



JANUARY 2, 2004-4

DAIRY NEWS

No-Growth Milk Culture Results

John H. Kirk, DVM, MPVM

Extension Veterinarian

School of Veterinary Medicine

University of California Davis, Tulare, CA

After your herd veterinarian talked you into taking some milk samples for culture in hopes of finding out what bacteria was causing your mastitis problem, you are disappointed to get back several culture results reporting “No growth” or simply NG. You wonder how this can happen when the milk samples were collected from the cows soon after the cows were noticed by the milkers to have abnormal milk. Here are some of the reasons for NG.

According to Philpot and Nickerson in their book, Winning the Fight Against Mastitis, you can expect that about 30% of the milk samples taken from cows with clinical cases of mastitis or with elevated somatic cell counts will come back as NG. They suggest that in chronic coliform infections the numbers of bacteria shed in the milk may be below the detection limit of the routine laboratory culture techniques. In other cases, the laboratory methods may not detect a particular type of organism such as *Mycoplasma* that require specialized methods for detection. In other cases with high cell counts, the mammary gland may have already cleared the pathogen and all that remains are the somatic cells attempting to heal the injured tissues in the gland.

In herds where clinical infections with coliform bacteria are common, the percentage of NG culture results may be between 30-50%. With coliform mastitis, the mammary gland defenses, mainly the somatic cells, usually do a good cleaning up of the coliform bacteria within 8-12 hours. So that in 2x milking herds, if the infection starts soon after one milking, there may be few bacteria left to detect by the next milking even though the milk may look terrible and the cow is very sick. Herds milking 3x or 4x should have a lower percentage of NG from coliforms due to the shorter interval between milkings.

With the contagious bacterial pathogens that often produce chronic infections lasting for many months, it is also possible to get NG. This may be due to intermittent shedding patterns and sampling frequency. As an example, with chronic *Staphylococcus aureus* infections, a single quarter sample will not detect the infection about 25% of the time. If two samples are taken on consecutive milkings, only 6% of the infections would be missed. Three samples would reduce

the reports of NG to only 2%. The problem here is to take the milk sample when the bacteria are being shed in sufficient numbers to be detected by the routine laboratory techniques.

Another possibility is that bacteria in the milk sample are lost during storage. Most laboratories suggest that the samples be kept on crushed ice when they are to be delivered to the laboratory within 4-6 hours after collection. When the samples are to be delivered to the laboratory before 24 hours, they can be store in a refrigerator. Samples to be held on the dairy for more than 24 hours should be frozen at a constant temperature. The problem is that many home freezers do not maintain a constant temperature. Frost free freezer compartments routinely vary the temperature to remove the frost. This variation in temperature is especially harmful for the coliform bacteria. However, in some cases, it actually might increase the likelihood for detection of Staphs or Streps.

Here are some suggestions to minimize the number of NG reports from the laboratory:

1. Train your milkers to detect clinical cases of mastitis. Let them know why it is important to collect milk samples at the very first instance of abnormal milk. This is particularly important in 2x milking herds.
2. To optimize the detection of contagious pathogens, particularly when attempting to detect subclinical infections in high somatic cell count cows, it is necessary to collect more than one milk samples for culture. The urgency of total detection will dictate whether 2, 3 or even 4 samples should be taken.
3. Deliver the milk samples to the laboratory soon (4-6) after collection and keep them in crushed ice until they reach the laboratory.
4. If milk samples are to be frozen, try to limit the storage time in the freezer to less than one week.

Even when all your collection, storage and deliver strategies have been properly accomplished, there may still be up to 30% of the samples that are reported NG. Depending on the clinical signs on your dairy and previous culture results, you may be justified in concluding that these cases were due to coliforms in most of the NG cases. Your herd veterinarian can help you optimize your mastitis culturing program.