

Introducing...

Brucellosis in Horses

Horses can be infected with *Brucella abortus* or *B suis*. Suppurative bursitis, most commonly recognized as fistulous withers or poll evil (*Fistulous Withers and Poll Evil*), is the most common condition associated with brucellosis in horses. Occasionally, abortion has been reported. It is unlikely that infected horses are a source of the disease for other horses, other animal species, or humans.

See Also

[Introduction](#)

[Brucellosis in Cattle](#)

[Brucellosis in Goats](#)

[Brucellosis in Pigs](#)

[Brucellosis in Sheep](#)

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We had fistulous in horses on the ranch
before we started vaccinating for brucellosis

JOE

This statement was written by long time
Rancher and resident of Deer Lodge Mt. his
name is Joe Applegate

 PRINT THIS PAGE

Introducing...

Brucellosis in Large Animals: Introduction

Brucellosis is caused by bacteria of the genus *Brucella* and is characterized by abortion, retained placenta, and to a lesser extent, orchitis and infection of the accessory sex glands in males. The disease is prevalent in most countries of the world. It primarily affects cattle, buffalo, bison, pigs, sheep, goats, dogs (*Brucellosis in Dogs: Introduction*), elk, and occasionally horses. The disease in humans, sometimes referred to as undulant fever, is a serious public health problem, especially when caused by *B melitensis*.

See Also

[Brucellosis in Cattle](#)

[Brucellosis in Goats](#)

[Brucellosis in Horses](#)

[Brucellosis in Pigs](#)

[Brucellosis in Sheep](#)

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Brucellosis

From Wikipedia, the free encyclopedia

Brucellosis, also called **Bang's disease**, **Crimean fever**, **Gibraltar fever**, **Malta fever**, **Maltese fever**, **Mediterranean fever**, **rock fever**, or **undulant fever**,^{[1][2]} is a highly contagious zoonosis caused by ingestion of unsterilized milk or meat from infected animals or close contact with their secretions. Transmission from human to human, through sexual contact or from mother to child, is rare but possible.^[3] *Brucella* spp. are small, Gram-negative, non-motile, non-spore-forming, rod shaped (coccobacilli) bacteria. They function as facultative intracellular parasites causing chronic disease, which usually persists for life. Symptoms include profuse sweating and joint and muscle pain. Brucellosis has been recognized in animals including humans since the 19th century.

Contents

- 1 History and nomenclature
- 2 Brucellosis in animals
 - 2.1 Brucellosis in cattle
 - 2.2 Brucellosis in Ireland
 - 2.3 Brucellosis in the Greater Yellowstone area
 - 2.4 Brucellosis in dogs
- 3 Brucellosis in humans
 - 3.1 Symptoms
 - 3.2 Treatment and prevention
 - 3.3 Biological warfare
- 4 See also
- 5 References
- 6 External links

History and nomenclature

Under the name *Malta fever*, the disease now called brucellosis first came to the attention of British medical officers in the 1850s in Malta during the Crimean War. The causal relationship between organism and disease was first established in 1887 by Dr. David Bruce.^{[4][5]}

In 1897, Danish veterinarian Bernhard Bang isolated *Brucella abortus* as the agent; and the additional name **Bang's disease** was assigned.

Maltese doctor and archaeologist Sir Themistocles Zammit earned a knighthood for identifying

Brucellosis

Classification and external resources



ICD-10	A23.
ICD-9	023
DiseasesDB	1716
MedlinePlus	000597
eMedicine	med/248
MeSH	D002006

unpasteurized milk as the major source of the pathogen in 1905, and it has since become known as Malta Fever. In cattle, this disease is also known as **contagious abortion** and **infectious abortion**.

The popular name **undulant fever** originates from the characteristic undulance (or "wave-like" nature) of the fever, which rises and falls over weeks in untreated patients. In the 20th century, this name, along with *brucellosis* (after *Brucella*, named for Dr Bruce), gradually replaced the 19th century names **Mediterranean fever** and *Malta fever*.

In 1989, neurologists in Saudi Arabia discovered **neurobrucellosis**, a neurological involvement in brucellosis.^{[6][7]}

The following obsolete names have previously been applied to brucellosis:

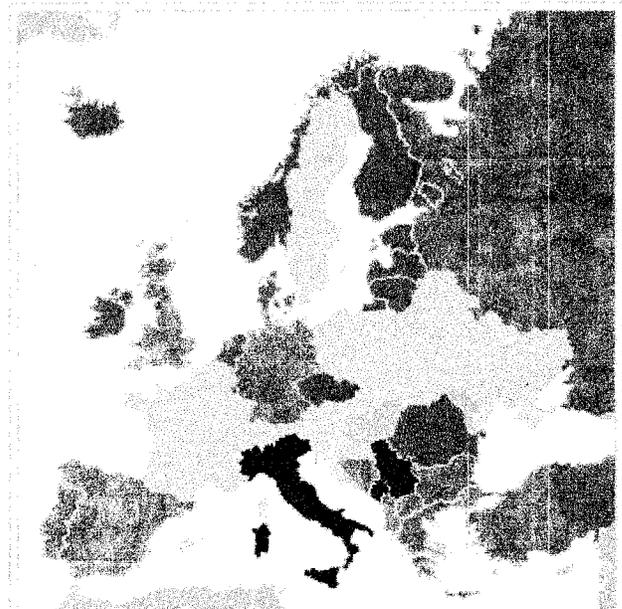
- *Brucelliasis*
- Bruce's septicemia
- Chumble fever
- continued fever
- Crimean fever
- Cyprus fever
- *febris melitensis*
- *febris undulans*
- Fist of mercy
- goat fever
- *melitensis septicemia*
- melitococcosis
- milk sickness
- mountain fever
- Neapolitan fever
- Satan's fever
- slow fever

Brucellosis in animals

Species infecting domestic livestock are *B. melitensis* (goats and sheep, see *Brucella melitensis*), *B. suis* (pigs, see Swine brucellosis), *B. abortus* (cattle and bison), *B. ovis* (sheep), and *B. canis* (dogs). *B. abortus* also infects bison and elk in North America and *B. suis* is endemic in caribou. *Brucella* species have also been isolated from several marine mammal species (pinnipeds and cetaceans).

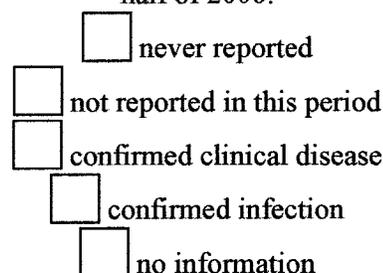
Brucellosis in cattle

The bacterium *Brucella abortus* is the principal cause of brucellosis in cattle. The bacteria are shed from an infected animal at or around the time of calving or abortion. Once exposed, the likelihood of an animal becoming infected is variable, depending on age, pregnancy status, and other intrinsic factors



of the animal, as well as the amount of bacteria to which the animal was exposed.^[8] The most common clinical signs of cattle infected with *Brucella abortus* are high incidences of abortions, arthritic joints and retained after-birth. There are two main causes for spontaneous abortion in animals. The first is due to erythritol, which can promote infections in the fetus and placenta. The second is due to the lack of anti-Brucella activity in the amniotic fluid. Males can also harbor the bacteria in their reproductive tracts, namely seminal vesicles, ampullae, testicles, and epididymides.

Disease incidence map of *Brucella melitensis* infections in animals in Europe during the first half of 2006.



Dairy herds in the USA are tested at least once a year with the Brucella Milk Ring Test (BRT).^[9] Cows that are confirmed to be infected are often killed. In the United States, veterinarians are required to vaccinate all young stock, thereby further reducing the chance of zoonotic transmission. This vaccination is usually referred to as a "calthood" vaccination. Most cattle receive a tattoo in their ear serving as proof of their vaccination status. This tattoo also includes the last digit of the year they were born.^[10]

Canada declared their cattle herd brucellosis-free on September 19, 1985. Brucellosis ring testing of milk and cream, as well as testing of slaughter cattle, ended April 1, 1999. Monitoring continues through auction market testing, standard disease reporting mechanisms, and testing of cattle being qualified for export to countries other than the USA.^[11]

The first state–federal cooperative efforts towards eradication of brucellosis caused by *Brucella abortus* in the U.S. began in 1934.

Brucellosis in Ireland

Ireland was declared free of brucellosis on 1 July 2009. The disease had troubled the country's farmers and veterinarians for several decades.^{[12][13]} The Irish government submitted an application to the European Commission, which verified that Ireland had been liberated.^[13] Brendan Smith, Ireland's Minister for Agriculture, Fisheries and Food, said the elimination of brucellosis was "a landmark in the history of disease eradication in Ireland".^{[12][13]} Ireland's Department of Agriculture, Fisheries and Food intends to reduce its brucellosis eradication programme now that eradication has been confirmed.^{[12][13]}

Brucellosis in the Greater Yellowstone area

Wild bison and elk in the Greater Yellowstone Area (GYA) are the last remaining reservoir of *Brucella abortus* in the U.S. The recent transmission of brucellosis from elk to cattle in Idaho and Wyoming illustrates how the GYA is the last remaining reservoir in the United States, adversely affecting the livestock industry. Eliminating brucellosis from this area is a challenge, as there are many viewpoints on how to manage diseased wildlife.

Brucellosis in dogs

The causative agent of brucellosis in dogs is *Brucella canis*. It is transmitted to other dogs through breeding and contact with aborted fetuses. Brucellosis can occur in humans that come in contact with

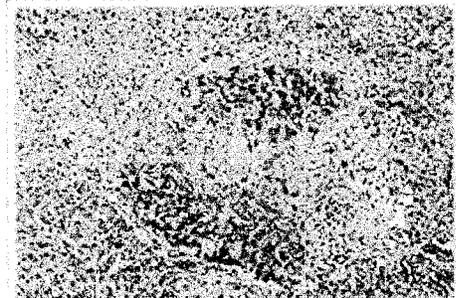
infected aborted tissue or semen. The bacteria in dogs normally infect the genitals and lymphatic system, but can also spread to the eye, kidney, and intervertebral disc (causing discospondylitis). Symptoms of brucellosis in dogs include abortion in female dogs and scrotal inflammation and orchitis (inflammation of the testicles) in males. Fever is uncommon. Infection of the eye can cause uveitis, and infection of the intervertebral disc can cause pain or weakness. Blood testing of the dogs prior to breeding can prevent the spread of this disease. It is treated with antibiotics, as with humans, but it is difficult to cure.^[14]

Brucellosis in humans

Symptoms

Brucellosis in humans is usually associated with the consumption of unpasteurized milk and soft cheeses made from the milk of infected animals, primarily goats, infected with *Brucella melitensis* and with occupational exposure of laboratory workers, veterinarians and slaughterhouse workers. Some vaccines used in livestock, most notably *B. abortus* strain 19, also cause disease in humans if accidentally injected. Brucellosis induces inconstant fevers, sweating, weakness, anaemia, headaches, depression and muscular and bodily pain.

The symptoms are like those associated with many other febrile diseases, but with emphasis on muscular pain and sweating. The duration of the disease can vary from a few weeks to many months or even years. In the first stage of the disease, septicaemia occurs and leads to the classic triad of undulant fevers, sweating (often with characteristic smell, likened to wet hay) and migratory arthralgia and myalgia. In blood tests, is characteristic the leukopenia and anaemia, some elevation of AST and ALT and positivity of classic Bengal Rose and Huddleson reactions. This complex is, at least in Portugal, known as the Malta fever. During episodes of Malta fever, melitococemia (presence of brucellae in blood) can usually be demonstrated by means of blood culture in tryptose medium or Albini medium. If untreated, the disease can give origin to focalizations or become chronic. The focalizations of brucellosis occur usually in bones and joints and spondylodiscitis of lumbar spine accompanied by sacroiliitis is very characteristic of this disease. Orchitis is also frequent in men.



Granuloma and necrosis in the liver of a guinea pig infected with *Brucella suis*

Diagnosis of brucellosis relies on:

1. Demonstration of the agent: blood cultures in tryptose broth, bone marrow cultures. The growth of brucellae is extremely slow (they can take until 2 months to grow) and the culture poses a risk to laboratory personnel due to high infectivity of brucellae.
2. Demonstration of antibodies against the agent either with the classic Huddleson, Wright and/or Bengal Rose reactions, either with ELISA or the 2-mercaptoethanol assay for IgM antibodies associated with chronic disease
3. Histologic evidence of granulomatous hepatitis (hepatic biopsy)
4. Radiologic alterations in infected vertebrae: the Pedro Pons sign (preferential erosion of antero-superior corner of lumbar vertebrae) and marked osteophytosis are suspicious of brucellic spondylitis.

The disease's sequelae are highly variable and may include granulomatous hepatitis, arthritis, spondylitis, anaemia, leukopenia, thrombocytopenia, meningitis, uveitis, optic neuritis, endocarditis and

various neurological orders collectively known as neurobrucellosis.

Treatment and prevention

Antibiotics like tetracyclines, rifampicin and the aminoglycosides streptomycin and gentamicin are effective against *Brucella* bacteria. However, the use of more than one antibiotic is needed for several lifetimes, because the bacteria incubate within cells.

The gold standard treatment for adults is daily intramuscular injections of streptomycin 1 g for 14 days and oral doxycycline 100 mg twice daily for 45 days (concurrently). Gentamicin 5 mg/kg by intramuscular injection once daily for 7 days is an acceptable substitute when streptomycin is not available or difficult to obtain.^[15] Another widely used regimen is doxycycline plus rifampin twice daily for at least 6 weeks. This regimen has the advantage of oral administration. A triple therapy of doxycycline, together with rifampin and cotrimoxazole has been used successfully to treat neurobrucellosis.^[16] Doxycycline is able to cross the blood–brain barrier, but requires the addition of two other drugs to prevent relapse. Ciprofloxacin and co-trimoxazole therapy is associated with an unacceptably high rate of relapse. In brucellic endocarditis, surgery is required for an optimal outcome. Even with optimal antibrucellic therapy relapses still occur in 5–10 percent of patients with Malta fever.

The main way of preventing brucellosis is by using fastidious hygiene in producing raw milk products, or by pasteurizing all milk that is to be ingested by human beings, either in its unaltered form or as a derivate, such as cheese. Experiments have shown that cotrimoxazol and rifampin are both safe drugs to use in treatment of pregnant women who have Brucellosis.

Biological warfare

In 1954, *B. suis* became the first agent weaponized by the United States at its Pine Bluff Arsenal in Arkansas. *Brucella* species survive well in aerosols and resist drying. *Brucella* and all other remaining biological weapons in the U.S. arsenal were destroyed in 1971–72 when the U.S. offensive biological weapons (BW) program was discontinued.^[17]

The United States BW program focused on three agents of the *Brucella* group:

- Porcine Brucellosis (Agent US)
- Bovine Brucellosis (Agent AB)
- Caprine Brucellosis (Agent AM).

Agent US was in advanced development by the end of World War II. When the U.S. Air Force (USAF) wanted a biological warfare capability, the Chemical Corps offered Agent US in the M114 bomblet, based after the 4-pound bursting bomblet developed for anthrax in World War II. Though the capability was developed, operational testing indicated that the weapon was less than desirable, and the USAF termed it an interim capability until replaced by a more effective biological weapon. The main drawbacks of the M114 with Agent US was that it was incapacitating (the USAF wanted "killer" agents), the storage stability was too low to allow for storing at forward air bases, and the logistical requirements to neutralize a target were far higher than originally anticipated, requiring unreasonable logistical air support.

Agents US and AB had a median infective dose of 500 org/person, and AM was 300 org/person. The rate-of-action was believed to be 2 weeks, with a duration of action of several months. The lethality estimate was based on epidemiological information at 1–2%. AM was always believed to be a more

Temperature

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Brucellosis Guide

 Doctor-reviewed article from RightHealth and A.D.A.M.

- « Full Article
- « Definition
- « Alternative Names
- « Causes, Incidence, And Risk Factors
- « Symptoms
- « Signs And Tests
- « Treatment
- « Expectations (Prognosis)
- « Complications
- « Calling Your Health Care Provider
- « Prevention
- « References

Definition

Brucellosis is an infectious disease caused by contact with animals carrying bacteria called *Brucella*.

Alternative Names

Rock fever; Cyprus fever; Undulant fever; Gibraltar fever; Malta fever; Mediterranean fever

Causes, Incidence, And Risk Factors

Brucella can infect cattle, goats, camels, dogs, and pigs. The bacteria can spread to humans if you come in contact with infected meat or the placenta of infected animals, or if you eat or drink unpasteurized milk or cheese.

Brucellosis is rare in the United States, with approximately 100 - 200 cases each year.

People working in jobs requiring frequent contact with animals or meat -- such as slaughterhouse workers, farmers, and veterinarians -- are at high risk.

Symptoms

Acute brucellosis may begin with mild flu-like symptoms or symptoms such as:

- Fever
- Abdominal pain
- Back pain
- Chills
- Excessive sweating
- Fatigue
- Headache
- Loss of appetite
- Joint pain
- Weakness
- Weight loss

Classically, high fever spikes occur every afternoon. "Undulant" fever derives its name from this up-and-down fever.

Additional symptoms that may be associated with this disease:

- Muscle pain
- Swollen glands

The illness may be chronic and persist for years.

Signs And Tests

- Blood culture
- Clean catch urine culture
- CSF culture
- Bone marrow culture
- Serology detecting brucellosis antigen

This disease may also alter the results of the following tests:

- Quantitative immunoglobulins (nephelometry)
- Serum immunoelectrophoresis
- Febrile/cold agglutinins

Treatment

Antibiotics are used to treat the infection and prevent it from coming back. Longer courses of therapy may be needed if there are complications.

Expectations (Prognosis)

Relapse may occur, and symptoms may continue for years. As with tuberculosis, the illness can come back after a long period of time.

Complications

- Bone and joint lesions
- Chronic fatigue syndrome
- Encephalitis
- Infective endocarditis
- Meningitis

Calling Your Health Care Provider

Call for an appointment with your health care provider if you develop symptoms of brucellosis.

Also, call if your symptoms worsen or do not improve with treatment, or if new symptoms develop.

Prevention

Drinking and eating only pasteurized milk and cheeses is the most important preventative measure. People who handle meat should wear protective glasses and clothing and protect skin breaks from infection. Detecting infected animals controls the infection at its source. Vaccination is available for cattle, but not humans.

References

Franco MP, Mulder M, Gilman RH, Smits HL. Human brucellosis. *Lancet Infect Dis*. 2007;7:775-86.