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LYME DISEASE IN NEBRASKA
General Information

Figure 1 - Dog tick

It's that time of year again when our work and recreation takes us outdoors. We look out our kitchen windows during those long cold winter months just waiting for the warm weather to arrive so that we can get outside and enjoy the fresh air and the many activities of spring and summer. However, before we get too far into the season, it might be a good idea to review one of the latest diseases to cause concern among public health officials. The disease, of course, is Lyme disease that is spread by ticks. It is not lethal but is a nuisance and may even become a chronic nuisance. So, take a few minutes to review the disease and its characteristics before you start your field season.

Lyme disease was first recognized in the early part of the 1970's near Lyme, Connecticut. At first, it was viewed as a curious outbreak of juvenile rheumatoid arthritis among a statistically significant sample of the children near Lyme and its environs. Further study revealed that Lyme disease, as it is now named, was caused by a spirochete bacterium (*Borrelia burgdorferi*) and the deer tick was identified as the vector that transmitted the disease. As research work continued, it became fairly apparent that the disease had been described in Europe since the turn of the century and that it may have spread to this country in the early 1900's

The disease begins as a rash that has been named erythema migrans (EM). It often first appears near the site of the tick bite. In its early stages, the rash may appear as a red spot but it quickly becomes larger and may be shaped as a circular, oblong, or triangular spot. In some cases, the center is clear so that the rash resembles a bulls eye. The rash may be small or may cover a large area of the body. Other common symptoms may include those associated with viruses and include such things as fatigue, stiff-neck, body aches, and, of course, fever and headache. If untreated for several months, arthritis may develop in about half of those infected and may eventually cause a chronic arthritic syndrome characterized by painfully swollen joints. In a few cases, heart problems may develop and complications to the nervous system in the form of Bell's palsy, weakness in the limbs, and even memory loss. Symptoms can last weeks, months, or years depending upon length of infection, aggressiveness of treatment, and health of the victim. Even though it was

identified over twenty years ago Lyme disease is still difficult to diagnose and may not respond well to treatment. A vaccine is not yet available for the disease.

A regimen of antibiotics is the preferred method of treatment. Most cases can be treated successfully with doxycycline or amoxicillin. Lactating women or children under nine years of age are usually treated with amoxicillin or penicillin since doxycycline can cause developing permanent teeth to turn yellow.

The deer tick is usually thought of as the principal vector of *B. burgdorferi* and certainly the most commonly infected ticks spend part of their life cycles feeding on deer and reproducing. In general, these ticks belong to the genus Ixodes and include *I. scapularis*, *I. dammini* (the deer tick), and *I. pacificus*. The lone star tick, *Amblyomma americanum*, has been identified in the southeastern part of the state and is thought capable of carrying the disease. Estimates suggest that approximately one percent of deer ticks actually carry the disease producing microbe although the proportion may rise to fifty percent in local instances. There is also some evidence that any tick, and possibly other blood sucking insects as well, may be capable of carrying the Lyme disease spirochaete.

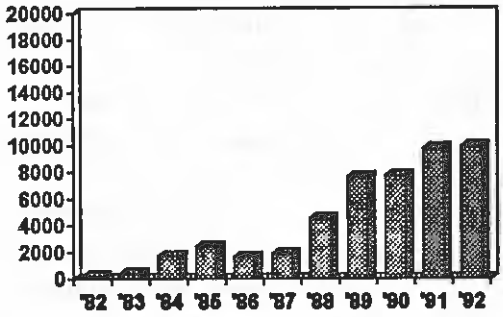

Figure 2 - Lyme Disease Growth 1982-92

The number of cases of Lyme disease has been growing steadily and has been reported in most states. It is, however, most commonly found in the northeast and mid-Atlantic states, northern California, and some parts of the upper midwest, principally Minnesota and Wisconsin. The burgeoning deer populations in both rural and urban areas has been instrumental in spreading the disease. Lyme disease, endemic to Asia and Europe, is also thought to have spread to South America.

The best way to avoid Lyme disease is to avoid the ticks that spread it. Deer ticks are found in mixed brushy and wooded areas and adjoining grasslands. When participating in outdoor recreation that includes hiking or walking it is best to wear light colored clothing that closes off tick entry points. This is accomplished by wearing tight fitting cuffs, pants that tuck into boots, full shoes or boots, and a hat. Walkers should also avoid, where possible, walking through brush in areas of infestation. It is often more prudent to use paths or walks if available. When entering the brush, clothes can be sprayed or treated with permethrin, a repellent that can be purchased at most garden stores. DEET (N,N-diethyl-M-toluamide) may also be helpful. Obviously, it is important to be cautious when using such chemicals. Babies may be especially sensitive to certain insect repellents.

After an outing in the country, it is a good practice for all parties to undergo a thorough inspection. Clothing should washed and pets and children inspected for ticks. Remember, the tick most likely to cause the disease may only be as big as a speck and can easily be

overlooked or mistaken for a small seed or speck of dirt. Ticks can also be transported into the house on a pet and infect a human subject later. If a tick is found and it has not become attached, remove and destroy it. Ticks are quite resilient and should be destroyed by putting them in a container filled with alcohol or similar substance. They can then be discarded once they are dead. If a tick is found and it is already attached, slowly pull it off using a tweezers. Care should be taken not to squeeze the body of the tick or to leave the head imbedded in the wound. The tick buries its head under the skin and the head can be torn off if jerked or yanked. Once removed, clean the bite with a good antiseptic and destroy the tick as described above.