



Montmorency Conservation District
13210 M-33 North (Fairgrounds)
P.O. Box 789
Atlanta, MI 49709
989-785-4083
montmorencyd.org

The Basics of Bovine TB

By Randy Mellberg, Conservationist, Alpena Conservation District

Most of us who live in the northeastern part of Michigan are familiar with the term TB. However, I'm thinking that some folks aren't familiar with the basics of the disease and the nuances associated with how the little bug (bacterium) lives in the environment. The following information is an outline of the disease to provide some insight on this nasty little bug.

First, let me explain the routes of infection. There are three ways the bacteria gains entry into a mammal. The most efficient means is inhalation, as only one bacterium is required to begin an infection. Coughing or sneezing by an infected animal puts the bacteria in the air, kind of like a spray can of air freshener. Another animal within approximately a 10-foot radius has the possibility of inhaling this and contracting the disease.

The second method is orally. This route of infection requires a much greater dose of bacteria than the inhalation route. For oral transmission to happen an uninfected animal has to consume feed or water contaminated with mucous, nasal secretions, feces or urine that contain the infective organism, or drink milk from an infected dam. Research has demonstrated the bacteria can be passed from deer to deer and deer to cattle on contaminated feeds.

The third and very rare are cases where humans can become infected with *M. bovis* (bug) via direct inoculation when a person is handling infected tissue. This lesion is known as Butcher's Wart.

While cattle are the principle host of bovine TB, virtually any warm-blooded animal (including humans) can be infected. The bug has a waxy outer coating that not only gives it some protection from the elements, but also protects it from the immune defenses of the animals it invades. Because of this waxy coating the bacteria can survive for long periods of time in cool, moist, shady areas where it is protected from sunlight. Researchers have demonstrated that the bacteria can survive for up to 16 weeks at 32° F if not exposed to direct sunlight. In fact the bacterium survives for 7 days on all types of feed tested even at 75° F!

The bug technically known as *Mycobacterium bovis* acts very slowly on the mammals (including humans) it infects. The animal infected may not show any signs of the disease for years, by which time the infected animal has infected many other animals. The most characteristic clinical sign of tuberculosis is weight loss, but this change only becomes obvious in the advanced stage of the disease. This is true for both cattle and wildlife infected with TB.

Just a little history: In the early 1900s one cow in every twenty had bovine TB in the United States. Records show that the northeastern portion of Michigan's Lower Peninsula was one of the areas with the highest incidence of bovine TB in the country. Epidemiologists feel that it was during the first half of the 20th century that some wild white-tailed deer in this area of the Lower Peninsula were infected by eating leftover feed contaminated by infected cattle. A perfect storm was created during the 1980s when baiting deer became increasingly acceptable to the hunting community and many non-hunters were feeding deer. The infected deer were now congregating over bait piles in an unnatural way, with deer from various matriarchal bands and bucks coming together to eat. This was a perfect setting for the disease to spread by both the respiratory and the oral routes. The supplemental feeding of deer also led to an increase in the deer population in the region, which in turn brought more deer in contact with each other over feed and bait piles.

Eventually this process was detected by the Michigan Department of Natural Resources (MDNR) as a hunter presented the MDNR with a bovine TB infected deer in 1975 and again in 1994. In a 1996 survey of the wild white-tailed deer of the region the MDNR tested 4,967 deer and found 56 bovine TB positives. The following year (1997) the MDNR tested 3,720 deer and found 73 bovine TB positives. The Michigan Department of Agriculture (MDA) found the first bovine TB infected herd in the region in June of 1998. Two other infected herds were found

that year and another in 1999. Accordingly the United States Department of Agriculture (USDA) Veterinary Services (VS) down graded Michigan's TB status from TB Free to Modified Accredited in October 2009 – 20 years after Michigan had obtained TB Free status.

Other interesting information associated with small mammals is that research has also looked at other small mammals that can become infected by eating carcasses of infected deer. The small mammals we have in Michigan do not develop overwhelming infections of bovine TB like the brush-tailed possum of New Zealand or the badger of Great Britton. Nor have researchers found that Michigan's small mammals pass significant numbers of bacteria in either their feces or urine so as to pose a health risk to cattle.

While Manitoba, Canada has a significant problem with bovine TB in wild elk contaminating cattle with bovine TB, to date only five elk have been found in Michigan with bovine TB.

Randy Mellberg works with local landowners to reduce the risk of TB transmission due to deer/cattle contact.

If you have questions or concerns he can be contacted at the Alpena Conservation District office 989-356-3596 Ext. 108 or by email: randy.mellberg@mi.nacdn.net

More information on Bovine TB can be found at:

<http://www.michigan.gov/emergingdiseases/0,1607,7-186-25804---,00.html>

Further info on the Wildlife Risk-A-Syst program:

<http://web2.msue.msu.edu/bulletins/Bulletin/PDF/FAS113.pdf>