

Questions Regarding Eastern Equine Encephalitis and Horses

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Eastern equine encephalitis, commonly referred to as EEE, is a virus disease of wild birds that is transmitted to horses and humans by mosquitoes. The virus is found near wetland habitats along the eastern seaboard from New England to Florida. New Jersey represents a major focus for the infection with some form of documented viral activity nearly every year. Horse cases are most common in the southern half of New Jersey because the acid water swamps that produce the major mosquito vectors are especially prevalent on the southern coastal plain.

The virus responsible for EEE attacks the central nervous system of its host and horses are particularly susceptible to the infection. Onset is abrupt and horse cases are almost always fatal. Symptoms include unsteadiness, erratic behavior and a marked loss of coordination. There is no effective treatment and seizures resulting in death usually occur within 48-72 hours of an animal's first indications of illness.

EEE is not new to New Jersey, but the disease is poorly understood by the average horse owner. A vaccine is available, but a surprisingly high number of valuable animals go unvaccinated each year. This fact sheet has been designed to answer the most commonly asked questions regarding EEE and its potential impact on New Jersey's horse industry. For additional information on the subject, contact your County Agricultural Agent, your County Mosquito Control Agency, the New Jersey Agricultural Experiment Station and the New Jersey Department of Agriculture - Division of Animal Health.

Where Does EEE Come From?

EEE virus occurs naturally in a wide variety of wild song birds. Blood samples from New Jersey birds indicate that Blue Jay, Wood Thrush, Tufted Titmouse, Chickadee, Catbird and Cardinal show the highest incidence of infec-

tion in our state. EEE virus normally appears in local bird populations shortly after the nesting season is over in the spring. Mosquitoes transmit the infection from bird to bird during the early summer months and infections usually peak sometime in August. In some years, the virus remains in local bird populations and does not pose a health threat to horses or humans. When mosquito populations are high, however, transfer from birds to horses and/or humans is possible. In a typical outbreak year, horse cases begin to appear in unvaccinated animals in mid-summer. All equine cases are the result of mosquitoes which have fed on infected birds and then feed on unvaccinated horses.

Does EEE Represent a Serious Health Threat to Humans?

Human cases of EEE are very rare, averaging less than 1 overt case every 5 years. The disease, however, produces serious illness when it is contracted via mosquito bite and the probability of recovery is less than 50%. In overt cases, the virus produces an illness that begins with low fever, 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 that do recover usually do so with brain damage. Children appear to be more susceptible to overt cases than adults. Research indicates that most humans that 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 is estimated at 1 overt case for every 23 individuals that are bitten by infected mosquitoes. Salt marsh mosquitoes are the main transmitters of EEE to humans in New Jersey, thus human encephalitis is a coastal phenomenon that is associated with the large populations of mosquitoes encountered at the shore. To date, no human involvement has ever been associated with the horse cases that are relatively common on the



coastal plain in the southern portion of the state.

Can Humans Contract EEE Directly from Horses?

The virus that causes EEE cannot be passed from horses to humans by contact, body fluids or any other physical mechanism. Moreover, horses do not circulate sufficient virus in the blood stream to reinfect mosquitoes. EEE is only acquired from mosquitoes that have previously fed on infected birds. A sick horse does not pose a health threat to its human owners. A sick horse is an indication that the local bird population is circulating virus and that local mosquitoes are making contact with the infection. Transmission is not possible from horse to horse, horse to human or even horse to mosquito. Virtually the only way that EEE can be acquired is via the bite of a mosquito that has fed upon an infected bird.

What is the Best Method of Protecting My Horse?

The virus that produces EEE in horses is widespread in wild bird populations and professional vaccination is the only method available to protect horses from the disease. Vaccinations should be administered by a licensed veterinarian to assure that viable vaccine is utilized and injections are properly administered. Mistakes in vaccination protocol by well-meaning horse owners can result in ineffective protection in an animal that was thought to be risk free. All too frequently, owner vaccinated horses develop overt cases indicating that the animal was improperly vaccinated or was vaccinated with vaccine that had lost its protective properties. Properly administered vaccinations are effective for only one year, thus, booster shots are required on an annual basis. Newly vaccinated animals require a two-shot series administered 2-4 weeks apart before protection can be guaranteed. Foals should be revaccinated during summer to ensure protection during the first year of life. It is recommended in the face of a fall epidemic, horses vaccinated in March should be boosted later in the season.

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What is the Best Method of Protecting My Family If My Horse Contracts EEE?

Although human cases have never been associated with equine EEE, a sick horse is an indication that the virus is present in local mosquitoes. There is no human vaccine available for routine usage, thus mosquito avoidance is the best protection in an area where EEE is known to be present. Homeowners should contact their county mosquito control agency and make them aware of the situation. Mosquito control personnel are familiar with the EEE cycle and have the expertise to reduce the mosquitoes that function in the cycle. Have your family and employees avoid mosquito-infested areas and use insect repellents 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 out at least once a week to reduce mosquitoes near the paddock area. Work with your county mosquito control agency and point out any wetland habitats that may have produced the mosquito responsible for the infective bite.

What Should I Do If My Horse Develops Symptoms?

Suspect horse cases should be reported to your veterinarian as soon as possible. Your veterinarian will diagnose the infection and take blood or tissue samples for confirmation. Euthanasia may be necessary because the disease is fatal in unvaccinated animals. The veterinarian will probably request the brain since brain tissue is the only certain way to confirm the diagnosis. Some horse owners are reluctant to report suspect cases for fear of quarantine. There is no quarantine for EEE and non-reporting only postpones the mosquito control activities that could protect other horses on your farm and the immediate vicinity. The cycle of EEE is not yet completely understood. Quick reporting of a suspect case could provide valuable information for the future.