



## Pennsylvania Game Commission Wildlife Disease Reference Library

# Brucellosis

**Other Names: Mediterranean fever, Malta fever, undulant fever, Bang's disease, contagious abortion**

### **Cause**

Brucellosis is a disease of animals and humans. There are multiple species of these bacteria in different animals. *Brucella abortus* infects cattle and bison and this is the greatest concern for potential human infections. *B. suis* infects mostly swine and caribou, while *B. melitensis* usually infects goats but is not currently found in the United States. All *Brucella* species are capable of causing infection in other mammalian host species, but they usually occur associated with the hosts listed above.

### **Significance**

Brucellosis is a zoonotic disease, meaning that humans can become infected by coming into contact with infected animals or contaminated animal products. Though it is uncommon in the United States, brucellosis can cause a debilitating disease in humans called undulant fever. Veterinarians, hunters, cattle farmers, slaughterhouse workers, wildlife biologists, and people who drink raw milk are at greater risk of exposure. Brucellosis was once a more common disease in people, but the pasteurization of milk eliminated this biggest source of human infection.

### **Species Affected**

Many domestic and wild mammal species are known to be susceptible to brucellosis. Free ranging bison and elk are the primary wildlife reservoirs for the disease. Brucellosis can also affect moose, many species of deer (including white-tailed deer), caribou, rodents,



Bison are a wildlife reservoir for brucellosis. Photo courtesy of USGS.gov

opossums, rabbits, foxes, bears, feral swine, and raccoons. Dolphins, seals, and sea otters have been diagnosed with brucellosis. Domestic animals such as cattle, swine, goats, and dogs can also become infected.

### **Distribution**

Brucellosis is found worldwide and was probably introduced to North American wildlife when European cattle were brought to the continent. In the United States, the disease is relatively rare in deer, but is more of a concern in wild bison, elk, and moose. The nation-wide eradication program has been successful in nearly eliminating the disease from domestic cattle, but complete eradication will be challenging because the disease now persists in wildlife populations. Elk and bison in Yellowstone National Park and its surrounding areas are known wildlife reservoirs of *Brucella*. Brucellosis has also been nearly eliminated from domestic swine herds, but feral swine in at least 14 states have tested positive for the disease and could potentially reintroduce it into domestic herds. Native wildlife is not believed to be a reservoir for brucellosis in Pennsylvania.

### **Transmission**

Brucellosis is usually transmitted via direct contact with infected animals or contact with a contaminated environment. Many *Brucella* bacteria are present in the aborted fetus, placenta, fetal fluids, and vaginal discharges of infected females. The disease is often transmitted when other animals lick these infected materials following abortion. Animals can also acquire brucellosis by consuming contaminated food or water. Infection can spread via inhalation and exposure of the eyes or open wounds to contaminated material. Some experiments show that the disease may be transmitted via blood-feeding ticks, fleas, or mosquitoes, but this has not yet been observed naturally. Male deer, elk, and moose can transmit the disease to females during mating, and calves can become infected in utero or following consumption of infected milk. The *Brucella* organism can survive for long periods of time in the environment, especially under cool, moist conditions.

Humans can be exposed to infection by way of inhalation, or contamination of eyes or wounds. Consumption of contaminated milk or milk products is another source of human infection, but it can be prevented with proper pasteurization.

### **Clinical Signs**

Brucellosis can affect multiple organ systems, so disease signs can vary; however, it most commonly targets the reproductive system. The most common clinical signs are abortion late in the pregnancy, or birth of weak calves. Males and females alike may have inflammation of the reproductive tract, which can lead to infertility in females. Some animals will show no clinical signs, but will still shed bacteria in feces and urine. Other clinical signs include arthritis, lameness, and abscesses.

Bison often exhibit abortion and retained placenta. The most common clinical signs in elk are abortion and stillbirth. Brucellosis causes progressive weakness in moose and may be fatal. Humans who become infected also exhibit a wide range of clinical signs ranging from inapparent infections to flu-like symptoms to more serious conditions of different organ systems.

## **Diagnosis**

Diagnosis of Brucellosis can be difficult because of its variable incubation period and inconsistent clinical signs. The diagnosis is reached through a laboratory test.

## **Treatment**

Brucellosis is difficult to treat, and while antibiotics may reduce the severity of the disease, most animals remain chronically infected. Treatment is not usually attempted with cattle or wildlife because even if clinical signs are cleared, the animals can continue to shed the bacteria and infect others.

## **Management/Prevention**

Brucellosis control efforts are focused on prevention. Cattle are vaccinated against brucellosis though no effective system has been developed for wildlife. The United States began a nation-wide bovine brucellosis eradication program in 1934. The program involves testing cattle for brucellosis, removing positive animals, and vaccinating heifers. As a result of these efforts, the majority of cattle herds in the US are free of the disease. Pennsylvania has been classified as brucellosis free since April 1, 1983. Other parts of the country, particularly Yellowstone National Park, are focusing management efforts on controlling brucellosis in wild bison and elk because the disease passes between these wild populations and domestic cattle.

## **Suggested Reading**

Bureau of Animal Health and Diagnostic Services. Brucellosis. Pennsylvania Department of Agriculture. <[http://www.portal.state.pa.us/portal/server.pt/gateway/PTARGS\\_0\\_2\\_24476\\_10297\\_0\\_43/http%3B/10.41.0.36/AgWebsite/ProgramDetail.aspx?name=Brucellosis-&navid=12&parentnavid=0&palid=28](http://www.portal.state.pa.us/portal/server.pt/gateway/PTARGS_0_2_24476_10297_0_43/http%3B/10.41.0.36/AgWebsite/ProgramDetail.aspx?name=Brucellosis-&navid=12&parentnavid=0&palid=28)>.

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