



Bovine Tuberculosis

Information for Livestock Producers

Tuberculosis (TB) is an infectious bacterial disease that usually affects the respiratory system of mammals. Bovine TB is caused by *Mycobacterium bovis* (*M. bovis*). This bacterium can infect all warm-blood animals including humans. Human TB is most often caused by *Mycobacterium tuberculosis*.

Transmission

M. bovis bacteria are excreted in the exhaled air, sputum, feces, urine, and milk of infected animals. The most common method of disease transmission between cattle is inhalation of the bacteria.

Over 95% of bovine TB cases are the result of direct contact with infected cattle. Transmission can also occur through ingestion of contaminated feed and water. The organism can remain viable in the environment for 6-8 weeks or longer depending on temperature and humidity. Only 1-5% of infected cattle shed the organism in their milk. Transmission from an infected dam to calf can occur through the consumption of the dam's milk.



Farm employees in contact with infected cattle may serve as carriers of the bacterial agent on their clothing or shoes. In some cases, people infected with *M. bovis* TB can transmit the disease to cattle through sputum, respiratory droplets or urine and is an area of current active research.

Effects of the Disease

Once mycobacteria are inhaled or ingested, the immune system releases inflammatory cells to wall off the infection. The specific lesions of TB are called tubercles, which are masses of inflammatory cells that, when chronic, form a granuloma. In approximately 90% of TB infected cattle, the lung and lymph nodes of the respiratory system are the primary sites for TB lesions. Lesions can also be found in the thoracic cavity, head, and mesenteric lymph nodes.

Signs of the Disease

TB is a slowly progressive disease often taking months or years to develop. Cattle with bovine TB infection are often without clinical signs, but may eventually exhibit weight loss and a gradual decline in general health. If present, signs may include cough, production loss, rough hair coat, chronic weight loss, variable appetite, and fluctuating fevers.

Public Health Risk

Time/Temperature regulations for milk pasteurization are designed to protect consumers from contracting bovine TB. *M. bovis* can spread to humans through the consumption of raw milk or unpasteurized, or improperly pasteurized, dairy products from infected animals. The incidence of the *M. bovis* strain of TB in people is higher in California compared to the rest of the U.S., likely due in part to the consumption of unpasteurized cheese, such as the popular queso fresco from Mexico, which has been found to contain *M. bovis* and should be considered unsafe. In California, all raw milk dairies are tested annually to ensure product safety. *M. bovis* infection in humans is difficult to treat because it is resistant to some drugs used in the standard six-month course of TB treatment; however, in those cases, treatment is typically extended three additional months.

Disease Significance

Bovine TB is of great concern to the California cattle industry due to the potential risks to human health and the establishment of infection in a wide range of hosts, including free-roaming wildlife. The presence of bovine TB in the state may also lead to the loss of consumer confidence in milk and beef products, additional testing requirements prior to cattle movement out of the state, and the imposition of trade restrictions on the state's dairy products.

Historic United States Eradication Efforts

Bovine TB eradication efforts began in 1917 due to the significant animal and human health concerns associated with the disease. Initially, the federal TB program consisted of area testing, in which approximately 15% of a state's cattle population was tested each year. All herds in the state would be tested every six years. Area testing was the primary tool of the eradication effort until the national prevalence level of TB was greatly reduced, and the test method was no longer an efficient way to detect disease. California discontinued area TB testing in 1994.



Current United States Eradication Efforts

The current program relies on two strategies for the detection of bovine TB:

- **Live Animal Surveillance** - Field veterinarians conduct the caudal fold skin test on cattle for interstate movement, herd accreditation, and disease investigations. Animals with a response to the initial caudal fold test are subject to additional confirmatory diagnostic testing by regulatory veterinarians.
- **Routine Slaughter Surveillance** – Primary method of surveillance. Cattle slaughtered at state and federally inspected slaughter plants are inspected for granuloma lesions. Suspect lesions undergo laboratory diagnostics to confirm presence of *M. bovis*. Any carcass with confirmed lesions is not used for human consumption, and the herd of origin for the condemned carcass is TB tested.

Detection of TB Affected Animals

When an animal in a herd is confirmed as infected by laboratory testing, this herd is placed under quarantine and TB tested to determine the presence or absence of other infected animals. Additionally, cattle that have moved into or out of the herd, or have had contact with the herd, are traced and tested.

To comply with disease control, owners of affected herds may either depopulate the affected herd or engage in a test and removal plan. In a test and removal plan cattle are repeatedly tested, and infected and suspect cattle at each test are removed until the remaining herd tests negative for the disease. This process can take 4-7 years to attain the required series of negative herd tests.

USDA State Classification for TB

The United States Department of Agriculture (USDA) evaluates TB control efforts in each state and assigns a status classification. The basis of state status is the prevalence of the disease in cattle and bison, the effectiveness of the surveillance and control program, and compliance with the USDA TB standards. The classification system is being updated, but currently there are five classifications:

- Accredited-free,
- Modified Accredited Advanced,
- Modified Accredited,
- Accreditation Preparatory, and
- Non-Accredited.

The state status determines the interstate TB testing requirements for cattle. The classification system ensures that all states meet the requirements for obtaining national eradication of bovine TB.

California is classified as “TB-free” as of August 2016.

On Farm Prevention for TB

Cattle producers, in consultation with the herd veterinarian, should develop and implement a herd health program, which includes prevention of bovine TB. Importation of cattle, particularly breeding stock, stocker cattle, and roping/rodeo stock, can pose a significant disease threat to your herd. All imported cattle should be tested for TB prior to entering the herd. Record individual animal identification and maintain accurate records to enhance disease traceability.

To decrease the risk of TB:

- Maintain a closed herd, if possible,
- Isolate and test purchased additions,
- Isolate and test cattle re-entering the herd (e.g. contract-raised heifers),
- Enhance and enforce premises biosecurity to prevent contact with cattle of unknown TB status,
- Raise replacement heifers in areas kept entirely separate from feeder cattle and cattle of Mexican origin,
- Prevent commingling of replacement heifers with feeder cattle, including in the sick pen,
- Have diagnostic workups of suspicious sick or dead animals performed using services of your veterinarian and the California Animal Health and Food Safety Services Laboratory System,
- Establish a TB education and testing policy for employees, and
- Pasteurize colostrum and waste milk before feeding to calves.



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