

Questions About Eastern Equine Encephalitis and Horses



Introduction

Eastern equine encephalitis (EEE) and western equine encephalitis (WEE) virus infections occur in horses and other equids in Louisiana. Eastern equine encephalitis (EEE) is more common and tends to occur in outbreak form. These diseases are transmitted to horses and humans by mosquitoes that have fed on infected wild birds. The EEE virus was first identified in mosquitoes in Louisiana in 1951 near Ponchatoula in Tangipahoa Parish. The virus is active in horses to some degree every year.

EEE virus attacks the central nervous system of its host. Unvaccinated horses are particularly susceptible to the infection. The disease appears within five days after mosquitoes transmit the virus to the horse. Onset of clinical signs of EEE are abrupt, and affected horses die within three days. Signs of EEE in horses include fever; a sleepy appearance; some muscle twitches of the head, neck, shoulder and flank; and a weak, staggering gait. Affected animals are soon down, unable to stand. There is no effective treatment. The fatality rate is 90 percent or higher. An animal that survives may have permanent brain damage.

Where does EEE come from?

EEE occurs in nature in a wide variety of songbirds. Blood samples from New Jersey birds,

where most of the research on EEE has been done, indicate that the blue jay, tufted titmouse, chickadee, catbird and cardinal are most often infected. Although these birds do not develop the disease, they maintain high levels of the EEE virus. They are considered reservoirs in the disease cycle.

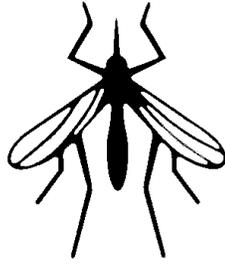
Culiseta melanura is the primary mosquito species that transmits the virus from bird to bird. This mosquito inhabits marshes and wooded wetlands and rarely feeds on people or horses. Consequently, the EEE virus normally exists in a rather secluded environment where it does not pose an immediate threat to horses or people.

Are emus susceptible to EEE and WEE?

An exotic species sometimes grown in Louisiana, the emu is susceptible to EEE and WEE. The emu infected with EEE virus develops a fatal intestinal disease characterized by bloody diarrhea. Emu owners need to be aware that an infected emu is a source of virus to be spread by mosquitoes. A person should not skin an infected emu or contact the bloody stool. The emu develops a nervous system illness when infected with WEE virus. Emus should be vaccinated annually for EEE and WEE.

What causes an EEE outbreak in horses ?

There are two possible explanations for EEE outbreaks in horses, and both are probably responsible in part during epidemic years. One factor involves mother nature, and the other is related to health management of the horses.



Transmission of EEE from birds to horses and people can occur when mosquito populations are high. In this situation, mosquito species other than *Culiseta melanura* become involved in the transmission cycle of the EEE virus. Since these other mosquitoes are more likely to feed on people and horses, it gives the EEE virus a means of escape from the bird reservoir and from the more secluded habitats of *Culiseta melanura*. Horses are usually the first to become infected because they are normally housed in rural areas and they have a much greater exposure to mosquitoes.

The potential for an outbreak of the disease in horses may correspond to the number of unvaccinated animals present. It is unusual to see EEE in a horse that has received the initial vaccine series and timely boosters. During an outbreak, most people have their animals vaccinated but then fail to follow up with annual booster shots the next year or so. Two or three years after the last outbreak, the population of unvaccinated animals has increased considerably, and another outbreak is possible.

How do horses get EEE?

Horses become infected when they are bitten by a mosquito carrying the EEE virus.

What time of the year does EEE infect horses?

EEE cases in horses usually begin to appear in mid to late summer and increase into the fall. In 1998, following a warm winter, infected horses

were seen in south Louisiana beginning in early spring. The outbreak continued to spread north during the summer. In Louisiana, outbreaks of EEE in horses tend to occur at two- to four-year intervals.

What is the best way to protect my horse?

Annual vaccination of all horses and other equids is recommended. Horses vaccinated for the first time must receive an injection of EEE-WEE combined vaccine followed by a second dose of the vaccine three to four weeks later. This two-dose series is essential to establish an effective immune response. A booster shot should be given in the spring each year thereafter. If an outbreak of EEE or WEE occurs in the area in late summer or fall, a second booster is advised.

Foals should be vaccinated at 4, 5 and 6 months of age (three doses total) to ensure protection. Another booster should be given in six months and annually thereafter.

Vaccines are available from various sources. Proper handling and administration of vaccine are essential to ensure adequate protection. An overall health program for horses is recommended. It would include vaccinations administered by a veterinarian.

What should I do if my horse develops symptoms?

It is important to find out the cause of the illness. Other diseases and poisoning may have similar symptoms or clinical signs. The veterinarian may want to obtain blood samples to send to a diagnostic laboratory to test for EEE. Rabies, equine infectious anemia (EIA), equine leucoencephalomalacia (moldy corn poisoning), liver failure, equine protozoan myelitis (EPM), botulism, West Nile Virus and other conditions must be considered. If the animal dies, a thorough autopsy may be necessary to confirm the cause of

illness. In some cases, removal of the brain for laboratory analysis may be all that is needed.

EEE in horses does not require a quarantine. It is important to confirm the diagnosis of EEE so other horse owners can be told of the need to vaccinate their animals.

Can humans contract EEE directly from infected horses?

No, the EEE virus is not passed from horses to humans by contact with body fluids or in other ways. Furthermore, it is not spread from horse to horse either. EEE-infected horses generally do not have enough virus in their blood to infect mosquitoes. The horse is described as a “dead-end host.” EEE is acquired only from mosquitoes that have fed on infected birds. An infected horse does not pose a disease threat to its human owners. It does indicate that the virus is present in the local bird population and that local mosquitoes are transmitting the disease.



How do humans get EEE?

Humans can become infected when they are bitten by a mosquito carrying the EEE virus.

Does EEE represent a serious health threat to humans?

Human cases of EEE are rare, but they can occur during an outbreak year. The disease produces serious illness, and the probability of recovery is less than 50 percent. In overt cases (cases where infection actually develops into disease), the virus produces an illness that begins with headache and stiff neck. As the disease progresses, the patient can fall into coma, with death as a likely outcome. Recovery is possible, but individuals who recover usually have brain damage. Children appear to be more susceptible than adults. The good news is that most humans

who are bitten by infected mosquitoes abort the infection in the early stages and recover with no evidence that they ever had the disease. The overt to inapparent ratio of encephalitis in New Jersey, where most of the research on EEE has been done, is estimated at one overt case for every 23 individuals bitten by infected mosquitoes. People who live near acid water swamps and in close proximity to ponds filled with emergent vegetation are at increased risk from mosquitoes that transmit EEE.

What is the best way to protect my family if my horse contracts EEE?

No human vaccine is available for routine use, so avoiding mosquitoes is the best protection where EEE is present. In parishes with mosquito control districts, these agencies should be made alert. Mosquito control personnel are familiar with the EEE cycle and have the expertise to reduce the mosquitoes that transmit the disease. Homeowners as well as horse owners can take measures to reduce the threat of EEE.

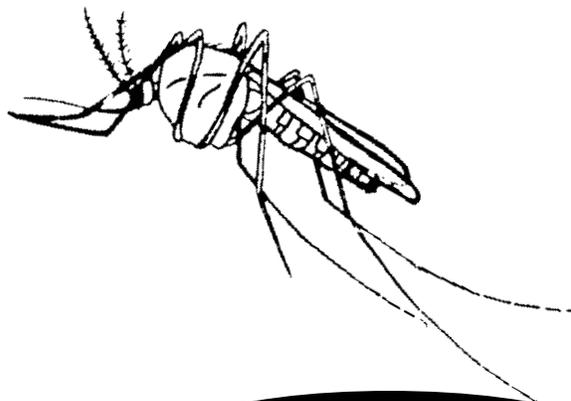
First, avoid mosquito-infested areas and use insect repellent when exposure is unavoidable. Eliminating water-holding containers from your property (buckets, tires and other receptacles) will reduce mosquito breeding in the immediate vicinity. Horse troughs provide excellent mosquito breeding habitat and should be flushed at least once each week to reduce mosquitoes near the paddock area. The use of residual insecticides for treating mosquito resting areas around homes and livestock premises is helpful, too.



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