Skin Diseases in Dogs: A client’s guide
The Skin’s Many Functions
- Largest organ in the body
- Protects from outside environmental impacts while allowing movement
- Pigment deposition in deeper layers protects from solar radiation damage
- Temperature regulation is controlled through the skin and panting
- Hair production occurs in the skin and aids in thermoregulation, physical protection and appearance
- Tiny muscles allow hair shafts to stand erect for heat escape and for communication during confrontation
- Several cells of the immune system live within the skin to protect from bacteria, fungi and viruses
- Nerves present within the skin allow sensory perception
- Sebaceous glands produce sebum which keeps skin soft and well-hydrated
- Fat, proteins and electrolytes are stored in the skin
- Important source of vitamin D

About the Skin

The skin is an organ of many functions with a particularly dynamic nature. There can be many disease processes that result in changes in the skin. Genetic or contagious diseases can affect the skin and hair quality. An improper diet may also cause dermatitis. Dull or flaky skin can indicate an imbalance of vitamins or essential fatty acids. It is best to have your pet examined by a veterinarian before adding anything to the diet because arbitrary supplementation may exacerbate the problem, cause additional issues in other organs or delay appropriate medical therapy.

Multiple layers of self-renewing cells make up the skin. The basal cells, the deepest layer comprised of the newest cells, continuously flatten and harden as they move towards the surface through each layer. On a regular basis, the outermost layer sloughs off into the environment at a rate typically unnoticed. However, in certain skin abnormalities, such as inflammation, infection or hormonal imbalance, this cycle is accelerated producing larger sheets of dead skin, or white flakes.

This Shar-Pei had several problems that affected the skin and other organ systems.
**Bricks and Mortar**

The top layer of the skin, stratum corneum, is likened to a brick wall. The skin cells are like the bricks and the mortar helps hold them together. Mortar is a paste-like material with a significant portion of water that holds bricks together. Without functional mortar, the brick was can be more easily damaged and make it easier for other substance to pass from one side to the other. In addition to the water within the “mortar” of the skin, there is a balanced amount of fatty acids and oils needed to ensure the skin remains a protective barrier to the outside and prevent excess water loss from other skin layers.

**Four Main Stages of Hair Growth**

Hair and skin can also demonstrate changes indicating problems in the animal’s body. The growth cycle of hair is demonstrated above, and each phase can vary in length of time depending on breed. Animals with shorter anagen phases will have shorter hair compared to the pets with longer anagen phases resulting in a longer hair coat. Normally, each follicle will vary at which phase or part of a phase it’s in to avoid large patches of hair loss at one time when the animal sheds. Therefore, when an area of bare skin is seen on a pet, this indicates a disruption in the cycle and warrants further work-up to find the underlying cause. Illness can result in a shortening of the anagen phase as the body shifts its energy and nutrients toward fighting the illness and away from normal growth.

The hair bulb, which is where the hair begins, is influenced by a variety of hormones. These include glucocorticosteroids, thyroid and sex hormones. Any number of imbalances within these substances may lead to alterations in the hair cycle as well. **This does not mean, however, that neutering or spaying is dangerous to your pet’s skin and hair health.**

The skin and hair coat often indicate underlying or impending disorders. Your pet’s health and even survival are dependent on the many functions and duties of the skin. A well-balanced diet and proper maintenance care in regards to grooming and bathing are a wonderful start to help your fury family member’s skin stay happy and healthy.
Grooming And Bathing

The type and frequency of grooming and bathing can differ drastically depending on the type of hair coat your pet has and personal expectations. If you’d like more details on a particular breed, please consult a groomer or a more breed-specific resource. In general, however, a dog with healthy skin and hair coat should need a bath much less frequently than one with compromised skin. Pets with skin problems may need to be bathed once a week or even more with special products.

**It is important to have your pet examined by a veterinarian if you suspect skin issues, mostly due to certain products causing more irritation if used more frequently.**

A groomer is a wonderful option if you desire a particular cut and style or if you are unable to keep up with your pet’s regular skin and hair maintenance. It’s important to realize that regular grooming involves much more than bathing and brushing. Conditioning the hair and skin, combing, nail trimming, and anal gland expression as well as ear cleaning on occasion are all part of maintain healthy skin.

Proper and regular grooming can prevent potential skin problems and can even help in the treatment of already present ones. Without maintaining your pet’s skin and hair coat, they can have excess shedding, irregular distribution of essential skin oils, and possibly develop inflamed or infected skin, ears or anal glands which are often accompanied by foul odors. Regular grooming gives you a chance to examine the overall condition of your pet’s skin, feet, ears and even teeth. Detecting any problems early can prevent a disaster at a later date.

Brushing

More frequent brushing for a shorter period of time is the best approach. A slicker brush is a good general purpose brush for most pets. The head is typically rectangular and consists of fine metal bristles. This prevents and loosens mats and removes the undercoat. A groomer can be a great resource in selecting the optimal brush for your pet.

Even with frequent brushing, mats can occur. If a mat is encountered, it’s important to go slowly and prevent as much harm to the pet’s skin as possible. Patience is key to working out a mat, grass awns or burrs. Sometimes they will need to be clipped away from the hair. Electric clippers are preferred because scissors have the potential of cutting the skin.
**Regular Grooming**

- Brushing
- Bathing
- Drying
- Conditioning
- Combing
- Nail trimming
- Ear Cleaning
- Expression of anal glands

**Bathing**

In general, a mild shampoo is all your pet may need. It is important to review the particular shampoo instructions. However, to avoid any residue build-up or even irritation the coat should be thoroughly rinsed after bathing. A conditioner may benefit some breeds as well.

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**Shampoo Options**

There are many shampoo options nowadays, ranging from natural to medicated, and making the right choice for your pet can be daunting. Often, your individual preference, type of hair coat, and your pet’s skin condition will dictate which shampoo is best. Due to an animal’s dynamic skin quality, shampoo requirements will likely change overtime. Also, a shampoo that is appropriate for one dermatological condition may not be the right choice for another. Shampoos are rarely a “cure all” for any one condition, but the appropriate one can be an integral part of the treatment plan.

Medicated shampoos come in many different forms. Antimicrobial shampoos are used for bacterial and fungal infections. Depending on how severe the infection and what kind of infection (bacterial, fungal or both), there are different shampoos to choose from and additional medical therapy may be needed.

Anti-seborrhea shampoos are used to help control conditions ranging from dry scales (dandruff) to greasy and oily hair coats. These shampoos are important for pets suffering from a primary issue of flakey skin or a secondary issue while additional work-up is performed to find the initial problem. Ingredients included within these shampoos can be tar, sulfur, selenium sulfide, salicylic acid, and benzoyl peroxide. Generic products aimed at controlling seborrhea should be avoided initially as there is a wide range of quality and could be less effective. In some cases, it may be beneficial to bathe your pet in a mild cleansing shampoo before using medicated soaps.

*Photo courtesy of Dr. Tom Manning.*
There are many shampoos to choose from when your pet is suffering from a skin issue. For the most effective and fastest relief, it's important that you know and understand your pet’s skin disease. There are many different ingredients available in shampoos that aim to tackle specific problems, and additional irritation can occur if the primary problem is not identified before using them. Your veterinarian or veterinary dermatologist will be able to examine your pet, perform appropriate diagnostics and recommend the best shampoo for his or her condition.

Flea Shampoos can be used for short-term control, however, this is not the best way to control an infestation or protect your pet. In fact, the adult fleas seen on an animal represents only about 10% of the population within an environment. Additional information regarding flea control will be addressed later.

Shampoos can actually have direct soothing and anti-itch factors as well. While some shampoos offer the pet relief from irritation by tackling the primary problem, there are others that can help with the symptoms while additional diagnostics are taking place. Oatmeal is a common ingredient in these shampoos as it can be helpful with little adverse reactions. However, the length of relief is short-acting — 1-2 days.

Topical steroids are probably the most useful medication applied directly to the skin. However, the excessive use of them can lead to localized and systemic side effects.

Gather Before You Lather

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A flea infestation can be exhausting as flea control can be an extremely frustrating process. An organized approach to the problem and patience can lead to a successful eradication, though. Mild to moderate flea infestations may not actually result in a problem for humans in the house, but a relatively few number of fleas can cause significant issues for household pets. Consulting with a veterinarian concerning an infestation is important not only to develop a plan but to ensure your pet’s safety. Products used during the extermination process can be toxic to some pets.

Fleas, Ticks and Other Parasites

Fleas

A flea infestation can be exhausting as flea control can be an extremely frustrating process. An organized approach to the problem and patience can lead to a successful eradication, though. Mild to moderate flea infestations may not actually result in a problem for humans in the house, but a relatively few number of fleas can cause significant issues for household pets. Consulting with a veterinarian concerning an infestation is important not only to develop a plan but to ensure your pet’s safety. Products used during the extermination process can be toxic to some pets.

While adult fleas spend most of their time on an animal’s body, they only account for approximately 10% of the population. Therefore, control is essentially a three-pronged attack: targeting the yard, the house and the pet. Wild and stray animals can be a continuous source of fleas, so continual protection for your pet is imperative. Fleas can be even more difficult to get rid of in a home due to their extremely lengthy time cocoons can survive in the environment. An “all-of-the-sudden” infestation in the home after a vacation does not necessarily mean your pet brought them from the boarding facility.
Protect Your Pet

- Shampoos
- Dips
- Powders
- Spot-on products
- Sprays
- Foams
- Collars
- Monthly pills
- Monthly topicals

Internal Parasites Too?
Most internal parasites do not normally cause problems in the skin. If there is a link, it is most likely due to the parasites affecting your pet’s overall health and making them more susceptible to skin issues. Rarely, they can find their way to the skin and cause sores, rashes or itching. Be aware that if your pet is positive for heartworm or intestinal parasites, it may complicate test results when skin disease is also present. For an overall healthy pet it’s important to test for and treat for internal parasites to avoid other possible complications.

The use of sprays in the environment can be complicated. A pet owner should read labels carefully and thus environmental therapy may best be performed by a professional. Some spray products containing insect growth regulators can block the development of the immature stages and offer a greater long-term control. Please ensure that you are paying close attention to the label as some sprays can be toxic to your family, pets and the environment. Some dog flea products can be LETHAL to cats. It is best to focus on areas where your furry companion spends a lot of time. It is also important to find sprays specifically for the yard as some agents used for flea control can be broken down by sunlight.

Vacuuming can be a key first step for indoor control. Remember to dispose of the bag or empty the collection container outside to avoid recontamination. Wash the pet’s bedding in hot water. Again, the use of a spray with an adulticide and insect growth regulator is preferred for optimal control. Be sure to concentrate your efforts in the areas where your pet frequents, but treating the whole house is also recommended. Be sure to include closets, attics, basements, porches and crawl spaces. The use of premise sprays is typically more effective than foggers, which may not reach under furniture into or around corners. Products used for your pet include shampoos, dips, foams, powders, sprays, collars, as well as oral and topical monthly preventatives. The length of time for all of the products vary drastically. Shampoos and sprays can be a useful start in treating an infestation but are not recommended for long-term control. Dips may last a little longer than shampoos but frequency of use should be limited due to toxicities. There is a large variation of flea collars alone with a wide range of reported effectiveness. These products also vary in how they control or kill the flea population. Many factors should be considered when choosing the right control for your pet. They include the individual environments, type of pet, and your ability to administer the preventative or treatment. Consultation with your veterinarian is strongly advised in order to achieve rapid success in a safe manner.
Ticks

Ticks are another type of insect that may feed on the blood of your pet. They may also carry diseases. Therefore, a heavy infestation may lead to a severe anemia. The saliva of ticks can also decrease the host’s local immune system allowing infection to occur. This could lead to the animal continuously scratching at the site and causing additional irritation.

Should a tick attach to your pet, prompt removal is required. Fine-pointed tweezers or any number of tick removal devices that get close enough to the skin surface in order to remove the entire tick will suffice. Localized irritation may occur due to either tiny pieces of skin being removed along with the tick or mouth parts of the tick being left behind. The area should be washed with soap, and the person removing the tick should wear gloves during the process. Petroleum jelly, matches and other home remedies are not recommended and may worsen the situation.

It is important to know the elimination of other hosts, such as deer and rodents, has not been successful in controlling tick infestations. Environmental control with sprays can be achieved on a limited basis. There are many different products specifically for your pet, including collars, topical spot treatment, and pills, with varying rates of success depending on type of tick and duration. They can also be killed by many of the flea products discussed previously. Be sure to check label for effectiveness and consult with your veterinarian about what is best for your pet.

Lice

The diagnosis of lice in small animals is becoming increasingly rare. Partly due to the use of flea control products which eliminate lice as well. Both the adults and eggs can be seen by the naked eye. A different type of louse affects dogs than the ones found on humans, which is also a different one affecting cats. Lice can cause inflammation and profound itching, but are easily treated with products used to kill fleas.

Demodex mites are passed from dam to her pups.

Tick Facts

- Ticks have four life stages: egg, larva, nymph and adult
- Can carry pathogenic organisms that cause diseases such as Rocky Mountain Spotted Fever and Lyme Disease
- The adult may increase its weight 100 times while feeding
- Females can release thousands of eggs once detached from the host
- The bite itself is painless, allowing the tick to stay attached
- Ticks are attracted by motion, heat, carbon dioxide and changes in light

The deer tick is the most common carrier of Lyme Disease.
There are many different types of mites that can be associated with skin problems in pets. The two most common mites seen in dogs are demodex and sarcoptic mites, and the animals exhibiting disease associated with these are considered to have “mange.” Other mites include cheyletiella, ear mites, and even more mites less commonly seen. Most mites are so small that they can only be confirmed through the use of a microscope.

First, sarcoptic mites, or scabies, can cause one of the itchiest skin diseases seen in dogs. It can be highly contagious within a household, but not all animals exposed to the infested one will show symptoms. Clinical signs include extreme itching and crusts on the margins of the ears, elbows and skin over the chest. However, there are some animals that will be affected in different areas, or could only show signs of itching with no crusts, redness or hair loss. These mites can also cause problems, only temporarily, in humans. If you suspect this, you are advised to seek an evaluation with your own physician or MD dermatologist.

Demodex mites usually do not cause itching. Very small number may actually found on uninfected dogs and are not contagious. Transmission occurs when puppies are a few days old and nursing. Clinical signs associated with demodex include patchy hair loss on the face and feet, unaccompanied by itching. However, sometimes other areas are affected and itching may be present. Samples taken from skin scrapes are used to microscopically diagnose the infestation.

Localized demodicosis, having only a mild case affecting a single or few limited areas, is considered self-limiting and will often resolve on its own. In fact, it is recommended not to treat localized disease in order to see if the animal develops a generalized form. More severe cases will often affect several areas or even the whole body and are considered to have generalized demodicosis.

Genetic predisposition, general ill health and the use of drugs that suppress the immune system, such as steroids, can contribute to these severe cases. Because generalized disease is considered to have a genetic component, it is not recommended to breed these animals. When an animal is even more severely affected, the skin is often suffering from a secondary infection. Open sores may ooze and have a foul odor.
There are a few different types of allergies that can be seen in your pet, and often they may have symptoms that look alike with only subtle differences in history, distribution of clinical signs, or response to therapy. However, some pets may manifest their allergies in other ways, such as ear and skin infections. The two most common types seen in dogs include flea allergy and environmental allergy. The substances, or allergens, gain access to the body. Normal animals do not have a problem with allergens but Allergen exposure in an allergic pet results in the development of symptoms. These symptoms are due to a complex relationship between abnormal skin and an abnormal immune response.

**Flea Allergy**

Dogs affected by flea allergy can suffer from intense discomfort and itch from an imperceptible flea bite. The allergic pet's immune system actually reacts to the flea's saliva, and the reaction can occur almost immediately and last many days. This differs greatly from when normal dogs are heavily infested with fleas, causing occasional itching. Flea allergy is the most common allergy seen. Clinical signs are often worse near the area of the bite, but can manifest at distant locations. The “rump” region is the most common location of itching, redness, small bumps, hair loss and self-induced trauma. Excessive licking or chewing of both the front and rear legs and paws can be seen with flea allergy as well as other allergies.

Eradication of fleas from the pet and the environment is the most important aspect of controlling a flea-allergic dog. Treating a flea infestation is explained in previous pages. It is important to realize that flea control products requiring the flea to bite the animal before being to be exposed to the product, may not be helpful for flea-allergic dogs.
This disease, also known as atopy, involves allergic reactions to various pollens or spores from grasses, trees, molds and weeds, as well as other microscopic allergens. While humans suffering from allergies have runny noses, irritated eyes and sneezing, most dogs manifest the disease by scratching, rubbing, licking and biting themselves. Feet, forearms, armpits, abdominal region, face, ears and sometimes the rump can become red and irritated. Ear and skin infections accompanied by a foul odor are often present. Bacteria and yeast take advantage of the abnormal skin and create secondary problems.

Typically, the dogs suffering from environmental allergies begin showing symptoms between 1-3 years of age, and clinical signs may be more prominent during a particular season. As the disease progresses, the dog’s discomfort can occur all year long. However, in milder climates, symptoms may initially start at a younger age and be present year round. The ubiquitous nature of allergens and how affected animals become symptomatic makes environmental allergies difficult to control.

Medical therapy maybe necessary if the clinical signs cause the pet to be uncomfortable. Various types and combinations of medications can be used, and individual pets can respond differently depending on what allergens they react to, their environment and even their geographic location. As environmental allergies are typically a progressive life long disease, options to long term medical therapy should be strongly considered. Allergy testing and allergen specific immunotherapy should be important components of managing this disease.

Intradermal testing and blood testing are used to test for specific allergen sensitivities. Blood testing involves obtaining a sample of blood and submitting it to an outside laboratory. While the blood test is somewhat easier to perform and interpret, it only measures the immune components within the blood. The intradermal testing offers the opportunity to evaluate the immune response in the skin.
Food Allergy
This type of allergy is a common disease, but is often overemphasized as the source of itchy skin. Clinical signs may be sudden in onset and are practically indistinguishable from those seen in environmental allergies. Gastro intestinal signs can also be seen in some patients. The symptoms are not usually associated with a sudden change in diet, can start at any age and do not vary with seasons. While having food allergy is uncommon, the pets suffering from it may often have other allergies as well. Work-up to determine why your pet is itching may involve testing for food, environmental allergies and flea allergy.

The only way to diagnose a food allergy is by conducting a food trial using a proper hypoallergenic diet. This involves a novel protein and a single well-tolerated carbohydrate source. A novel protein, meaning the animal has never been exposed to it, is necessary to determine if your pet truly has a food allergy. Commercial diets may advertise as having a novel protein, but can actually contain other types, such as chicken, in addition to the hypoallergenic ingredients. Today, a novel protein can be difficult to find because of the varied diet of many pets and the small print in the ingredients. This accentuates the importance of reading the ingredients carefully and consulting with a veterinarian before starting a hypoallergenic diet. Hydrolyzed diets contain proteins that have been reduced to such a small size that they are too small to cause allergic symptoms but not all hydrolyzed diet have been reduced to a small enough size. While on a diet trial, the pet MUST NOT eat anything else other than the hypoallergenic food. Unflavored medications, such as heartworm and flea medication should be substituted for flavored or chewable products. The use of treats or flavored medication can invalidate a diet trial and make it even more difficult to find a novel protein.

The resolution of clinical signs during the diet trial is only the first step in proving your pet was suffering from a food allergy. After a trial of 8-10 weeks on the diet, it is important to reintroduce the original food and watch for the return of itching within 7-14 days. After a food allergy is confirmed, the trial diet can be continued, as long as it is balanced, to control the clinical signs.
Seborrhea

Seborrhea can range from dry flakes to excessive greasiness. Often, this disease is a secondary issue to another disease process. Primary seborrhea is diagnosed only after no other underlying cause is identified and a skin biopsy is compatible to the diagnosis. Lifelong therapy will likely be necessary, and treatment centers around controlling secondary infections and shampoo therapy. Additional medications ranging from naturally occurring to steroids may be used. Primary seborrhea rarely has life-threatening issues associated with it, but maintenance of the disease requires diligence and patience.

Other Common Problems

Bacterial infections are especially common and are often related to an underlying problem such as an allergy or hormonal imbalance. Superficial skin infections are commonly caused by an overgrowth of *Staphylococcus pseudintermedius*. Yeast infections are also common. Most of the organisms causing infection are not contagious, but are actually found in the environment and even on your pet in small numbers. When the skin becomes compromised, the organisms take advantage and grow out of control. Ringworm is an exception; this fungus can be transmitted among pets and people. Animals can be asymptomatic but be able to pass the organism to those with compromised immune systems. The use of the word “worm” is confusing because it is caused by a fungus and worms have nothing to do with the disease.

Skin infections do not always cause itching in your pet. A bad odor can be associated with both bacterial and yeast infections. Hair loss is also a common symptom of infections. While ringworm is associated with hair loss and, less commonly, rash, hair loss in a circular pattern is most likely caused by bacteria. Usually identifying and treating these infections are straightforward. Challenging cases are present due to coexisting complicating diseases, an extension deeper into the skin and subcutaneous tissue, or the recurrence of the infection.

Diagnosing the organism causing the infection is done by obtaining samples from your pet’s skin and examining them under a microscope. Occasionally, performing skin cultures are needed for complicated infections in order to completely treat the infection. Your veterinarian may recommend reevaluating your pet during or after the use of drug therapy, to ensure the original problem has been brought under control.
Hypothyroidism

Hypothyroidism is the most well known hormonal disease causing hair loss. This disease refers to the lack of thyroid hormone present in the body and its interaction with the individual cells of the body. Thyroid hormone is important in the general health of a pet, as well as to the skin and immune system. Clinical signs are quite variable and common ones are rarely noticed initially. Recurrent skin infections may occur, and the hair coat can be sparse, dull, dry and scaly, or may become oily. Weight gain may be seen in some pets as well as a decrease in energy.

Diagnosis of hypothyroidism involves testing for blood levels of various substances associated with the functioning of the thyroid gland. Treatment is relatively straightforward as replacement of those substances should help improve clinical signs. The thyroid replacement therapy and blood level reevaluations will be necessary for the rest of the pet’s life.

Steroid-Related Disease

The disease can be associated with an excessive amount or lack of normal production of steroids. The excessive amount of steroids within the body is called hyperadrenocorticism, or Cushing’s, and is the most common steroid-related disease. An endogenous disease is an abnormality within the body, while the administration of steroids can cause iatrogenic disease. Prudent and limited use of steroid medication rarely causes problems.

Symptoms can occur slowly and may make the dog appear as if premature aging is occurring. Initially the pet can have increased appetite and thirst, increased urination and panting, Weight gain, behavior changes, liver damage, poor hair coat, demodectic mange, thin skin, comedones (blackheads), and hair loss are common long-term clinical signs. As the disease progresses, a syndrome called calcinosis cutis can also occur. This is the deposition of calcium in the skin causing patches of hairless, thickened skin. Cushing’s disease can be life-threatening, but so can the treatment. Fortunately, many patients do well once a medical protocol is established and clinical signs are resolved. Continued reevaluation is required with this disease.

Having too low of steroids is known as hypoadrenocorticism or Addison’s disease. This disease can be life-threatening and quite varied in symptoms. Skin-related issues are actually rarely reported.
This group of diseases are often seen with severe symptoms affecting the skin and sometimes other parts of the body. The most well-known is “lupus” which is also seen in people, and symptoms are not always seen in the skin. Another disease called pemphigus is also a common immune-mediated disease affecting the skin in dogs. The clinical signs include sores and scabs on the feet, mouth, nose and the areas around the eyes and genitals are often affected first and patients may become systemically ill.

Diagnosing these diseases can be frustrating and may involve many tests including blood tests and skin biopsies. The rule out of additional or more common diseases is necessary as they can often complicate diagnostics. Even with meticulous care, an absolute diagnosis is not always possible.

If the diagnosis of an immune-mediated or autoimmune disease is made, then high dose steroids, or other drugs that suppress the immune system, may be used to control the symptoms. Follow up tests and regular reevaluations by your veterinarian or veterinary dermatologist are often necessary because of the life-threatening nature of these diseases and the potential side effects associated with treatment.
Many different types of disease can affect the skin directly and indirectly. In addition, various skin problems look very much alike. Therefore, it can be frustrating for the patient and the pet owner when trying to discover what is causing the issues and how to effectively treat them. Many factors must be considered when thinking about the next step: the likelihood of particular diseases, the possibility of concurrent problems, and the cost and invasiveness of the tests and treatment options.

Often, it is necessary to treat the more common and apparent disease before pursuing further diagnostic tests or treatments. In some cases, the possibility that the general health of the body may be affected suggests that tests be performed to make sure that systemic diseases are not present. If you suspect your pet has abnormal skin or you have additional questions about any of these diseases affecting the skin, please contact your veterinarian or veterinary dermatologist.