

West Nile Virus – Update 2002

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West Nile Virus appeared on national headlines in the summer of 1999 as reports of dead birds and cases of human disease and some fatalities occurred around New York City. The first dead crows and other birds were found in June of that year. This was followed by the first cases of human encephalitis in August. Also in August, cases of horse encephalitis appeared. Since that time, reports of dead birds, sick horses and human illness have spread from the initial New York City location. In addition, the disease has re-appeared again in 2000 and 2001. By August 2002, cases of WNV had been reported in horses as far west as Texas, Kansas, South Dakota, North Dakota and Wyoming (Figure 1). Many cases in horses have been confirmed in the southern states such as Florida and Louisiana. Positive cases have also been confirmed in birds from the eastern US to the central US with a western border from Texas up through Kansas and Nebraska continuing all the way north to the Dakotas. Many Canadian provinces north of these US states are also reporting WNV isolations. In 2002, there have been 156 confirmed or probable human cases. Most of the cases have been in Louisiana, Mississippi and Texas (Figure 2). Other states reporting human cases include Alabama, District of Columbia, Florida, Illinois, Indiana, Wisconsin, Ohio, Michigan, Arkansas, Tennessee, Kentucky, South Dakota and Massachusetts.

West Nile Virus is a viral disease as its name suggests. The virus was first isolated in Uganda, Africa in 1937 and since has caused sporadic epidemics across Europe, Russia and in Israel. How the virus arrived in North America is unknown. West Nile virus causes encephalitis, an inflammation of the brain. It should be kept in mind that most cases of West Nile Virus in humans are asymptomatic where no clinical signs are noticed by the infected person, or the person may have a mild fever, head and body aches and in some cases, rash and swollen lymph nodes. So far in 2002 in the US, over 150 cases have occurred and nine people have died from the disease. The clinical syndrome in horses is similar to that of humans, however, the mortality rate in horses with clinical signs (40-50%) is much higher than in clinical human cases (11%).

For horse owners, there is a vaccine available for West Nile Virus. Fort Dodge has a killed virus vaccine that has conditional approval for horses. It requires two doses, 3 to 6 weeks apart. Note that the *USDA conditional approval* means that there are special circumstances (high number of horse deaths) and that the vaccine is pure, safe and has a reasonable expectation of providing protection. However, the vaccine has not been tested enough to be licensed as an *USDA-approved* veterinary product. Consult your veterinarian about this vaccine.

The virus is propagated in birds and transmitted by mosquitoes. The cycle of transmission is similar to that of St. Louis (SLE) and Eastern Equine Encephalitis (EEE) where wild birds serve as the reservoir for the virus. But unlike SLE and EEE, the West Nile virus infects a wide range of avian species (it has been isolated from 78 species in the U.S.) and kills many of them. The crow family of birds is particularly susceptible to fatal infection and dead crows have become a sensitive indicator that West Nile virus may be circulating in an area.

Mosquitoes feeding on birds that have the WNV in their blood move the virus from one bird to another. As the mosquitoes populations grow in the warm summer months, more and more mosquitoes and birds become infected. At times, the mosquitoes will feed on humans and horses. These non-birds hosts for the mosquitoes are dead-end hosts in that the virus will not spread from them to other animals or birds. Dead wild birds that were positive for the virus have provided the earliest indication of West Nile in most cases, preceding human or equine infections. Migrating birds may be responsible for some of the movement of WNV across the US. In addition, the virus is capable of over-wintering in mosquitoes thus once it enters an area, it may persist from year to year.

The potential impact of West Nile virus infection for commercial poultry flocks is uncertain, but appears to be minimal. Some mortality in chickens was attributed to West Nile virus in the 1999 New York outbreak. However, experimental infections of chickens, pheasants and domestic pigeons have resulted only in low mortality. The recent movement of the West Nile virus into a major broiler chicken-producing region of the southeast will soon reveal the true consequences of widespread infection on this industry.

At this time, it would seem that dairy cattle are not at risk of becoming infected with West Nile Virus. This particularly true for dairy cattle in California as the West Nile Virus does not seem to be present in California at this time. Despite this lack of risk for California cattle, dairymen should be alert to the possibility of mosquito buildup around the lagoons on their dairies to protect themselves and their employees. Under the right conditions, large populations of these mosquitoes can develop by mid-summer or early fall. Two genres of mosquitoes are probable transmitters of the West Nile Virus. They are the *Culex* and *Aedes* mosquitoes. One of the *Culex* species, *C. quinquefasciatus*, prefers to breed in waste lagoon such as those commonly found on dairies. For this reason, mosquito control around dairy lagoons is a good idea. Livestock producers should also keep informed on the continued movement of the virus across the USA.

Reduction in the mosquito population can help to decrease the risk of WNV cases in horses or human. General recommendations to remove breeding sites include:

1. Remove all potential sources of stagnant water where mosquitoes might breed.
2. Dispose of any containers such as old tires that might hold water.
3. Drill holes for water drainage in containers that are left outdoors.

4. Check rain gutters for blockages that might hold water.
5. Remove water from plastic pool, wheel-barrow and bird baths regularly.
6. Stock ornamental pools with fish that eat mosquito larvae.
7. Check for ground pools that may hold water for more than four days as they are breeding sites.
8. Routinely clean water troughs on a monthly basis.

As each of these control measures are put into practice it can be anticipated that more reduction in the mosquito population will occur.

For updated information on West Nile Virus try these two websites: the USDA site, www.aphis.usda.gov/oa/wnv or the Centers for Disease Control site, www.cdc.gov/ncidod/dvbid/westnile/index.htm.

Figure 1. Distribution of WNV horse cases confirmed or probable during 2002 in the US.



