

# Human Brucellosis Risk From Feral Swine

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Brucellosis (Bang’s disease) is caused by a group of bacteria in the genus *Brucella*. These bacteria are gram-negative (red-staining), non-motile, coccobacilli (short rod-shaped organisms) that reside inside the white blood cells of the infected animal. Seven brucellae species have been identified, each of which causes disease in a specific mammalian host or group.

Brucellosis is a **zoonotic disease**. A zoonotic disease is one which affects humans and animals either by direct contact, indirect contact or through an arthropod vector (tick, flea, mosquito, etc.). The seven brucellae species, their hosts and their infectivity for humans is outlined in the chart below.



Feral Swine photo courtesy of Terry H. Conger

## Symptoms

In their natural host, the disease is a chronic (long-term or permanent) infection, localizing and multiplying largely in the host’s reproductive organs (uterus and testicles). This typically causes a disruption in normal reproduction, resulting in premature birth of the offspring, abortion in the third trimester of pregnancy and/or sterility.

The bacteria are shed in milk, urine and discharges from the reproductive tract, contaminating the environment and thus spreading to other members of the herd. Humans generally are infected by coming into direct contact with contaminated reproductive products or by consuming

| Brucella Species*                   | Natural Host(s) Affected                     | Pathogenic for Humans? (yes or no) |
|-------------------------------------|--|------------------------------------|
| <i>B. melitensis</i>                | goats, sheep                                 | yes                                |
| <i>B. abortus</i>                   | cattle, elk, bison                           | yes                                |
| <b><i>B. suis</i></b>               | swine, reindeer, caribou, <b>feral swine</b> | <b>yes</b>                         |
| <i>B. canis</i>                     | dogs   | yes (rare)                         |
| <i>B. pinnipedia/maris/cetaceae</i> | marine mammals                               | yes                                |
| <i>B. ovis</i>                      | sheep (primarily rams)                       | no                                 |
| <i>B. neotomae</i>                  | desert wood rat                              | no                                 |

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\*Listed in order of decreasing severity in humans (i.e., *B. melitensis* is most severe; *B. canis*, least severe; *B. cetaceae*, undetermined).

unpasteurized dairy products from infected cows or nannies/doe goats.

In humans the disease is commonly referred to as **undulant fever** (if from cattle or swine) or **Malta fever** (if from goats) because the most prominent symptom/clinical sign is a **fever** (particularly at night, which often results in “night sweats” and then subsides in the morning, like an ocean wave). If the disease is not resolved in its early stages, the fever (and other signs) will repeatedly return for an indefinite period of time when the body is under stress.

Other clinical signs in humans include headache, weakness, painful joints, depression, weight loss, fatigue and liver dysfunction. Any organ or system can be affected. In humans, the urinary tract may be involved with swollen/inflamed testicles in up to 20 percent of men; the uterus in women is rarely involved. The nervous system can be infected resulting in depression, mental inattention and/or psychosis due to toxic effects of the brucella organism on the brain. Joint pain is involved in 20-60 percent of the chronic cases because of arthritic changes (resulting in inflammation in the weight-bearing joints and in the lower back).

*Brucella suis* has been shown to be endemic (present at a low level) in the feral swine populations in Arkansas, Mississippi, Louisiana and Texas.

#### **The human population at risk of infection by *Brucella suis* (carried by feral swine):**

- Farmers with domestic hogs that are exposed to feral swine.
- Veterinarians working with swine.
- Slaughter house workers processing swine carcasses.
- Feral swine hunters.

## **Transmission and Diagnosis**

Transmission of *B. suis* to humans is commonly through direct contact with contaminated tissue such as vaginal discharges, aborted fetuses, placentas and newborn piglets. Swine hunters are commonly infected by bare skin contact when butchering feral swine carcasses. The organism can also be contracted by splashing of contaminated fluids into the eyes and by eating undercooked meat since *Brucella suis* remains viable in the meat. The incubation period for the disease after exposure ranges from 7-21 days to several months.

The disease is diagnosed using a blood test for *Brucella* antibodies. A definitive diagnosis of the swine species (*Brucella suis*) can be accomplished only by culturing the organism from a blood sample from the patient.

## **Treatment**

Effective antibiotic treatment is dependent on an early specific diagnosis of brucellosis to select the appropriate regimen of antibiotic treatment for one to two months. If antibiotic treatment is ineffective in the early stages of the disease, the brucella organisms can become permanent residents in the body. The fever and discomfort will return repeatedly throughout life.

### **Feral Swine Hunter Safety**

- Avoid eating, drinking or using tobacco when field-dressing or handling carcasses.
- Use latex or rubber gloves when handling the carcass or raw meat.
- Avoid direct contact with blood, reproductive organs and fecal matter.
- Wear long sleeves, eye protection and cover any scratches, open wounds or lesions.
- Clean and disinfect knives, cleaning area, clothing and any other exposed surfaces when finished.
- Wash hands frequently with soap and water.
- Cook meat from these animals to 160°F or until juices run clear.
- If an unexplained fever should occur, immediately seek a diagnosis and treatment from your physician, being sure to relate to him/her your history of hunting feral swine.

### **Swine Herd Owner Safety Measures**

- Prevent exposure of domestic hogs to feral hogs (there is no vaccine available).
- Report any feral swine observed in your area to the local animal control agency or contractor.
- Consult with your physician should you experience an unexplained febrile illness.
- Consult with your veterinarian should you experience abortions in your herd.
- Develop a herd health program with your veterinarian.
- Participate in the USDA's brucellosis and pseudorabies herd certification testing program through an accredited veterinarian.

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