



## ***Leptospirosis and White-tailed Deer Fact Sheet***

### **What is leptospirosis?**

Leptospirosis is a group of diseases caused by the bacteria *Leptospira interrogans* that infect humans, domestic animals, and wild animals. The *Leptospira* bacteria are small, filamentous, motile, spirochetes coiled around an axial filament ranging in size from 0.1 to 0.3  $\mu\text{m}$  in width and 6 to 20  $\mu\text{m}$  in length. Severity of infection can vary from inapparent to fatal. Leptospirosis is responsible for significant economic losses to the livestock industry, primarily due to abortion, reduction of milk and growth rates, and secondarily due to death. Leptospirosis is thought to have little effect on the health of wildlife such as white-tailed deer. Certain species of wildlife, however, may serve as a source (reservoir) of infection for domestic animals and humans.

### **Does Leptospirosis Affect White-Tailed Deer in Wisconsin?**

In Wisconsin, between 1999 and 2001, approximately 500 white-tailed deer from across the state were screened for Leptospirosis. Leptospirosis antibodies were found in 7-10% of the sampled deer, which is similar to what has been reported nation wide. All the measured concentrations of antibodies, or titers, were considered low, which is more compatible with exposure not resulting in clinical disease (sickness). Naturally occurring clinical leptospirosis in white-tailed deer is considered extremely rare and no clinical cases of leptospirosis have been recorded by the Wisconsin DNR's Wildlife Health

### **How is Leptospirosis Transmitted?**

The *Leptospira* bacteria are able to infect a variety of animals and persist in the environment outside of the host. Transmission occurs through contact with contaminated water and food, during coitus, or during pregnancy. The *Leptospira* bacteria are known to produce a persistent infection in the kidneys and urinary tract where they may be excreted with the urine. Infective urine constitutes the major sources of infection for humans, domestic animals, and wild animals. Transmission usually occurs when there is direct contact between urine droplets or urine contaminated water and the mucous membranes of the eye, nose, and mouth or through abraded skin. Among carnivores, the most significant route of transmission is through the food chain by the ingestion of leptospiral-infected carcasses.

The *Leptospira* organisms can survive outside the body if environmental conditions are favorable. The bacteria prefer moist, slightly alkaline soil, stagnant ponds, and low-flow, slow-moving, slightly alkaline streams. In these conditions, the organism can survive for several weeks.

Once infection has occurred, the leptospire can multiply in the kidneys, lungs, reproductive organs, and brain. Uterine infection in pregnant animals can result in infection of the fetuses.

### **What are the Symptoms and Effects of Leptospirosis?**

Severity can vary from mild to fatal. Leptospiral infections in wildlife are usually self-limiting without significant clinical disease (sickness); the host recovers but may act as a reservoir. Experiments involving white-tailed deer resulted in a small number of infections with clinical signs ranging from inapparent to fever, abortion, and death. Clinical signs observed in most of the experimental deer were a transient fever, anorexia, weakness, anemia, hemoglobin in the urine, and jaundice.

Pathological changes in wildlife species are rarely recorded. Lesions consistent with an infection are not evident in white-tailed deer, skunks, raccoons, opossums, fox, rats, and mice. In the experimental infections with *L. interrogans pomona* in white-tailed deer, nephritis, hepatitis, and widespread hemorrhages were observed.

### **How is Leptospirosis Diagnosed?**

The most effective diagnostic technique is a combination of clinical signs and blood serum tests. It can also be diagnosed through growing bacterial cultures using blood, spinal fluid, urine, or specific tissues.

### **How can Leptospirosis be Treated or Prevented?**

Recovery from leptospirosis results in immunity for the particular serovar that caused the infection. Wild animals are generally not treated for leptospirosis and control is not feasible due to the multiplicity of serotypes, the broad range of susceptible hosts, and the possible extended carrier state of the disease.

### **What is the Significance of Leptospirosis?**

In wildlife species, the significance of leptospirosis appears to be minimal other than some species acting as potential reservoirs. Even this status is not clear because very few leptospirosis outbreaks in humans and domestic animals have implicated wildlife species other than rodents. Investigations have indicated that, while white-tailed deer are exposed to Leptospirosis, deer populations are largely unaffected and play an insignificant role in the transmission of bovine leptospirosis. No human cases of leptospirosis have been traced to contact with deer, and the risk of direct infection from free-ranging, wild animals is virtually non-existent.

(Some information adapted from Michigan DNR: [http://www.michigan.gov/dnr/0,1607,7-153-10370\\_12150\\_12220-26943--,00.html](http://www.michigan.gov/dnr/0,1607,7-153-10370_12150_12220-26943--,00.html)).