Volume 44

March 2008

Dairy Details

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Toward More Rational Therapy of Mastitis

Try this multiple choice question: You have a cow with clinical mastitis. She has clots in the milk and moderate udder swelling, but she is not sick. You treat her with a tube of Pirsue once a day for two days. On the third day her milk still looks abnormal so you begin treatment with Hetacin-K once daily for three days. At about the time you finish treatment you notice that the milk now is normal and the udder is soft. What can we conclude from these observations? Which answer below is correct?

a. Pirsue did not work; Hetacin-K cleared the mastitis.
b. Pirsue did work, but you could not determine this by looking at the milk when you switched treatments.
c. The mastitis cleared up spontaneously; treatment had no effect.
d. Nothing worked; she still is infected.
e. Any of the above could be correct.

The correct answer is e. Any of the scenarios could have occurred. Let's look at each one. Most people would probably pick the first choice. It certainly appears that Pirsue did not work and that Hetacin-K did. However, research has shown that milk in an infected quarter will often not return to normal for days following a cure. In our example it is just as likely that Pirsue did work, and the Hetacin-K was wasted (answer b). Answer c is just as likely as a or b because many cases of mastitis cure spontaneously. This is particularly true with coliform infections. Coliform infections often represent nearly 50% of the cases of clinical mastitis on a dairy. Choice d is somewhat less likely, but still possible. Some infections, especially those caused by Staph aureus, may appear to clear in response to treatment even though the organism is still present in the udder.

Answer "a" probably reflects the most common practice used on dairy farms. However, there are a least two problems with this choice. In addition to the fact that we may have switched products too soon, it is very likely that we over treated the cow and discarded too much milk. The correct method may have been to treat the cow for the number of days in our farm protocol and then stop treatment. Milk can be returned to the line once the appropriate antibiotic withdrawal period is observed. If the milk in the treated quarter is still abnormal at this time, the milk from that quarter should be discarded (using a quarter milker) until it appears normal. What if the milk does not return to normal?

Well, it would certainly help if we knew what organism was causing the mastitis. If we knew that the cow had a Staph aureus infection, for example, we would have treated her for a longer period of time, or we may have elected no treatment based on her history and the knowledge that effective treatment of Staph aureus is often ineffective. If she had a Strep uberus infection, we may have chosen not to use Pirsue, but instead started with the Hetacin-K, or perhaps used Cefa-Lak or Spectramast. These products are more likely to be effective on Strep infections. If she had a Klebsiella infection, we may have treated her with Spectamast, which is the most likely to be effective. If she had an E. coli infection, we probably would not have treated her at all. If we don't know what the organism is we can take a milk sample for culture, treat her again, or continue to discard milk from the quarter. If

Special points of interest:

- Research has shown that milk in an infected quarter will still appear abnormal for some time following a bacteriological cure.
- Mastitis cases caused by coliform organisms often cure spontaneously.
- Treating based on culture can reduce drug usage, decrease number of treated cows, keep more milk in the tank and lower somatic cell counts.

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the cow has had multiple cases of mastitis in that quarter, we may choose to dry that quarter up or cull the cow. Of course, on most farms to know that she had multiple cases in the same quarter someone would have to be recording clinical cases in a record system.

Let's go back a redesign a treatment system using what we know from this exercise. First, we should take a sterile milk sample before the cow is treated. Then we need to either set up an on farm culture or bring the sample to our lab here at NVDPMC for identification. In most cases a diagnosis can be made in 24 hours. Research has shown that the efficacy of mastitis treatment is not compromised by waiting several days from the onset of clinical signs until treatment, so it is OK to wait to treat the cow. The only time it is not OK is if the cow has a very severe, typically coliform, infection that makes her ill. So another thing we need in our plan is a scoring system for the severity of mastitis. A very simple system uses three classifications. Grade one is abnormal milk, normal udder, normal cow. Grade two is abnormal milk, swollen udder, and normal cow. Grade three is abnormal milk, swollen udder, and sick cow. Sometimes one has to be very vigilant to find the grade three cases, because cows may not appear ill early on in the course of the disease.

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Next, we develop protocols for treating grade three cases, because we do not want to wait for cultures are done before treating these animals. We need protocols for grade one and two cases as well, but we will treat after culture results are known. Typically we will choose not to treat coliform infections, because most will clear up on their own. In fact, many will show no growth on culture because the organism has already died. On some farms we may choose to treat Klebsiella infections, a subset of coliform infections, because they can be more severe or more likely become chronic. We will treat all grade one and two cases based on the protocols we have set up for the different causes of mastitis. We will record the mastitis event, the culture results, and treatment used in our record system. We will treat for the number of days specified in the protocol rather than treating until the milk looks normal. If the milk is not normal once the antibiotic withholding period is reached we will decide if further treatment is warranted, based on culture results, number of cases in that quarter, and the relative quality of the cow.

Isn't it difficult to do cultures on farm? Not really. The University of Minnesota has two systems designed to be used on farms. They require a small investment in equipment and materials. Just a little training from one of our staff members can get you up and running quickly. Isn't it too expensive to send every sample to the lab? While it does cost somewhat more than if you do them yourself, ultimately it will save you money. You save money because you will treat many less cows. If 50% of your cases are coliforms or "no growths" you will save all the drug costs and discarded milk costs for 50% of the cases. This will take 50% less labor and there will be less cows in your treated pen. In addition, you will be discarding milk for less days on the gram positive cases.

This system should result in 50% less treated cows for most farms, less drug usage, and more milk in the tank. It should also result in better cure rates because appropriate therapy can be designed for each case. This will result in lower somatic cell counts, less chronic or recurrent infections, and more milk in the tank. Fewer treated cows, less drugs, more milk, better treatment response, and lower somatic cell counts sounds great for any dairy farm. We can help design a system for your farm. Speak to your herd veterinarian at the next visit or call our office. (Information for this article was provided by Dr. Pamela Ruegg from the University of Wisconsin, personal communication, 2007).