

Brucellosis:

What is brucellosis?

Brucellosis is an infectious disease caused by the bacteria of the genus *Brucella*. These bacteria are primarily passed among animals, and they cause disease in many different vertebrates. Various *Brucella* species affect sheep, goats, cattle, deer, elk, pigs, dogs, and several other animals. Humans become infected by coming in contact with animals or animal products that are contaminated with these bacteria. In humans brucellosis can cause a range of symptoms that are similar to the flu and may include fever, sweats, headaches, back pains, and physical weakness. Severe infections of the central nervous systems or lining of the heart may occur. Brucellosis can also cause long-lasting or chronic symptoms that include recurrent fevers, joint pain, and fatigue.

Where is brucellosis found?

Although brucellosis can be found worldwide, it is more common in countries that do not have good standardized and effective public health and domestic animal health programs. Areas currently listed as high risk are the Mediterranean Basin (Portugal, Spain, Southern France, Italy, Greece, Turkey, North Africa), South and Central America, Eastern Europe, Asia, Africa, the Caribbean, and the Middle East. Unpasteurized cheeses, sometimes called "village cheeses," from these areas may represent a particular risk for tourists. Brucellosis is not very common in the United States, where 100 to 200 cases occur each year. But brucellosis can be very common in countries where animal disease control programs have not reduced the amount of disease among animals.

How do animals get infected with brucellosis?

Penetration of mucous membranes by *B. suis* results in colonization of regional lymph nodes, either in lymph or within macrophages. Colonization in regional lymph nodes is followed by long, continuous or intermittent periods of bacteremia. The bacteria then infect and persist in many other organs, including lymph nodes, placenta, mammary gland, joint fluids, bone and in the testicles or accessory genital organs of boars.

A large percentage of swine, especially the females, recover after several months. The recovery rate in boars is low, perhaps never more than 50%. Enough animals remain infected in a herd to perpetuate the disease. Surprisingly, most piglets in infected herds are free of infection at the time of weaning.

How do people get infected with brucellosis?

Humans are generally infected in one of three ways: eating or drinking something that is contaminated with *Brucella*, breathing in the organism (inhalation), or having the bacteria enter the body through skin wounds. The most common way to be infected is by eating or drinking contaminated milk products. When sheep, goats, cows, or camels are infected, their milk is contaminated with the bacteria. If the milk is not pasteurized, these bacteria can be transmitted to persons who drink the milk or eat cheeses made it. 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 where the organism is cultured. Inhalation is often responsible for a significant percentage of cases in abattoir employees. Contamination of skin wounds may be a problem for persons working in slaughterhouses or meat

packing plants or for veterinarians. Hunters may be infected through skin wounds or by accidentally ingesting the bacteria after cleaning deer, elk, moose, or wild pigs that they have killed.

What are the signs and symptoms of brucellosis?

Brucellosis can cause a range of signs and symptoms, some of which may present for prolonged periods of time.

Initial symptoms can include:

- fever
- sweats
- malaise
- anorexia
- headache
- pain in muscles, joint, and/or back
- fatigue

Some signs and symptoms may persist for longer periods of time. Others may never go away or reoccur.

These can include:

- recurrent fevers
- arthritis
- swelling of the testicle and scrotum area
- swelling of the heart (endocarditis)
- neurologic symptoms (in up to 5% of all cases)
- chronic fatigue
- depression
- swelling of the liver and/or spleen

How do you prevent the transmission of brucellosis?

Do not consume unpasteurized milk, cheese, or ice cream while traveling. If you are not sure that the dairy product is pasteurized, don't eat it. Hunters and animal herdsman should use rubber gloves when handling viscera of animals. There is no vaccine available for humans.