

Help! My horse doesn't sweat!

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Introduction

Anhidrosis is defined as a decreased ability to sweat in response to increased body temperature. Failure to sweat has been described in both horses and man, and it occurs primarily in hot, humid climates. In the working horse, thermoregulation is mainly accomplished by sweating. Between 15-25% of heat is dissipated by the respiratory tract, while 65-70% of heat is lost via the evaporation of sweat. Humid environments also result in less efficient evaporation of sweat from the skin surface, magnifying any preexisting sweating abnormalities.

Anatomy/Physiology

Sweat glands are densely packed in horse skin (810 glands per cm²), primarily exiting to the skin surface at a hair follicle. These tubular, coiled glands have a rich blood supply and numerous nerves are found in close proximity to the glands. The sweat produced has a number of components, including proteins, electrolytes and significant amounts of water. The proteins found in sweat are primarily glycoproteins, surfactants and proteins associated with skin defense. Electrolytes (including sodium, potassium, and chloride) are found at a higher concentration than blood, particularly potassium. The signaling mechanism to initiate sweat production is not fully understood, but stimulation of the sweat glands occurs either via messengers circulating in the bloodstream or via direct stimulation from nerves found in the area of the sweat glands.

In chronic cases, microscopic examination reveals atrophied sweat glands and there is a poor response to epinephrine injected into those sweat glands. In acutely affected horses, these abnormalities are not yet present. The discrete defects in sweat gland function or signaling that cause anhidrosis have not yet been proven, though several theories exist.

Prevalence

The disease is widespread in Florida and other hot, humid climates. There is no apparent age, sex, breed, or color predisposition to the disease. Both Florida-bred and imported horses may be affected. Epidemiologic studies have suggested a prevalence of between 2-6% of horses. In a study of non-racetrack Florida farms, 1.8% of horses were anhidrotic and 11.2% of farms reported at least one case of anhidrosis.

Clinical Signs

Onset can be gradual or acute with increased respirations and failure to cool after exercise the most common initial clinical finding. In situations that should elicit copious sweating, these animals will have minimal or no sweat production. Poor appetite combined with high fevers may be misdiagnosed as an infection, especially in the acute phase.

With chronic disease, horses develop dry flaky skin (especially on forehead), hair loss, fatigue, anorexia, and decreased water consumption. Some areas still sweat, which can be confusing.

Diagnosis

Anhidrosis can often be diagnosed presumptively, based on the clinical signs and examination by a veterinarian. Confirmatory testing utilizing epinephrine or terbutaline can be performed if the diagnosis is unclear or as a method to evaluate treatments. A suspected anhidrotic horse and a normal horse can be injected at the same time and their sweat production compared. A quantitative test using terbutaline is also available. Serial dilutions of terbutaline are administered intradermally and the sweat is collected on absorbent pads for weighing.

Treatment

There is no known successful therapy for anhidrosis except moving the horse to a cooler climate. Not only does this help manage the high body temperatures, but horses are also noted to start sweating once in a cooler environment.

It is essential that non-sweaters living in Florida are carefully managed to prevent high body temperatures. These horses should be kept stalled or in a shaded paddock during the daytime. Access to fans and misters can be helpful in keeping them cool. Some horses will get into water sources found in their pastures (such as ponds or big water troughs) to cool off. Also ensure that they have constant access to cool, clean drinking water. Adjunctive feeding of electrolytes or salt mixtures (“Lite salt”) will help them maintain appropriate total body electrolyte concentrations.

Many Florida horse owners feel that supplements such as *One-AC* or *Let ‘M Sweat* offer anhidrotic horses relief, but this is an anecdotal observation with no research to support efficacy. Many other treatments are attempted with minimal evidence, including oral supplementation with dark beer, salts, vitamins/electrolytes or thyroid supplementation. Most of these other treatments are not dangerous, but also do not appear to improve the animal’s ability to sweat. Medical treatment has also been attempted with ACTH, alpha-2 agonists, prostaglandins (Lutalyse), antihistamines and Methyldopa (Aldo-Met), but has been generally unsuccessful.

Additional work is needed to better identify the specific causes of anhidrosis and will help in developing useful treatments. Acupuncture appears promising as a treatment and there is an ongoing clinical trial (at UF) to assess its efficacy.