



# Brucellosis

**Causative agent: *genus Brucella (Brucella spp.)***

## Incidence

Brucellosis refers to a group of infectious diseases which evolve in a similar way and that are spread from domestic animals or animal products to humans. The main reservoirs for this causative agent are dogs (bacterium: *B. canis*), swine (*B. suis*), cattle (*B. abortus*), sheep and goats (*B. melitensis*). Animals seldom present with symptoms, although *B. abortus* can cause cattle to abort. Brucellosis can be found throughout the world. However, countries that are particularly affected include the Mediterranean (Spain, South of France, Greece, Turkey and North Africa), Asia, the Caribbean and generally countries which lack an adequate sanitary infrastructure.

## Identification

The onset of the disease is characterised by flu-like symptoms, such as aching limbs, headaches, sweating and periodic bouts of fever. As the infection progresses, severe swelling of the liver and the spleen occur. Occasionally, the joints, the central nervous system and other organs also become inflamed. The disease has both an acute and chronic form.

## Diagnosis

The diagnosis of brucellosis is based on cultivation techniques of blood or bone marrow samples; the process takes up to 4 weeks. A back-up procedure is also performed which involves serological assays, i.e. methods based on antibody detection, such as the ELISA test.

## Transmission

Bacteria are transmitted by direct contact with infected animals; the disease can be spread indirectly through their excrement. Transmission in humans may also occur due to the ingestion of unpasteurised dairy and cheese products or through aerosols in abattoirs. Infection by inhalation may also occur in the laboratory as a result of undue precaution when handling cultures. Human-to-human transmission is very rare, though infection through breast milk or sexual contact has been documented.

## Incubation period

The incubation varies considerably. On average it is between 10 and 21 days, but can be as much as 100 days.

## Prophylaxis

Vaccines for animals are widely available in industrialised countries, although a vaccine for humans has yet to be authorised. When travelling to at-risk countries, people may be afforded some protection by the non-consumption of unpasteurised dairy products.

## Treatment

Brucellosis is generally treated with antibiotics. According to WHO recommendations, treatment consists of a combination course of doxycycline and rifampicin or of doxycycline and gentamicine, which is administered over six weeks. The mortality rate without treatment is between 1 and 3%.

## Genus *Brucella* as a biological warfare agent

It is estimated that inhalation of only a few bacteria is sufficient to cause disease in man. This is why *Brucella spp.* is considered a potential biological warfare agent, despite its low mortality rate. There is at least one documented case of the military production of this substance: in 1954, the US, as part of its offensive biological weapons' programme, produced *Brucella suis* and sent it to be weaponised at the Pine Bluff arsenal.