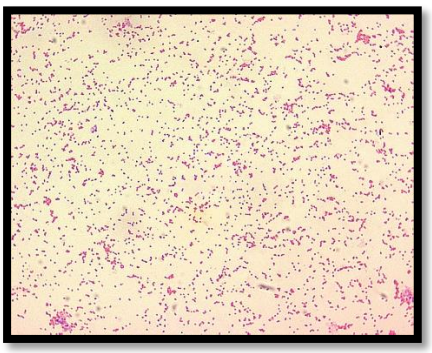
Brucellosis

(Bang's disease in animal's undulant fever or Malta fever in humans)

Etiology:

- It is caused by bacteria belonging to the **genus *Brucella***.
- gram-negative coccobacilli.
- The five species of Brucella most commonly associated with brucellosis are *B. abortus*, *B. ovis*, *B. suis*, *B. melitensis*, and *B. canis*.



Hosts

1. Brucellosis has been identified in **cattle**, **sheep**, **goats**, **pigs**, **dogs**, **horses**.
2. **Humans** can be infected by many of the **species of *Brucella***.
3. ***B. abortus*** primarily infects cattle, but is also found in humans.
4. ***B.ovis*** is responsible for testicular inflammation in rams and occasionally for abortion in ewes but does not infect other animals or humans. Goats are susceptible to this species by experimental infection.
5. ***B.suis*** covers a wider host range than most other *Brucella* species.
6. ***B. melitensis*** causes a highly contagious disease in sheep and goats, although cattle can also be infected**.**
7. ***B. melitensis*** is the most important species in human infection
8. ***B. canis*** causes testicular inflammation in the male dog and abortion and uterine infection in the female.

Transmission

In animals, transmission is by **direct contact** with an **infected animal**, or by coming in **contact** with **blood**, **urine**, **vaginal discharges**, **placentas**, or **aborted fetuses** from **infected animals**.

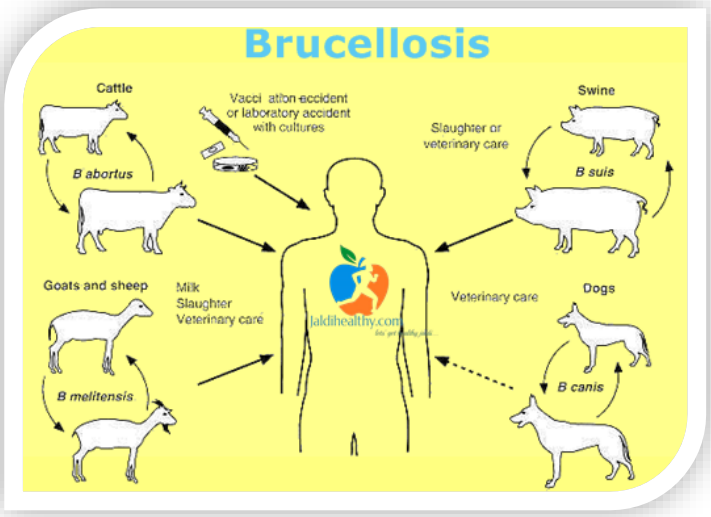
During the period of the Brucella life cycle when the bacteria are found in the blood, blood-sucking arthropods may transmit the organism.

In humans' transmission occurs in one of three ways:

1. Drinking **unpasteurized milk**, eating cheese made from unpasteurized milk, especially soft cheeses, when cattle, sheep, goats, and camels are infected, the *Brucella* organism is found in their milk. Pasteurizing milk will kill the organisms.

2. Coming into direct contact with **placental tissues** or **vaginal secretions** from infected animals. The Brucella organism will most often enter the human body through a wound.

3. Inhaling an aerosol, which occurs primarily in laboratories where Brucella organisms are grown.



Brucellosis in Animals

In animals, brucellosis is usually associated with **late-term abortions** in females and **inflammation in the male reproductive tract**.

Cattle

In cattle, brucellosis is called **Bang's disease**

In cows the organism causes **disintegration** of the placenta, leading to late-term abortion.

In bulls, it causes testicular inflammation and sometimes arthritis.

Transmission can be through ingestion of the organism or as a sexually transmitted disease (STD).

The incubation period can be as short as **2 weeks**, or as long as a year or more.

Sheep and Goats

B. melitensis is associated with late-term abortions in sheep and goats or weak lambs or kids.

It also causes mastitis, especially in goats.

Transmission is through ingestion of the organism

B. suis is a problem in rams, where it causes testicular inflammation. It rarely causes abortion in sheep and goats.

Horses

B.abortus causes **abscesses** which contains the organism and is a source of infection to humans.

B. abortus has been identified as the cause of **late-term abortion** in a mare, but this is an unusual occurrence.

Brucellosis in Humans

1. **Brucellosis** in humans is also known as **Malta fever** (because it was first identified on the island of Malta) or **undulant fever** (because of the waves of rising and falling body temperature).
2. The incubation period is usually **1 to 2 months**.
3. Some infected people show no clinical signs. In other people, the appearance of clinical signs may be sudden, or they may come on slowly.
4. Brucellosis first presents with flu like symptoms, such as **vomiting**, **diarrhea**, **constipation**, **headaches**, **chills**, **weakness**, **painful muscles**, **loss of appetite**, and **weight loss**.
5. Men may develop **testicular inflammation**, and pregnant women could suffer a spontaneous **abortion**.
6. Rarely, the disease becomes **chronic**, with **depression**, **arthritis**, and **chronic fatigue** recurring months after apparent recovery.
7. **Death** is rare, but when it happens, it is usually associated with an inflammation of the inner lining of the heart (**endocarditis**)

Diagnosis

1) In animals

Serological antibody testing is the most reliable diagnostic test for brucellosis.

2) In humans

- An initial diagnosis is based on **history** and **clinical signs**. The diagnosis can be confirmed by culturing blood, bone marrow, lymph nodes, cerebral spinal fluid, or abscesses.
- Serological tests are more commonly used to confirm brucellosis.
- Some types of bacteria cause cross-reactions in some serological tests, resulting in a false-positive reaction.

Treatment

Animals

Treatment involves antibiotics and supportive care and is a long process.

Extreme care must be taken to prevent human infection from the exudate of the abscesses.

Humans

Treatment for brucellosis in humans involves combination antibiotic therapy for up to 6 weeks.

Prevention and Control

Domestic animals

Control is based on identification, segregation, and elimination of infected breeding animals.

Humans

- People who travel to countries where brucellosis is prevalent should be careful to not drink unpasteurized milk or eat products made from unpasteurized milk.
- People who work in veterinary practices, laboratories, stockyards and slaughterhouses should wear protective gear when handling suspect animals, tissues, or fluids.

Salmonellosis

It is a bacterial infection of the gastrointestinal tract that is usually associated with eating feces-contaminated food.

Etiology

- Salmonellosis is caused by many serotypes of the Salmonella bacteria.
- Gram-negative.
- facultatively anaerobic, meaning they live in the presence or absence of oxygen.
- Salmonella live in the intestinal tracts of people and animals.

Hosts

- Animals Salmonella resides in the intestinal tracts of both warm blooded and coldblooded animals
  .
- In people, anyone who is infected with the Salmonella organism can get sick, but it most commonly affects children under 5, elderly people, and people with compromised or weakened immune systems.
- Salmonella carriers often appear healthy.

Transmission

- Many people become infected with ***Salmonella*** organisms by eating contaminated food, such as **chicken**, **raw eggs**, **beef**, **milk**, **milk products**, and **vegetables**, any food of animal origin can be a potential source of infection to people.
- Livestock can become infected, if they come in contact with infected animals.
- Pets, especially those with diarrhea, can pass ***Salmonella*** in their feces, transmission to people occurs when people do not wash their hands after coming in contact with the feces.
- Person-to-person transmission can occur if infected people do not wash their hands after using the bathroom and then handle food.

Salmonellosis in animals

Salmonellosis in animals may or may not be apparent. Some animals are carriers that shed *Salmonella* at various intervals.

- **Ruminants**
  1) Salmonellosis affects calves primarily and is stress-related, with a high mortality rate.
  2) Adult cattle also can be affected. The clinical signs start with high fever, followed by severe diarrhea and abdominal pain.
  3) Abortion may occur.
  4) Carrier animals shed Salmonella in feces and milk.

- **Fowl**

1) **Chickens**, **turkeys**, and **ducks** are some of the most important sources of **human salmonellosis**.
2) **Raw eggs** can also be a source of ***Salmonella***.
3) The **outside shell** can become contaminated with infected feces and the interior can become infected before the shell is formed.

Salmonellosis in humans

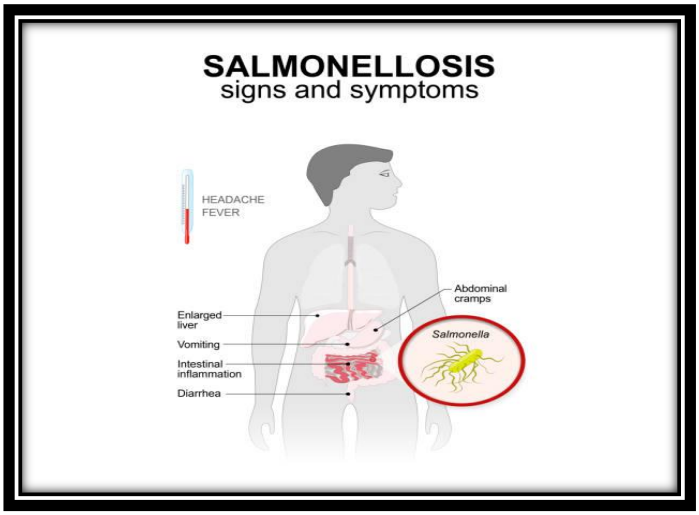
a. Not everyone exposed to Salmonella will become ill.

b. When illness does occur, it will manifest itself as diarrhea, possibly bloody, abdominal cramps, and fever between 12 and 72 hours after infection.

c. Other clinical signs may include headache, vomiting, and muscle aches.

d. Without treatment, most people will recover within a week. It may take some people months before their bowel movements are completely back to normal.

e. In some cases, the organism may pass into the blood stream and be distributed throughout the body, causing organ damage and possibly death.



Diagnosis

In people:

- **Salmonellosis** is diagnosed through laboratory tests that include **culturing** the **feces** of sick people.
- **Serologic** testing is also used.

- Once salmonellosis has been diagnosed, further testing to identify which **serotype** is involved will help determine which **antibiotic** can be used.

In animals

Diagnosis is based on **fecal culture** and **serologic testing**.

Treatment

- Antibiotics may become necessary only in severe cases.
- Most people and animals will recover without any medical intervention.
- People should not take antidiarrheal medication.

Prevention

- Wash hands thoroughly with warm water and soap after using the bathroom and after handling pets or their feces
- Consider all meat, poultry, vegetables, and milk or milk products contaminated, and handle them accordingly
- Buy only pasteurized milk and milk products
- Wash and properly store all vegetables and fruits
- Carrier animals must be identified and eliminated from a herd or flock