dogs and is a common etiological agent in otitis

externa.<sup>3</sup> It has been reported that *Malassezia Pachydermatis* can cause nosocomial infection in humans.<sup>12</sup> Factors favoring its growth include abnormal levels of ceruminous lipids, high humidity, and abnormal cell-mediated immunity. Another prerequisite for optimal growth is a pH in the range of five to eight with a marginal to null growth around pH 3.4 *Staphylococcus Pseudintermedius* is a common commensal of oral, nasal, and skin flora in healthy dogs, where it can also cause invasive disease. In humans, it is recognized as an invasive zoonotic pathogen and has been isolated from 18% of canine-inflicted wounds.<sup>5</sup> *Pseudintermedius* species has been shown to be resistant to antibiotics which is a cause of concern to public health.<sup>6</sup> The optimal pH

level for growth is between 7 and 7.5. At pH 5 the growth will be inhibited and under pH 4 it will not grow. It has also been reported that *Staphylococcus* is a biofilm producer at certain pH levels. The capability to produce biofilm is inhibited at pH 3.7. The concerned microorganisms are sensitive to changes in the physical environment in the ear. Moisture, lipid levels and pH changes can significantly change optimal growth conditions and disturb colonization.

Treatment and prophylaxis therapy for otitis externa typically involve careful cleaning of the auditory canal with liquid ear cleaners. By removal of lipid substrates the necessary conditions for growth and reproduction of the organisms are eliminated. There are numerous ear cleaners commercially available containing a variety of ingredients, such as alcohols, organic acids, propylene glycol, various peroxides and detergents all in liquid preparations. However, liquid preparations have some disadvantages as dogs may resist liquids in the ear.

The authors wanted to investigate whether a powder containing lactic acid, kaolin, lactose, L-fucose and HMO (Human Milk Oligosaccharides) could have an effect on clinical signs of otitis externa as well as to evaluate the acceptance by dogs when receiving powder in the ears.

It has been demonstrated in numerous papers that by lowering pH with organic acids the microbial growth will be inhibited. This effect is at its highest when there is a maximum of dissociated acid. The proportion of dissociated and undissociated acid is equal when the pH is equivalent to the pKa.<sup>8</sup> L-Fucose and HMO are special sugars that in certain cases can connect to lectins on bacteria and by doing so inhibit the adhesion to cells. It has been shown that Fucose and Galactose has an antiadhesive property on *P.*

*Aeruginosa* in humans.<sup>9</sup> Further L-Fucose has been shown to have wound healing properties by modification of dermal fibroblasts thru collagen biosynthesis.<sup>10</sup> HMO may also modulate epithelial and immune cell responses.<sup>11</sup>

The authors have no intention to show that the application of a powder is a treatment in the pharmaceutical sense, rather a prophylaxis for ear infection by controlling the microbial overgrowth.

## MATERIALS AND METHODS

The study was designed to make the participants their own controls. In the design of the study it was decided that swabbing would not be used as the quantification using swabbing may pose difficulties and uncertainty when it comes to the evaluation of the results.

Rather a more broad approach was chosen where clinical signs of otitis externa would serve as a sign of microbial

overgrowth. The use of clinical signs of otitis externa is a well established diagnostic tool in the initial phase of an examination.

The participants were randomized and divided into two groups each with a dedicated veterinarian. On day one all participants met with a veterinarian at the clinic for an initial examination. Each clinician examined the dogs by ocular exam and graded the clinical sign on a scale from zero to five. Where zero is no clinical sign and five is a severe clinical sign, although not serious enough to be treated with pharmaceuticals.

To be included in the study the patient had to be exhibiting at least one clinical sign of pruritus, head shaking, foul odor, excessive lipid/wax buildup or erythema. Patient with a more severe manifestation of clinical signs with a grade exceeding 5 of the clinical sign scale were excluded from participating in the study.

After the initial examination the veterinarian showed the participant how to give the powder by administering the first dose. The dose given was adapted to the size of the ear of the specific dog.

The participants were given a canister with the powder and a measuring spoon together with a report card. They were asked to give one dose once per day for the following four days and one dose on day nine and 13. They were also asked to make comments on the report card of their observations from day two to day 13.

On day 14 the participants came back to the clinic and were once again examined by



photo: Justyna Ciechańska

External auditory canal dog



photo: Justyna Ciechańska

Ear canal after OTICURANT application

the same veterinarian that did the first examination. The veterinarian then conducted a final grading of the clinical signs.

Twenty privately owned dogs with documented clinical signs for otitis externa were enrolled in the study. The total amount of ears examined was 32. Three participants did not follow the protocol and were therefore excluded from the final report. Of the 17 dogs that completed the study 10 were



Dog's ear canal after OTICURANT treatment

photo: Justyna Ciechańska



males and 7 females with an age of 2 to 13 years. Of the 17 dogs 13 had a previous history of ear problems, 10 of them in the last 12 months.

The results below are in the case of odor, excessive accumulation of lipid/wax and erythema based on individual ears ( $n=32$ ).

### STATISTICAL ANALYSIS

Two-tailed paired t-test was used to compare results from visit one and two. A level of  $P < 0.05$  was used to indicate a statistically significant difference.

### RESULTS

A significant decrease in overall clinical signs was observed in the study ( $p<0,05$ ). Out of the 17 dogs participating in the study 76% showed an overall improvement.

Pruritus and Head Shaking were both significantly better ( $p<0,05$ ). For 13 dogs out of 17 with pruritus the average clinical sign grade at the initial examination was 2,7 and at the final examination 0,7 and for head shaking it went from 2,7 to 0,4.

Excessive accumulation of lipid/wax was significantly reduced ( $p<0,05$ ). The average clinical sign grade for 23 ears of 32 went from an average of 3,0 to 1,3.

Foul odor was also significantly reduced ( $p<0,05$ ) where 13 ears had an average clinical grade of 2,3 at the initial grading and 0,8 at the final examination. Of the 32 ears 6 did not have any odor at the beginning or the end of the study. Another 6 ears had no odor in the beginning but all received grade 1 on day 14.

At the same time these 6 ears all had gone from grade 3 in pruritus to grade 0 and from 2, 4 and 3 to 0, 0, 1 in shaking head.

There was no significant change in the clinical sign grades for erythema although 50 % of the ears improved. 37 % showed a slight worsening. The rest were unchanged.

The powder was well tolerated and no adverse side effects were observed. No obstruction of the powder in the ear canal was reported. The dog owners reported that it was easy and convenient to administer the powder, as the dogs did not resist when given the daily dose.

All dogs enrolled completed the study.

### DISCUSSION

To the authors' knowledge, there are no published reports on the use of an ear powder in dogs with otitis externa. The primary objectives of this study were to evaluate the powder and its effect on clinical signs of otitis externa and the acceptance by the participating dogs in respect to receiving a powder in the ear.

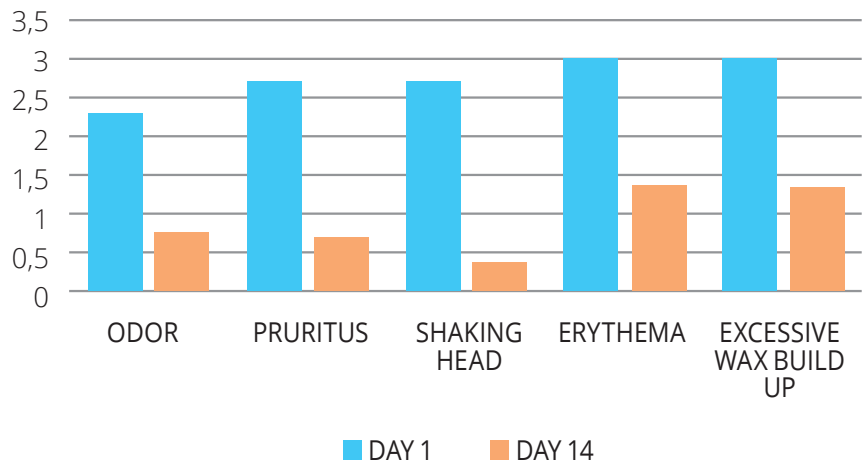
All clinical signs except erythema were significantly improved in this study. We cannot explain why erythema alone did not significantly improve as the rest did. It may



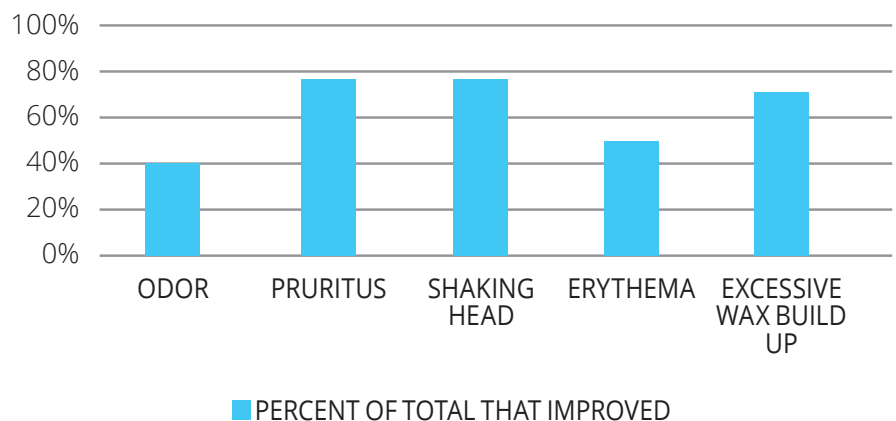
The correct appearance of the ear canal after OTICURANT treatment

photo: Justyna Ciechańska

### AVERAGE CHANGE IN CLINICAL SIGN GRADE FOR THOSE PARTICIPANTS THAT IMPROVED



### PERCENT OF TOTAL POPULATION THAT IMPROVED



be that the duration of the study was too short. It could be of interest to look further into this by conducting a study with a longer duration.

It is clear that the powder have physical properties that absorb moisture, lipids and lowers pH below 4. The powder is composed of several different components, none of them can be considered an active ingredient alone but the combination obviously have an additive effect on the clinical signs studied and as stipulated an effect on microbial growth.

## LACTIC ACID

Lactic acid is natural organic acid that has a quick onset as it dissolves rapidly in water. The pH for the powder dissolved in water is just below 4, which is equivalent to lactic acids pKa of 3,86. This will give the maximum inhibitory effect on microorganisms. Lactic acid is highly hygroscopic as well; giving an additive effect to lactose and kaolin that are the two main absorbents of moisture and lipids in the formulation.

## KAOLIN AND LACTOSE

Some lipid dependent *Malassezia* species have been isolated in canine ears but the most common yeast is *M. pachydermatis*. For this yeast lipids is not essential for growth although needed for a rapid growth.<sup>12</sup> Kaolin and Lactose are two effective absorbent of lipids and moisture keeping available lipids at a minimum. Both ingredients are highly hygroscopic substances that dry out the humid ear canal removing the moisture necessary for *Malassezia* to function.

## L-FUCOSE AND HMO

The scope of the study was to evaluate clinical signs not separate ingredients. Having said that, based on the literature it could be of interest to conduct further studies with the objective to evaluate these sugars role in inhibiting microbial growth.

## EXCESSIVE LIPID/WAX DEPOSITS

A surprising finding in the study was the significant lowering of excessive lipid/wax deposits. During the study period the participants were not allowed to clean the ears of their dogs. When considering that the powder was poured into the ear it may be expected that excess powder would accumulate in the ear. This was not the case in this study.

Actually the opposite was true as ears were significant cleaner ( $p < 0,05$ ) at the end of the study than on day one.

It was considered whether Epithelial Migration (EM) could be the answer to the significant result. EM is the self-cleaning mechanism of the ear canal as well as the tympanic membrane. Although difficult to measure, several studies have tried to evaluate the EM rate. One study report EM rates on the tympanic membrane between 96.4

( $\pm 43.1$ )  $\mu\text{m}/\text{day}$  and 225.4 ( $\pm 128.1$ )  $\mu\text{m}/\text{day}$  in healthy dogs.<sup>13</sup> There are other studies reporting similar results. In this study the participants all showed clinical signs of otitis externa. It has been speculated that otitis externa may obstruct the EM.<sup>14</sup> Considering that this study only lasted 14 days the EM does not explain why the study population had significant cleaner ears.

## PHYSICAL ACTION

Once the ingredients in the powder come in contact with a moist surface it will directly dissolve and cling to the moist surface. When the powder has saturated the surface the rest of the powder will be free flowing and the superfluous powder may fly out. It has been noted ex vivo that the powder initially absorbs moisture and fatty substances and subsequently after the moisture evaporate building flakes that have a tendency to fall off.

This may be an explanation to cleaner ears. However this must be studied in a canine population.

## COMMENTS FROM DOG OWNERS

On the report cards filled out by dog owners several commented on the ease of using the powder unlike any liquid earlier used. Their dogs did not resist when they applied the powder, which resulted in 100 percent compliance. Some of the participants reported improvement in clinical signs after three to five days.

## CONCLUSION

The use of the powder is a safe and an effective measure to reduce clinical signs of otitis externa. The powder was well tolerated and no adverse side effects were observed.

No buildup of powder in the ear canal was reported and all dogs enrolled completed the study. The administration of the powder was well accepted by the dogs and the compliance was 100 percent. This powder may provide an alternative therapeutical and prophylactic approach to lower the risk of microbial overgrowth that can cause ear infection.

## ACKNOWLEDGEMENT

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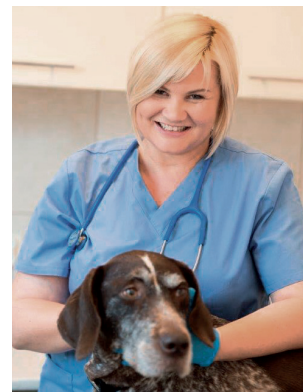


Product description in VetPharmacy



# Pilot clinical trial on the VetoSkin preparation in dogs with atopic dermatitis

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Essential unsaturated fatty acids (n3 and n6) have been widely used in the treatment of atopic dermatitis for more than 25 years. Their clinical significance has so far been proved in about twenty studies (1-3). Currently, essential unsaturated fatty acids are widely used in the treatment of atopic dermatitis in dogs (7,9). They inhibit the synthesis of LBT4 by re-balancing the hydrolipid barrier on the whole surface of the dog's skin. Polyunsaturated fatty acids are components of cell membranes; their oxidation contributes to the formation of prostaglandins and leukotrienes, two eicosanoids which take part in the development of inflammatory conditions. Both the eicosapentaenoic and gamma-linolenic acids (omega-3 and omega-6 respectively) participate in the metabolism of arachidonic acid by competing with the same enzymes, and thus reduce the production of inflammatory eicosanoids (e.g. PGE2, PGI1, LTb4). This, in turn, favours the production of anti-inflammatory eicosanoids such as PGE1, PGE3 or LT5. Eicosapentaenoic acid can be found in oil obtained from some fish and the highest concentration of gamma-linolenic acid is in oils from evening primrose and borage (4,5,7).

Preparations containing essential unsaturated fatty acids combined with other substances, such as vitamins, minerals or cofactors have been a relatively new area and further experiments are needed to evaluate their effectiveness (7,8). Many producers believe that the right combination of a few substances will maximize their efficiency (7). So far, however, there are no studies concerning those types of products. So far, no studies which would confirm the efficiency have been presented. In one study involving a double-blind trial the product containing

polyunsaturated fatty acids and cofactors proved less effective than a product without cofactors (10). However, further research is needed.

The analysed Vetoskin preparation contains omega-3 and omega-6 acids as well as B vitamins, biotin and zinc. B vitamins are constantly synthesized by the intestinal flora but as they are water-soluble they are not stored in the body. Therefore, they have to be continuously supplied. Deficiency in group-B vitamins may lead to skin conditions. Such conditions, however, are not very specific and other diseases should be taken into consideration in the process of differential diagnosis. Clinical symptoms of a B-group vitamin deficiency include dull hair, dry seborrhea and hair-loss on some facial areas. Vitamin B (pyridoxine) takes part in the metabolism of many nutrients related to the normal functioning of hair and skin, such as the transformation of linoleic acid into arachidonic acid, methionine into cysteine and tryptophan into niacin (vit. PP). It also participates in the synthesis of picolinic acid, crucial for zinc to penetrate the intestinal mucosa (7,8).

Zinc is an integral part of many metallo-enzymes which participate in regulating the metabolism. It is an important cofactor for the RNA and DNA polymerases and particularly important for fast dividing cells, such as those of the epidermis. Zinc is essential for the biosynthesis of fatty acids and takes part in the metabolism of vitamin A. Zinc plays a crucial role in ensuring the normal functions of the immune system and is also present in inflammatory reactions. The dermatological symptoms of zinc deficiency include a slow healing of wounds, local erythema, patches of hair-loss, crust and desquamation. The

above-mentioned lesions usually occur in places prone to injuries, such as skin-membrane connections, distal parts of the body and fingertips. Fur becomes dull, and bacterial and fungal infections occur. However, diet-related zinc deficiency is infrequent (7).

Biotin (vitamins H and B7) is a co-enzyme of a few various enzymes. It is an essential component of biotin-dependent carboxylases. Carboxylases are enzymes which are vital for many important biochemical reactions, for example in the process of the formation of glucose (gluconeogenesis), the synthesis of fatty acids or the cycle of citric acid. Biotin supports the normal functions of the thyroid gland and contributes to the normal functioning of the skin and hair. Symptoms of biotin deficiency include dermatitis, urticarial and hair-loss. Other systemic manifestations may include an elevated level of cholesterol and inflammatory lesions in the bowels. As biotin can be synthesized by the intestinal flora, deficiency occurs very rarely and is usually caused by other than nutritional factors. Biotin deficiency happens during a prolonged antibiotic therapy which is often prescribed in the treatment of post-atopic dermatitis bacterial infections (phlegmon) (1,7,9).

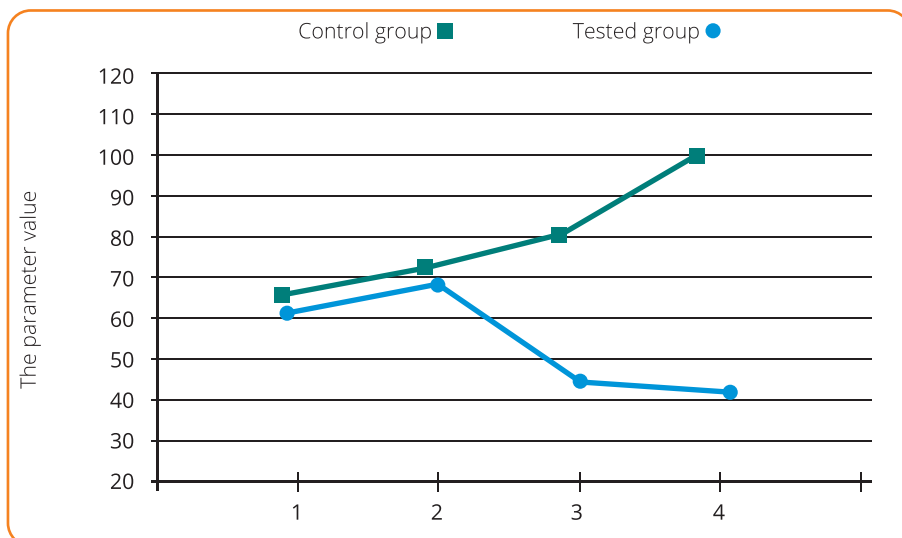
## Material and methods

The study was carried out on 20 dogs included in the study group (group I) and 10 dogs qualified to control group (group II). All dogs had atopic dermatitis. The diagnosis of atopic dermatitis was performed on the animals from both groups based on the diagnostic criteria of Claude Favrot (12,13) and intradermic tests (Agroskin RTU 20; Agrolabo). Additionally, before carrying out the intradermic test, all dogs were subject to ra-

Tab.1. Median absolute deviations (95% of confidence intervals) for the value of the parameter in both groups in successive time points.

Group	Day 0.	Day 30.	Day 60.	Day 90.
Study (n = 20)	62,3 ± 1,9 (95% CI: 58,5-66,1)	69,1 ± 2,4 (95% CI: 64,2-74,0)	42,6 ± 2,6 (95% CI: 37,2-48,0)	40,8 ± 2,6 (95% CI: 35,5-46,0)
Control (n = 10)	66 ± 2,6 (95% CI: 60,6-71,4)	71,6 ± 3,4 (95% CI: 64,6-78,6)	80,0 ± 3,7 (95% CI: 72,4-87,6)	100,0 ± 3,6 (95% CI: 92,6-107,4)
P value in the Tukey's test	0,994	0,999	<0,001	<0,001

Graph. 1. Means (95% of confidence intervals) for the value of the parameter in successive time points.



pid diagnostic tests to assess the total number of IgE antibodies (VetExpert). The tests gave positive results in all cases. The intradermic tests were conducted at least 3 months before the animals were qualified for the study. All the dogs were found sensitive to many all-year allergens. Dogs with seasonal allergies were not included in the study.

In all dogs from both groups the symptoms of atopic dermatitis of varied intensity had been present for the whole year. The study group consisted of dogs aged 2-6 years (the average of 4.2 years), 10 females, including 4 spayed, and 10 males, including 5 castrated ones. The dogs represented different breeds, 5 Labradors, 5 mongrels, 3 West-highland white terriers, 3 Beagles, 3 German shepherds and 1 Dachshund and their body weight ranged from 10 to 30 kg. The control group consisted of 10 dogs aged 3-6 years (the average of 5 years), 5 females, including 4 spayed ones, and 5 males, including 3 castrated ones. The dogs represented different breeds, 2 Labradors, 3 mongrels, 2 West-highland white terriers and 3 German shepherds of body weight ranging from 10 to 40 kg. Food allergies were excluded in all dogs by using hydrolyzed elimination diet for at least 12 weeks. Throughout the study all dogs from both groups followed the same diet (Hypoallergenic® Royal Canin). The dogs did not undergo allergen immunotherapies. During the three-month study the dogs did not receive anti-inflammatory drugs, glucocorticoids, antibiotics, antihistamines or cyclosporine.

Animals from the study group received VetoSkin® containing B-group vitamins (B1, B2, B6 and B12), NNKT-Omega-3/Omega-6, biotin and zinc. The product was administered to the dogs by their owners at home for 12 consecutive weeks (90 days/3 months) in March, April and May. The dosage of the product was determined based on the animal's body weight and was as follows: 1 capsule of VetoSkin® for every 10 kg of body weight. The capsules could be administered in whole or,

as they are twist-off type, it was also possible to only give the content. Dogs from the control group did not receive VetoSkin®.

All dogs underwent dermatological examinations four times on the following days: 0, 30th, 60th and 90th. The intensification of lesions was assessed by using the CADESI 03 system. The levels of erythema, lichen, skin abrasion and hair-loss caused by self-mutilation in 62 areas of the body were analyzed. The following point-scale was used to assess the lesions: 0-no lesions, 1 – mild lesions, 2,3 – moderate lesions and 4,5 – considerable lesions. All dogs were in remission from the disease and mild to moderate intensity of the symptoms of atopic dermatitis were observed. On the 0 day the dogs scored up to 84 points in the CADESI system.

Additionally, the intensity of pruritus in the PVAS (Pruritus Visual Analog Scale) 5-stage scale was measured. The criteria defining pruritus used in the study were according to Marselli et al.: 0 points -no pruritus, 1 point – mild pruritus, the animal scratches itself for less than 10% of the observation time, 2 points – mild to moderate pruritus, 30% of time spent on scratching, 3 points – moderate pruritus, 30-50% of time spent on scratching, 4 – moderate to considerable, 50-75% of time, including at night and 5 – considerable pruritus when the animal scratches itself for more than 75% of time, including at night and while eating. The assessment was done by the owners on the following days of the study: 0, 30th, 60th and 90th and the results were marked on the scale of pruritus intensity.

### Statistical analysis

The quantitative variable was presented as an average standard deviation. Additionally, a 95% confidence interval (95% CI) was calculated for average group means. The statistical analysis was conducted using a two-way repeated measures analysis of variance (group as the random factor and time as the non-random factor). As sphericity was

assumed (the Mauchley test  $p=0,206$ ), one-dimensional tests were used. The Tukey test was used for uneven group numbers in the post-hoc analysis. The result was considered statistically significant when the two-tailed  $p$  value was less than 0,05. The statistical analysis was carried out by Michał Czopowicz, D.V.M. PhD from the Laboratory of Veterinary Epidemiology and Economics of the Department of Veterinary Medicine of the Warsaw University of Life Sciences in Warsaw, Poland.

Statistically significant differences were observed for inter-group comparison ( $p<0,001$ ), inter-time points comparison ( $p<0,001$ ) and for the interaction of group and time ( $p<0,001$ ). The value of the measured parameter changed over time in both groups and the direction of those changes was divergent.

In the study group the CADESI value remained the same between day 0 and 30 ( $p=0,248$ ) but was statistically significantly lower between the 30th and 60th days ( $p<0,001$ ) and remained constant between the 60th and 90th days ( $p=0,998$ ). Statistically significant decrease in the CADESI value



photo: Dorota Pomorska-Handwerker

Intradermal skin tests carried out in a dog qualified for the study.



photo: Dorota Pomorska-Handwerker

Erythema in the course of otitis externa in a dog with atopic dermatitis.

happened between the 30th and 60th days. In the control group the CADESI value systematically increased and on the 60th day was statistically significantly higher ( $p=0,016$ )



compared with day 0, and on the 90<sup>th</sup> day it was statistically significantly higher than on days 0, 30 and even on the 60<sup>th</sup> day ( $p < 0.001$ ).

The CADESI value was different between the groups. A statistically significant difference between the study and control groups occurred on the 60<sup>th</sup> ( $p < 0.001$ ) and 90<sup>th</sup> days ( $p < 0.001$ ). There was no statistically significant difference between the groups on days 0 ( $p = 0.994$ ) and 30 ( $p = 0.999$ ). It is good because it means that the groups were comparable at the very beginning of the study.

## Results of the study and discussion

At the beginning of the study in dogs from both groups mild to moderate symptoms of atopic dermatitis were observed. On day 0 the CADESI value in group I (the study group) ranged from 53 to 84 points (the average of 62) and in group II (control) it was from 49 to 79 points (the average of 65). On the 30<sup>th</sup> day the CADESI value in group I was from 63 to 83 points (average 70) and in group II from 49 to 90 (average 75). On the 60<sup>th</sup> day of the study the CADESI value for group I ranged from 34 to 50 points (average 42) and in group II from 32 to 130 (average 80). On the 90<sup>th</sup> day of the study the CADESI value for group I was from 21 to 49 points (average 39) and in group II from 42 to 120 (average 100).

The intensity of pruritus according to PVAS (Pruritus Visual Analog Scale) was also assessed four times. On day 0 in 9 dogs from the study group (45%) mild pruritus was observed, in 8 dogs (40%) it ranged from mild to moderate and was moderate in 3 dogs (15%). On day 0 mild pruritus was observed in 4 dogs (40%), mild to moderate in 3 dogs (30%) and moderate in 3 dogs (30%). On the 30<sup>th</sup> day of the study in 7 dogs from group I (35%) mild pruritus was observed, in 9 dogs (45%) it ranged from mild to moderate and it was moderate in 4 dogs (20%). In group II mild to moderate pruritus was reported in 7 dogs (70%) and in the case of 3 dogs (30%) it was moderate. On the 60<sup>th</sup> day in the study group in 10 dogs (50%) a mild intensity of pruritus was observed, mild to moderate in 9 dogs (45%) and moderate in 1 case (5%). In control group the intensity of pruritus was mild to moderate in 5 dogs (50%), moderate in 2 dogs (20%) and moderate to considerable in 3 dogs (30%). On the 90<sup>th</sup> day of the study in 12 dogs from the study group (60%) the intensity of pruritus was mild and it ranged from mild to moderate in the remaining 8 dogs (40%). On the same day in control group moderate pruritus was reported in 4 dogs (40%) and in 6 dogs (60%) it ranged from moderate to considerable.

The results of the study indicate that after 2 months of constant administration of the VetoSkin® preparation the clinical condition of dogs with atopic dermatitis improved and remained stable for the following 4 weeks. In control group, where the preparation was not administered the clinical condition worsened over time.

Similar results were obtained in earlier conducted studies (1,2,5,7). In one of the studies it was observed that in young dogs with recently developed atopic dermatitis the response of the body was significantly better after two months. In this study the improvement was observed in both younger (2/3 years) and older (5 years) dogs (2-4). In the study concerning the intensity of pruritus according to PVAS (Pruritus Visual Analog Scale) a considerable reduction in the intensity of pruritus was observed in the study group after 60 and 90 days. In the dogs from control group the intensity of pruritus increased gradually over time and was followed by complications such as phlegmon, which required a treatment with glucocorticoids

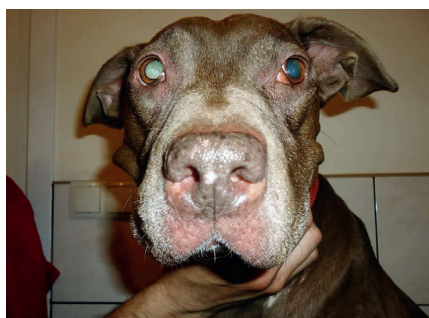


photo: Dorota Pomorska-Handwerker

Erythema on the facial area of a dog with AD.

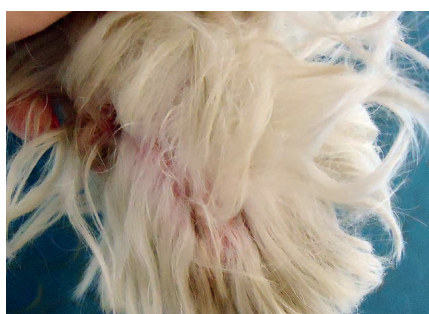


photo: Dorota Pomorska-Handwerker

Small erythema in the interdigital area of a WHWT with mild atopic dermatitis.

and antibiotics after the study had finished. In none of the dogs from the study group the side effects mentioned in the available literature, including diarrhea and pancreatitis were noticed (7). The results obtained in the present study indicate that VetoSkin® containing polyunsaturated fatty acids, B-group vitamins, zinc and biotin may be used in dogs with atopic dermatitis to alleviate the dermatological symptoms and the intensity of pruritus.

An article in the Polish version has been published in issue 11-12 / 2014 of „Veterinary Practice“.

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Product description in VetPharmacy.

## Diets for dogs



### Dermatosis Salmon

#### SALMON & POTATO

Complete and balanced dietary food for adult dogs, the administration of which supports the functions of the skin in case of dermatosis and excessive hair loss and limits the occurrence of ingredient and nutrient intolerances. Contains high levels of essential fatty acids, selected proteins and limited sources of protein (salmon) and carbohydrates (potatoes and rice). The food recipe is monoproduct (fresh salmon, dehydrated salmon protein, hydrolyzed salmon) and gluten free.

**Indications:** Support of skin function in the case of dermatosis and excessive loss of hair. Reduction of ingredient and nutrient intolerances.

**Composition:** Fresh salmon (40%), dehydrated salmon protein (25%), potato (20%), chicken fat, hydrolyzed salmon (5%), rice, beet pulp, dehydrated fish protein, inulin (FOS source, 0.25%), minerals, yeasts, fish oil (0.1%), MOS (0.1%), citrus extracts, marigold (lutein source, 0.05%), ginger (0.05%), Yucca schidigera (0.03%).

**Analytical Constituents:** Crude protein 28% , Crude fat 18%, Crude fiber 2.3%, Crude ash 7% , Moisture 9%, Omega-6 fatty acids 2.95%, Linoleic acid (LA) 2.55%, Omega-3 fatty acids 1.1%, EPA + DHA 0.5%, Calcium 1.1%, Phosphorus 0.7%, L-glutamine 100 mg/kg, Taurine 750 mg/kg, L-carnitine 70 mg/kg, ME: 399kcal/100 g

**Packaging:** 12 kg, 2 kg and 300



### Dermatosis Rabbit

#### RABBIT & POTATO

Complete and balanced dietary food for dogs, the administration of which supports the functions of the skin in the event of dermatosis and excessive hair loss and reduces the occurrence of intolerance to ingredients and nutrients. Contains high levels of essential fatty acids, selected proteins and limited sources of protein (rabbit) and carbohydrates (potatoes). The food recipe is monoproduct (fresh rabbit meal, dehydrated rabbit protein, rabbit hydrolyzate) and gluten free.

**Indications:** Support of skin function in the case of dermatosis and excessive loss of hair. Reduction of ingredient and nutrient intolerances.

**Composition:** Fresh rabbit meat (35%), dehydrated rabbit protein (20%), potato (20%), potato protein (7%), rabbit hydrolyzate (5%), oils and fats (5%), beet pulp (3%), yeasts (2%), carob meal (1%), sodium chloride (0.8%), sodium polyphosphates (0.30%), potassium chloride (0.1%), inulin (FOS, 1000 mg/kg), ginger (1000 mg/kg), Mannanoligosaccharides (MOS, 260 mg/kg), Yucca schidigera (0.02%).

**Analytical Constituents:** Crude protein 26%, Crude fat 15%, Crude fibre 2.5%, Crude ash 7.2%, Moisture 9%, Calcium 1.1%, Phosphorus 0.8%, Omega-6 fatty acids 2.43%, Linoleic acid (LA) 2.22%, Omega-3 fatty acids 0.45%, EPA+DHA 400 mg/kg, Taurine 30 mg/kg, L-Carnitine 70 mg/kg, ME: 382 kcal/100g

**Packaging:** 12 kg, 2 kg and 300 g



### Hypoallergenic Ultra

#### HYDROLYSED PROTEIN

Complete and balanced dietary food for dogs, the administration of which reduces the occurrence of intolerance to ingredients and nutrients. The food contains a single source of protein in the form of low molecular weight hydrolysed fish and highly protein-refined potato starch as the source of starch. The high level of Omega-3 Fatty Acids supports the proper skin functions. The food recipe is monoproduct (hydrolysed protein and 70% of its molecules are less than 2 kDa) and gluten free.

**Indications:** Reduction of ingredient and nutrient intolerances. Support of skin function in the case of dermatosis and excessive loss of hair.

**Composition:** hydrolysed fish protein (30%), potato starch, sweet potato starch, fish oil, sunflower oil, dicalcium phosphate, potassium carbonate, chicory root, brewers' yeasts.

**Analytical Constituents:** Crude protein 22%, Crude fat 14%, Moisture 8%, Crude fibre 1.7%, Crude ash 7.2%, Calcium 1.2%, Phosphorus 0.9%, Sodium 0.2%, Potassium 0.55%, Magnesium 0.07%, Omega-6 - 1.6%, Omega-3 2.1%, DHA 1%, EPA 0.7%, EPA+DHA 1.7%, Linoleic acid (LA) 1.5%.

**Packaging:** 8 kg, 2 kg



### Hypoallergenic Insect

#### HERMETIA ILLUCENSE PROTEIN & DRIED POTATO

Complete and balanced dietary food for dogs, the administration of which reduces the occurrence of intolerance to ingredients and nutrients. The food recipe is monoproduct (dried insect) and gluten free.

**Indications:** Support of skin function in the case of dermatosis and excessive loss of hair. Reduction of ingredient and nutrient intolerances.

**Composition:** Dried insects, dried sweet potato, dried potato, potato starch, poultry fat, minerals, salmon oil (0.5%), flaxseed oil (0.3%)

**Analytical Constituents:** Crude protein 21%, Crude fat 16%, Crude fiber 5.6%, Crude ash 8%, Moisture 8%, Linoleic acid (LA) 27 g/kg, Omega-3 fatty acids 0.43%, EPA+DHA 0.9 g/kg, Calcium 1.2%, Phosphorus 0.9%, Taurine 1000 mg/kg, L-Carnitine 50 mg/kg, ME: 341 kcal/100 g 341

**Packaging:** 12 kg and 2 kg



## Diets for dogs



### Dermatosis Salmon

#### SALMON & POTATO

Complete and balanced dietary food for adult and growing dogs, the administration of which is recommended to support the function of the skin in the case of dermatoses and excessive hair loss. Food can also be served to reduce intolerance to ingredients and nutrients.

**Indications:** Support of skin function in the case of dermatosis and excessive loss of hair. Reduction of ingredient and nutrient intolerances.

**Composition:** salmon (37.5%), potatoes (15%), potato flakes (3%), cellulose (2%), minerals (1%), salmon oil (0.2%).

**Analytical Constituents:** Crude protein 6.9%, Crude fat 6.1%, Crude fiber 2.5%, Crude ash 3%, Moisture 73 %, Calcium 0.4%, Phosphorus 0.33%, Omega-6 FA 0.9%, Linoleic acid (LA) 0.8%, Omega-3 FA 0.84%, EPA+DHA 0.39% , ME: 108 kcal/100g

**Packaging:** 400 g

## Diets for cats



### Hypoallergenic

#### HIGH QUALITY PROTEIN & SPIRULINA

Complete and balanced dietetic food for adult cats intended to support the reduction of ingredient and nutrient intolerances. The food recipe is monoproduct (turkey) and gluten free, enriched with spirulina and inulin, which have a beneficial effect on the functions of the gastrointestinal tract.

**Indications:** Reduction of ingredient and nutrient intolerances. Support of skin function in the case of dermatosis and excessive loss of hair.

**Composition:** turkey (70%), minerals (1%), inulin (0.1%), spirulina (0.1%).

**Analytical Constituents:** Crude protein 10.2%, Crude fat 5.6%, Crude ash 2.5%, Crude fibre 0.5%, Moisture 79%, Calcium 0.29%, Phosphorus 0.24%, Omega-6 FA 0.9%, Omega-3 FA 0.1%, ME: 96.7 kcal/100 g

**Packaging:** 100 g



### Dermatosis Cat

#### DUCK & RICE

Complete and balanced dietetic food for adult cats intended to support the function of the skin in the case of dermatoses and excessive hair loss. It also supports the reduction of ingredient and nutrient intolerances. The food recipe is monoproduct (dried duck, freshly prepared duck)

**Indications:** Support of skin function in the case of dermatosis and excessive loss of hair. Reduction of ingredient and nutrient intolerances.

**Composition:** Duck 43% (Dried Duck 28%, Duck Fat 10%, Freshly Prepared Duck 5%), White Rice (23%), Brown Rice (15%), Prairie Meal, Potato Protein, Hydrolyzed Chicken, Tomato Pomace, Minerals, Vitamins, Omega 3 Supplement (0.7%), Salt, Seaweed, Chicory (0.3%), Dried Carrot, Dried Cranberry, Yucca Schidigera Extract (200 mg/kg).

**Analytical Constituents:** Crude protein 32%, Crude fat 18%, Crude ash 7.5%, Crude fibre 1.5%, Omega-6 FA 3.2%, Omega-3 FA 0.3%, EPA+DHA 0.166, LA 3.2, Zinc: 95mg/kg, ME: 96.7 kcal/100 g

**Packaging:** 6kg, 2kg and 250g

## Supplements



### VetoSkin

**Composition:** 2.20.1 refined borage oil Borago officinalis\*\*, 10.4.6 fish oil\*, 2.20.1 refined soybean oil Glycine max. (L.) Merr., 9.3.1 beeswax, 2.21.1 crude lecithins.

**Intended use:** The product is recommended for dogs and cats in order to maintain optimal skin condition and coat quality. Use in animals with dry skin and dull coat as well as with excessive coat loss.

**Instructions for proper use:** Cats and dogs up to 15 kg b.w. – 1 capsule daily. Dogs over 15 kg b.w. – 2 capsules daily. The capsule tip should be twisted off or cut, squeezed out content and mixed with food or administered directly into the mouth. Animals should always have access to fresh water. The product is recommended to be used for at least 2 months or until optimum effect is achieved.

**Storage conditions:** The product should be stored in a dry place, in temperature between 15°C and 25°C in a tightly closed container. Protect from direct sunlight and humidity. Keep it out of reach of children and animals.

**Analytical constituents and levels:** crude protein – 4.57%, crude ash – 10.85%, crude fat – 64.10%, crude fibre – 0.05%, moisture – 1.06%.

## Hygiene & Care Products



### Oticurant



OTICURANT® is a patented ear care and hygiene product for dogs. The product binds moisture and helps to remove residual wax and eliminate unpleasant odor. In case of discomfort (e.g. itching) it brings relief.

**Instruction for use:**

1. Before opening the sachet, shake the powder thoroughly.
2. Lift the dog's ear and hold it. With the other hand, pour the powder into the ear canal.
3. Lower the ear. There is no need to massage this.
4. It is normal for the dog to shake its head after application.
5. Repeat with the other ear.

If Oticurant® has not been used before, initially use 1 sachet in each ear 1 x daily for 5 days. If further application of the preparation is required after this time, depending on the size of the dog's breed and ear size, ¼ to 2 sachets should be poured into each ear canal at a time, 1 x daily. Depending on the breed and the size of the ear, use from ¼ to 2 sachets (per ear) once a day. 24 sachets allow for a 3-month care dose for a dog weighing between 10 to 40 kg.

**Ingredients:** 6-deoxy-L-galactose, oligosaccharide, lactic acid and excipients.



### Otihelp

Otic emulsion for dogs and cats.

Optimal pH 5 as well as chlorhexidine and Tris EDTA content are responsible for its antifungal and antibacterial. OtiHelp is recommended for proper ear canals function restoration and maintenance, without any risk of microbial resistance development. Could be used in all cases of otitis externa despite its cause (fungal, bacterial).

**Usage:** Small amount of fluid should be administered into external ear canal. Careful massage of ear base after administration is recommended. Excessive amount of the fluid should be removed using cotton pledget.

**Caution:** for animal treatment only. Store in room temperature. Keep out of the reach and sight of children and animals.

**Ingredients:** Aqua, Propylene Glycol, Sodium Lauroyl Sarcosinate, Panthenol, Glycerin, Allantoin, Urea, Chlorhexidine Digluconate, Salicylic Acid, Xanthan Gum, Menthol, Citric Acid



### Otiflush

Otic fluid for ear canal flushing in dogs and cats.

Optimal pH 5 of the product prevents from the growth of different microorganisms that is why it could be used in all cases of otitis externa despite its cause (fungal, bacterial). It contains chlorhexidine which exerts antibacterial and antifungal activity. OtiFlush could be used for flushing of ear canal during inflammation both as a sole product or for cleaning purposes before applying other pharmaceuticals.

**Usage:** Small amount of fluid should be administered into external ear canal. Careful massage of ear base after administration is recommended. Excessive amount of the fluid should be removed using cotton pledget.

**Caution:** for animal treatment only. Store in room temperature. Keep out of the reach and sight of children and animals.

**Ingredients:** Aqua, Propylene Glycol, Cetearyl Alcohol, Sodium Lauroyl Sarcosinate, Panthenol, Glycerin, Allantoin, Urea, Chlorhexidine Digluconate, Salicylic Acid, Xanthan Gum, Menthol, Citric Acid



### Eye Cleanser

Eye tonic for cats and dogs

The specialist eye tonic for the care of the area around the eyes of dogs and cats, struggling with the problems of excessive tearing. The eye tonic is based on physiological saline and contains: hyaluronic acid and lactic acid with a moisturizing effect, bearberry extract rich in arbutin with brightening properties, boric acid and the natural equivalent of triclosan which supporting hygiene around the eyes. The composition is complemented by the equivalent of fructan, which has prebiotic action. The formula is based on neutral pH, thanks to which it does not irritate the delicate eye area. The product does not contain any dyes, and its color is due only to the presence of ingredients of natural origin. This does not affect product quality and application properties.

**Usage:** Apply a small amount of tonic on a cotton pad and gently wipe the skin around the eyes. Use 1-2 times a day. Be careful not to get the preparation into the eyes.

**Caution:** for animal treatment only. Store in room temperature. Keep out of the reach and sight of children and animals.

**Ingredients:** Aqua, Propylene Glycol, Boric Acid, Triethanolamine, Sodium Caproyl/Lauroyl Lactylate, Panthenol, Sodium Chloride, Hydrolyzed Hyaluronic Acid, Arctostaphylos Uva Ursi Leaf Extract, Fructan, Triethyl Citrate, Phenoxyethanol, Methylparaben, Butylparaben, Ethylparaben, Propylparaben, Ethylhexylglycerin, Butylene Glycol, Lactic Acid.

**Packaging:** 100ml





## Hygiene & Care Products



### Stimuderm Ultra

#### SHORT HAIR SHAMPOO

**Indication:** intended for skin and hair care of short-haired dogs with excessive hair loss of various types and/or with weakened hair.

**Key ingredients:** ACTIVE NTM™, panthenol, allantoin, Equisetum Arvense extract, hydrolyzed silk proteins.

**Description:** ACTIVE NTM™ – a patented vitamin derived substance that induce the anagen phase and prolong its duration, improves skin microcirculation and strengthens the hair follicle, positively influencing its nutrition (by affecting the release of prostacyclin). Panthenol – a humectant, shows a soothing and irritation relieving effect, promotes skin regeneration and accelerates healing. Allantoin – has soothing, anti-inflammatory, keratolytic properties, stimulates wound granulation and improves skin hydration. Equisetum arvense extract – rich in valuable elements including potassium, magnesium, iron, phosphorus, vitamin C, flavonoids and silica with high bioavailability. Hydrolyzed silk proteins – create a protective film on the surface of the skin and hair, moisturize, reduce the roughness of the epidermis and hair.



### Stimuderm Ultra

#### LONG HAIR SHAMPOO

**Indication:** intended for skin and hair care of long-haired dogs with excessive hair loss of various types and/or with weakened hair.

**Key ingredients:** ACTIVE NTM™, panthenol, allantoin, Equisetum Arvense extract, hydrolyzed silk proteins.

**Description:** ACTIVE NTM™ – a patented vitamin derived substance that induce the anagen phase and prolong its duration, improves skin microcirculation and strengthens the hair follicle, positively influencing its nutrition (by affecting the release of prostacyclin). Panthenol – a humectant, shows a soothing and irritation relieving effect, promotes skin regeneration and accelerates healing. Allantoin – has soothing, anti-inflammatory, keratolytic properties, stimulates wound granulation and improves skin hydration. Equisetum arvense extract – rich in valuable elements including potassium, magnesium, iron, phosphorus, vitamin C, flavonoids and silica with high bioavailability. Hydrolyzed silk proteins – create a protective film on the surface of the skin and hair, moisturize, reduce the roughness of the epidermis and hair.



### Stimuderm Ultra

#### SERUM

**Indication:** serum intended for topical application to areas affected by alopecia.

**Key ingredients:** ACTIVE NTM™, panthenol, glycerine, hydrolyzed silk proteins.

**Description:** ACTIVE NTM™ – has properties that induce the anagen phase and prolong its duration, stimulates hair regrowth, improves skin microcirculation and strengthens the hair follicle. Panthenol and glycerine – are highly moisturizing, exhibit soothing and irritation-relieving effects, reducing redness; promote skin regeneration and accelerates healing. Hydrolyzed silk proteins – form a protective film on the surface of the skin and hair, moisturize and make combing easier but also gives a beautiful shine to the hair.



### Specialist Shampoo

**Indication:** Care for skin affected by inflammation caused by bacteria or fungus.

**Key ingredients:** chlorhexidine, ketoconazole

**Description:** Ketoconazole – an antifungal drug from the azole group, with wide ranging action against dermatophytes, yeast and polymorphic fungi. It affects the permeability of the cell wall, which eventually kills the fungi cell. Chlorhexidine – a synthetic antiseptic, used in gluconate or acetate form. It works effectively against Gram-positive bacteria. It is mainly used as a disinfectant for skin, mucous membranes, wounds and surgical instruments. At physiological pH, chlorhexidine salts dissociate and release a positively charged chlorhexidine cation. The bactericidal effect is the result of this cation association with the negatively charged bacterial cell wall.



### Benzoic Shampoo

**Indication:** Care for skin prone to oiliness in the event of folliculitis or demodicosis.

**Key ingredients:** benzoyl peroxide

**Description:** Benzoyl peroxide – featuring strong oxidizing properties and stimulates the granulation process and collagen synthesis. Its antibacterial properties consist in the release of active atomic oxygen from the benzoyl peroxide molecule, which inhibits the development of anaerobic bacteria. Due to its antibacterial and keratolytic effects, it reduces the number of blackheads and eliminates inflammatory exanthema. It improves the oxygen supply to tissues, easily passes through the stratum corneum, where it is metabolized in keratinocytes to benzoic acid and eliminated with the urine.



### Antiseborrhoeic Shampoo

**Indication:** Care for skin prone to seborrhea.

**Key ingredient:** salicylic acid, octopirox, zinc gluconate, pyridoxine

**Description:** Salicylic acid – removes exfoliated epidermis and dandruff, reduces pruritus, and has an antibacterial effect. It is recognized as an antiseborrhoeic substance. Octopirox – has anti-inflammatory properties and eliminates the pathological microflora present within dandruff lesions, inhibits the development of the fungus responsible for dandruff symptoms – Malassezia furfur. Normalizes and restores the balance of the epidermal microflora preventing the frequent recurrence of troublesome ailments. Due to the wide and documented range of benefits, it is used in antidandruff shampoos.



### Hypoallergenic Shampoo

**Indication:** Sensitive and demanding skin, prone to irritation, allergy, dryness, or intolerant to other shampoos.

**Key ingredients:** oat proteins, allantoin, panthenol, hydrolyzed keratin

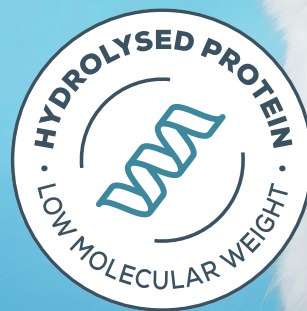
**Description:** The shampoo contains very mild surfactants and emollients, as well as a range of softening and moisturizing agents. Oat proteins are very easily absorbed by the skin and coat, which ensures that the skin is moisturized and elastic, while the coat is glossy. Allantoin soothes and regenerates. Panthenol accelerates regeneration and supports damage repair. Hydrolyzed keratin builds into hair structure, replenishes defects and creates a conditioning film on its surface, protecting it from damage and breakage. Adds shine and a healthy appearance. Thanks to its incredible ability to bind water it helps to maintain the proper hydration.



NEW

# HYPOALLERGENIC ULTRA

The effective solution in the  
diagnosis of adverse food reactions  
and nutrients intolerance in dogs



High quality hydrolysed protein with low molecular weight



Monoprotein - herring as the only source of protein



Highly purified potato starch as the only source of carbohydrates



High concentration of EPA+DHA



High level of Omega-3 Fatty Acids

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BASED ON EVIDENCE