

African Horse Sickness – the dilemma

by Dr Glynn Catton

We are still in the danger zone concerning the potential for horses to become infected with African Horse Sickness (AHS). This viral disease is transmitted by biting midges or muggies (*Culicoides spp*). They are very small blood-sucking insects, similar to a mosquito. In horses they can transmit AHS, while in sheep they can transmit Blue Tongue.

Vaccines are available for both diseases and are composed of multiple strains of the virus, in an attempt to ensure a satisfactory immune response. *Culicoides* midges predominantly feed at night and the high risk periods are from dawn to dusk. A common response following midge bites, is an allergic skin reaction known as “summer itch”. If your horses show summer itch, you know they are being bitten. The dilemma is how to protect our horses from being bitten by *Culicoides* midges.

Research and treatment

Most of the currently registered external parasite treatments for horses, are based on insecticides or insecticides combined with synergists and plant oils/volatile oils. Research work has been conducted in many parts of the world to try to ensure that horses can be protected by the application of a treatment which would either kill or repel the biting midge, before it can transmit the disease. Of all the insecticides, the pyrethroids are the most effective as a repellent. Yet they are not sufficiently repellent to prevent *Culicoides* biting horses.

Most products that have been developed for treating horses, have been formulated in a manner whereby they will produce efficacy against both nuisance and biting flies, as well as ticks. Typical examples of nuisance flies are house flies and the larger biting flies, which

are the horse fly or stable flies. The larger ones can be artificially bred in laboratories, lending themselves to efficacy-testing under laboratory conditions. But there are no similar laboratory tests for *Culicoides* midges.

In the late 1990s, the Israeli government tasked two veterinary researchers to investigate the repellency properties of a variety of active ingredients, to determine how they would provide insect repellency when screened against field strains of *Culicoides*, using a light trap method. At that time, the standard recommendation for treatment of horses or sheep to prevent AHS or Blue Tongue, was to use a permethrin-based insecticide.

The results of this trial showed that permethrin had a repellency for approximately one hour. Certain plant extracts had repellency properties for about two hours and one of the best known insect repellents, DEET, was effective for up to four hours. A combination product which included a pyrethroid and several other active ingredients, proved an effective repellent for about nine hours.

Protecting our horses

In the quest to prevent AHS transmission to horses, one has to consider the life-cycle and typical habits of the midges. They are bloodsuckers and are drawn to the horse by the warmth emitted by that animal, the CO₂ expired in its breath and the

horse's smell, which is always present in equine environments.

The midges are not insects that land on surfaces like walls or structures like roofing, in which horses are stabled. The large variety of breeding sites for *Culicoides* makes it difficult to apply any form of effective treatment to the breeding sites. Light traps have been used in many parts of the world and have proved very effective in capturing huge numbers of midges, but these do not seem to reduce the population.

Protection of horses has to be focused on preventing the midges from entering stables or by confusing them so that they cannot find the horses. A stable which has effective mosquito-proof mesh applied to all apertures, should prove successful. Overhead fans erected and operated throughout the time the horses are in the stables, will break up and distribute the typical "odour plume" from horses. The midges will then have difficulty finding their prospective blood meal.

The last standard protection is to apply a **registered** product on the horses which may kill the midges that bite and, depending on its ingredients, has a repellency effect for a certain period of time. Based on the registered products currently available, the best protection for horses is if they are treated every night before they are placed in stables and especially if it is not possible to stable them. It is also imperative that the vaccines that are available, are used strictly according to recommendations, as they are the best option of stimulating the horse's immunity to protect itself.

The dilemma

One should always recognise the fact that there are massive numbers of midges that are hungry for a blood meal. If alternative hosts are available, the midges will preferably feed on the easiest blood meal. If cattle are in close proximity, they will provide an alternate blood meal and will not allow the virus to multiply in them. If, however, zebra are near horses, they will be a source of infection for midges biting them, and which may later bite horses and transmit the disease.



Two examples of the dreaded "summer itch"

AHS is a disease of horses and other *equidae*. Not all midges are infected, but it is a numbers game. Should there be a source of infection, then the incidence of infected midges will increase rapidly and a horse's chance to become infected, rises dramatically.

Insect control measures which will serve little purpose in trying to control midges are fly baits, products for application to walls, doors, rafters or applications for manure heaps, fly traps, sticky tapes or localised protection measures like tick and ear greases. The *Culicoides* midges predominantly bite on the topline of horses and therefore physical barriers like blankets or face masks, will prevent midges biting. SAH