Lyme borreliosis is a disease caused by the spirochete bacterium *Borrelia burgdorferi* and affects people and animals. It is transmitted by the hard tick *Ixodes dammini*, commonly called the deer or bear tick. How the bacteria is transmitted from the tick to animals and between individual animals in a herd is not well understood. The pathogenesis (creation of disease) of *B. burgdorferi* infection in domestic animals is not known. A definitive diagnosis by culture techniques is very difficult as the spirochete is not readily found in high numbers. The currently used laboratory serological test identifies antibodies against the genus *Borrelia* and is not completely specific for *B. burgdorferi*. There are other species of *Borrelia* known to infect domestic animals and humans. It is not known if these other species are present in Michigan.

**Clinical Signs in Domestic Animals**

There are very few documented reports of Lyme disease in domestic animals. Dogs, horses and cattle are the only species that have been described in the literature. Lyme disease has not been reproduced experimentally in any of these species, so describing the disease is difficult because it has not been well studied. How the spirochete causes damage is not known.

**Dogs**

Clinical signs of Lyme borreliosis in dogs as reported in the literature include fever, lymphadenopathy (swollen lymph nodes), and lameness in one or more joints. Spirochetes have been cultured from dogs with these clinical signs. There has been one case of a dog with kidney failure attributed to the presence of spirochetes in the kidney.

**Cats**

There are no reported cases in the literature. There are some reports from veterinarians indicating that cats have similar signs as dogs.

**Horses**

Clinical signs associated with positive test results have been reported in horses. However, there have been few cases where the spirochete has been cultured from the animal. The clinical signs reported include lameness, encephalitis (inflammation of the brain), uveitis (inflammation of the middle coat of the eye), and a transient edema of the legs in foals. Many of these cases were diagnosed on positive test results. An attempt at culturing the spirochete was not done. It is difficult to make definite conclusions on the cause of clinical signs. Also in several cases other causes for disease were not dismissed.

**Cattle**

There has been only one case report of *B. burgdorferi* infection in cattle, a heifer which developed laminitis in the forefeet following calving. The animal was treated and improved, but subsequently deteriorated and was euthanized. Arthritis, weight loss, kidney, liver and lung damage were found. The spirochete was found in the lungs and liver. There have been numerous field reports of presumed Lyme disease in cattle herds. However, other causes of the clinical signs were not ruled out in each case. Identification of the spirochete was not attempted in most cases.

**Pigs, Sheep and Goats**
It is not known if these species develop Lyme borreliosis.

**Treatment and Prevention**

Treatment with penicillin or tetracycline is very effective in humans and dogs. Since the organism “hides” in tissue, it is necessary to treat for a minimum of 14 days to reach and kill all organisms. In some cattle herds, tetracycline given during the dry cow period appears to be beneficial in alleviating signs attributed to Lyme disease. When treating livestock, it is important that meat and milk withdrawal times are strictly observed. Because the tick prefers mice and deer as its host, strict rodent control and fencing out deer will help decrease exposure to the ticks. Keeping brushy areas around the barn, house and fields mowed will also decrease tick habitat. Checking animals (and humans) thoroughly for ticks and removing any that are found is recommended. Place ticks in alcohol for later identification.

**Conclusions**

There are many unanswered questions about Lyme borreliosis in domestic animals. Researchers are investigating other possible means of transmission including biting insects, animal-to-animal contact, and urine. The form of the disease in each species is also being looked into to determine if different species have different responses to the spirochete. At this time, a presumptive diagnosis of Lyme disease is made if all other reasons for the clinical signs are ruled out, the animal has a high or rising antibody titer and responds to treatment. For further information, contact Dr. Charles Gibson or Dr. Ann Donoghue.