

## What is brucellosis?

Brucellosis, also called undulant fever, is an infectious disease caused by various species of the bacteria *Brucella*. Primarily a disease of animals, it occasionally causes disease in humans who have contact with infected animals, or who consume food products from infected animals. A number of species of the bacteria can infect sheep, goats, cattle, deer, elk, pigs, dogs, and several other mammals. Brucellosis is not very common in the United States, where 100 to 200 cases occur each year. Many of these cases are associated with foreign residence or travel. Brucellosis continues to be common in countries where animal disease control programs have not reduced the amount of disease among animals. Since 1990, there have been eight confirmed cases of brucellosis in Oklahoma.

## What are the symptoms of brucellosis?

In humans, brucellosis can cause a range of symptoms that may include fever, sweats, headache, back pain, and physical weakness. Severe infections of the central nervous system or lining of the heart may occur. Brucellosis can also cause long-lasting symptoms that include recurrent fever, joint pain, and fatigue.

## How is brucellosis transmitted to humans, and who is likely to become infected?

Humans are generally infected in one of three ways: consuming food or beverages that contains *Brucella* bacteria, breathing in the organism, or having the bacteria enter the body through breaks in the skin. The most common way to be infected is by eating or drinking milk products from infected animals. When female sheep, goats, cows, or camels are infected, their milk becomes contaminated with the bacteria. If the milk is not pasteurized, these bacteria can be transmitted to persons who drink the milk or consume dairy products made from the milk. Inhalation of *Brucella* organisms is not a common route of infection, but it can be a significant hazard for people in certain occupations, such as those working in laboratories. Infection through breaks in the skin may occur in slaughterhouse or packing plant workers, those assisting an animal birth, or veterinarians handling infected animals and carcasses. Hunters may be infected through skin wounds or by accidentally ingesting the bacteria after butchering deer, elk, moose, or wild pigs.

## My dog has been diagnosed with brucellosis. Is that a risk for me?

*B. canis* is the species of *Brucella* species that can infect dogs. This species has occasionally been transmitted to humans, but the vast majority of dog infections do not result in human illness. Although veterinarians exposed to blood of infected animals are at risk, pet owners are not considered to be at risk for infection. This is partly because it is unlikely that they will come in contact with blood, semen, or placenta of the dog. The bacteria may be cleared from the animal within a few days of treatment; however re-infection is common and some animal body fluids may be infectious for weeks. Immunocompromised persons (cancer patients, HIV-infected individuals, or transplantation patients) should not handle dogs known to be infected with *B. canis*.

## Can brucellosis be spread from person to person?

Direct person-to-person spread of brucellosis is extremely rare. Mothers who are breastfeeding may transmit the infection to their infants. Sexual transmission has also been reported. Breastfeeding infants of infected mothers or sexual partners of infected cases can take antibiotics to reduce their risk of becoming infected.

## How soon do symptoms appear?

The time period is highly variable, but symptoms usually appear within 5 to 30 days.

## Could *Brucella* be used in a bioterrorism attack?

Different disease-causing agents have been ranked by experts on the likelihood of being used as bioweapons. The ranking system is based primarily on how easily the agent can be released into the environment or transmitted from person to person; whether it could result in high disease and death rates, and the potential to cause panic and social disruption. The highest risk agents are category A, followed by B and C. *Brucella* is considered a category B agent because it is moderately easy to disseminate and would result in moderate rates of disease and low death rates.

## How is brucellosis diagnosed?

Brucellosis is diagnosed in a laboratory by finding *Brucella* organisms in samples of blood or bone marrow. Also, blood tests can be done to detect antibodies against the bacteria. If this method is used, two blood samples should be collected 2 weeks apart.

**Is there a treatment for brucellosis?**

Yes. While treatment can be prolonged, doctors can prescribe effective antibiotics. Usually, doxycycline and rifampin are used in combination for 6 weeks to prevent reoccurring infection. Depending on the timing of treatment and severity of illness, recovery may take a few weeks to several months. The death rate is low, with fewer than 2% dying of the disease, and is usually associated with endocarditis (an infection of heart tissue).

**Is there a vaccine for brucellosis?**

There is no vaccine for humans against brucellosis. In livestock, vaccination has been a cornerstone of the successful brucellosis control program in the United States.

**What can be done to prevent infection with brucellosis?**

1. Do not consume milk, cheese, ice cream, or other dairy products while traveling unless you can verify that it has been pasteurized.
2. Wild pigs may be infected with brucellosis. Do not handle meat from these animals without wearing rubber gloves. Be sure to bury remains deeply enough that scavengers such as coyotes cannot retrieve them.
3. Hunters, herdsman, and those working in animal processing should wear rubber gloves when handling animal tissue, including afterbirths.
4. Afterbirths (placenta) can contain *Brucella* bacteria. Wear rubber gloves when assisting an animal birth, and disinfect the area following the birth. Dispose of the afterbirth, discharges, and fetuses.
5. Immunocompromised persons (cancer patients, HIV-infected individuals, or transplantation patients) should not handle dogs known to be infected with *Brucella canis*.

