

Therapy of fungal and bacterial dermatoses



Dermatology

Diagnostics of atopic dermatitis.
Comparison of intradermal and
serologic tests.

Nutrition for Cats
and Dogs with Skin
Conditions

Dear Readers,

„Based on evidence” – in our VetExpert logo is not a coincidence. Since the beginning of our activity we put emphasis on reliable studies supporting the safety, effectiveness and efficiency of our products. Every year, we execute series of our own studies, but also we cooperate with academic institutions, and veterinary practices. We decided to collect the fruits of our efforts and present them to you.

The 1st edition of „Veterinary Life” is a collection of articles and publications on skin problems of dogs and cats.. This issue, as well as another editions 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 other European countries.

Since next editions are already planned, the editorial team is counting on all comments and observations on the current issue, and is eagerly waiting for proposals of topics for the next issues. We also encourage those who want and have an opportunity to cooperate, to present their knowledge, achievements or thoughts in „Veterinary Life”.

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



Editorial: Natalia Jackowska, Izabela Cupiał, Radosław Balcewicz,
Editor-in-chief: Anna Rutkowska, a.rutkowska@vetexpert.pl
Proofreading: Krystyna Sutowska
Graphic designer: Michał Kaczor
Print: Javelin
Publisher: Vet Planet Sp. z o.o.
Circulation: 4000 sztuk
All rights reserved. Without written permission of the publisher, no part of this publication can be reproduced. Editors reserve the right to edit submitted texts.
Editor address: Brukowa 36/2 street 05-092 Łomianki Poland

CONTENTS 1/2016

Expert eye

- 4 **Therapy of fungal and bacterial dermatoses.**
Jarosław Popiel
- 7 **Treatment of recurrent otitis externa in dogs – the expert’s approach.**
Joanna Karaś-Tęcza
- 9 **Bioresonance as an alternative in allergy diagnostics.**
Beata Milewska-Ignacak
- 11 **Nutrition for Cats and Dogs with Skin Conditions.**
Michał Jank
- 14 **Diagnostics of atopic dermatitis. Comparison of intradermal and serologic tests.**
Karolina Fidura

Practice from shelf

- 17 **Field study on the application of 4T Veterinary Diet Dermatitis Dog as an elimination diet in dogs with food allergy.**
Dorota Pomorska-Handwerker, Aneta Birszel, Katarzyna Sikora
- 20 **The effect of an ear powder on clinical signs in canine with otitis externa.**
Mikaela Heydrich.
- 25 **Pilot clinical trial on the VetoSkin® preparation in dogs with atopic dermatitis.**
Dorota Pomorska-Handwerker, Agnieszka Pomorska
- 28 **Otitis externa: VetExpert’s approach.**
Natalia Jackowska

VetPharmacy

- 30 **4t Veterinary Diet Dermatitis Dog, VetoSkin, VetExpert Oticurant, Otihelp, Otiflush**

Therapy of fungal and bacterial dermatoses

Jarosław Popiel DVM PhD University of Life Sciences in Wrocław, Poland



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 Pseudintermedius* 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,



photo: Jaroslaw Popiel

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



photo: Jaroslaw Popiel

Phot. 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.

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 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.

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,



photo: Jaroslaw Popiel

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

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 pro-

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

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

liferation. 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.

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 microsporosis, 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. 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:



photo: Jarosław Popiel

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

- 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

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



photo: Jarosław Popiel

Phot. 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.

candidiasis.

Vaccinations can be helpful in the treatment of mycoses. It has been found that

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



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 pro-

cedures; 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?

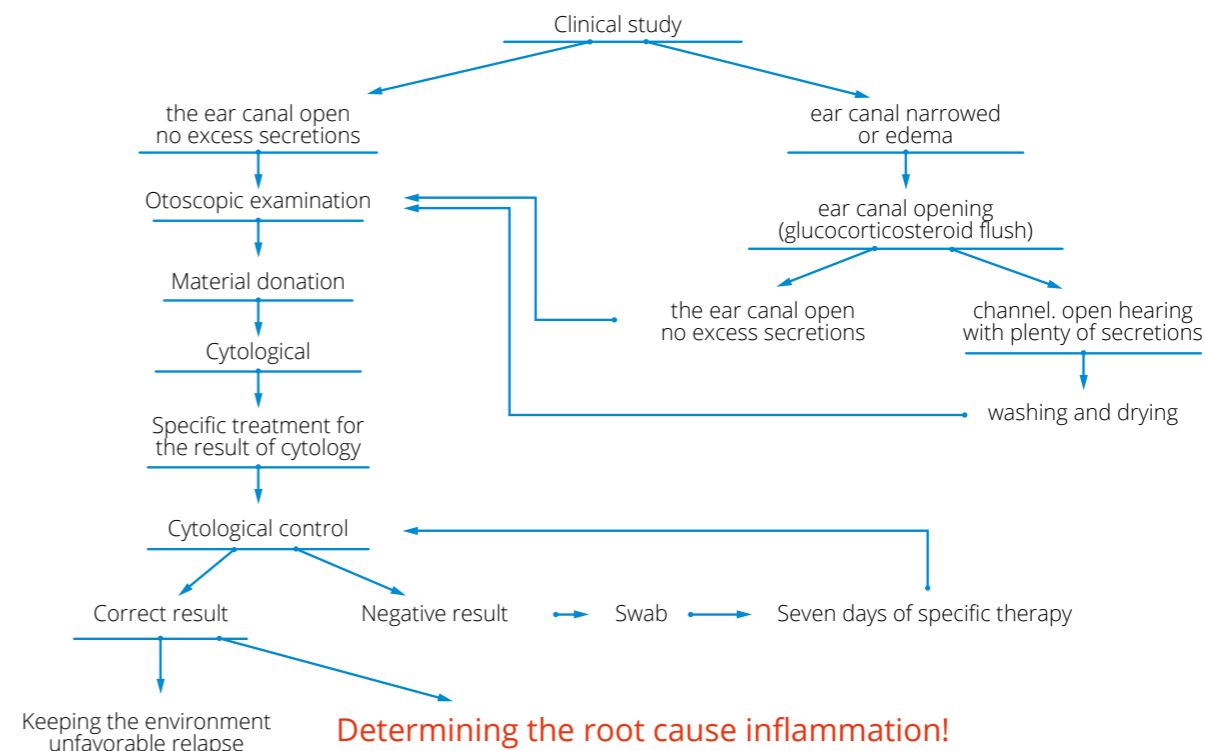
After a thorough otologic exam, the next step is to run a cytology of the material collected from left and right ear canals. Sometimes, however, a thorough otologic exam is not possible during the first visit, because

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

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



Scheme: Algorithm with inflammation of the external ear canals of dogs and cats. J. Karaś-Tęcza, DVM

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 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 predis-

posing factors for this infection, or remove primary reasons. Then fighting yeast might not be necessary at all.



photo: J. Karaś-Tęcza

Purulent inflammation of the ear canal

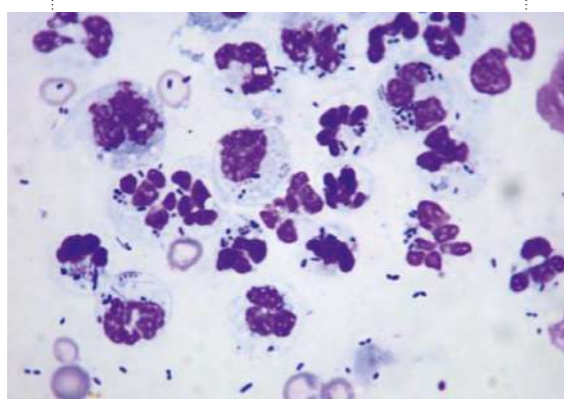


photo: J. Karaś-Tęcza

Cytology of the ear canal

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.

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.

Bioresonance as an alternative in allergy diagnostics

Beata Milewska-Ignacak DVM, Przychodnia Weterynaryjna Wetlandia



Allergies in animals is a fairly frequently recurring problem in veterinary practices, which has been growing for years, and it looks like it is not going to slow down in the nearest future. Along with our civilisation progress that boils down to ever greater pollution and ever greater amounts of chemical substances in processed food, our immune system and the immune system of our pets becomes severely unstable.

It is our role to help the patients, to diagnose particular allergens for a given patient, to remove them from food, environment, or to prescribe allergen immunotherapy, if possible. To be able to do it, we need tests. Everyone knows intradermal tests and blood tests which seem to be the most popular nowadays.

There is yet another method, namely bioresonance. It is not a very popular method, and it is not included in the curriculum of veterinary studies. It is considered to be an unconventional method because it is based on laws of physics and Traditional Chinese Medicine. Insofar as no one challenges physics' laws, the theories of Traditional Chinese Medicine have not been empirically confirmed yet. Nevertheless, quite recently acupuncture became widely accepted, and since then the number of its advocates and persons volunteering to use this method has considerably grown.

Let us have a look at what this mysterious bioresonance is, starting with some theory and history.

Bioresonance was used for the first time in medicine by Germans in the late 80s. The name bioresonance therapy (BRT) was coined in 1987. The method has been created by a German physician, Dr Franz Morell. The first bioresonance machine was called MORA. In the German Institut für Regulative Medizin, a computer-controlled equipment for bioresonance diagnostics and treatment has been developed and called BICOM.

The method is based on the accomplishments of biophysics, quantum physics and Traditional Chinese Medicine. It uses a system of meridians and acupuncture points taken from Chinese Medicine. The meridians act as pathways for the flow of chi, the

Chinese name for what Europeans understand as "energy". The more precise name, however, would be quantum pulse. The chi oscillates, becoming vibrations, and using this way to transfer information. The streams of quanta in the meridians create a closed circuit. Whenever there is a blockade in the meridian caused by e.g. a scar or an inflammation, quanta cannot flow anymore; moreover, the direction of flow changes. This leads to development of an incorrect polar system.



photo: Beata Milewska



photo: Beata Milewska

The therapy uses electromagnetic vibrations present in the organism that are superior in respect to biochemical processes and control them. Beside physiological (harmonic) electromagnetic vibrations, in the organism there are also pathologic (dis-



photo: Beata Milewska



photo: Beata Milewska

sonant) vibrations, disruptive ones, caused by pathogens. The total sum of physiological and pathologic vibrations constitutes the organism's endogenous vibrations. The spectrum of these vibrations range from extremely long to very short ones. They can be picked up from the skin surface, from tissues and from organs.

These vibrations are processed thanks to state-of-the-art electronic equipment into therapeutic vibrations and transferred back to the patient's organism. The harmonic frequencies are amplified (positive feedback), while dissonant ones - inverted (negative feedback). The patient's electromagnetic field immediately reacts to a precisely matched therapeutic signal and in turn transfers to BICOM its changed vibrations pattern. This process is repeated in split seconds. This way pathologic signals in the organism are

reduced, and finally removed, while physiological regulatory forces start to correctly control biological processes. BICOM equipment allows transferring to the organism a fairly narrow frequency range, thanks to which the therapeutic signal is as precise as possible.

In the case of allergies, the method assumes the existence of oscillatory biofield of the organism and the oscillatory biofield of the allergen, and the existence in the patient of allergy engrams typical for every sensitising allergen. The diagnostic consists in finding these engrams.

In other words:

- every information can be saved as an electromagnetic wave;
- people and animals with allergies have got in their organisms such piece of information that can be saved or found as an electromagnetic wave;
- diagnostics consist in looking for such waves;
- the desensitisation consists in transferring changed waves that will cause the removal of pathologic information; one can say that they will bring about a reset of the organism.

Diagnostics with this method is absolutely non-invasive, and makes it possible to verify any material thing or substance. Other methods do not offer such options. One can try to desensitise against every allergen.

Everyone knows that the allergy can be caused by food, environmental factors, plants, or fungi.

However, in our everyday lives do we link what these notions mean? Is a food allergy related only to a type of a protein, grains, eggs, milk, etc.? Perhaps it is caused by chemical substances used in food? Additives such as colourants, aromas, flavour and aroma enhancers, thickeners, emulsifiers, antioxidants, and other substances are present in our processed food, but also in commercially available pet food. Thus, are all hypoallergenic diets really hypo? And are they hypoallergenic for everyone? Does lack of improvement after introducing a hypoallergenic diet mean that this was not a food allergy, or perhaps that the diet was not properly selected, or maybe that there are other factors besides food? Is hydrolysis of proteins always efficient?

Is environmental allergy only related to dust, wool and feather down, or is it caused also by chemicals used at home, air fresheners, cigarette smoke, or perhaps a new varnish applied on the floor or a fresh paint on the wall? Can a dog become allergic to a cat or a rabbit, and can a cat become allergic to a dog? Are we sure that synthetic fibres, the ever present fleece blankets, never cause allergies? And what about rubber and plastic toys?

If problems aggravate after the pet was out in the garden - is the problem caused by plants? Or by chemical substances used by the owners in the garden?

Yeast fungi are not only found in the old walls and in humid areas, they also present in the soil and on plants.

Allergies are a difficult problem, especially when they are complex, when the observed lesions have been caused by several different factors. If we do not identify all allergens, we will not be successful.

Case 1

Siberian Husky, female, 5 years old

First consultation: July 2011; recurrent cough and upper respiratory tract inflammation from 2009 in history. After antibiotic treatment improvement, then recurrence, most frequently at home, after sleep. Not related to year season.

Bio-resonance test performed.

Food allergens – negative

Food chemicals – negative

Case 2

Boxer, female, 4 years old

First visit – February 2015. In history dermatological problems since 5 months of age, including recurrent otitis. Worsening of clinical picture in summer. Blood test performed – positive for dust, however immune therapy without effect.

Dog is living in house with garden, constant contact with cats and horses. During clinical examination significant pruritus of whole body, visible loss of hairs, presence of crusts, deep pyoderma on elbows.

Bio-resonance test performed

Food allergens – grains (whey, rye, barley, buckwheat, oat, corn, soybean, rice, spelt, millet, sesame), meat (chicken, turkey, duck, quail, goose, beef, veal, pork, pheasant, guinea fowl), all fish, milk protein, lactose, egg, yeast and nuts

Food chemistry – positive

Environment – dust positive

Mould fungi – negative

Plants – positive for grass, grains and pokrzywa

Case 3

Poodle, female, 2 years old

First visit – October 2014. In history problems with ocular discharge despite of treatment. Owner joined beginning of problems with the procedure of restoration of lacrimal duct patency performed year and a half earlier. Owner expected cessation of the problems after switching into natural food. This was the reason for tests.

Bio-resonance tests performed

Food allergens – all grains positive except rice, chicken, turkey, beef, tomatoes,

Food chemicals – positive

Environment – positive for dust mites, street dust, puddle water

Mould fungi – negative

Plants – some grasses

Owner switched to home-made food,

Literature:

1. Becker R.O., Selden G., Elektropolis. "Elektromagnetyzm i podstawy życia", Instytut Wydawniczy PAX Warszawa 1994
2. Hołownia J., „Podstawy teoretyczne i środki techniczne terapii biorezonansowej”.
3. Materiały seminaryjne, „Seminarium Stowarzyszenia Elektryków Polskich”, Oddz. Wrocławski, Kolegium Sekcji Automatyki i Po-

Dust, wool, feather, cat, home chemicals – negative

Plant – negative

Mould fungi – positive for 12 mould types

Owner decided to start immune therapy. Every other week immune therapy for 3 different moulds was performed.

Improvement was observed after each visit, there was no need for antibiotic treatment, cough disappeared. Immune therapy ended at the beginning of September 2011. No recurrence up to now.

Positive for some shampoos and anti-tick product

Microscopic evaluation of scraping – negative. Swam for bacteriology taken. Feeding was evaluated and only negative in test foods were selected.

Change of food, bathing in proven shampoo and dust and plant immune therapy recommended.

On the beginning of March due to bad skin condition antibiotic was given for 3 weeks. Further immune therapy and evaluation for other possible allergens recommended. Positive results for washing powder and oil for floor conservation.

At the end of March skin condition significantly improved.

Plant immune therapy continued till the half of May (owner lives around 200 km from the clinic). All pathological changes resolved without any recurrences and complications.

Last visit in January 2016 for the evaluation of aesthetic drugs, antibiotics and sutures before planned neutering. Dog in very good condition.

immune therapy for dust performed. Due to lack of expected results home chemicals and dog cosmetics were evaluated. (This was exhibition dog so used a lot of cosmetics). Part of cosmetics turned out to be positive. They were eliminated together with some home chemicals.

In February 2015 owner noticed visible improvement. On owner request the immune therapy of selected cosmetics was performed.

There was also positive result for wall painting – and the immune therapy for that was performed.

The condition of eyes in May 2015 was very good; immune therapy for street dust was performed. Immune therapy for plants was not performed since the summer season did not resulted in worsening of dog condition. Since that time no recurrence was note.

miałów Koło SEP przy Instytucie Metrologii Elektrycznej Politechniki Wrocławskiej, Wrocław 22.03. 1997

4. Presman A.S., „Pola elektromagnetyczne a żywa przyroda”, PWN Warszawa 1971
5. Schumacher P., „Biofizyczna terapia alergii”.
6. „Rozszerzona terapia biorezonansowa”, Centrum Medycyny Alternatywnej i Biorezonansu MONADITH 1996

Nutrition for Cats and Dogs with Skin Conditions

Michał Jank PhD, DVM

Institute of Veterinary Medicine, Faculty of Veterinary Medicine and Animal Science, Poznan University of Life Sciences



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,

Table 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

hydrolysed 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 decreases 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.

Literature:

1. Bauer J.E.: The potential for dietary polyunsaturated fatty acids in domestic animals. *Aust. Vet. J.*, 71, 342-345, 1994.
2. Watson T.D.: Diet and skin disease in dogs and cats. *J. Nutr.*, 128, 2783-2789, 1998.
3. Abba C, Mussa PP, Vercelli A, Raviri G. Essential fatty acids supplementation in different-stage atopic dogs fed on a controlled diet. *Journal of Animal Physiology and Animal Nutrition* 89 (2005) 203–207.
4. Hensel P. Nutrition and skin diseases in veterinary medicine. *Clinics in Dermatology* 2010; 28(6):686-696.

Diagnostics of atopic dermatitis.

Comparison of intradermal and serologic tests.

Karolina Fidura DVM. WETMEDYKA24 veterinary clinic, Member of European Society of Veterinary Dermatology



Diagnostics of atopic dermatitis. Comparison of intradermal and serologic tests.

Atopic dermatitis is a complex disease, frequently with a very complicated course, and one that poses several difficulties when diagnosing. Based on the most recent research it is estimated that in the USA about 27% of dogs are affected. The number has considerably grown since 1971 when it was on the level of about 3%. In human medicine the frequency of incidences has been growing systematically as well, especially in developed countries. The available research shows that 10 to 20% of children have contracted this disease. In this article I will try to present the subsequent stages of diagnosing atopic dermatitis and compare diagnostic tests available on the market.

Atopic dermatitis is an inflammatory skin disease with genetic background, accompanied by different level of pruritus and characteristic clinical symptoms. In its immunopathogenesis, the main role is played by specific IgE antibodies against particular environmental allergens. The disease might be inherited, and in the case of children whose parents are at risk of incurring the disease, the probability is about 65%.

In the course of atopic dermatitis, we see a variety of clinical symptoms that might depend on:

- genetic factors (phenotypes related to breed, for instance higher incidence of pyotraumatic pyoderma in Labradors and Golden Retrievers, or pododermatitis of front feet in West Highland White Terriers),
- how lesions are spread (local or generalised),
- stadium of the disease (acute or chronic),
- presence of secondary bacterial or yeast infections and other exacerbating factors.

Another difficulty in diagnosing atopic dermatitis is the fact that similar clinical symptoms may be present in other diseases, and there is a possibility of coexistence of a few diseases at the same time.

Diagnostics of atopic dermatitis should include a few stages:

1. identification and treatment of other conditions related to long-term pruritus, such as:
 - a. parasitic diseases caused by fleas, scabies (*Sarcoptes scabiei*), *Demodex* spp, *Cheyletiella*, etc.;
 - b. skin infections (bacterial or fungal caused by *Staphylococcus* spp. or *Malassezia* spp.);
 - c. Allergic skin diseases (flea allergy



External inflammation of the lips (cheilitis)

photo: Karolina Fidura

- d. hypersensitivity to insect bites;
 - e. neoplastic diseases, for example skin lymphoma;
2. A thorough interview, history of the disease and treatment and a very precise clinical examination to show typical symptoms and characteristic distribution of lesions.
 3. Evaluation of skin reactivity by performing intradermal allergy tests or measuring the level of IgE antibodies specific for allergens and circulating in blood.

The first symptom of atopic dermatitis is pruritus that can be manifested by scratching, chewing, over-grooming and/or licking, or head shaking. Depending on allergens that cause the symptoms, pruritus

might be perennial or seasonal. The most frequently affected regions of skin are the facial part of the head, the concave side of pinnae, axillae, inguinal area, perianal area and distal extremities. Lesions in atopic dermatitis are predominantly a result of pruritus and self-trauma. In the acute stage of the disease, erythema and skin injuries related to rubbing prevail. In the chronic form, chronic dermatitis, bacterial and yeast infections, hyperpigmentation and seborrhoea are present.

In order to facilitate the diagnosis of atopic dermatitis, diagnostic criteria have been introduced. They are called Favrot's criteria and are the following:

- age at onset under 3 years of age;
- symptoms present in dogs residing mostly indoors;
- corticosteroid-responsive pruritus;
- chronic or recurrent yeast infections;
- affected peripheral parts of front legs;
- affected pinnae;
- non-affected ear margins;
- non-affected dorso-lumbar area.

If 5 out of 8 criteria are met, sensitivity reaches 85%, and specificity – 79%.

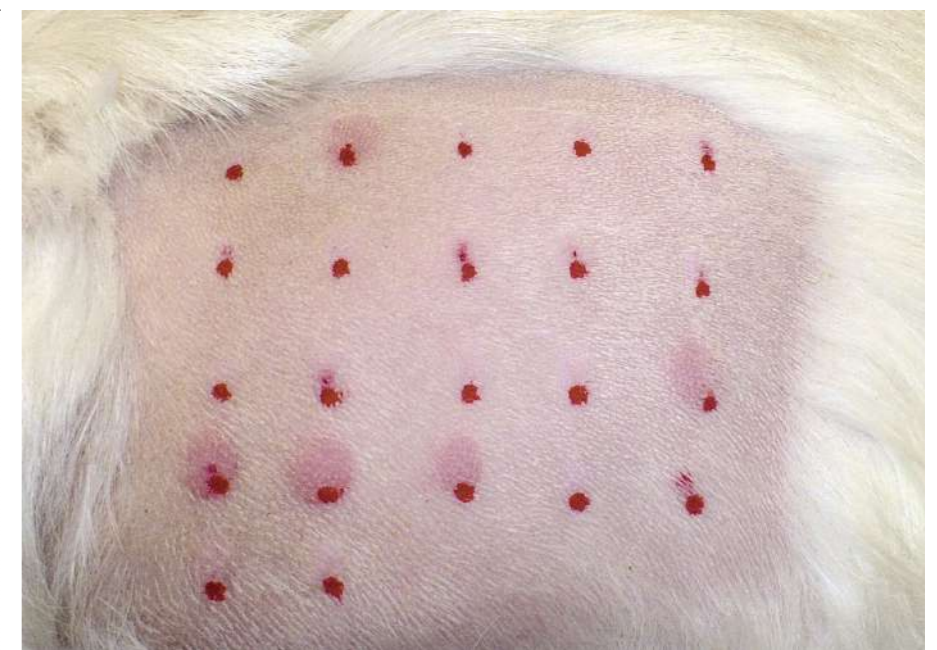
The evaluation of skin reactivity by performing allergic intradermal tests or detection of allergen specific IgE antibodies present in the blood is the last stage of diagnostics workup in this disease. These tests are performed to identify the allergens, with an attempt to eliminate them from the environment. Knowing which allergens cause the problem is also fundamental to prepare a solution for an allergen specific immunotherapy. However, neither of the tests is recommended as a screen test for atopic dermatitis. These tests should only be used to confirm the clinical diagnosis of the condition.

The major mechanism in immunopathogenesis of atopic dermatitis is type I hypersensitivity reaction, caused predominantly by allergen specific IgE antibodies. It has been shown that also IgG antibodies might coat mast cells, which can also be found in blood free or attached to the circulating neutrophils.

Type I hypersensitivity has two stages: sensitisation and repeated exposition.

During sensitisation state, the antigen penetrates the skin and is uptaken and processed by APCs - antigen presenting cells. Next, after maturing, the dendritic cells transfer information to regional lymph nodes. There, Th2 lymphocytes are activated and with the help of certain cytokines they stimulate B lymphocytes to differentiate into plasma cells and produce allergic specific IgE antibodies. These antibodies bind to Fcε receptors on the surface of local mast cells, and then can migrate to blood and coat circulating basophils and mast cells present in areas other than skin.

During the next contact of the allergen



Intradermal test in dogs with atopic dermatitis

photo: Karolina Fidura

with skin, IgE antibodies bound on the surface of mast cells recognise the allergen and start a cascade leading to degranulation of mast cells. The released inflammatory mediators cause vasodilation, oedema of the surrounding tissues, accumulation of eosinophils and pruritus.

Intradermal tests make it possible to detect specific IgE antibodies as well as specific IgG antibodies that sensitise mast cells in the skin. Serologic tests, on the other hand, make it possible to detect the level

of IgE antibodies specific for individual allergens and circulating in patient's blood.

IDT – intradermal tests

On the skin of lateral side of the thorax, solutions of different allergens are applied intradermally and the resulting reaction in the form of erythema and vesicles is compared to positive control (histamine) and negative control (saline). The results are ready within 5 to 20 minutes. Reactions are evaluated based on the size and strength of the erythema and how the vesicle was



Otitis externa with a visible inner side of erythema earlobe.

photo: Karolina Fidura

formed.

Positive results of intradermal tests should always be correlated with a history of exposure to a specific allergen. This method might produce both false positive and false negative results.

False positive results are rare if dilution of the allergen was correct. Other factors causing false positive reactions may include contamination of allergen solution with bacteria or fungi, irritating action of the solution (especially in the case of glycerine-containing ones), inappropriate technique or substances causing a non-immunological histamine release.

False-negative results may happen in the case of atopic dermatitis without IgE antibodies or in situations where IgE antibody level in the skin was below detection level at the moment of performing the test. A severe skin inflammation and scars might also falsify the results. Some drugs may also cause false-negative results, for example glucocorticosteroids (applied both topically and systemically), antihistamines, drugs changing blood pressure, e.g. tranquilizers. Other reasons for negative results include subcutaneous administration of the allergen, too low dosage of allergen (expired tests, too low volume of injected allergens), stress (both related to fear and systemic diseases), performing the tests too long after exposure to allergens or in the peak of allergen exposure.

Before we consider that we are dealing with a false-negative case, every time we should make sure that we have excluded other diseases with pruritus.

ASIS – Allergen Specific IgE Serology

Nowadays the most common method used to detect and measure the level of allergen specific IgE antibodies is ELISA test. Generally speaking, this test works as follows:

- patient's serum is added to known allergens in solid-phase, for instance on paper discs, or in liquid phase. If the serum contains IgE antibodies against these allergens, they become permanently attached and an antigen-antibody complex is created. The surplus antibodies are washed away.
- Next, antiserum containing IgE specific antibodies bound with an enzyme is added. Again, excessive amount of antibodies is washed away.
- Finally, a substrate for the enzyme is added and the reaction starts. Its colourful product can be quantitatively evaluated by the colour strength, using a spectrophotometric method.

In ELISA tests, antibodies that are bound with the enzyme are polyclonal and/or monoclonal. There is another test available in which instead of these antibodies a recombinant Fc RI α receptor is used with a very high affinity to IgE antibodies in dogs.

False positive results tend to happen more frequently if polyclonal antibodies are used in the test. On one hand, polyclonal antibodies increase the opportunity to bind and detect IgE, but they are not always 100% specific for these antibodies. On the other hand, monoclonal antibodies directed always against the same spot in IgE molecules might miss it if the spot is hidden, for example owing to the change of the spatial shape of the IgE molecule which sometimes happens when the allergen is placed in solid-phase. This situation causes a false-negative result. The method with Fc ϵ RI α receptor eliminates cross reactions with IgG immunoglobulins, and a very high affinity of the receptor to Fc region of IgE antibody makes this method very specific.

Another reason for false-negative results might be the decreased amount of IgE antibodies circulating in the serum, or the fact that serologic tests do not take into account other immunological mechanisms responsible for the development of atopic dermatitis.

Both methods - intradermal and serologic tests - have got their advantages and disadvantages.

Definitely the fact that the patient doesn't have to be sedated or his coat shaved, which is more comfortable for the patient, is a great advantage of serologic tests; besides, the result is quantitative, the test is easy to perform and available for every veterinarian. The test can be performed irrespectively of the patient's condition; in the case of skin inflammation the intradermal test cannot be performed. In serologic tests the risk of the anti-inflammatory or antipruritic drugs interfering with test result is very low. The disadvantage is the occurrence of false positive results and clinically insignificant results.

Despite the advantages of serologic tests several dermatologists believe that the intradermal tests are the golden standard in diagnosing atopic dermatitis in dogs. Their significant advantage is the fact that they test the organ directly affected by the disease. There is also a lower number of clinically insignificant positive reactions, as compared to in vitro tests. The intradermal tests, besides detecting dermal IgE specific antibodies, also detect IgG antibodies of the sensitised mast cells. Yet another advantage of intradermal tests is a quick and direct result within less than 20 minutes. Their disadvantages, on the other hand, include the impact of several factors (drugs, hormones, stress), the necessity to learn appropriate technique and interpretation, lack of option to perform the test in the case of strong inflammation of the skin and a limited availability for veterinarians.

Atopic dermatitis is a multifactorial disease and can be a real diagnostic challenge. The diagnosis of the disease should always

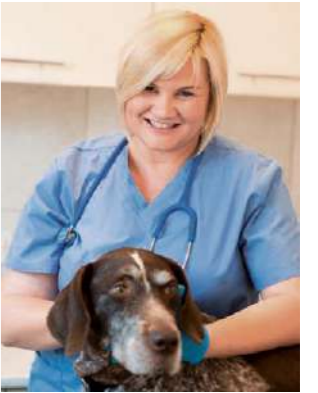
be based on exclusion of other conditions with pruritus and on finding clinical symptoms according to Favrot's criteria. Intradermal and serologic tests are helpful in diagnostic process; however, they should not be used as screening tests in diagnosing atopic dermatitis. One should remember that their main objective is to identify allergens in order to prepare a solution for specific immunotherapy or to attempt to eliminate the allergens from environment.

Literature:

1. Cherie M. Pucheu-Haston CH.,M. Santoro D., Bizikova P., Eisenschenk M.,N.,C., Marsella R., Nuttal T. : Review: Innate immunity, lipid metabolism and nutrition in canine atopic dermatitis. *Veterinary Dermatology* 2015, 26, 104-114.
2. Day M.J. *Clinical Immunology of the Dog and Cat*, Second Edition, 2011, Manson Publishing
3. Day M.J. (2015) :The skin immune system and immunity to cutaneous microorganisms. *Proceeding book ESVD Immunology Workshop*, 25th -27th November York, UK
4. De Boer D.J., Hillier A.: The ACVD task force of canine atopic dermatitis (VXI) : laboratory evaluation of dogs with atopic dermatitis with serum -based „allergy” tests. *Veterinary Immunology and Immunopathology* 2001, 81, 277-287
5. Hensel P., Santoro D., Favrot C., Hill P. and Griffin C., Henselet al.: Canine atopic dermatitis: detailed guidelines for diagnosis and allergen identification. *BMC Veterinary Research*, 2015, 11:196
6. Meury S., Molitor V., Doherr M.G., Roosje P., Leeb T., Hobi S., Wilhelm S. and Favrot C. : Role of the environment in the development of canine atopic dermatitis in Labrador and golden retrievers. *Veterinary Dermatology*, 2010, 22, 327-334
7. Miller W.H., Griffin C.E., Campbell K.L.: *Muller and Kirk's Small Animal Dermatology*, 7th Edition, 2012, Elsevier, Mosby.
8. Picco F., Zini E., Nett C., Naegeli C., Bigler B., Rüfenacht S., Roosje P., Ricklin Gutzwiller, M.E., Wilhelm S., Pfister J., Meng E. and Favrot C.: A prospective study on canine atopic dermatitis and food-induced allergic dermatitis in Switzerland. *Veterinary Dermatology*, 2008, 19, 150-155
9. Shaw S. et al. : Estimation of heritability of atopic dermatitis in Labrador and Golden Retrievers. *American Journal of Veterinary Research*, 2004, 65, 1014-20

Field study on the application of 4T Veterinary Diet Dermatitis Dog as an elimination diet in dogs with food allergy

Dorota Pomorska Handwerker, DVM, PhD; Aneta Birszel, DVM; Katarzyna Sikora, DVM Lubelska Poliklinika Weterynaryjna 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 hypersensitivity 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 hypersensitivity 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

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 hypersensitivity 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

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 4T 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.



photo: Dorota Pomorska-Handwerker

Materials and methods

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, demodicosis) and other hypersensitivities (contact allergy, flea allergy) (5,6).

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 hypersensitivity 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

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 4T 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:

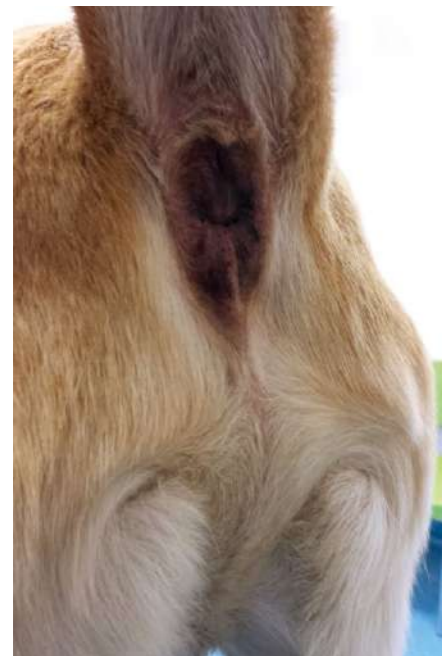


photo: Dorota Pomorska-Handwerker

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.

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 4T 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

Table 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

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.



photo: Dorota Pomorska-Handwerker

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 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, seborrhea, 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).

Based on the above-mentioned results of the field study on the application of 4T 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

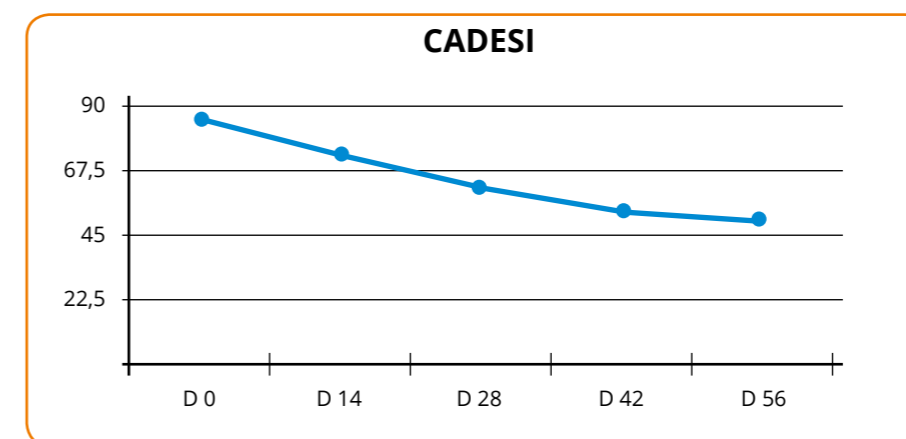
An article in the Polish version has been published in issue 4/2016 of "Veterinary Practice"

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



Literature:

- August J.R.: Dietary hypersensitivity in dogs. Cutaneous manifestation, diagnosis and treatment. *Compent. Cont. Educ.* 7: 469, 1985
- Cartotti D.N. i in.: Food allergy in dogs and cats. A review and report of 43 cases. *Vet. Dermatol.* 1:55, 1990
- Chesney C.J.: Food sensitivity in the dog: a quantitative study. *J. Small Anim. Pract.* 43 (5): 203-207, 2002
- Day M.J.: The canine model of dietary hypersensitivity. *Proc. Nutr. Soc.* 64 (4): 458-464, 2005
- Denis S, Paradis M. : L'allergie alimentaire chez le chien et le chat. *Revue de la littérature. Med. Vet. Quebec.* 24, 11, 1994
- Fadok V.A.: Diagnosing and managing the food allergic dog. *Compend. Contin. Educ. Pract. Vet.* 16: 1541, 1994
- Groh M., Moser E.: Diagnosis of food allergy in the nonseasonally symptomatic dog using a novel antigen, low molecular weight diet. A prospective study of 29 cases. *Vet. Allergy Clin. Immunol* 6:5, 1998
- Harvey R.G.: Food allergy and dietary intolerance in dogs. A report of 25 cases. *J. Small Anim. Pract.* 33:22, 1993
- Helm R.M., Burks A.W.: Animal Models of food allergy. *Curr. Opin. Allergy Clin. Immunol.* 2 (6): 541-546, 2002
- Jeffers J.G. i in.: Responses of dogs with food allergens to single ingredient dietary provocation. *J. Am. Vet. Med. Assoc.* 209:608, 1996
- Kaminogawa S.: Food allergy, oral tolerance and immunomodulation - their molecular and cellular mechanisms. *Biosci. Biotechnol. Biochem.* 60 (11): 1749-1756, 1996
- Olivry T. i wsp.: Treatment of canine atopic dermatitis: 2010 clinical practice guidelines from the International Task Force on Canine Atopic Dermatitis. *Veterinary Dermatology*, 21, 233-248, 2010
- Olivry T. i wsp.: Treatment of canine atopic dermatitis: 2015 updated guidelines from the International Committee on Allergic Disease of Animals (ICADA): *BMC Veterinary Research* 11: 210, 2015
- Sampson H.A.: Adverse reaction to foods. W Middleton E. i in.: *Allergy Principles and Practice* V. C. V. St. Luis, 1998, str 1162
- White S.D.: Food allergy in dogs. *Comp. Cont. Educ. Pract. Vet.* 20:261, 1998

Contact to the author:
Dr n. wet. Dorota Pomorska Handwerker
Lubelska Poliklinika Weterynaryjna sc
al. Kraśnicka 89, 20-718 Lublin, pomorska@list.pl



Product description in VetPharmacy

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

Mikaela Heidrich, DVM. EVIDENSIA Djursjukhuset Karlstad, Stallplatsvägen 2, 654 65 Karlstad, Sweden
email: mikaela@djursjukhusetkarlstad.se

Conflict of Interest
Omidea 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 therapeutic 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.¹ 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.¹ 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.² *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 ex-

terna.³ It has been reported that *Malassezia Pachydermatis* can cause nosocomial infection in humans.¹² 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.⁵ *Pseudintermedius* species has been shown to be resistant to antibiotics which is a cause of concern to public health.⁶ 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 typical 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.⁸ 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.⁹ Further L-Fucose has been shown to have wound healing properties by modification of dermal fibroblasts thru collagen biosynthesis.¹⁰ HMO may also modulate epithelial and immune cell responses.¹¹

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 over-



External auditory canal dog

photo: Justyna Ciechańska

Table 1.

Average change in clinical sign grade for those participants that improve	Średnia zmiana stopnia nasilenia objawów klinicznych u psów, których stan uległ poprawie
Odor	Nieprzyjemny zapach
Pruritus	Świąd
Shaking head	Potrząsanie głową
Erythema	Rumień
Excessive wax build	Nadmierne wydzielanie woskowiny
Day 1	Dzień 1
Day 14	Dzień 14
Percent of total population that improved	Procent psów, których stan uległ poprawie, w stosunku do badanej populacji
Odor	Nieprzyjemny zapach
Pruritus	Świąd
Shaking head	Potrząsanie głową
Erythema	Rumień
Excessive wax build up	Nadmierne wydzielanie woskowiny
Percent of total that improved	Procent psów, których stan uległ poprawie, w stosunku do badanej populacji

growth. 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 of 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 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 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



Ear canal after OTICURANT application

photo: Justyna Ciechańska

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.

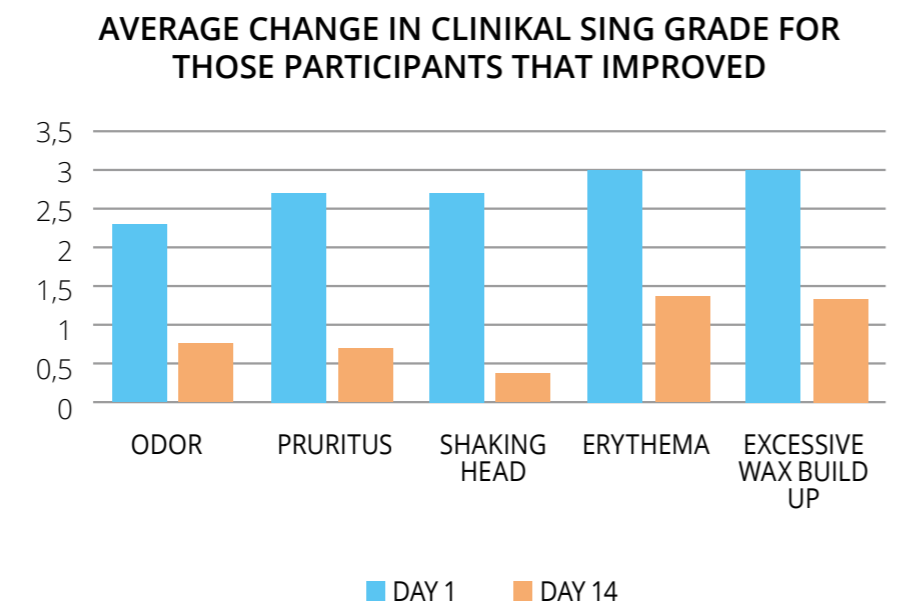
Foul odor was also significantly reduced

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.

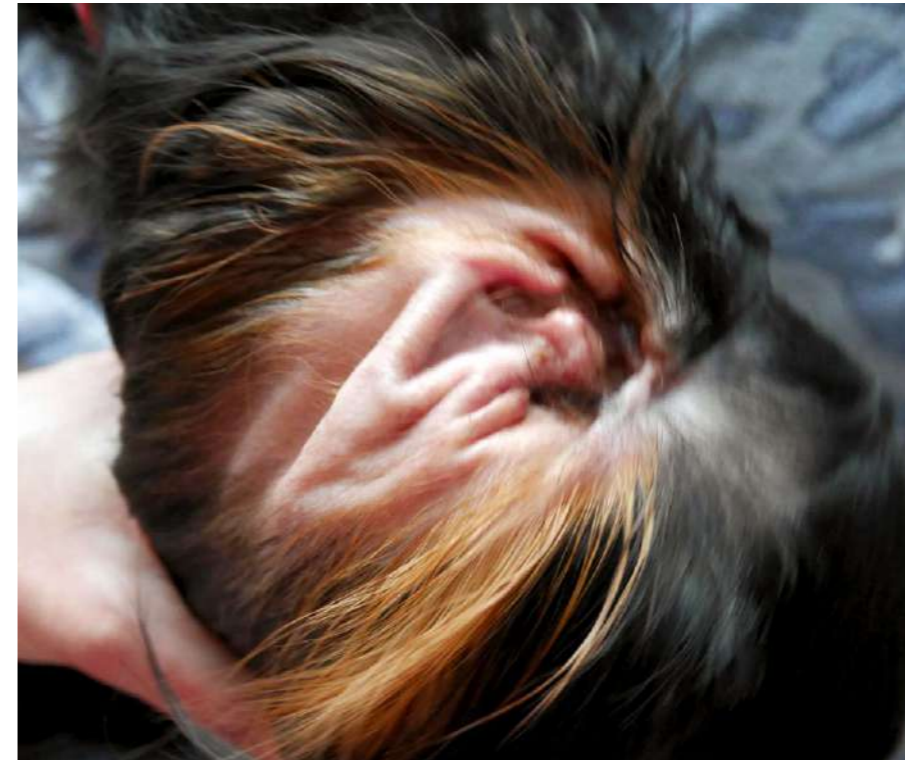
There was no significant change in the clinical sign grades for erythema although 50 % of the ears improved. 37 % showed a slight worsening. The rest were unchanged.

The powder was well tolerated and no



(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

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 giv-



Dog's ear canal after OTICURANT treatment

photo: Justyna Ciechańska

en the daily dose.

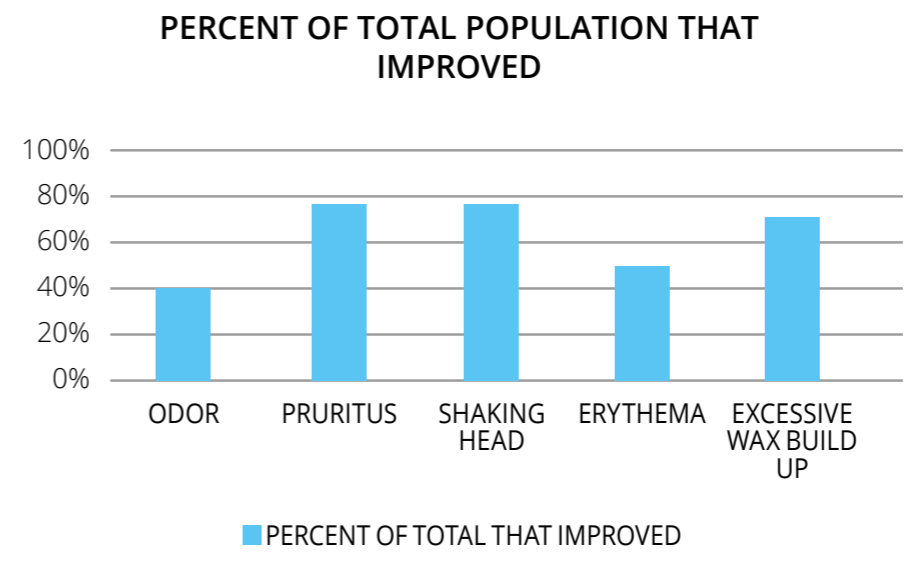
All dogs enrolled completed the study.

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

significantly improve as the rest did. It may 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



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

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.12 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 significantly 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 (±43.1) µm/day and 225.4 (±128.1) µm/day in healthy dogs.13 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.14 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



The correct appearance of the ear canal after OTICURANT treatment

photo: Justyna Ciechańska

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 evaporation 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

The author likes to thank all colleagues that participated in the study along with Omnidea AB, Stockholm, Sweden that supplied the powder for the study.

Literature:

1. Scott DW, Miller WM, Griffin CE. Muller & Kirk's Small Animal Dermatology. 5th ed. Philadelphia, PA: WB Saunders; 1995:351-357, 970-987.
2. Plant JD, Rosenkrantz WS, Griffin CE. Factors associated with and prevalence of high *Malassezia pachydermatis* numbers on dog skin. *J Am Vet Med Assoc.* 1992;201:879-882.
3. Prevalence of *Malassezia pachydermatis* in dogs with suspected *Malassezia dermatitis* or otitis in Slovakia. Eva Čonková, Edina Sesztáková, Ľubomír Páleník, Peter Smrčo, Ján Bilek. *ACTA VET. BRNO* 2011, 80: 249-254; doi:10.2754/avb201180030249
4. Evaluation of the effect of pH on *in vitro* growth of *Malassezia pachydermatis* Jennifer L. Matousek, Karen L. Campbell, Ibulaimu Kakoma, Philip F. Solter, and David J. Schaeffer. *Can J Vet Res.* 2003 January; 67(1): 56-59.
5. Clinical Isolates of *Staphylococcus intermedius* Masquerading as Methicillin-Resistant *Staphylococcus aureus*. Sudha Pottumarthy1, Jeffrey M. Schapiro1, Jennifer L. Prentice1, Yolanda B. Houzel1, Susan R. Swanzly1, Ferric C. Fang1,2 and Brad T. Cookson1,2,*J. *Clin. Microbiol.* December 2004 vol. 42 no. 12 5881-5884
6. Antibiotic Resistance Profiles of *Staphylococcus pseudintermedius* Isolates from Canine Patients in Korea. Yoon, Jang Won, Ki-Jong Lee, So-Young Lee, Min-Joo Chae, Jae-Keun Park, Jong-Hyun Yoo, and Hee-Myung Park. *J. Microbiol. Biotechnol.* (2010), 20(12), 1764-1768 doi: 10.4014/jmb.1001.01011 First published online 7 October 2010
7. A Microtiter plate assay for *Staphylococcus aureus* biofilm quantification at various pH levels and hydrogen peroxide supplementation. Tarek Zmantar, Bochra Kouidhi, Hanene Miladi, Kacem Mahdouani, Amina Bakhrouf. *NEW MICROBIOLOGICA*, 33, 137-145, 2010
8. *Staphylococcal* biofilm formation as affected by type acidulant. Antonia Nostro, Luigna-Cellini, Giovanna Ginestra, Manuela D'Arrigo, Mara Di Giulio, Andreana Marino, Anna Rita Blanco, Angelo Favalaro, Giuseppe Bisignano. © 2013 APMIS. Published by John Wiley & Sons

Ltd

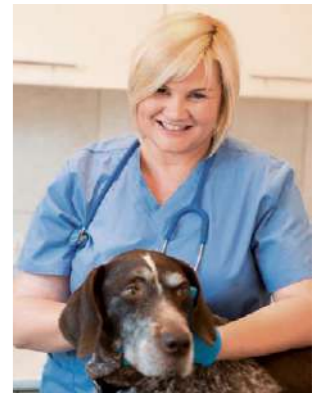
9. Inhalation with Fucose and Galactose for Treatment of *Pseudomonas Aeruginosa* in Cystic Fibrosis Patients Hans-Peter Hauber Maria Schulz Almuth Pforte Dietrich Mack Peter Zabel Udo Schumacher *Int. J. Med. Sci.* 2008, 5(6):371-376
10. Role of sugars in surface microbe-host interactions and immune reaction modulation David H. Lloyd, Jacqueline Viac, Dirk Werling, Christophe A. Rème, Hugues Gatto © 2007 The Authors. *Journal compilation © 2007 ESVD and ACVD.* 18; 197-204
11. Human Milk Oligosaccharides: Every Baby needs a Sugar Mama Lars Bode The Author 2012. Published by Oxford University Press.
12. Atypical Lipid-Dependent *Malassezia* Species Isolated from Dogs with Otitis Externa M.J. Crespo, M.L. Abarca, F.J. Cabanes. *JOURNAL OF CLINICAL MICROBIOLOGY*, June 2000, p. 2383-2385
13. Epithelial migration on the canine tympanic membrane. Natalie E. Tabacca, Lynette K. Cole, Andrew Hillier, Päivi J. Rajala-Schultz *Veterinary Dermatology* DOI: 10.1111/j.1365-3164.2011.00982.x
14. Logas DB. Diseases of the ear canal. *Veterinary Clinics of North America Small Animal Practice* 1994; 24:905-19.



Product description in VetPharmacy

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

Dorota Pomorska-Handwerker, DVM. Agnieszka Pomorska, DVM Lubelska Poliklinika Weterynaryjna s.c. w Lublinie, Wydział Medycyny Weterynaryjnej Uniwersytetu Przyrodniczego w Lublinie



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).

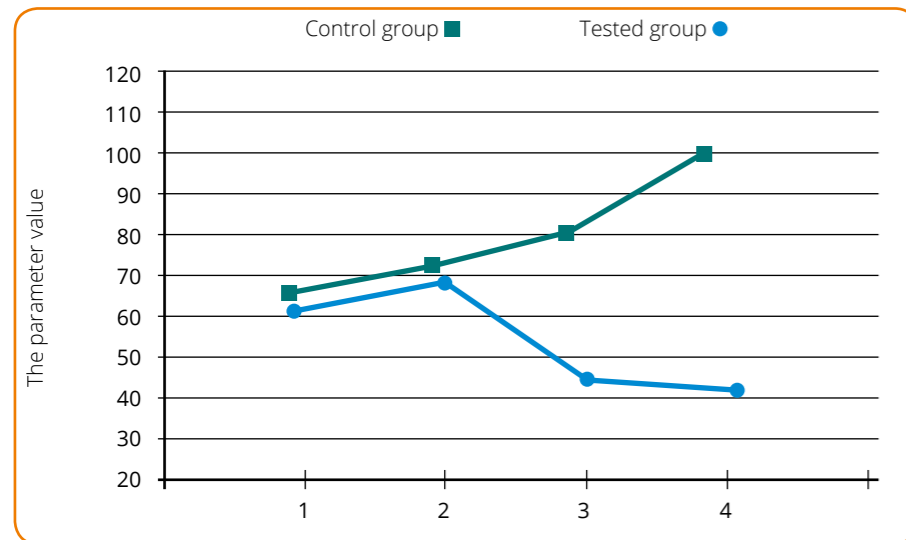
Material and methods

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

Chart 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 Mauchly 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 Czapowicz, 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 90th day it was statistically significantly higher than on days 0, 30 and even on the 60th 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 60th ($p<0,001$) and 90th 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 30th 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 60th 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 90th 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 30th 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 60th 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 90th 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“.

Literature:

- White P.: Essential Fatty Acids: Use in Management of canine atopy. „Compend. Contin. Educ.“, 1993, 15: 451.
- Bond R., Lloyd D.H.: A double-blind comparison of olive oil and a combination of evening primrose oil and fish oil in the management of canine atopy. „Vet. Rec.“, 1992, 131 (24): 558-560.
- Bond R., Lloyd D.H.: Randomized single-blind comparison of an evening primrose oil and fish oil combination and concentrates of these oils in the management of canine atopy. „Vet. Dermatol.“, 1992, 3 (n/a): 215.
- Harvey R.G.: A blinded, placebo-controlled study of the efficacy of borage seed oil and fish oil in the management of canine atopy. „Vet. Rec.“, 1999, 144 (15): 405-407.
- Scott D.W.: Comparison of the clinical efficacy of two commercial fatty acid supplements (EfaVet and DVM Derm Caps) evening primrose oil and cold water marine fish oil in the management of allergic pruritus in dogs: A double blinded study. „Cornell Vet.“, 1992, 82: 319.
- Mueller R., Fettman M.J., Richardson K. i in.: The effect of omega-3 fatty acid supplementation on cutaneous and plasma fatty acid concentration in dogs with atopic dermatitis. „Vet. Dermatol.“, 2004, 15 (s): 65.
- Olivry T., Marsella R., Hillier A.: The ACVD task force on canine atopic dermatitis (XXIII): are essential fatty acids effective? „Vet. Immunol. Immunopathol.“, 2001, 81 (3-4): 347-362.
- Marsh K.A., Ruedisueli F.L., Coe S.L. i in.: Effects of zinc and linoleic acid supplementation on the skin and coat quality of dogs receiving a complete and balanced diet. „Vet. Dermatol.“, 2000, 11 (4): 277-284.
- Bensignor E., Morgan D.M., Nuttal T.: Efficacy of an essential fatty acid enriched diet in managing canine atopic dermatitis: a randomized, single-blinded, cross-over study. „Vet. Dermatol.“, 2008, 19 (3): 156-162.
- Scott D.W., Miller W.H. Jr, Decker G.A., i in.: Comparison of the clinical efficacy of two commercial fatty acids supplements (EfaVet and DVM Derm Caps) evening primrose oil and cold water marine fish oil in the management of allergic pruritus in dogs. A double blinded study. „Cornell Vet.“, 1992, 82: 319-329.
- Saevik B.K., Bergvall K i in.: A randomized, controlled study to evaluate the steroid sparing effect of essential fatty acid supplementation in the treatment of canine atopic dermatitis. „Vet. Dermatol.“, 2004, 15, 137-145.
- Prelaud P., Guaguere E., Alhaidari Z. i in.: Reevaluation of diagnostic criteria of canine atopic dermatitis. „Rev. Med. Vet.“, 1998, 149: 1057-1064.
- Favrot C., Steffan J., Seewald W. i in.: A prospective study on the clinical features of chronic canine atopic dermatitis and its diagnosis.



Product description in VetPharmacy.

Otitis externa: VetExpert's approach

Natalia Jackowska, DVM



Inflammation of the external auditory canal is one of the most frequent complaints that bring dog owners to veterinary clinics. Recurrent infections and repeated visits can cause frustration in both owners and doctors. Staphylococcal or fungal infections are typical complications of the primary disease (such as atopy, polyps, or neoplastic processes), and a protracted inflammation and inappropriate treatment of the external auditory canal may result in infections with Gram-negative bacteria (bacilli). The frequent failure of treatment in otitis externa raises an important question: are medications (antibiotics and anti-fungal agents) necessary in the first place? An attempt to eliminate just the secondary disease (otitis externa) often ends in failure. It is crucial to determine the primary cause and adopt the correct course of action. Bilateral otitis is often observed in atopic dermatitis, and, as has been shown, treating the ears alone fails to address the root cause of the problem. Antibiotics and anti-fungal drugs will not help eliminate the disease, and may cause a series of additional problems, such as increased bacterial resistance and bacilli infections. To address the issue of bacterial resistance and recurrent otitis, VetExpert proposes an alternative solution.

Oticurant

Oticurant is an absorbent powder that soaks up moisture and lipids, reducing the pH below 4, which impedes the growth of microorganisms. At the pH of 5, the proliferation of *Staphylococcus pseudintermedius* is significantly slowed down, and at the pH of 4, it stops completely. A powder formula facilitates the application of the product. Another frequent commensal of the auditory canal is *Malassezia pachydermatis*, whose proliferation is promoted by an excess of sebum, high moisture, and an abnormal immunological response of the cellular type. A necessary condition for the proliferation of yeast is the pH of about 5-9; at the pH of 3, on the other hand, the growth is minimal or shuts down completely. Oticurant is ideal for dogs suffering from pain and swelling in the auditory canal. Easy application without the need to massage the base of the ear allows to control the disease even in pets usually qualified for sedation. Oticurant has many advantages and can be used in most cases of *otitis externa*; it should be kept in mind,

however, that when Gram-negative bacteria are involved, a large pH drop may contribute to infections. Prior cytology it will be necessary to choose the appropriate course of treatment.

Otiflush

Otiflush is a hygiene product designed for rinsing the auditory canals. An optimum pH of 5 makes it suitable for use regardless of the root cause (fungal or bacterial) of *otitis externa*. The main ingredient of the product, chlorhexidine, has strong antibacterial and antifungal properties, and thanks to its safe concentration, Otiflush has no ototoxic side-effects. Tris-EDTA increases the permeability of cell membranes in bacteria, showing a strong bactericidal effect also on *Pseudomonas aeruginosa*, and the chelation of metal ions necessary to ensure the integrity of cell walls counteracts sores and tissue necrosis caused by infections with this strain of bacteria. Otiflush can be used to rinse auditory canals in inflammations accompanied by excessive exudate, regardless of their underlying cause, in monotherapy or in order to prepare the

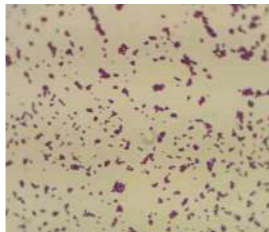

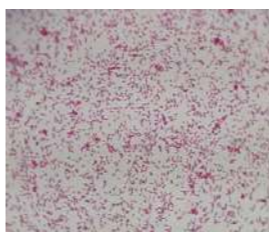
auditory canal for treatment.

Otihelp

An emulsion for the daily hygiene of auditory canals. An optimum pH of 5 and the presence of chlorhexidine and Tris-EDTA ensure a strong antibacterial and antifungal effect. It should be kept in mind that recurrent inflammations of the auditory canal are caused by an underlying primary disease. Otihelp is ideal for maintaining and restoring the normal function of auditory canals without the risk of increasing the antibiotic resistance of the overgrown bacterial and/or fungal flora.

The key to success in the treatment of otitis externa is choosing the correct approach. Keeping the inflammation down to a manageable level helps ensure the good mood of both the pet and the owner. The line of VetExpert products makes it possible to select the appropriate treatment algorithm and guarantees that the therapy is safe and effective.

Table 1.

Cytology result	VetExpert product	Proposed treatment
Cocci 	Otihelp Otiflush Oticurant	Rinse the auditory canal with Otiflush; for daily hygiene, apply Otihelp for a minimum of 7 days or according to your doctor's recommendations. Oticurant can be used in monotherapy or after the prior rinsing of the auditory canal with Otiflush.
Malassezia 	Otihelp Otiflush Oticurant	
Gram-negative bacilli 	Otihelp Otiflush	The presence of Gram-negative bacilli in cytology is a serious complication of <i>otitis externa</i> and involves a high risk of increased antibiotic resistance. Rinse the auditory canal with Otiflush and continue using Otihelp daily until you receive a negative swab test result. It is extremely important to eliminate the primary disease.

Product description in VetPharmacy



Product description in VetPharmacy





4t Veterinary Diet Dermatitis Dog

It is a complete and balanced dietetic feed for dogs for the reduction of nutrient intolerances and support of skin function in the case of dermatosis and excessive fur loss. This feed contains high level of essential fatty acids and specially selected easily digestible proteins.

Feeding instructions: The feed given in amounts showed in feeding guide meets nutritional requirements of dog. The initial amounts are shown in the table on the packaging. The doses may be divided into two or more meals. It is advised to consult a veterinarian before first use of the product or extending the period of feeding. The recommended period of administration in case of reducing the occurrence of feed intolerance is from 3 to 8 weeks. If the symptoms of intolerance subside, the feed may be given for an indefinite period of time. In case of maintaining the normal functions of the skin in dermatoses and in case of excessive fur loss the feed should be given up to 2 months. Keep the fresh water available at all times.

Ingredients: Fresh salmon (40%), Salmon meal (25%), Potatoes (20%), Chicken fat, Rice, Sugar beet pulps, Fish meal, Yeast, Hydrolysed salmon (5%), Fish oil, Inulin (FOS 0,25%), Sodium chloride, MOS (250 mg/kg), Extract of lemon, Extract of Yucca, Potassium chloride, Monocalcium phosphate, Ginger.

Additives: Vitamin A – 20000 IU/kg, Vitamin D3 – 2000 IU/kg, Vitamin E – 600 mg/kg, Iron 185 – mg/kg, Iodine – 3.5 mg/kg, Copper – 13 mg/kg, Manganese – 7.5 mg/kg, Zinc – 180 mg/kg, Selenium – 0.6 mg/kg, L-glutamine – 100 mg/kg, Taurine – 750 mg/kg, L-carnitine – 70 mg/kg.

Technological additives: antioxidants natural tocopherols (280 mg/kg).

Sensory additives: lutein (8 mg/kg). Contains EU permitted antioxidant.

Analytical constituents: Crude protein – 28.00%, Oils and crude fats – 18.00%, Essential omega-3 unsaturated fatty acids – 1.10%, Essential omega-6 unsaturated fatty acids – 2.95%, EPA + DHA – 0.50%, Crude fibre – 2.30%, Crude ash – 7.00%, Calcium – 1.10%, Phosphorous – 0.70%.



VetoSkin

Composition: 2.20.1 Borage oil reOiled, 10.4.6 Ósh oil, 2.21.1 lecithin, Additives: 3bE6 zinc oxide 56 mg, 3a Cyanocobalamin 5.75 mg (Vit. B12), D-biotin 1, 15 mg, 3a riboflavin 0.575 mg (Vit. B2), 3a pyridoxine hydrochloride 0.307 mg (Vit. B6), 3a thiamine hydrochloride 0.258 mg (Vit. B1).

Indications: The product is recommended for dogs and cats suffering from dermatological disorders, with symptoms including dry, dull and falling out fur and peeling skin.

Dosage: 1 capsule for animals up to 15 kg of body weight, 2 capsules for animals above 15 kg of body weight. The capsule may be administered as a whole or cut and mixed with food or administered directly into the animal's mouth. It is recommended that the product be used for at least 2 months or until the optimum result is achieved. The **Twist off** technology is practical and user-friendly. It ensures the durability and quality of easily oxidizing fatty acids.

Storage conditions: Store in a dry place at room temperature. Protect from direct sunlight. Store in a place out of reach and sight of children and animals.

Analytical constituents: Crude protein 4.57%, crude ash 10.85%, crude fat 64.10%, crude fibre 0.05%, moisture 1.06%.



VetExpert Oticurant

Oticurant eliminates odors, clean ears and prevents ear infection in dogs. Oticurant® is an ear care product that supports physiological ear conditions and helps to prevent unpleasant odor and calm the itching of the ears. The odor comes when fungi and bacteria grows out of control. Moisture and wax in the ear canal promotes unchecked growth. The by-products that the fungus produces have a characteristic odor that is normally perceived as bad. Oticurant® restores balance by binding moisture and wax which are important nutrients for fungi and bacteria and needed for their reproduction. The pH is lowered with lactic acid making the environment less conducive for bacteria and fungi growth. Additionally the absorbing effect of Oticurant® has been shown to give dogs cleaner ears, which has been scientifically proven. If Oticurant® has not been used previously then put one packet in each ear once a day for five days. After the initial dosing regime is concluded put one packet in each ear once a week as a maintenance dosing. If the dog weighs less than 10 kg use one packet and if over 40 kg use 2 packets for each ear. The 24 pack provides three months of maintenance dosing for a dog weighing 10 to 40 kg.

Instructions for use

1. Shake down the powder before the packet is opened.
2. Hold the earflap with one hand and pour the powder into the ear canal.
3. Let go of the earflap. No massaging of the ear after administration is needed.
4. Your dog may shake the head this is normal.

Contents: 6-Deoxy-L-galactose, Oligosaccharide, Lactic Acid, Excipients.
Patent pending



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 Lauryl 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 Alkohol, Sodium Lauryl Sarcosinate, Panthenol, Glycerin, Allantoin, Urea, Chlorhexidine Digluconate, Salicylic Acid, Xanthan Gum, Menthol, Citric Acid

Do not hide problems!



VetExpert *found complex solution*

Ear:



- OtiFlush
- Otihelp
- Oticurant

Hair:



- Benzoic Shampoo
- Specialist Shampoo
- Hypoallergenic Shampoo
- Antiseborrheic Shampoo
- Beauty & Care Shampoo
- Puppy Shampoo

Skin:



- VetoSkin

Test:



- Total IgE Ab

Diet:



- 4T Veterinary Diet Dermatitis Salmon & Rice
- 4T Veterinary Diet Dermatitis Rabbit & Potato

