

Control of Brucellosis in Swine

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Brucellosis in swine has been recognized in some areas for many years. While not as prevalent as in cattle, it has been costly to the swine industry and is a definite hazard to human health. *Brucella suis* is more pathogenic to man than is *Brucella abortus*. Cattle may become a carrier of *Brucella suis*, while swine are less likely to become carriers of *Brucella abortus*. Many farmers, housewives and packing house workers contract the disease each year from exposure to infected hogs or products therefrom.

Brucellosis in swine, like the corresponding disease in cattle, has been known as abortion, contagious abortion, or Bang's disease, and lately as brucellosis. The word abortion is misleading in swine because the premature birth of the young is not always a prominent symptom of the disease. In fact this insidious-like disease may present a picture which is unlike the disease in cattle and therefore should not be too closely compared.

Following exposure to *Brucella suis*, swine commonly develop a bacteremia in which the organism may remain in the blood stream for 60 to 90 days. During and following this period the organism may localize in almost any part of the body. This has been demonstrated by the isolation of the organism in practically

every organ and tissue in the body such as lymph nodes, uterus, testicle, spleen, liver, kidney, bladder, mammary tissue, joints, bone marrow, brain and spinal cord and many other tissues.

With the variation of the location of the organism, and in view of the fact of its tendency toward abscess formation, it is understandable how a herd may carry an infection for a long period of time and yet show no noticeable abortions. Lameness, posterior paralysis, sterility, orchitis, metritis and abscess formation may be prominent symptoms without abortions. However, abortions do occur and may range as high as 50 to 75 percent in some herds. Abortions in the sow may also occur in the very early stages of gestation and she may be rebred without the owner's knowledge.

Sterility in sows and boars is common and may be the only indication of brucella infection in the herds. This type of sterility may be more or less temporary, but brucellosis should be ruled out before any other method of treatment is attempted.

Orchitis in the boar is frequently seen in infected herds and if caused from *Brucella suis* is a source for the spread of the infection. The orchitis is usually unilateral, rarely bilateral.

Vaccination with *Brucella abortus* vaccine (Strain 19) as a control measure must be ruled out as having little or no value. Perhaps a similar preparation manufactured from *Brucella suis* would be of considerable value, but being a live

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culture would be dangerous to human health to place it on the market under our present control laws.

There seems to be little difference in the susceptibility of swine to brucellosis after reaching the age of eight to twelve weeks. Contrary to this, there is considerable natural resistance to brucellosis in cattle until sexual maturity is reached.

The agglutination test in swine has its limitations, but if interpreted on a herd basis, these limitations become insignificant.

Eradication of the Disease in Swine

Economically the eradication of the disease in swine is more favorable than in cattle, especially is this true of the dairy animal.

First, the infected sow or gilt is disposed of for pork at her true market value, except where valuable blood lines are concerned, and replacements can be purchased at little or no loss; whereas a dairy animal sold for beef results in a financial loss.

Secondly, in the matter of replacement, the sow or gilt replaces herself five or six times each year, and the dairy heifer or cow reproduces her kind only once in two years. With knowledge of the above facts a test and slaughter program is a feasible approach to the control and eradication of brucellosis in swine.

The Veterinary Research Institute at Ames, in cooperation with the United States Department of Agriculture, Bureau of Animal Industry, has studied a number of infected field herds in the State. In these "pilot" herds, brucellosis was eliminated by a rather simple test and segregation program which actually interfered very little with swine production on the farm.

From the experience gained from the work done with these "pilot" herds, a program has been set up under the name of the "Iowa Accredited Swine Brucellosis-Controlled Herd Program." Three plans have been outlined, one of which will be applicable to fit the needs of most any herd in Iowa.

How the Program Works

The program is entirely voluntary as far as the swine owner is concerned. The State merely acts in a supervisory capacity, testing the blood samples sent in and issuing official certificates to the herds in which swine brucellosis has been controlled. No indemnity will be paid by the State or any of its cooperating agencies. The owner and his veterinarian will work out the details as they apply to the individual herd.

The veterinarian may then proceed at the owner's expense to bleed all of the breeding animals over six months of age and submit those samples to the State-Federal Serological Laboratory at Ames for official agglutination tests. Since blood samples from swine are so perishable, it is recommended that only tubes supplied by the laboratory be used and that after contraction of the clot the clear serum be poured off and sent separately from the clot. Small degrees of hemolysis will render the samples unsuitable for test in the low dilutions used. In the herds where no animals react in the 1-100 dilution, it is believed that occasional lower titer reactions do not indicate exposure to brucellosis. Therefore, a test shall be considered negative if it does not react in the 1-100 dilution provided that no other animal in the herd reacts positive 1-100, or higher. However, if any animal in the herd reacts positive 1-100, all of the animals showing any reaction, 1-25 or 1-50, shall be considered infected; in fact, in such a herd some of the negative animals may be infected also.

If all of the animals in the herd are negative, the herd will be eligible for accreditation when it has passed a second negative test between 30 and 90 days after the first clean test. This certificate must be renewed annually by passing a single clean test on the entire herd, provided all additions to the herd have been made in compliance with the regulations.

If any animal reacts 1-100 or higher the entire herd is considered infected. It is to be emphasized that the entire herd must be handled as an infected unit and

that each animal is a potential source of spread to any clean animals it contacts.

Three Alternate Plans

PLAN I

This plan is especially recommended to the commercial herds in which the maintenance and propagation of the blood lines is of little importance.

1. Dispose of the entire herd of swine for slaughter.
2. Clean and disinfect houses and equipment. Rest hog lots if possible.
3. Replace with stock from brucellosis-free herds, preferably on clean ground for as long as possible.
4. When two clean tests on the entire herd 30 to 90 days apart have been passed, the herd is eligible for certification.

PLAN II

1. Separate pigs from sows at 56 days of age or younger, and isolate as completely as possible.
2. Market infected herd as soon as practicable. If sows are held for later litters, complete isolation is essential. It should be born in mind that young gilts become increasingly susceptible as they approach sexual maturity.
3. Test the gilts to be used for the following breeding season about 30 days before breeding. Save only those gilts which are negative 1-25. Breed only to negative boars.
4. Retest the gilts after farrowing and before removing them from individual farrowing pens. Should reactors be found they should be segregated as far as possible from the remainder of the herd. Only pigs from negative sows should be selected for breeding gilts.
5. If the herd is not clean at this time the process is repeated another year. As soon as the entire herd can pass two negative tests between 30 and 90 days apart it becomes eligible for certification.

PLAN III

This plan is not recommended in general, but may be used in small herds where only a few reactors are found and where no clinical symptoms of brucellosis have been noted.

1. Remove reactors from farm.
2. Retest herd at 30 day intervals, removing reactors, until entire herd is negative.
3. Two clean tests, between 30 and 90 days apart, qualifies the herd for certification.
4. If the herd is not readily freed of infection abandon this plan in favor of Plan I or Plan II.

Points to be Especially Noted

It should be remembered that reinfection is commonly the result of the introduction of animals from herds. Therefore replacements should be procured from accredited brucellosis controlled herds, or if obtained from other sources they should be purchased well in advance of the breeding season so they may pass two clean tests, at least 30 days apart, before being released from quarantine into the breeding herd.

Bred sows and gilts are to be kept in strict quarantine until they have passed a negative test after they have farrowed.

All swine brought onto the farm for feeding purposes must be kept in strict isolation from the breeding herd.

Infected animals constitute a potent hazard to human health.

All swine reacting to the agglutination test should be kept in strict isolation until they can be sent direct to slaughter.

The implantation of one 50 mg. tablet of stilbestrol in the udders of virgin ewes induced satisfactory lactation in nine to fifteen days. Implantation of larger doses and implantation in the neck was less satisfactory. Although the implant was made in the right side of the udder in all cases, the milk production of the two ewes was uniform. *Vet. Med.* XLIII Nov. 1948.