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## West Nile Virus: Risk and Prevention for Horses in Florida<sup>1</sup>

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### Introduction

West Nile is a type of virus that is transmitted by mosquitoes to humans, birds, and horses. The presence of the virus in these hosts can lead to encephalitis, or swelling of the brain. Until 1999, the virus had never been seen in the United States. The virus was first detected in New York City in the summer of 1999, and again in 2000 and 2001 in the northeastern United States. It was first reported from Florida in June, 2001 and caused over 400 equine cases of West Nile by the end of that year. Transmission to horses continues to be reported in 2002.

### Transmission

Mosquitoes become infected by feeding on animals (reservoir hosts) that are infected with the virus. The reservoir hosts involved in West Nile transmission are wild birds and infections in these hosts may be fatal to the animal. Crows, in particular, are susceptible to infection with West Nile virus and experience high mortality. Many birds generally produce a large number of virus particles circulating in their blood and when certain species of mosquitoes feed on the infected animals, the virus

multiplies in these mosquitoes. If the infected mosquito takes a second blood meal from a horse several days later, the horse may then become infected with the virus. The time between the bite of the infected mosquito and the appearance of symptoms of the disease is between 5 and 15 days. Following the bite of an infected mosquito, the virus multiplies in the horse's blood and crosses the blood-brain barrier and infects the brain. The virus then interferes with the central nervous system and can cause inflammation of the brain.

When a horse is infected, the number of virus particles is generally very low compared to the natural reservoir hosts, birds. Because the number of particles are so low, uninfected mosquitoes do not pick up enough of the virus from horses or humans to become infected. Therefore, horses (and humans) are called "dead-end hosts."

### Clinical Signs

In 1999, twenty-five horses in Long Island, New York showed clinical signs of infection with West Nile virus. The clinical signs that were seen in these horses included listlessness, stumbling and incoordination, weakness of limbs, ataxia, partial

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paralysis, and death. Fever was not generally observed. Other signs that can be indicative of a West Nile virus infection in horses are impaired vision, head tilt, convulsions, inability to swallow, circling, hyperexcitability, or coma. Of the 25 horses with clinical signs, 9 died or were euthanized, and the remaining 16 recovered. Other horses in the area were likely infected with the virus without showing clinical signs. At least 35 other horses in the vicinity were found with antibodies to West Nile virus, but never showed signs of illness. Infection with the virus was not linked to the horse's age, breed, or size. In 2000, there were more than 60 cases reported in horses in the following states: Connecticut, Delaware, Massachusetts, New Jersey, New York, Pennsylvania, and Rhode Island.

### Diagnosis and Treatment

If a horse shows signs that are suggestive of infection with West Nile virus, contact a veterinarian to examine and test the horse. It is important not to presume that horses with these signs have West Nile encephalitis. A definitive diagnosis is required to rule out other diseases with similar signs (for example: rabies, botulism, Eastern Equine Encephalitis, Western Equine Encephalitis, and Venezuelan equine encephalitis). A positive diagnosis for West Nile virus can be confirmed by testing the blood of an infected horse for virus or antibody.

There is currently a vaccine available, through veterinarians, for prevention of WN infection, but there is no cure for infected horses. The vaccine development was facilitated by United States Department of Agriculture's Animal and Plant Health Inspection Service (USDA-APHIS) making the avian and equine West Nile virus isolates available to agencies with proper facilities for doing vaccine development research.

Florida Agriculture Commissioner Charles H. Bronson urges all equine owners to have their horses vaccinated to be vigilant about receiving booster shots at regular intervals. For more information on the vaccine, contact your veterinarian or call the Florida Department of Agriculture and Consumer Services WN vaccine hotline: 850-410-0900.

Horses that have been vaccinated against Eastern Equine Encephalitis (EEE) are *not* protected from West Nile virus. EEE virus belongs to a different family of viruses and there is no cross protection. Treatment of infected horses is often based on clinical signs and reducing the severity of the disease. Fluid and nutrient supportive therapy may be required.

According to USDA-APHIS Veterinary Services, horses that are infected with West Nile virus *are not required to be euthanized*. Horses are incidental hosts and it is unlikely that mosquitoes feeding on infected horses could ingest enough of the virus to transmit it to other animals. Horses are euthanized only when they are suffering from severe encephalitis from which they will not be able to recover. Also, because horses are dead-end hosts, quarantines are unnecessary.

### Prevention Measures

The most important measure of prevention at this time is to be aware of current the local situation (<http://eis.ifas.ufl.edu/>) and to prevent exposure of the animals to mosquitoes. The following steps can be taken to help prevent exposure to mosquito populations:

- Remove potential mosquito-breeding sites. This includes removing water-holding containers, tires, wheelbarrows, buckets, clogged roof gutters, bird baths; any object that can hold stagnant water.
- Turn over wading pools.
- Remove water from swimming pool covers that hold water.
- Thoroughly clean livestock-watering troughs every 1-3 days.
- Drill holes in containers that hold water to allow drainage.
- Watch for water puddles that exist for more than 4 days and drain these if possible.
- Keep horses stabled during peak mosquito feeding times, generally at dusk and dawn, to reduce exposure to mosquitoes.

- Use a topical mosquito repellent for horses. Read the label before using the product and follow the directions. DEET is generally NOT used on horses. Most repellents for horses contain permethrin.

Pay attention to medical and veterinary alerts and follow the specific recommendations. Since West Nile virus can be fatal to some birds, the Florida public is encouraged to report dead bird sightings, especially crows, via the Web at <http://wld.fwc.state.fl.us/bird>. For those who do not have access to the web, contact the local county health department or regional Fish and Wildlife Conservation Commission office. West Nile virus was detected in a single dead bird in Jefferson County, Florida collected on June 18, 2001, heralding the arrival of West Nile virus to Florida. It has since been reported in humans, horses and sentinel animals throughout Florida.

For additional information on West Nile virus in horses, refer to the following Web sites:

Centers for Disease Control and Prevention

<http://www.cdc.gov/ncidod/dvbid/westnile/index.htm>

United States Department of Agriculture

[www.aphis.usda.gov/oa/wnv](http://www.aphis.usda.gov/oa/wnv)

For current updates on West Nile virus and other mosquito-borne diseases, visit the FMEL Encephalitis Information System Web site at:

<http://eis.ifas.ufl.edu/>

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