Western Beef Resource Committee

Fourth Edition

Cattle Producer's Handbook

Animal Health Section 663

Brucellosis Considerations for Western Beef Herds

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Brucellosis is a serious disease of cattle caused by the bacteria *Brucella abortus.* It can also affect swine, sheep, goats, horses, and humans. Brucellosis is a public health hazard that may be transmitted to humans in raw milk or by contact with aborted calves or their afterbirth.

In all but isolated areas of the United States, brucellosis is under control or no longer exists in cattle herds. This is because of the success of the National Brucellosis Eradication Program that includes vaccination, testing, and slaughter of infected cattle. However, it remains a threat to the beef cattle industry as it may still re-emerge from some isolated area to invade cattle herds.

The disease mainly affects sexually mature cows. Commonly, it causes abortion of late-pregnancy calves, retention of the afterbirth, and resulting poor-doing cows. The organism lives in the udder and the lymph glands. From there it invades the womb when a cow becomes pregnant. The organism causes gradual destruction of those parts of the fetal membranes that are responsible for maintaining the blood supply to the fetus. The viability of the fetus is progressively lowered until the calf is aborted.

If infection does not cause abortion, calves may be stillborn, weak, or even normal at birth. Calves born from infected dams usually do not keep the infection. However, a small number (about 5 percent) do retain the infection for life and will become antibody positive at first calving, and may spread the infection to other susceptible females.

How the Disease Is Spread

Today, the most common source of brucellosis is by purchasing infected cattle. At calving, the disease is spread when unprotected cattle ingest *Brucella* microbes while licking contaminated fetuses, fetal membranes, fetal fluids, and discharges from infected females (Fig. 1).

Most cows that have aborted become carriers of the disease. They shed the organism for 2 to 4 weeks after calving, thereby infecting pastures and other cows that lick infested spots or discharges. Infected cows also excrete *Brucella* in their milk, potentially infecting a healthy calf.

Fig. 1. Brucellosis is commonly spread within herds by cows licking contaminated fetuses or discharges.

Bulls can become infected but rarely transmit the disease. If infected, they may develop arthritis or an inflammation of the testicles leading to infertility. Bulls should be blood tested and culled if found positive. Vaccination is not recommended for young bulls because some may become infertile.

Brucellosis in wildlife species has not proved to be a problem for domestic cattle except under special circumstances. The disease persists in certain bison and elk populations in the western United States. While difficult to control inside the animal, *brucella* microbes do not survive in sunlight, high temperatures, or dry environmental conditions.

Vaccination Considerations

Brucellosis vaccination requirements vary widely. Some states require it. Others do not. Call your veterinarian to find out if and when it is required to vaccinate.

From the 1920s until the late 1990s Brucella Strain 19 vaccine was used to control brucellosis in the U.S., and it caused "false positive" test results to occur in some cows as they were tested at slaughter plants.

The term "false positive" refers to animals that have a positive test result but are not infected. Some cattle vaccinated with Brucella Strain 19 produce a "false positive" result if they were vaccinated after becoming sexually mature (usually older than 10 months of age), or were accidentally vaccinated twice.

In the U.S. brucellosis surveillance program, all test-positive cattle are evaluated to be certain they are not infected with a field strain of *Brucella abortus* even after vaccination. When vaccination ear tags fall out and vaccination tattoos "disappear," cattle with a positive test result look like they were naturally infected. The surveillance test cannot differentiate the vaccine Strain 19 from the wild-strain; therefore, tissues are cultured to identify the *Brucella* strain. Cattle producers and regulators can spend significant time and effort testing animals in herds where these "false positives" occur.

RB51 vaccine is a modified live bacterial vaccine that is currently used throughout the United States. Its use should reduce the number of "false-positive" test results as experienced with the Strain 19 vaccine. RB51 vaccine is a mutant strain of *Brucella abortus* and does not produce cross-reacting antibodies in vaccinated cattle that confuse results in the routine surveillance tests. That is, cattle vaccinated with RB51 do not produce "false positive" test results on the brucellosis surveillance tests. Thus, "false positive" reactions may become a thing of the past.

Fig. 2. A disease-free herd is the cattle producer's goal.

RB51 vaccine has other advantages including (1) no clinical disease in vaccinated calves, (2) it does not spread to non-vaccinates, (3) it very rarely causes abortions (if pregnant cattle are vaccinated), and (4) it is safe for all cattle older than 3 months of age.

RB51 should be considered capable of causing disease in humans, and any accidental human injection should be handled promptly. The RB51 tattoo differs from the Strain 19 tattoo in that an "R" replaces the letters A, B, C, or D that were formerly used to designate the quarter of the year when Strain 19 vaccine was administered.

Prevention

1. Vaccinate replacement heifers when they are between 4 and 10 months old, if required by law or as additional protection against disease, especially in high-risk areas.
2. Purchase only brucellosis-vaccinated heifers for the same reasons as listed in number one.
3. Attempt to reduce animal density on calving grounds by removing new cow-calf pairs as soon as possible.
4. If any abortions occur in your herd it is recommended to perform the following tasks as a precaution:
   a. Send aborted fetuses and afterbirth material to a laboratory for diagnosis and isolate the affected cow.
   b. Immediately remove all potentially infected material from the calving area and burn or bury it.
   c. Keep cows with retained placentas and other suspected cows with vulvar discharges separate from unaffected cows for 3 to 4 weeks after calving.

Control After Infection

In infected herds, cattle over 12 months of age may be vaccinated with RB51 vaccine to slow the spread of brucellosis. Prior permission of the State Veterinarian would be required for this vaccination. In addition to practices outlined as prevention, other recommendations include:

1. Carry all infected material away instead of dragging it on the ground. Use plastic tubs or garbage cans.
2. Keep isolation and calving pens from the main herd.
3. Keep dogs away from areas where calving and newborn animals are present.
4. Use individual sterile plastic-sleeves for reproductive exams and calving assistance.
5. Be certain that people handling aborted calves and/or the afterbirth thoroughly disinfect before they come in contact with other cattle or cattle feed on the ranch.
6. Do not commingle horses with cattle. Horses may carry the infection.

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