

## BRUCELLOSIS

By

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The term "brucellosis" has been adopted to replace the many common names used to describe the disease produced by infection with the three organisms, *Brucella abortus*, *B. suis*, and *B. melitensis*. In the past brucellosis was often referred to as Bang's disease for cattle, infectious abortion for cattle and swine and undulant, Malta, or goat fever for the infection in man.

The genus name *Brucella* was given these germs because of the early work of an English physician, Dr. Bruce, in his studies on Malta fever. Dr. Bang in Denmark established the nature of brucellosis in cattle and his colleagues named the disease in his honor. Dr. Traum first incriminated a *Brucella* organism as a cause of abortion in swine. Dr. Alice Evans was the first to demonstrate that Malta fever in man and Bang's disease in cattle were caused by closely related micro-organisms.

The cattleman or swine producer who has experienced a storm of abortions in his herd or drove due to *Brucella* infection knows the seriousness of this disease and also knows the economic loss which may be felt.

Those people who have had brucellosis also know the debilitating effects of the disease. The loss from hospitalization and inability to work may be high and at times brucellosis in the human may result in death.

At the present time there is not a cattleman in the country who is not making an effort either to prevent his herd from becoming infected or is attempting to eradicate the disease from his herd. The Public Health officials are also trying to find more effective means of preventing the spread of *Brucella* infection from animals to man.

*Brucella* infection in cattle is spread almost entirely by way of the mouth. Infected cows spread the organisms in the aborted calf, the placental membranes or after-birth, and in the normal discharges of "heat" periods. Other cattle licking any contaminated material swallow the germs and may become infected. Cattle frequently shed *Brucella* germs in the milk; in this way animals or people drinking the milk may become infected.

People are not as likely to become infected with *Brucella* organisms through the digestive tract as are cattle. In most cases people become infected through a break in the skin or by breathing dust-filled air from goat, cattle, or swine pens which have held infected animals. One of the most common ways in which man becomes infected is in handling aborted or normal calves from cows infected with the *Brucella* organisms. Butchers may become

infected in the routine handling of meat from infected cattle, goats, or swine. Veterinarians, farmers, and butchers are the types of people most commonly found to be suffering from brucellosis.

It is much easier to prevent the spread of brucellosis among people than it is among animals. Milk that is boiled or pasteurized is safe to drink. Raw milk should be used only in those cases where it is known that the cows do not react to the agglutination test used for the detection of brucellosis. Whenever the herdsman assists in the delivery of young to cows, goats, or swine he should wear rubber gloves and thoroughly clean and disinfect all clothing, instruments, and the premises after the delivery. Any wounds on the hands and arms of the person should be cleansed and treated with antiseptic material after handling animals or animal products in which there is a possibility of *Brucella* infection.

Insects feeding on *Brucella* containing materials can transmit the disease. All barns should be sprayed to eliminate as far as possible all insects.

*Brucella* infection in animals may manifest itself in several different ways.

**Cattle:** The symptom which usually attracts most attention is the abortion of immature calves. Many infected cows however do not abort. In some cases there is difficulty in getting the cows to conceive, in others there are frequently retained placentas. Sometimes there are swollen joints following localization of the organisms in the joints. The udders of many cows become the permanent source of a constant supply of *Brucella* organisms. Often times apparently normal calves born from infected cows die shortly after birth.

**Swine:** Sometimes there are many abortions, particularly among young sows. Often times the boars show orchitis or swelling of the testicles. Frequently the *Brucella* organisms localize in the joints or the vertebrae and produce malformation of the bones.

**Goats:** In goats abortions are not as common as in cattle but udder infections are frequent.

**Horses:** *Brucella* organisms are frequently found associated with fistula of the withers and poll evil.

**Poultry:** Birds may become infected but do not show symptoms.

**Man:** In the human the outstanding symptom of brucellosis appears to be an undulating fever with a general malaise. Various studies have shown a higher incidence of the disease among men than among women which appears to be the effect of the type of work done by the different sexes.

The agglutination test is still the most accurate method of diagnosing brucellosis. It must be realized by the patient or herd owner that the agglutination test is useful only after infection has taken place. An animal may abort or a human be very ill and

the agglutination test will be negative. This is because the infected individual has not had time to produce those antibodies in the blood that will react with the *Brucella* organisms to cause the agglutination reaction.

*Treatment:* So far there has not been found a drug that is effective in treating cases of *brucellosis* in man or animals. Many investigators are working on this phase of attempting to control the disease, but so far we must depend on other methods.

*Prevention of Infection:* This method of control has been effective where it could be satisfactorily conducted. If no visitors, animal trucks, neighbors' cattle or new animals are introduced onto a farm there is little chance of *Brucella* infection being brought in. This, of course, is very difficult to carry out.

If ordinary precautions are observed such as good fences to prevent stray animals from mingling with the herd, the use of a single boar or bull and the use of routine testing, *brucellosis* can be kept from a herd.

All replacement animals should be tested on arrival and kept in strict isolation for thirty days before being added to a herd. All replacement animals added to a herd should be negative to the agglutination test and should come from herds in which all animals are negative to the test. It is equally important that an animal come from a *brucellosis* free herd as it is that the animal itself be negative.

*Eradication of Brucellosis:* The eradication of *brucellosis* is based on two methods. One, the test and slaughter method requires that all animals reacting to the agglutination test be sold for slaughter and the premises cleaned and disinfected. This method is recommended for commercial herds and those purebred herds in which the incidence of disease is low. Two, the alternative plan is either adult vaccination or the retaining of infected animals without vaccination and the practice of calf vaccination. Under either of these the calves are all vaccinated and the older animals kept as long as they are economically valuable. The practice of keeping the infected animals on a farm should be discouraged. They form a constant source of possible infection for people and other animals. Many reactor cows are not profitable animals because of breeding difficulties.

Under these plans the objective is to raise as many calves as possible from the cows and gradually eliminate the infected animals and to replace them with non-infected vaccinated animals.

*Vaccinations:* Drs. Cotton and Buck found a strain of *Brucella abortus* that was very similar to the ordinary type, but was not capable of producing the disease characterized by abortions. This is referred to as Strain 19. An injection of a culture of Strain 19 produces a mild attack of *brucellosis*. Young animals show a positive agglutination test for a year or so and then become negative. These animals are more or less resistant to *Brucella* infection by

the more pathogenic types. While Strain 19 has offered a very useful and valuable aid in controlling brucellosis it has not been entirely satisfactory. Vaccinated animals may become infected when they are exposed to a large number of virulent organisms. Dr. Huddleson has recently developed a variant type of *Brucella abortus* which may prove a great value in controlling this disease.

In summarizing this discussion one might go as far as to say that if the cattlemen and swinemen will buy only animals negative to the agglutination test they will save themselves a great deal of trouble.

Further it has been established that calf vaccination with Strain 19 is of high prophylactic value, but that clinical brucellosis may follow vaccination.

It is suggested from many investigations that every effort should be made to prevent a herd from becoming infected with brucellosis and that in the event infection does take place that a combination of the preventive hygiene and vaccination be utilized.

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