2013-03-20-006 Bovine tuberculosis - USA: (MI), bovine
To: (04) Mycobacterial diseases; (07) Zoonoses, general;
****

BOVINE TUBERCULOSIS - USA: (MICHIGAN), BOVINE
****
A ProMED-mail post
Date: Thu 3 Jan 2013
Source: New England Cable News (NECN), Associated Press (AP) report [edited]
<http://www.necn.com/01/03/13/Alpena-County-cattle-test-positive-for-b/landing_nation.html?&apID=54be281146ee451db9b8d478c4dacd6a>

Officials say a dairy cattle herd in the northeastern Lower Peninsula has tested positive for bovine tuberculosis.

The Michigan Department of Agriculture and Rural Development said Thursday (3 Jan 2013) the disease was found on an Alpena County farm with 50 to 100 cattle. The diagnosis was confirmed after routine testing by the state agency and the US Department of Agriculture.

A public meeting to discuss the findings is planned for 10 Jan 2013 at Wilson Township Hall.

Bovine TB is a contagious bacterial disease. All of Michigan's 14 000 cattle farms have been tested since an outbreak began in the mid-1990s. Bovine TB has been found in 55 of them.

Most of the state is designated as free of the disease, but 11 counties are considered at higher risk and require additional cattle testing.

--
Communicated by:
ProMED-mail
<promed@promedmail.org>

[The primary cause of tuberculosis in cattle is the bacterium _Mycobacterium bovis_. This bacterium is in the same family with bacteria that cause Johne's disease and leprosy. Adult cattle are usually infected by inhaling invisible droplets containing the bacteria into their lungs, while pre-weaned calves are more often infected by drinking contaminated milk. The route of entry will ultimately determine the clinical signs of the disease.

Since the bacterium is usually inhaled into the lungs in adult cows, the most common clinical signs are related to pulmonary tuberculosis.
Once the bacteria enter the lungs, they begin to multiply and generally spread to the lymph nodes near the lungs. At this primary site of infection, the lesions can remain quietly inactive or develop further depending on the ability of the cow to fight off the infection. When the immune system of the cow is fully activated, the infection may remain limited to the lungs and could go undetected for the productive life of the cow. If the infection over-powers the body defenses, the bacteria may be carried to other locations in the body in the lymph or blood circulation. New areas of infection often occur in the lungs, kidneys, liver, spleen, and the lymph nodes associated with these organs. In cases allowed to progress over an extended period of time, lesions may be present in the uterus or mammary gland.

When calves are exposed to the tuberculosis bacteria in the milk, the most common lesions are noted in the lymph nodes at the junction of the neck and head around the throat. The main sign may be swelling of these nodes. The primary lesions in calves, however, are most frequently located in the lymph nodes along the intestinal tract.

Other species of _Mycobacterium_ may complicate the diagnosis of tuberculosis in cattle caused by _M. bovis_, but cattle are resistant to these infections, and they rarely cause infections with clinical signs. _Mycobacterium avium_, causing infection by ingestion and lesions in the intestinal tract of

adult cows, and _Mycobacterium tuberculosis_, the main cause of human tuberculosis, are 2 of these species. They cause the cattle to be sensitive to tuberculin testing and give false positive reactions when tests are being conducted to find cows with _M. bovis_ infections. These other bacteria are more important as causes of infection in swine, sheep, goats, and humans.

Live, infected cattle are diagnosed as being infected with _M. bovis_ with the tuberculin test. The appropriate tuberculin is purified protein derivative (PPD), as it is specific and not costly to produce. In the US, the tuberculin is injected into the caudal fold of the tail near the tail head by a federally accredited veterinarian. A 0.1 ml dose of PPD is injected intradermally. Infected cows will have an allergic type reaction to the PPD at the injection site. The test is read in 72 hours by palpating the injection site for the allergic swelling. When sufficient swelling is found to indicate infection with mycobacteria, follow-up testing is usually performed by state officials to determine that the swelling is due to _M. bovis_ and not a different type of mycobacterium.

Nationwide, there is active surveillance at slaughter plants. State and federal meat inspectors check the lymph glands and other organs of each cow for signs of tuberculosis. When any signs suspicious of tuberculosis are found, tissues are collected and sent to the National Veterinary Services Laboratories for confirmation. If bovine tuberculosis is confirmed, trace-back studies are performed to find the herd of origin. The most effective means of control in a tuberculosis herd is to depopulate the entire herd and compensate the owners. Otherwise, the herd will be quarantined and tested repeatedly until all evidence of infection is eliminated.

Tuberculosis is a slow, insidious disease that can lurk for quite a while before rearing its head. Unfortunately, the best tests, as noted above, do not always detect this disease in its earliest stages.

Science has been hard at work trying to develop a better test for this disease but has not yet succeeded.

Portions of this comment were extracted from <http://www.vetmed.ucdavis.edu/vetext/INF-DA/Tuberculosis.pdf>.

The state of Michigan can be located on the HealthMap/ProMED-mail interactive map at <http://healthmap.org/r/2E*V>. Alpena County can be seen on the map at <http://www.digital-topo-maps.com/county-map/michigan.shtml>. - Mod.TG]

[see also:
2012

Bovine tuberculosis - USA (02): (MI) bovine 20120629.1184446 Bovine tuberculosis - USA: (MI) cervid 20120218.1045847
2011

Bovine tuberculosis, bovine - USA (06): (IN) 20110924.2891 Bovine tuberculosis, bovine - USA (05): (IN) 20110918.2839 Bovine tuberculosis, bovine - USA (04): (AZ) ex Mexico 20110612.1793 Bovine tuberculosis, bovine - USA (03): (CA) 20110429.1328 Bovine tuberculosis, bovine - USA (02): (MI) 20110416.1196 Bovine tuberculosis, cervid - USA: (MI) 20110322.0895 Bovine tuberculosis, bovine - USA: (IN) 20110301.0670]