

# West Nile Encephalitis and Poultry

In 1999, West Nile encephalitis became a public health concern in the United States. The disease, which previously had not been recorded in this country, broke out in the New York City metropolitan area, where the Centers for Disease Control and Prevention confirmed 62 human cases of encephalitis, including seven deaths. The West Nile virus, which causes the disease, was isolated not only from people but also from a large number of dead crows, a variety of zoo birds, various native bird species, and horses with encephalitic signs.

Although chickens and turkeys can become infected when experimentally inoculated with the virus or bitten by infected mosquitoes, these birds do not develop the clinical disease. Their immune system quickly responds to infection by producing antibodies that clear the virus from their body. Also, because the virus can be transmitted only through the bite of an infected mosquito, infected poultry present no significant public health risk. Poultry can neither directly infect other birds, animals, or humans, nor act as a reservoir for the virus.

Pennsylvania has in place an intensive West Nile virus surveillance program. This program includes attempting virus isolation from mosquitoes and wild birds (primarily crows). Blood samples from sentinel chickens are tested to detect West Nile virus antibodies. In addition, veterinarians can request that equine blood samples be tested for diagnostic purposes.

## **WHAT IS WEST NILE ENCEPHALITIS?**

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West Nile encephalitis is a brain infection caused by the West Nile virus. The majority of people and animals that become infected with the virus either have no symptoms or experience mild illness. However, a small proportion of infected people and animals (primarily horses) develop an illness, which may progress to full-blown encephalitis, which can be fatal.

## **WHEN WAS WEST NILE ENCEPHALITIS FIRST SEEN IN THE UNITED STATES?**

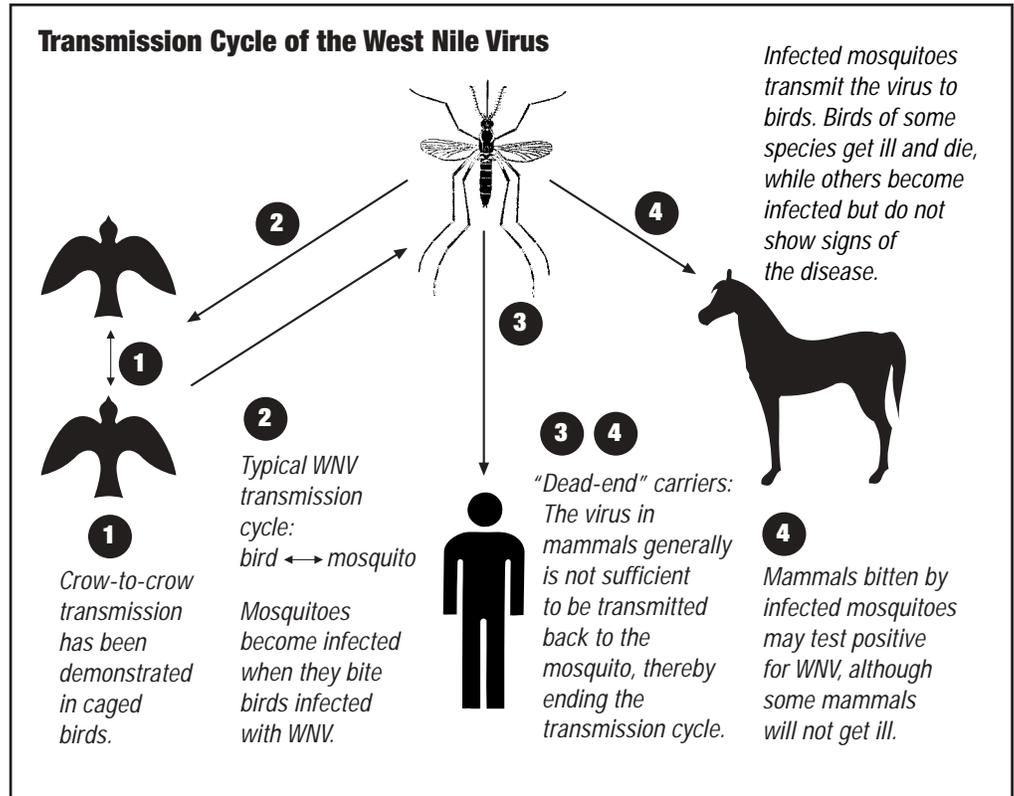
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In late summer of 1999, exotic birds in a New York City zoo began to die unexpectedly at the same time that wild crows were dying in large numbers. In addition, an increase in the incidence of encephalitis in horses was seen, and several elderly people died from the same condition. Dr. Tracy McNamara, the Bronx Zoo's veterinarian, and Dr. Millicort Edison, a New York State public health veterinarian, suspected that the cases were related and caused by an infectious agent not previously reported. They enlisted the aid of the National Veterinary Services Laboratory and the Centers for Disease Control and Prevention, who subsequently isolated and identified the agent as West Nile virus. The virus had until that time been found only in Africa, Eastern Europe, West Asia, and the Middle East. The virus may have been introduced into the United States by an infected bird or mosquito.

## HOW IS WEST NILE VIRUS SPREAD?

There is no evidence of animal-to-person or person-to-person transmission of West Nile virus. The only known way in which people can become infected is through the bite of an infected mosquito. However, even in areas where mosquitoes do carry the virus, very few mosquitoes are infected. Mosquitoes become infected after taking a blood meal from a wild bird carrying the virus in its bloodstream. Although some wild birds may harbor the virus, most species, with

the exception of crows, do not become clinically ill. American crows, however, constitute a large proportion of the dead birds that have tested positive for the West Nile virus. Because the only means of preventing transmission of West Nile Virus is through mosquito control, mosquito control efforts will be increased in any areas where West Nile virus is found to be present.



## CAN POULTRY BECOME INFECTED?

Many birds and mammals, if bitten by infected mosquitoes, can become transiently infected. There is no experimental or field evidence that clinical disease will develop in chickens or turkeys. Any infection they sustain is mild and brief. For example, during a West Nile virus epidemic in Romania in 1996, 41 percent of the chickens developed antibodies to the virus—meaning they had been bitten by an infected mosquito—but none died as a result. Because chickens develop antibodies to the virus, they are being used as sentinels to monitor for the presence of infected mosquitoes in high-risk areas. There is some evidence that waterfowl may be more susceptible to the virus than chickens or turkeys, but the susceptibility of game birds is unknown at this time.

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**WHAT ACTIONS HAVE BEEN TAKEN IN PENNSYLVANIA?**

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The Pennsylvania Department of Health, in cooperation with the Department of Agriculture, Department of Environmental Protection, and several other state agencies, has established a surveillance program for West Nile virus. This program involves placing and testing sentinel poultry for antibodies to West Nile virus; trapping and testing mosquitoes; testing fresh, dead birds (in particular, crows, blue jays, and raptors—hawks and owls) for the virus; examining brain tissue from horses that died from encephalitis; testing equine serum for antibody from horses that may have encephalitic signs; and evaluating encephalitis cases in people.

Sentinel poultry are to be placed at various sites throughout the state. These chickens are bled and tested weekly during the mosquito season for antibodies to the virus. Note that these sentinel chickens present no significant public health risk to other animals or people, including handlers and consumers; this is, in fact, why chickens are being used.

Producers, service people, and veterinarians are being asked to submit to a diagnostic laboratory any mammalian or avian species that may show encephalitic signs (including trembling, paralysis, convulsions, and abnormal positioning of the head).

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**WHAT OTHER SOURCES OF INFORMATION ARE AVAILABLE?**

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Several fact sheets, including *Mosquito Biology and Control*, *West Nile Encephalitis: What You Need to Know*, and *West Nile Encephalitis in Horses* are available from Penn State's College of Agricultural Sciences. Contact the Publications Distribution Center, The Pennsylvania State University, 112 Agricultural Administration Building, University Park PA 16802 or call 814-865-6713.

- Pennsylvania Department of Health Web site: <http://www.westnile.state.pa.us/>  
Toll-free telephone number: 1-877-PA-HEALTH (724-3258)
  - Pennsylvania Department of Agriculture: 1-717-783-9550
  - Penn State's West Nile Virus Web site: <http://www.pested.psu.edu/spwestnile.html>
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