There have been many exciting advances in veterinary dermatology in the last few years in the diagnosis and treatment of parasites, infections, otitis, topical therapy, food allergy and atopic dermatitis. This presentation will highlight some important new information for each of these disease categories, with the goal of maximizing clinical success for your dermatology patients.

1. Demodicosis

*Demodex injai*

*Demodex injai* is a recently discovered long-bodied *Demodex* mite that causes a pruritic dorsal greasy seborrheic dermatitis. Terrier breeds, especially wire-haired fox and West Highland White terriers, seem to be predisposed to this condition, but it can be seen in other breeds such as Shih Tzu’s. The mite lives in the hair follicles and sebaceous glands, and is associated with sebaceous gland hyperplasia, leading to a greasy matted coat. Erythema, alopecia, ceruminous otitis and severe pruritus (including facial) can be seen, and it may occur along with secondary bacterial and yeast infection and atopic dermatitis. Diagnose is made from skin scrapings and ear swabs and treatment is similar to *D. canis* demodicosis. It is worth looking for this mite in adult dogs (especially terriers) with a pruritic dorsal greasy dermatitis or facial pruritus, especially if they also have atopic dermatitis.

**Ivermectin**

Many dermatologists and general practitioners are using daily oral ivermectin as a first-line therapy for demodicosis due to ease of administration and convenience, although it is not labeled for this use in dogs, and owners should be advised as to the off-label nature of this treatment. High dose daily ivermectin should be avoided in ivermectin-sensitive herding-type breeds such as the collie, Shetland sheepdog, Old English sheepdog, and Australian shepherd. Patients should be tested negative for heartworm prior to its use. Do not use with ketoconazole (or other azole antifungals) or spinosad-containing flea products (Comfortis, Trifexis) due to increased risk of neurotoxicity from elevated ivermectin levels. The 1% solution is dosed at an average of 300-400 (up to 600) µg/kg/day PO once daily. Higher remission rates with shorter courses of treatment are seen with the higher doses. However, some dermatologists, including the author, feel that higher doses are associated with more side-effects and recommend a maximum starting dose of 300 – 400 µg/kg/day. Potential side effects of high dose daily ivermectin include lethargy, depression, mydriasis, vomiting, diarrhea, ataxia, temporary blindness and coma. Slowly increase the
dose of ivermectin starting with a 50 ug/kg “test dose” and build up to the full dose over 10-14 days to minimize the risks of side-effects. Test dosing with ivermectin at 50 ug/kg can identify those dogs that are P-glycoprotein deficient due to a deletion mutation of the ABCB1 (formerly mdr-1) gene. These dogs may be more susceptible to the side effects of ivermectin (as well as moxidectin, milbemycin, loperamide, digoxin, chemotherapy drugs, and corticosteroids). A very accurate and easy to use cheek swab test has recently become available to test for the deletion mutation of the ABCB1 gene at Washington State College of Vet Medicine, Veterinary Clinical Pharmacology Laboratory, PO Box 609, Pullman, WA 99163-0609 (Phone/FAX 509-335-3745). They have a very informative web site at: VCPL@vetmed.wsu.edu/depts-vpcl. **It may be prudent to test all dogs for the ABCB1 mutation prior to using daily ivermectin,** as some cases of ivermectin toxicosis have occurred in non-herding breeds. Therapy is continued until there are 2 sets of completely negative skin scrapings done 4 weeks apart, or for 30-60 days beyond the first negative set of skin scrapings, with an average of 3-4 months of treatment needed.

**Imidacloprid + Moxidectin**

The use of imidacloprid/ moxidectin (Advantage Multi) for demodicosis is not approved in the U.S., but is approved in Europe for weekly application for severe cases to “Aid in the Control” of *Demodex*. Studies have shown that it is more effective when dosed weekly, rather than every 2 weeks or monthly. It was not as effective as daily high dose ivermectin in a Grenada veterinary school study. This treatment is probably best for mild-moderately affected dogs, and is an option for ivermectin-sensitive dogs and Collies/herding breeds. It may be used monthly in cured dogs to help prevent relapse.

**Doramectin**

Doramectin is approved for use only in cattle and swine as a long-acting avermectin dewormer for the treatment of internal and external parasites. It is not approved for use in dogs, and the label indicates that “use in dogs may result in fatalities.” However, some veterinarians have reported good success using this drug off label with weekly injections for demodicosis. A recent large study of 232 dogs using doramectin with weekly injections of 0.6 mg/kg SQ in dogs with generalized demodicosis (90 % were juvenile-onset) found that 95 % obtained remission (lower success rate of 67 % in adult-onset cases) in an average of 7 weeks. Two dogs had side-effects (ataxia, injection site reaction) and 3 dogs relapsed. In an earlier Australian study using the same dosing protocol, 60 % of mostly juvenile-onset cases were cured, with 5-20 weeks to remission; no side effects were noted. A third study from Japan using the same protocol had an overall cure rate of 72 % (83 % juvenile onset, 50 % adult onset), with a mean of 11 weeks to remission; 1 Golden retriever had mild ataxia. This protocol should not be used in herding breeds, and it is further recommended to
perform ABCB1 mutation testing (see ivermectin-above) in any dog that will be treated with doramectin in this fashion for demodicosis. Owner should be advised as to the off label nature of this treatment, and of the side effects that may occur.

**Isoxazolines for Demodicosis**

One of the more exciting breakthroughs in veterinary dermatology is the discovery of the isoxazoline class of systemic oral flea and tick medications such as sarolaner, afoxolaner and fluralaner. Besides their remarkable efficacy against fleas and ticks, there is some early evidence that they are effective against mites as well, including *Demodex, Sarcoptes* and *Otodectes*. Sarolaner is on label in Europe for the treatment of *Sarcoptes* mites. **None of these products are labeled for use against any mite in the US, and this constitutes off label use.**

**Sarolaner**, the newest isoxazoline, has been shown to be effective against these common mites. A recent European study on sarolaner showed excellent efficacy after 2 monthly treatments against *Demodex canis*. In a well-controlled laboratory study, dogs with natural generalized infestations of *Demodex canis* were randomized into 2 groups; group 1 was treated with sarolaner at 2mg/kg and group 2 treated with imidacloprid-moxidectin (I/M) spot-on. Sarolaner dogs were treated on day 0, 30 and 60. The I/M dogs were treated according to the EU label for generalized demodicosis on a weekly basis starting on day 0. Efficacy was assessed by comparing pre-treatment and post-treatment (Days 14, 29, 44, 59, 74 and 91) mite counts in skin scrapings from five different body areas and the extent and severity of the clinical signs of demodicosis. Efficacy for sarolaner based upon live mite counts was 97.1% and 99.8% on Days 14 and 29, respectively and 100% on all subsequent days. For I/M spot-on solution efficacy based upon live mite counts was 84.4%, 95.6% and 99.7% on Days 14, 29, and 44, respectively and 100% on all subsequent days. Clinical signs of demodicosis improved throughout the treatment period in both groups. Recent European studies on sarolaner also showed excellent efficacy after 2 monthly treatments against *Sarcoptes* and *Otodectes*. It is on label in Europe for the control of *Sarcoptes* mites.

**Fluralaner** has shown efficacy against *Demodex* mites. In a recent 3 month study in South Africa, 16 dogs older than 12 months of age with generalized demodicosis were treated with either fluralaner once orally (8 dogs) or imidacloprid/ moxidectin topically monthly for 3 mo (8 dogs). In the fluralaner- treated group, mites were reduced by 99.8% on Day 28, and by 100 % on Days 56 and 84. In the imidacloprid/ moxidectin group, mites were reduced by 95- 98.0%. Statistically significantly fewer mites were found on Days 56, 84 in the fluralaner-treated group. The authors concluded that single oral administration of fluralaner is highly effective against generalized demodicosis, with no mites seen at 56 and 84 days. In a second study from Poland presented at the ESVD meeting in 2015 and published in abstract
form, 163 dogs with generalized demodicosis (ages 2-18 months (63 %), > 2 years (37 %)), were treated with fluralaner, twice orally, 3 months apart; cephalexin was given for pyoderma. Results: 87 % of dogs had negative scrapes at 1 month post-treatment, 13 % (all > 2 years) needed 2 months. More dogs in the younger age group had negative scrapes at 1 month. The authors concluded that a single oral administration of fluralaner is highly effective against generalized demodicosis, with no mites seen in any dog after 2 months. **Afoxolaner** has recently been shown to be effective against *Demodex* in dogs with generalized demodicosis. In a recent 3 month study in South Africa, 16 dogs older than 6 months of age with generalized demodicosis were treated with either afoxolaner (8 dogs) on day 0, 14, 28, and 56 or imidacloprid/ moxidectin (8 dogs) topically at the same intervals. In the afoxolaner-treated group, mites were reduced by 99.2% on day 28, 99.9 % on day 56, and 100 % on day 84. In the imidacloprid/ moxidectin group, mites were reduced by 85.2- 89.8%. There were statistically significantly fewer mites found on Days 28, 56, 84 in the afoxolaner group. Skin condition improved significantly in the afoxolaner-treated group from days 28-84. The authors concluded that afoxolaner given orally every 2 weeks for 3 treatments, then monthly is highly effective against generalized demodicosis, within 2 months.

Larger placebo-controlled studies are needed to better judge the efficacy of this class against mites, but early results appear promising, and could potentially revolutionize the way we treat demodicosis and scabies in the future.

### 2. Flea Control

In the last 20 years we have made significant advances in our ability to control flea infestations. This is due to better knowledge of the flea life cycle, improved understanding of the role that wildlife and other pets play as reservoirs for flea infestations, and the large number of effective products now available to treat adult and immature fleas on pets and in the environment.

**New Thoughts on Flea Allergy Dermatitis (FAD)**

Flea feeding laboratory studies show that most fleas feed within less than 5 minutes. FAD is related to the degree of hypersensitivity of the individual, the number of fleas, and the amount of salivary antigen injected through feeding. Reduced flea burden and feeding, rather than complete elimination, leads to clinical improvement. This “threshold effect” varies among individual dogs, with some having severe pruritus with only a few flea bites. However, flea allergy is not an “anaphylactic”-like reaction, with a single bite causing severe disease in all flea allergic dogs.
When treating flea allergic dogs we need use highly effective systemically active products that minimize flea blood feeding, have a rapid speed of kill and excellent residual speed of kill throughout the entire dosing interval (no loss of efficacy at the end of the month) and that prevent flea egg production by killing adults before they can lay eggs- causing a "reproductive breakpoint". They should be easy to administer and have no loss of efficacy with bathing or swimming. Oral systemically active products meet these requirements, especially the new isoxazoline class.

Dogs with atopic dermatitis (AD) are very prone to developing FAD, and intermittent flea exposure (such as when starting and stopping flea preventatives or only using them when fleas are seen) increases the risk for flea allergy. Therefore dogs with AD, even if not currently flea allergic, must have year round flea control to prevent this additional allergy from developing. The 2015 updated ICADA guidelines for the treatment of canine atopic dermatitis recommend year round flea control with systemic oral adulticides with fast and prolonged residual speed of kill for dogs with atopic dermatitis.

The new isoxazoline class of flea and tick medications (sarolaner, fluralaner, afoxolaner) act by blocking the major inhibitory neurotransmitters GABA and glutamate’s gated Cl channels. This class preferentially blocks invertebrate>> vertebrate channels. Increased nerve stimulation leads to death of the flea or tick. These medications are highly effective and safe. They have a fast onset of action and residual efficacy, and kill fleas before they can lay eggs- controlling even severe environmental infestations in a few weeks. While not labeled for this use in the U.S., there is some evidence that they have good efficacy against Demodex, Sarcoptes and Otodectes mites. They are chewable and easy for owners to administer. Sarolaner is the newest isoxazoline parasiticide. It has excellent efficacy against fleas and ticks (indicated for: Ctenocephalides felis (cat flea), Amblyomma americanum (Lone star tick), Amblyomma maculatum (Gulf Coast tick), Dermacentor variabilis (American dog tick), and Rhipicephalus sanguineus) (brown dog tick)). It is a monthly liver-flavored chewable that can be given with or without food. It is for use in dogs 6 months of age or older and weighing 2.8 pounds or more. Sarolaner is fast acting and starts killing fleas in 3 hours.\(^1\) It is persistent and doesn’t lose efficacy at the end of the month, maintaining >96.2% efficacy at 8 hours through day 35.\(^1\) It kills fleas before they can lay eggs.\(^2\) In a simulated home infestation there was a >96.4% reduction of fleas within 14 days, and 100 % reduction by day 60.\(^3\) Sarolaner is 100% effective against a resistant KS-1 flea strain.\(^4\) It improves clinical signs of flea allergy dermatitis: > 87 % of treated dogs had improvement by day 90.\(^5\)

Zoetis Data on File, Study Number \(^1\)A166CUS-12-113, \(^2\)A166C-US-13-268, \(^3\)A166C-US-12-110, \(^4\)A166C-US-12-045, \(^5\)A161C-US-12-074.
3. Feline Dermatophytosis

**IDEXX PCR Dermatophytosis Test (test # 3565)**

PCR for dermatophytosis is a newly available test. Overall sensitivity of 95% and specificity of 99% are excellent. The major advantage of the test is the rapid turnaround – results are available in 1-3 days. Submit hairs, crusts for fungal identification in a sealed container and keep refrigerated. This test is useful for screening lesional cats: a negative result largely rules-out dermatophytosis. False negatives can occur very rarely because of too few organisms to detect or due to a new strain of dermatophytes not detected by the PCR. False positives are possible on post- treatment samples and for asymptomatic carriers. If positive for *Microsporum* spp, then an *M. canis* specific PCR is performed. If this is positive than a *M. canis* diagnosis is made. However, if the *M. canis* PCR is negative, then a culture should be performed to diagnose other species of *Microsporum* such as *M. gypseum*. If positive for *Trichophyton* spp, a culture should be performed to identify the specific species to help identify the origin of the infection.

**Topical Antifungal Treatment**

Systemic antifungal therapy only treats the hair beneath the skin in the follicle, not the hair above the skin. Hence, topical therapy is needed to treat the visible hairs to reduce zoonotic risk and to decrease environmental contamination by shed infected hairs. First comb the hair coat thoroughly to remove as many loose hairs as possible. Then bathe the cat with an antifungal shampoo containing 0.5 % climbazole, miconazole, or 1-2 % ketoconazole (avoid the eyes to prevent corneal ulcers which is possible with chlorhexidine-containing products) with a 3 minute contact time. Follow the bath with whole body lime sulfur dips (1:16=8 oz/gal) applied with a sponge or sprayer twice weekly. If there are children in the household, start by applying lime sulfur every 48 hours for 3 dips, as this will “jump start” the treatment and provide some residual activity to decrease contagion. If lime sulfur cannot be used, an alternative treatment protocol is to bathe the cat with an antifungal shampoo with a 3 min contact time, then apply an Accelerated Hydrogen Peroxide (AHP) leave-on rinse such as Pure Oxygen® shampoo rinse-free concentrate solution (dilute concentrate to 1:20 (6 oz/gallon); apply 3x weekly. However this has no residual activity (Ogenasolutions.com). In cases where the cat will not tolerate bathing, the leave-on AHP rinse can be applied to dry hair. All infected cats should continue having twice weekly lime sulfur dips for the duration of treatment. Spot treating localized lesions is not recommended, as spores have been found up to 10 cm away from the primary lesion. In sick cats that cannot get wet, apply 0.5 % climbazole mousse 2-3X/ weekly instead. In most cases, clipping or trimming of long hair is not needed if a thorough/ drenching application of antifungal topical solution can be applied at least twice weekly.
Systemic Antifungal Treatment

This is recommended for most cases of dermatophytosis and for ALL cases of generalized disease—kills spores in the hair follicle, not on the visible hairs. Systemic therapy should be combined with topical therapy to minimize contagion to other pets or people.

Itraconazole

Itraconazole has become the drug of choice for treating feline dermatophytosis for most dermatologists due to its high efficacy, good tolerability, and persistence in the skin and hair coat, which allows the use of pulse therapy. Ketoconazole causes vomiting, anorexia, and increased liver enzymes in many cats, so should not be used in this species. Itraconazole is dosed at 5 mg/kg/ day with a fatty meal in most cases of indoor pet cats. The dose may be doubled to 10 mg/kg/day for shelter cats in highly contaminated environments or severe cases. This drug is expensive and the 100 mg capsule needs to be compounded into smaller sizes for feline use using the actual itraconazole capsules, not the generic powdered chemical (due to low solubility and poor stability when the generic chemical is used). An alternative is to use the human pediatric liquid (10 mg/ml). A less expensive, although certainly not as accurate, method of dosing is the “butter technique” in which a single capsule of itraconazole is opened and the beads mixed thoroughly and evenly with 1-2 tsp of very soft butter or cream cheese. This mixture is then cooled in the refrigerator until firmer and rolled out evenly into a 1 inch tube shape that can be carefully divided for dosing (1/4 inch= 25 mg). Most cats readily consume this formulation and the fat in the butter or cream cheese aids in the drug’s absorption. However, it is not as accurate a dosing method as compounding or using the human pediatric liquid. In general, itraconazole is well-tolerated and very effective. Side-effects in sensitive cats include decreased appetite and increased liver enzymes. If these side-effects are seen, the drug should be discontinued until the cat is eating well and liver enzymes return to normal, then reinstituted at a lower daily dose, or given every other day. Itraconazole is very helpful in Persian cats with resistant generalized dermatophytosis. Recent evidence suggests pulse-dosing itraconazole may be as effective as daily dosing due to itraconazole’s ability to persist for long periods in keratin and nails. Reported effective pulse dosing protocols include: 28 days of daily treatment followed by 1 week on, 1 week off until cured; or repeated cycles of 7 days on, 7 days off until 2 consecutive negative cultures are obtained at weekly intervals. Culturing can begin after 1-2 weeks of therapy.

*Terbinafine (Lamisil)*
This newer antifungal drug is now available as a generic, is relatively inexpensive, is dosed at 30 mg/kg/day and has been reported effective by dermatologists. A recent study of shelter cats showed that terbinafine at 20-30 mg/kg/day given for 21 days along with twice weekly lime sulfur dips and environmental disinfection was effective in clearing infection with an average time to mycological cure of 22.7 days (range 13-39 days), similar to cats treated with 21 days of itraconazole. In cats, terbinafine concentrates in the hair for several weeks after daily treatment for 14 days, so pulse therapy may be considered in cats. It is currently not recommended to pulse dose terbinafine in dogs due to a recent study showing lack of concentration in the skin and sebum and varying serum levels after discontinuation in dogs. Dr. Karen Moriello recommends the following dosing protocol for kittens/ cats: < 2.8 kg- ¼ tab, 2.8-5.5 kg- ½ tab, >5.5 kg- ¾-1 tab. This may be a good alternative for dermatophytosis treatment for cats when itraconazole is unavailable/ impractical to use or for cats that cannot tolerate itraconazole.

Fluconazole

Can be used at 5-10 mg/kg orally once a day (not pulse dosed) and is well tolerated. There are anecdotal reports from dermatologists that this drug is not as effective as itraconazole or terbinafine. Advantages include easier dosing since the drug comes in a wide range of convenient sizes. The cost of generic fluconazole has recently risen significantly.

Environmental Control for Homes and Veterinary Hospitals

Cleaning Protocol for Homes

- Confine cat to a small easily cleaned room (tile floor) for the duration of treatment. It is especially important to keep cat off of carpets and upholstered furniture.
- Vacuum carpets and furniture daily. Clean the vacuum cleaner with a spray disinfectant that is labeled as effective against Trichophyton spp.
- Use Swiffer® cloths/ sweeper to remove infected hairs, dust from hard surfaces (baseboards, window ledges, floors) at least 3x weekly.
- Wet flat mop floors w/ soap and water, rinse, dry; then spray with accelerated hydrogen peroxide (AHP) disinfectant- 5-10 min contact time twice weekly. Accel TB® ( AHP 0.5 %) is recommended: dilute 8 oz/ gal water (1:16). Accel TB is available from Ogenasolutions.com and distributors. AHP products are safer and less irritating then bleach. Other options include Lysol Power and Free® (AHP) or Clorox®. AHP. All disinfectants used for dermatophytosis treatment should be labeled as effective against Trichophyton spp. Directions should be followed carefully and any safety precautions for use around pets and children should be followed. Make sure clients
know that AHP products should not be mixed with concentrated bleach as this can be toxic.

- Wash all bowls, litter pans, carriers, toys, brushes/combs in hot water and detergent; rinse; repeat, then dry 3 X weekly.
- Launder pet bedding, clothing, towels daily - bag it, last load of day, wash twice (bleach optional), disinfect washer/dryer and clean lint catcher after done.
- Discard items that cannot be cleaned (cat tree, pet clothing, fabric collars, beds)
- End of treatment: Steam clean carpets and drapes, change furnace filter.

**Cleaning protocol for clinic exam room, waiting rooms**

- Ideally schedule for the end of the day.
- Keep the cat in a carrier until ready for exam; have client cover with a towel.
- Cover entire examination surface with a blanket; keep cat on the blanket.
- Fold blanket from edges in so infective material is on the inside.
- Bag all laundry - wash lab coat/smock, blanket/towels separately.
- Change laboratory coat/smock after app’t, before seeing another patient or cleaning room.
- Mechanical removal of hair, debris - use Swiffer.
- Wash with detergent and water until visibly clean.
- Spray generously with a disinfectant – AHP preferred.
- Surface should remain wet for 10 minutes.
- Change laboratory coat or smock again after cleaning.

4. **Human Estradiol Transdermal Gel- Induced Alopecia in Dogs**

Estrogen is a hair growth inhibitor in dogs. A new hormonally-induced alopecia has been reported in dogs with close contact (sitting on lap, sleeping in bed) with middle-aged female owners who apply estrogen-replacement transdermal gels on the forearms or thighs for the treatment of postmenopausal symptoms. Anecdotally, this condition has also been seen in dogs with transgender owners. 11 dogs with this condition have been reported in 2 papers. Dogs had varying amounts of non-inflammatory alopecia and hyperpigmentation of the ventral and lateral trunk, upper legs and neck and face. All but one of the dogs tested in the reports had elevated estradiol levels, 4 had elevated progesterone levels and 5 had signs of feminization with enlarged nipples, prepuce or vulva. Clinical signs resolved in all dogs within several months once owners discontinued the estrogen gels. This condition should be suspected in dogs with endocrine-like alopecia and hyperpigmentation +/- vulvar and nipple enlargement, especially if thyroid and adrenal function tests are normal, with a middle-aged female or transgender owner. The condition can be confirmed if there are elevated estradiol
levels and a supporting history, but some dogs may have normal estradiol levels. Discontinuing contact with the hormone replacement estrogen gel is curative.

5. New otitis treatment products to increase compliance

Compliance with ear medications is very difficult for most owners. Recently, several animal health companies and compounding pharmacies (Best Pet Rx, Roadrunner, Wedgewood, BCP) have developed long-acting otic gels, liquid solutions or ointments that are applied by the veterinarian in the hospital, to alleviate the need for owners to treat their dog’s ears at home. Reverse thermal gelation products are now available where the product liquefies when refrigerated or frozen, and forms a gel at body temperature to give long-lasting treatment in the ear canal (Therma-verg Otic-Best Pet Rx, KC Oto-Pak gel- Dermazoo). In addition, lanolin-based compounded products (BNT ointment- BCP) have been developed that last for 1-2 weeks in the ear. There have been concerns from dermatologists with using lanolin-based products in dogs with ruptured tympanic membranes, as rarely the lanolin can form a thick mass in the bulla, cause vestibular signs and be impossible to remove without surgery. Because of this, the newer hydrophilic gels or liquids are preferred. Some examples of new veterinary labeled products include:

**EasOtic** (Virbac)- Gentamicin, miconazole, hydrocortisone aceponate (“soft” steroid).
5 day treatment: 1 ml/ ear once a day with easy to use flexible applicator. Highly lipophilic formulation penetrates epithelium. Best for acute otitis with *Staphylococcus* and/or *Malassezia*.

**KC Oto-Pack** ear gel: 0.15 % Ketoconazole and 1% hydrocortisone (DermaZoo). Reverse thermal gelation product useful for Malassezia otitis when owner cannot medicate their dog’s ears. In a small supporting study, 78 % of dogs with yeast otitis were successfully treated 7 days after a single infusion; the product’s anti-pruritic effect lasted 14 days. Ears should be flushed, dried, then filled by the veterinarian, and reapplied in 7 days if needed. It is safe to use if there is a ruptured tympanum.

**Osurnia** (Elanco): Florfenicol, terbinafine, betamethasone acetate bioactive gel; 2 dose treatment: 1 ml tube/ ear, repeat in 7 days. Single-dose tube with soft, flexible tip for easy application. Need to refrigerate. Best for acute otitis with *Staphylococcus* and/or *Malassezia*. Not for use if ruptured tympanic membrane. The product Freedom of Information (FOI) document states that in the laboratory safety study when Osurnia was given weekly for 5 weeks, “Unilateral vesicle formation within the epithelium of the tympanic membrane was observed in 2/8 dogs in the 1X group, and in 4/8 dogs in the 5X group. In 3/8 dogs in the 5X group, there was unilateral mucosal necrosis and ulceration of the lining of the middle ear cavity.”
**Claro** (Bayer) - Florfenicol, terbinafine, mometasone clear liquid solution
1 dose treatment. Best for acute otitis with *Staphylococcus and/or Malassezia*. Not for use if ruptured tympanic membrane. Contains alcohol so may irritate ulcerated ears.

6. Food allergy

A cutaneous adverse reaction to food (CARF) or “food allergy” is a non-seasonal, pruritic skin disorder associated with a hypersensitivity reaction to a variety of antigenic materials (usually proteins or carbohydrates) in the diet. Food allergy accounts for about 10-15 % of allergic dogs, but may act as a flare factor for dogs with atopic dermatitis in 20 % of cases. Most dermatologists believe that all pruritic dogs should have the diagnosis of food allergy ruled out before testing for atopic dermatitis, as food allergy is believed to contribute to pruritus in a significant number of atopic dogs. Common food allergens in dogs are beef, chicken, fish, eggs, dairy products, soy, corn and wheat.

**Diagnosis**

The most common presentation of food allergy is non-seasonal itch, especially if not steroid-responsive and if mites, fleas and infection have been treated or ruled out. Dogs of any age can be affected, including dogs under 6 months old or over 7 years old, and is a more common allergy than atopic dermatitis in this population. Predisposed breeds include: Labrador and golden retrievers, cocker spaniels, German shepherd dogs, Chinese shar peis, and poodles.

In dogs, food allergy can mimic various cutaneous syndromes. Dogs can present with dermatologic disease that resembles atopic dermatitis (face, ears, axilla, paws- “food-induced atopic dermatitis”), flea allergy dermatitis, “racing stripes” on the flanks, recurrent pruritic or non-pruritic pyoderma, seborrheic dermatitis, urticaria, recurrent otitis externa with or without other signs, chronic perianal pruritus/ scooting or anal sac disease (including anal sacs that need to emptied frequently): Think “Ears and rears”. Concurrent gastrointestinal disturbances, especially greater than 3 bowel movements/ day, excessive gas and borborygmi, periodic vomiting and frequent soft stools are reported in a significant number of cases with dermatologic signs.

**Home-cooked diets**

A diagnosis of food allergy is made using the history and physical examination and evaluating the dog’s response to a hypoallergenic elimination diet trial. Serologic testing for
foods is not useful and is best avoided. The diet should be composed of food substances to which the dog has not been commonly exposed. If possible, the diet should be free of additives including preservatives, colorings, and flavorings. Simply switching to another brand or form of commercial dog or cat food is not a valid test as many of the so-called “hypoallergenic” over-the-counter or on-line pet store diets and treats have been found to be contaminated with other proteins not listed in the ingredients during the manufacturing process, or to have ingredients listed that were not found in the diets when tested. The diet should be continued for 8 weeks. A longer time is not necessary- a recent evidence-based review found that 50 % of food allergic dogs responded to their diet trial by 3 weeks, 80 % by 5 weeks and 95 % in 8 weeks. Dogs are preferably fed a "hypoallergenic" home-cooked diet (for example ostrich, emu, rabbit, alligator, kangaroo, or kidney beans combined with sweet potatoes, yams, quinoa, oats or barley). Sources for these meats include specialty butcher shops, mypetgrocer.com and exoticmeats.com. Go to balanceit.com for easy recipes with a supplement to make the diet balanced or raynenutrition.com for prepared limited ingredient diets and treats that are mailed to the owner. A small percentage of food allergic dogs cannot tolerate any commercial diet and must be maintained on a home-cooked diet.

**Commercial Diets**

If the owner is unable or unwilling to prepare a home-cooked elimination diet then my second choice recommendation is a novel protein and carbohydrate commercial diet such as Royal Canin Ultamino®, (formerly Anallergenic®), Royal Canin rabbit or duck and potato, Royal Canin hydrolyzed soy protein HP diet®, Royal Canin vegetarian® or Eukabuba Kangaroo and Oat® (I do not recommend using the venison or fish-based diets as testing diets, as this ingredient cross reacts with beef/lamb and fish is found in many dog foods and treats). Some hydrolyzed chicken or soy based hydrolyzed protein diets may cause increased pruritus in 10-50 % of known soy or chicken allergic dogs, according to a summary article, and these diets are best not used in cases where chicken or soy allergy is suspected. Royal Canin Ultamino® is a new diet using a feather hydrolysate as its unique protein source. According to the manufacturer, there is extensive hydrolysis of proteins such that 95 % of the diet is < 1 kD amino acids, making it the most extensively hydrolyzed and potentially least allergenic commercial diet currently available, and is the preferred diet by the author. The diet also contains skin barrier repair ingredients and anti-oxidants. Royal Canin minimizes dietary protein contamination by rigorous sterilization of their manufacturing equipment between batches of food and performing PCR testing on each batch to confirm no protein contamination has occurred.

The owners need to be reminded not to give the pet any treats, rawhides, pig's ears, flavored pill pockets, flavored toothpastes or chewable medications-including chewable
heartworm preventatives, chewable or gelatin capsule antibiotics and chewable NSAID’s during the diet trial. Non-chewable, topical or injectable formulations should be substituted when possible.

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