NebGuide

University of Nebraska–Lincoln Extension, Institute of Agriculture and Natural Resources

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West Nile Virus Guidelines for Horse Owners

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Describes transmission and symptoms of West Nile Virus in horses and provides recommendations for controlling mosquitoes and managing horses to avoid infection.

West Nile Virus (WNV) is a mosquito-borne virus that can cause encephalitis (inflammation of the brain) or meningitis (inflammation of the lining of the brain and spinal cord) in humans and horses. Mosquitoes acquire the virus from infected birds and transmit it.

This virus was first discovered in the United States in New York in 1999 and has quickly spread throughout the United States. By the end of 2002, the virus had been found in 44 states and five Canadian provinces. In 2002, Nebraska reported 174 human cases in 48 counties with eight deaths. More than 14,000 equine cases were reported in the United States in 2002; more than 1,100 were in Nebraska. It is estimated that two to three times more cases occurred than were reported. In comparison, 149 human cases in nine states resulted in 18 deaths nationwide in 2001. That year, there were 731 equine cases in 20 states with a 25 percent mortality rate.

The greatest number of Nebraska cases were in the state's central and western areas. The first Nebraska cases of West Nile Virus in horses were reported in early August 2002, with the majority reported between early August and early October. By 2007, the reported number of equine cases of West Nile Virus had dropped to eight cases in Nebraska and 468 cases nationwide. However in 2007, Nebraska ranked seventh in the nation in human cases with 146 cases and three deaths.

Transmission

The virus is transmitted when a mosquito acquires it from an infected bird and then feeds on a horse, human or other mammal *(Figure 1)*. Many birds can be infected with West Nile Virus and not exhibit clinical signs. Crows and blue jays are most likely to die from West Nile infection, although researchers don't know why. Any type of bird or mammal may be susceptible. Horses and people are "dead-end hosts," meaning there is no horse-to-horse, horse-to-person or person-to-person virus transmission. Horses and humans do not develop sufficient quantities of virus in their blood to infect mosquitoes that may feed on them.

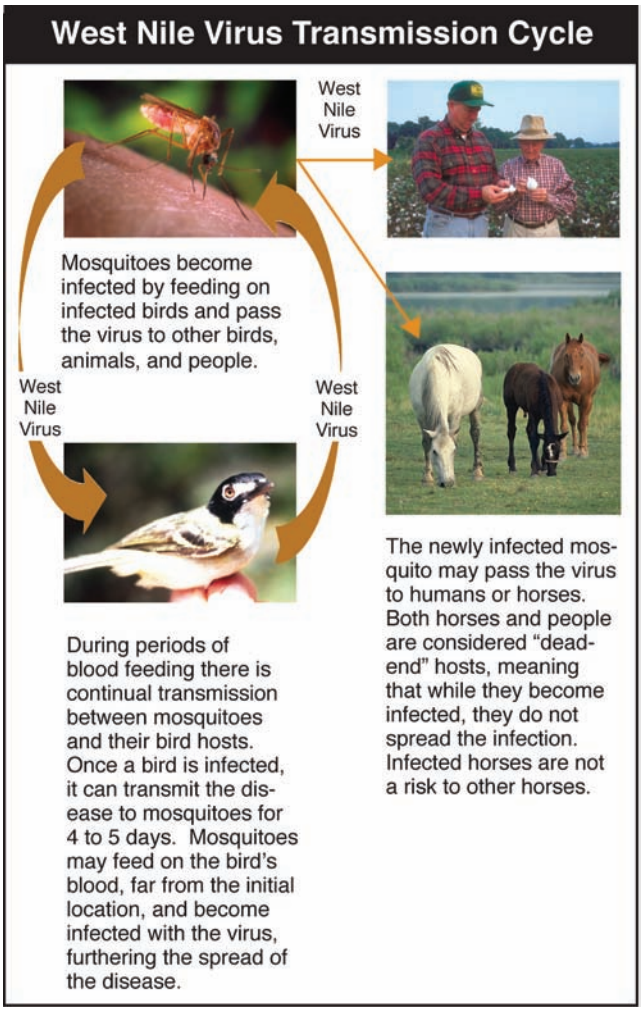

Figure 1. Transmission Cycle illustration courtesy of the Animal and Plant Health Inspection Service (APHIS) of the U.S. Department of Agriculture.

A bite from an infected mosquito will not always make a person or animal sick. Most people with this virus either have no symptoms or experience mild illness. The incubation period for humans is three to 15 days. All people in areas where virus activity has been identified are at risk, but persons older than age 50 are at highest risk. Most human infections are mild. Symptoms include fever, headache and body aches,

occasionally with skin rash and swollen lymph glands. More severe infections may be marked by headache, high fever, neck stiffness, stupor, disorientation, coma, tremors, convulsions, muscle weakness, paralysis, and rarely, death.

Symptoms in Horses

In horses West Nile Virus causes encephalitis — swelling of the brain and spinal cord. Once a horse has been bitten, it may take five to 15 days for symptoms to appear. The most common clinical signs in horses are muscle tremors and an altered gait. Other symptoms include loss of appetite, depression, weakness of the hind limbs, partial paralysis, fever, impaired vision, ataxia, head pressing, aimless wandering, convulsion, inability to swallow, circling, hyperexcitability, coma, and death. Affected horses may develop a fever 10 days before clinical signs appear. Many of the clinical symptoms are similar to those exhibited by horses with rabies, Equine Protozoal Meylities (EPM), equine encephalitis, and other serious neurological diseases. If symptoms are present, a veterinarian should be contacted immediately. There is no specific treatment for West Nile Virus other than supportive veterinary care standard for animals infected with a viral agent. Data has indicated a 30-40 percent mortality rate.

Prevention

Vaccination

A vaccine is approved for horses but must be administered by a veterinarian. For horses never vaccinated for West Nile Virus, the initial vaccine is a two-injection series given three weeks apart. Both injections are necessary to provide protection. Maximum protection occurs three to four weeks after the second injection. If a horse previously received the two-injection series, a single booster within six months of peak mosquito season is recommended. A booster every four to six months during mosquito season is suggested for horses in warmer climates. In Nebraska as of 2007, most veterinarians recommended previously vaccinated horses receive a single West Nile Virus booster in late spring or early summer. Foals born to mares that have been vaccinated for this virus should have the two-shot series at six months of age (two injections, three weeks apart). If the mare was not vaccinated, a three-injection series (three weeks apart) initiated at three months is suggested.

Other equine encephalitic diseases (sleeping sickness: eastern equine encephalitis, western equine encephalitis, and Venezuelan equine encephalitis) belong to a different family of viruses for which there is not cross-protection. As a result, horses should be vaccinated specifically for West Nile Virus as well as the various forms of equine encephalitis. Horse owners should consider West Nile Virus vaccinations one of the standard vaccines.

In a study to determine the effectiveness of the vaccine, a group of horses that had been vaccinated 12 months previously and a group of non-vaccinated horses were given West Nile Virus. Eighty-one percent of the non-vaccinated horses developed the disease, but only one of the vaccinated horses developed it, so the vaccine was reported to be 94 percent effective.

Mosquito Control

Limiting exposure to mosquitoes is fundamental to helping prevent the spread of West Nile Virus. Reducing the amount of standing water available for mosquito breeding is a key factor. Other mosquito control guidelines include:

- Dispose of tin cans, plastic containers, ceramic pots or similar water-holding containers.
- Remove all discarded tires.
- Drill holes in the bottom of recycling containers left outdoors.
- Clean clogged roof gutters.
- Turn over plastic wading pools when not in use.
- Turn over wheelbarrows and don't let water stagnate in birdbaths.
- Aerate ornamental pools or stock them with fish.
- Clean and chlorinate swimming pools when not in use.
- Use landscaping to eliminate standing water that collects.

Steps that can be taken with horses to prevent mosquito problems include:

- House horses indoors during peak periods of mosquito activity (dusk and dawn).
- Avoid turning on lights inside the stable during the evening and overnight.
- Place incandescent bulbs around the perimeter of the stable to attract mosquitoes away from the horses.
- Topical preparations containing mosquito repellents are available for horses. Read the product label before use and follow all instructions.
- Fogging of stable premises can be done in the evening to reduce mosquitoes; read directions carefully before using.

Web Sites for More Information

Nebraska Department of Health and Human Services (NDHHS)
http://www.hhs.state.ne.us/wnv/
U.S. Department of Agriculture, APHIS
http://www.aphis.usda.gov/vs/nahss/equine/wnv/
Center for Disease Control and Prevention (CDC)
http://www.cdc.gov/ncidod/dvbid/westnile/index.htm

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