

## Occupational Health - Zoonotic Disease Fact Sheet

### BRUCELLOSIS

#### **KEY FACTS:**

- Brucellosis is named for a British army surgeon, David Bruce, who isolated the organism from four fatal cases in 1887 on the island of Malta.
- The disease is recognized to have caused outbreaks of disease for thousands of years, with Brucellosis-type illnesses written by Hippocrates in his *Epidemics* volumes.
- As part of its offensive biological weapons program, *Brucella suis* became the first biological agent to be weaponized by the United States in 1954.

**SPECIES:** Brucellosis can affect cattle, sheep, goats, pigs, horses, and dogs. Brucellosis can also affect rats and wild animals including deer, bison, elk, moose, camels, water buffalo, and marine mammals.

**CAUSATIVE AGENT:** *Brucella abortus* (from cattle), *canis* (from dogs), *melitensis* (from sheep and goats), and *suis* (from swine). *Brucella* species are small, gram-negative, nonmotile, nonspore-forming, rod-shaped coccobacilli.

**TRANSMISSION:** In animals, Brucellosis is commonly transmitted by direct contact with infected animals or environment, including through some contact with infected birthing tissues and fluids, including placenta, fetal fluids, and aborted fetuses. The bacteria can also be found in the milk, blood, urine, and semen of infected animals. Humans can become infected with Brucellosis through eating or drinking unpasteurized/raw dairy products contaminated with the bacteria, through aerosol exposure to infected materials, and from direct contact with infected animals or materials – the bacterium can enter through a wound or cut in the skin/mucous membranes.

**DISEASE IN ANIMALS:** There is no effective way to detect infected animals by their appearance. Brucellosis causes abortions, stillbirth, and infertility in most species of animals. Other signs of brucellosis include retained afterbirths with resulting uterine infections, and occasionally enlarged, arthritic joints. Cows and pigs have been known to develop arthritis and goats have developed mastitis and lameness.

**DISEASE IN HUMANS:** Brucellosis can cause a range of signs and symptoms, including fever, headache, malaise, anorexia, joint and muscle pain, and sweats. Some symptoms may persist for long periods of time, or reoccur over a period of time, including recurrent fevers, arthritis, endocarditis, chronic fatigue, depression, swelling of the liver and/or spleen, and swelling of the testicle and scrotum area. Case fatality is less than 2-5 percent if left untreated.

**DIAGNOSIS:** Brucellosis is diagnosed by testing a sample of blood or bone marrow for the brucella bacteria or by testing blood for antibodies to the bacteria. Diagnosis of brucellosis in animals can only be confirmed by laboratory tests, such as ELISA, the Rose Bengal plate test, Serum agglutination test, or through culturing. *Please review current literature before prescribing diagnostic testing as recommendations may have changed.*

**TREATMENT:** Single-drug regimens are not recommended because the relapse rate may be as high as 50 percent. Combination regimens of two or three drugs are more effective. Either (1) doxycycline plus rifampin or streptomycin (or both), (2) trimethoprim-sulfamethoxazole plus rifampin or streptomycin (or both) are effective in doses for 21 days. Longer courses of therapy may be required to cure relapses, osteomyelitis, or meningitis. *Please consult your physician for treatment as recommendations may have changed.*

**PREVENTION\CONTROL:** Individuals working with potentially infected animals or materials should wear proper protective equipment, including rubber gloves, safety glasses/goggles, and gowns or aprons. Individuals at risk of aerosol exposure should wear NIOSH approved respirators, such as an N95. To prevent and control unintended infections, use uninfected animals for research, and isolate any animals used in clinical trials. Additionally, only conduct projects in laboratories with proper engineering controls and train staff members in the proper use of required personal protective equipment when they are in spaces containing live agent.

More information on Brucellosis can be found on the Centers for Disease Control and Prevention website at: <https://www.cdc.gov/brucellosis/>