An allergy is a hypersensitivity to an allergen, which is any substance that can stimulate the immune system such as parasites, bacteria, viruses, etc. When a horse is exposed to an allergen, the horse's immune system produces antibodies called immunoglobulin E (IgE).Normally, only a limited amount of IgE is produced that "primes" the immune system in case the horse comes into contact with that same (potentially dangerous) allergen again. In a horse with allergies, however, the horse's immune system makes an abnormally large quantity of IgE to "harmless" antigens, such as mold spores, pollens, and insect bites. After being repeatedly exposed to these harmless allergens, the allergens bind to the IgE molecules that coat the surface of special cells of the immune system called mast cells and basophils. Once stimulated, these cells release a large amount of inflammatory mediators (e.g., cytokines, histamine). These inflammatory mediators are extremely potent and cause classic signs of allergies due to smooth muscle constriction, dilation of blood vessels, and stimulation of the nervous system. Equine allergies, which primarily affect the skin and respiratory tract, are increasingly common. Horses can develop allergies at any age and remain allergic to those substances for the rest of their lives.

Allergic reactions range from mild reactions affecting a small region of the skin to life-threatening (e.g., anaphylactic) reactions. Common signs of skin allergies include itching, rubbing, and scratching, urticaria (i.e., transient focal swellings in the skin or mucus membranes called hives), thickened skin, and hair loss. Signs of respiratory allergy include coughing, labored breathing, exercise intolerance, and poor performance. Allergic airway disease is also referred to as heaves, recurrent airway obstruction, and inflammatory airway disease.

Some of the most common causes of allergies in horses include:

- Insect bite hypersensitivity from bitingmidges (Culicoides), as well as biting gnats, horse flies, house flies, and mosquitoes;
- Mites (chorioptic and psorioptic mangeand trombiculidiasis or "chiggers");
- Grass, weeds, and tree pollens;
- Horse feed ingredients or food additives;
- Mold spores;

- Vaccines and drugs;

- Animal danders, dust, feathers, aerosols,and volatile chemicals. A contact dermatitis can be caused by direct contact with an irritant such as a bit, saddle, or other tack item.

Skin allergies can only be diagnosed after all other known causes of itchiness (pruritus) have been ruled out by a thorough physical examination and history. Important facts your vet will consider are where the horse resides (stable or pasture), age of onset, seasonality of the condition, and the location and appearance of the lesions or rash. Biopsy of lesions and routine microscopic examination of the sample can help rule out other causes of skin problems. Some conditions mimicking skin allergies include reactions to heat, cold, or light (photosensitization, sunburn), infections, neoplasia, lungworms, or even psychogenic causes.

Two types of allergy tests are currently available: intradermal allergy testing (IDT) and serum allergy testing (SAT). These tests help identify allergens to avoid exposure and help choose allergens for allergen exposure immunotherapy (ASIT).The IDT involves injecting small amounts of aqueous allergen extracts into the skin (usually on the neck). The injection sites are assessed 15–30 minutes later (for immediate reactions) and between 4 and 24 hours (for delayed reactions). A positive response is the formation of a wheal (a raised flat-top swelling) at the injection site. The use of corticosteroids, antihistamines, or phenothiazine tranquilizers is known to interfere with the IDT, so these products must not be administered to the horse for about two to four weeks before testing, which could prove difficult in an itchy horse. Serum allergy testing (SAT) involves submitting a single blood sample to a laboratory that will then look for IgE antibodies against common allergens. The SAT is not impacted by the use of antihistamines.Both tests can generate false positives and negatives, and multiple factors can impact the test results (even excitement). Thus, the results of the IDT and SAT, even negative results, must be considered with the horse’s history and physical exam findings.

A multimodal treatment approach is encouraged for treating equine allergies. First, use blankets or pyrethrin-impregnated fly sheets on horses that are hypersensitive to culicoides (sweet itch), stable them during peak insect activity (early morning and evening), and use bug repellents, screens, and fans. Second, consider using soothing

shampoos and conditioners, and if necessary, topical corticosteroids. Third, corticosteroids are often used in horses with dermatologic (skin) allergic manifestations. Prednisolone given daily (orally) is expected to induce clinical remission. The dose can be tapered slowly over time to the lowest dose that will control the urticaria. Prednisolone is preferable to other corticosteroids such as dexamethasone or triamcinolone as prednisolone is less immunosuppressive and less likely to result in laminitis. Glucocorticoids exert profound effects upon all organ systems; longterm use can lead to an unacceptably high risk of serious side effects, compared with any possible benefits.Other agents that can be useful in managing urticaria are antihistamines, tricyclic antidepressants, phosphodiesterase inhibitors, diethylcarbamazine, levamisole, and cyclosporine, as well as nutritional supplements such as methylsulfonylmethane, antioxidants, and digestive support.

Hyposensitization, also referred to as allergen-specific immunotherapy (ASIT), has been used to manage urticaria, insect hypersensitivities, and allergen-induced RAO. Allergens are combined in solution and injected under the skin to induce immunologic tolerance. If effective, treatment is usually lifelong. Response to therapy is not immediate and it can take up to 12 months to determine efficacy. Finally, for horses with respiratory manifestations of allergies, treatment involves improving the environment; reducing airway inflammation; and dilating the airways to reduce obstruction. Owners should consider the horse's "breathing zone"—the two-foot sphere around his nose. This zone should be kept as clear of dust and particles as possible. Keep horses outside the barn and scatter hay on the ground rather than feeding from a bale. Acute flare-ups can be treated with corticosteroids (prednisolone or fluticasone) and/or bronchodilators.

Except for anaphylaxis, allergies aren't usually life-threatening. Successful treatment requires addressing "the patient's predisposing/environmental influences along with treating the secondary perpetuating factors..." all while specifically targeting the main cause of the allergy.