

BRUCELLOSIS AND THE DAIRY HERD

Dr. N. E. Schultz
Animal and Plant Health Service
Veterinary Services
Jacksonville, Florida

Brucellosis of livestock in the United States has been a serious problem for half a century. Losses due to this disease in our farm animals have exceeded hundreds of millions of dollars. Let's review for just a moment, some of the history of our fight to eradicate this disease: Just what is brucellosis - how it spreads - and what you as a dairy owner can do to prevent this costly disease from entering your herd or eliminate it should it gain entry.

Although efforts to control brucellosis first began under independent state programs way back in 1922, little progress was made until 1934 when the problem was attacked on a national scale. In that year, the Cooperative State-Federal Bovine Brucellosis Eradication Program was launched, and initial testing indicated that approximately 10 percent of the adult cattle in the United States were infected. The initial work proved the disease could be eliminated from areas of the cattle population; and as it was found to be more economical to eradicate brucellosis than to live with it, in 1954 funds were made available by the Congress and the various states for an adequate program. The incidence of brucellosis in this country has been dramatically reduced in the past twenty years through the cooperative efforts of the cattle industry, practicing veterinarians, and disease eradication officials. Thus we have seen the percentage of infected animals drop from a high of 10 percent in the 30's to less than 1 percent in the late 60's and early 70's. You may be interested to know that Secretary Butz has committed the U.S. Department of Agriculture to stamp out the disease by the end of 1975 which is a little over three short years away and some five years ahead of the original timetable.

To meet this new goal, added pressure will need to be exerted on the Market Cattle Identification Program to see that all test eligible cattle are properly tagged with "shoulder identification tags" so that reactor animals blood tested at time of slaughter may be traced back to the originating infected herd. Another change will require that cattle from other than brucellosis-free herds or areas, must be tested and found free of brucellosis within 30 days of movement or at the first concentration point. In other words, tested on the farm before sale, or tested at the livestock market. Cattle sent direct to slaughter will not require a test since these animals are routinely tested at the time of slaughter.

Brucellosis, often known as contagious abortion or Bang's disease, is caused by a bacteria and affects cattle, swine, and goats. In the female animal, abortion may occur while the male may suffer inflammation of the testicles. Infertility can occur in either sex as a result of the disease. Brucellosis occasionally affects horses causing the condition known as fistula of the withers or poll evil. In the human, the disease is known as undulant fever, so called because of the rise and fall of the fever from day to day. When the disease spreads rapidly through a cattle herd, many abortions may occur. Once the disease is established, the rate of abortions is low and may occur only in the first calf heifer, or not at all. Oftentimes, only an occasional abortion is noted along with sterility problems evidenced by a good number of animals that are "hard to settle" and cows that retain their placenta after calving. Some infected animals, and even herds, show no signs of the disease; nevertheless, these cattle carry the germ, shedding organisms throughout their life that are highly infectious to other cattle, and, of course, to man.

The disease is generally spread by ingestion of the germ. Cattle may eat feed and grass or drink water that has been contaminated with the germ. They may also be exposed by licking the genitals of infected animals or licking a recently aborted calf or placenta which is literally teeming with the germ. Even a live calf from a reacting cow is covered with the germs when first born, just as is the placenta and uterine discharge from a reactor animal. Bulls shedding the germ in their semen will infect cows. The disease may be spread by mechanical means; by this, I mean dogs or wild animals may drag aborted calves or placentas to another farm. Likewise, these highly infectious tissues may float for miles down a creek or river, eventually coming to rest on a farm downstream.

"Doc, how long does the germ live on my farm?", is a question we are often asked. Like most organisms, the viability of Brucella is influenced by temperature and the protection of the surrounding medium. They are killed in a few hours by direct sunlight and even sooner if it is hot and dry. Lysol (1 percent), Formalin (2 percent), or Sodium Orthophenylphenate at the rate of 1 pound to 12 gallons of water at 60° F kill the organism in less than 15 minutes. They have been known to live for as long as seven months in infected exudate kept in an ice chest, up to six months in an aborted calf placed in cool shade, and for up to twelve months in feces kept in a cool, moist, shaded area. This then, certainly points out the need for proper cleaning and disinfecting after removal of reactor animals from the herd.

Several methods are used to locate the disease and probably the most familiar one to this audience is the milk ring test or BRT, which is run every three months on milk samples from each dairy herd in the state, or the nation for that matter. The milk ring test is an excellent surveillance test to detect infection in a herd. As I am sure you all know, the milk ring test is not suited to locating individual infected animals, so a blood test is used should the milk test be suspicious.

The Market Cattle Identification Program provides a means to identify reactor animals disclosed at the time of slaughter. Cattle destined for slaughter are tagged at the farm or livestock market with a special coded

tag. A blood sample is taken at the packing house from all breeding cattle over two years of age which is keyed to the coded tag. When reactor animals are disclosed, tracing to the originating farm may be accomplished through the coded tag and a blood test of the herd is made to locate any other infected animals.

Presently, blood samples are taken at time of slaughter from breeding cattle over two years of age at all slaughtering plants in Florida. Both backtagged cattle arriving at the plant by way of the markets, as well as direct shipments from the farm to the plant, are sampled.

In Florida, the card test, plate test, and tube test are all recognized as official tests; however, due to the card test's ability to rule out vaccine titer, the card test is used routinely in our laboratory. In addition, the card test is highly sensitive and detects infected animals that may be suspects or even negative on the plate test. By spotting the infected animal earlier and eliminating reactions due to vaccine titers, the card test has proven to be an effective tool in cleaning up infected herds that were formerly such a headache when the plate test was used.

There are other tests used which we refer to as supplemental tests. These supplemental tests are very specific and positive findings are almost as accurate as finding the living bacteria in exudates from the reactor. The supplemental tests are used as back-up tests at the laboratory on all newly infected herds to establish that true infection does exist. In other words, as a double check to be sure vaccine is not clouding the picture and that we are dealing with actual Brucella infection.

Now, what can a dairy farmer do to prevent his herd from becoming infected? Brucellosis, as with any disease organism, doesn't just happen or come out of the thin air! Earlier, we discussed the means of spread and we pointed out that infection originates from an animal that is harboring the germ. Generally, infection gets into our herds by introducing an infected cow! In other words, this is a disease that is usually "bought and paid for". I can hardly emphasize enough the following piece of advice - DON'T BUY UNTESTED CATTLE - and even then, insist on a test record or a health certificate documenting the cattle listed were negative to test within the past few days. Check the animals to see that they are actually the same cattle listed on the certificate. Don't accept "lame excuses" that the cattle lost their tags or that the testing veterinarian put down the wrong numbers on the test papers. Keep these newly purchased cattle separate from your herd and have them tested again after at least 30 days have gone by. The cattle you have purchased may have been exposed to a reactor animal prior to or during transit. If so, the disease may be incubating and even though the animal was negative at time of purchase, she may go ahead and develop the disease as a result of her exposure and be a reactor on the later test. I realize many of you find it difficult or even impossible to isolate newly purchased cattle, but any way to keep her separate or even in a small unit until she has calved and undergone a test after about 30 days

will pay high dividends in protecting your herd. I am sure you realize a large portion of the nation is free of brucellosis but many areas and states still have a good deal of infection. As long as any area has infection, we have a good chance to import it since we bring in so many cattle to supply our needs. To re-emphasize - recently exposed animals may be clean on the test before purchase and the blood test won't show it until later when they have already infected your herd.

If your herd should become infected, there are certain basic steps you should take in order to clean up. This is extremely difficult in large herds where overcrowding is common. The major method of spread is direct contact with infected cows that either abort or have a normal calving. The calf, fetal membranes, and fluids, are highly contaminated and contain millions upon millions of the Brucella organisms or germs. Anything and everything you can do to reduce the exposure of your cattle to these materials is essential. Testing alone only locates the reactors after they become infected - so this is not enough! Large herds should be broken down into as many small separately pastured herds as possible. This is absolutely necessary in the dry herd. The dangerous animal is the one that has a calf or aborts. Heavy springers should be isolated from the rest of the dry herd. After they calve, they should be kept away from the rest of the herd until all uterine discharge has stopped. Should a cow abort, she should immediately be isolated from all other cattle. Dead calves and afterbirth should be burned or buried deeply so that other cattle do not have the opportunity to contact this material. Ponds and streams in the calving area should be fenced so that water is not contaminated, thus preventing spread to other cattle. The cows in the calving area should be watered in troughs which prevent wading and contamination of the water supply. Practice good sanitation throughout your operation by removing all litter from the cattle pens - especially discarded artificial breeding equipment such as pipettes, protective sleeves, gloves, and any other litter that may harbor disease organisms. Insofar as is possible, see that the lots are well drained to avoid standing water and mudholes in which disease germs can thrive for long periods of time.

I am sure many of you are wondering whether you should vaccinate your calves or not. Since there are both good and bad points about vaccination, let us take a moment to examine both sides.

By vaccinating calves at an early age - 3 to 4 months - and using the card test, the problem of retained vaccinal titer is practically eliminated. However, some animals actually become vaccine infected and, of course, when this occurs, they must be handled like field strain infected animals; that is, removed from the herd and sent to slaughter. As with all vaccines, those for animal or man, none are perfect. In some calves, the vaccine doesn't "take" or they just don't develop enough immunity, and when exposed to massive doses of bacteria, they become infected and, in turn, spread the disease. Vaccinated cattle also have a longer incubation period. Most non-vaccinated cattle will react to the tests within 30 days after becoming infected. Vaccinated cattle may take another month or even longer to show up on the test - meanwhile, they may be spreading the disease to other cattle.

On the other hand, Strain 19 vaccine has done a good job for us in the past by giving our cattle some immunity while the infection rate was high. But, as with all vaccines, once eradication of a disease is in sight, vaccines must be eliminated to assure the disease is not being masked and the last vestiges are stamped out.

In an area having little or no infection, vaccination and the problem it causes is not justified, so many states have stopped vaccination. In fact, vaccination is not allowed once an area becomes free of the disease.

Then, as individual herd owners, what should you do? If the area in which your herd is located is free of brucellosis or relatively free of the disease, we suggest vaccination be discontinued. If you have infection in your herd or if infection is prevalent in your area, it might be to your advantage to continue having your calves vaccinated. I would point out, however, that as the disease incidence is lowered, vaccine is to be phased out and will no longer be available.

Research is being done on some other experimental vaccines but the drawbacks are: They must be given once a year, they cause a good deal of tissue damage at the site of injection, they interfere with the test causing a positive reaction, and all thus far give rather poor immunity. Thus it becomes apparent the production of any "cure all" vaccine is quite unlikely.

To sum up some of the points that are essential in brucellosis eradication:

1. Purchase only test negative cattle.
2. Isolate purchased additions and retest 30 days after purchase and before adding them to your herd.
3. Keep heavy springers in a separate pasture or lot until after they calve and until all uterine discharge ceases.
4. Practice good sanitation and sound management procedures throughout your operation.
5. Insist on and do all you can to promote regulations and laws that will protect your herd. For example: Insist that all cattle be tested prior to sale, either tested on the farm, or tested at the market. Insist that cattle be identified before they move, so reacting animals may be traced to their herd of origin. We are in dire need of a dealer law in Florida which would require dealers to keep records of their purchases and individual identity of the cattle, so infected cattle can be traced to the infected herd. In addition, such a law or regulation would go a long way toward keeping the reactor and exposed animal out of the trade channels and from entering your herd. Equally important, is our failure to credit negatively tested animals to the proper county for recertification purposes. The existence of a dealer law would correct all these problems.

Let's hear from the dairy herd owners at the meetings of the Animal Industry Technical Council where proposed regulations are aired.

I observe many, many beef cattle owners in attendance at these meeting, but I have yet to see a dairy herd owner present (other than the dairy industry representative on the council), let alone hear his voice asking for legislation which would protect his herd and interests.

Gentlemen, we cannot become complacent about this disease. Should we decide to stop or even slow down, it wouldn't be long until the disease incidence would creep up to its former level where 10 percent of our cattle were infected, and all our gains would be lost.

Brucellosis, just like Glanders, Dourine, Foot & Mouth Disease, Screw-worms, can be eradicated from this country.

Let's get on with this task and have a brucellosis-free nation by the end of 1975.