

# We triggered the milk brucellosis ring test

by Hoard's Dairyman staff

WHEN we received a letter from the state veterinarian's office saying, "... a brucellosis infection may exist in your herd," we automatically assumed that there was some mistake . . . a mix-up in paperwork or some sort of a false positive. Still, seeing those words in print was chilling.

What if we actually had brucellosis in our herd? Wisconsin had been brucellosis-free since 1984. The last brucellosis-infected dairy herd



**SHELBY MOLINA**, the state veterinarian for our area, drew blood on 130 cows in just over two hours. She has a custom-made apron that holds up to 65 blood tubes and has pockets for new needles and a strap that holds a plastic box for discarded ones. She likes to use 18-gauge needles because they fill fast, although she uses 20-gauge needles on Jerseys because of their smaller veins.

detected by the milk brucellosis ring test (BRT) was in Florida in 2000.

Six brucellosis-affected herds were depopulated in the U.S. during 2004. There were four infected beef herds in Wyoming. Those infections were in the Yellowstone area and were traced back to elk.

Back at the Hoard's Dairyman Farm, our anxiety was eased a bit by some wording in the letter which called the BRT "*highly sensitive*." The letter continued, "*cross-reactions, leading to 'false positive' results, sometimes occur in herds that are not infected. Causes of false positive reactions include mastitis, colostrum, Strain 19 vaccinations, and systemic infections*." Of course, those conditions apply to about 99 percent of dairy herds, ours included.

The letter indicated a state or federal veterinarian "*will be contacting you to discuss this matter*." The positive tank was shipped on August 2. The letter was dated August 3, and we received the letter on August 4.

The following day, Shelby Molina, the state veterinarian in our area, phoned our farm manager, Jason Yurs, asking whether we had been experiencing any unusual herd health problems, especially late-term abortions. She said that the herd would be bled

as soon as it could be scheduled.

There was a certain irony surrounding the timing of our BRT positive. We received the letter from the state veterinarian's office the day before our editor and publisher, W. D. Knox, passed away at age 85. Back in the 1950s, he had been the founding chairman, secretary, and president of the National Brucellosis Committee. It was an emotional time in this office.

In the meantime, we began to educate ourselves about brucellosis, sometimes called "contagious abortion." It also often is referred to as "Bang's" disease because it was discovered by a Danish scientist by the name of Bang. Brucellosis hasn't been high on the dairy industry's radar screen, but it was a big deal to some of our dads and granddads. In 1956, there were 124,000 infected dairy and beef herds in the U.S., according to the website of USDA's Animal and Plant Health Inspection Service (APHIS).

## Screening continues . . .

We learned that in brucellosis class "free" states each dairy herd must be screened twice a year using the milk brucellosis ring test. Our hauler gets special, prelabeled sample vials. Those samples are sent directly to Wisconsin's state diagnostic lab. With Wisconsin's 15,000-plus dairy herds, that makes 30,000-plus BRTs a year, well over 130,000 nationally. During the past year, there were 11 BRT positives in Wisconsin and more than 200 across the nation, according to APHIS. We learned that only about one in four BRT-positive herds have one or more blood test suspects.

For the BRT, a suspension of stained, killed *Brucella* organisms is added to the milk sample. If the milk from one or more infected cows is present in the sample, a bluish ring forms at the cream line as the cream rises. The test is evaluated visually by the technician, who reads it either as a negative, 1+, 2+, 3+, or 4+. Our test was a 2+.

In addition, every adult animal slaughtered in the U.S., except steers and spayed heifers, has blood drawn as part of the cooperative federal/state brucellosis surveillance program. That totaled 8.3 million serum samples last year. Wisconsin state veterinarian Robert Ehlenfeldt said 19 slaughter plant samples reacted to the serum test in the state last year. Those reactions result in tracing the animal back to its source and then blood testing any animals that had been in contact.

## Possible factors . . .

Debra Donch, national brucellosis epidemiologist at APHIS headquarters in Maryland, described cows that could be involved in a herd ring test positive or individual

cow serum positive. She included cows with mastitis, lameness, other infections, recent vaccinations, those producing colostrum, and so on. The main goal would be to identify some cause of cross reactivity . . . some bacterial infection or other condition that made the cow react to the brucellosis serum test. We hadn't given any vaccinations recently.

High cell counts can trigger a BRT positive. But the SCC on our shipment that tested positive was 143,000.

## Breed differences?

"Anecdotally, Jerseys have the reputation of being more likely to trigger false positives with the BRT or serum tests," said Donch of her experiences in Michigan. She explained that Jerseys' immune systems develop at a younger age. Jersey titers used to be a problem before the new RB51 vaccine came into widespread use, according to Herby Lutz of AJCA's Jersey Marketing Service. "We've blood tested thousands of Jerseys in recent years without one positive," he said.

Of course, we have Guernseys. But some people believe that higher fat herds tend to trigger BRT positives more often. The agglutination formed with the killed *brucella* clings to fat globules in the milk sample. Our fat test was 4.37 at the time.

We learned that the most likely cause of a false positive, if that's what we had, was a cow that had been vaccinated with Strain 19 vaccine. Strain 19 was the standard calfhoo vaccination up until about 1995.

By 1997, the new brucellosis vaccine, RB51, essentially had replaced Strain 19. Since RB51 resulted in a weaker titer, vaccinates

were less likely to trigger false positive BRTs or serum tests.


Our purchases had included Ruthie, born in June 1995 when Strain 19 still may have been used in Pennsylvania. We checked, and Ruthie had, in fact, been calfhoo vaccinated . . . with Strain 19. There's an "R" in the "calfhoo" eartag or tattoo when RB51 was used. But she had been in milk last winter when we probably had our previous BRT.

Since we milk in tie stalls, taking the samples was not a big inconvenience. We had to sample several dry cows because we needed to include all cows that had gone into the tank on the August 2 pickup. The blood sampling took just over two hours. Our serum samples were tested using something called the rapid acidified plate method, a machine-read, screening test used in many states.

We got the results back in exactly one week as promised. As you can imagine, we were very relieved to learn that all cows tested negative. That meant "case closed" as far as the animal health officials were concerned.

Of course, that still left us wondering what triggered the false positive. We will never know for sure, but here's our best guess.

At the milking on the afternoon of August 2, the day of the positive sample, a 6-year-old, Darcina, had a hot quarter. She very well could have been shedding heavily at the morning milking which, with us on everyday pickup, made up half of the positive tank. With mastitis, more serum proteins (antibodies and other immune factors) cross over into the milk.

But, of course, we'll never know for sure. 

## To calfhoo vaccinate or not

BRUCELLOSIS was enough of a problem years ago that calfhoo vaccination was required by law. Most states dropped mandatory calfhoo vaccination about 10 years ago.

Wisconsin state veterinarian Robert Ehlenfeldt says that about 40 percent of dairy farmers in Wisconsin still calfhoo vaccinate.

Debra Donch, the APHIS brucellosis epidemiologist, told us that calfhoo vaccinations totaled around 9 million per year (dairy and beef) in the early 1990s. By 1996, the number had dropped. The final number for 2004 is expected to be just over 4 million.

According to the National Animal Health Monitoring System (NAHMS), calfhoo vaccination use is highest (86 percent) in the West where it is mandatory in some states. It drops to less than 26 percent in the Northeast. The

proportions of dairy farmers calfhoo vaccinating in the Midwest and Southeast are 56 percent and 66 percent, respectively.

APHIS says calfhoo vaccination is most important in areas of relatively heavy infection or in the case of owners who ship replacement cattle into areas where there are vigorous calfhoo vaccination programs. It is a matter that you should discuss with your dairy practitioner.

California, Washington, Idaho, Utah, Colorado, Oregon, and Arizona are among the states that do not permit entry of replacement cattle not calfhoo vaccinated. Therefore, not vaccinating may limit the replacement value of your heifers. (To learn about state-by-state requirements, see [www.aphis.usda.gov/us/sregs/](http://www.aphis.usda.gov/us/sregs/).)

Adult vaccination requires state approval and is used only in cases of heavy exposure.