Bulk Tank Cultures are the Dairyman's Best Friend

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The single most powerful tool for producing quality milk is routine monitoring of the types of bacteria in the bulk tank. This task can be performed done by the motivated diary operator or by one of the farm service providers. The two main sources of bacteria in raw milk are organisms transported from the environment into the milking machine and mastitis organisms from within the udder. Bacteria deposited in milk handling equipment will multiply and become a major source of contamination if this equipment is not cleaned and sanitized properly. Some form of testing for bacterial contamination is done periodically on all farms to assure compliance with national, state, and local requirements.

Tests routinely performed by the milk plant assess the bacterial quality of raw milk is the standard plate count (SPC) or Plate Loop Count (PLC) and more recently the Bactoscan. These are broad-spectrum tests indicate the number of bacteria present in the milk, but do not identify the types of organisms present and have little diagnostic value in determining the cause of bacterial contamination. Additional testing is required for diagnostic purposes.

A quantitative bulk tank culture is commonly used to diagnose mastitis problems and the cause of High Somatic Cell Counts. Information from the quantitative bulk tank culture can also be used to diagnosis the cause of high bacteria counts. High bacteria counts may result when certain types of mastitis organisms such as Strep. ag. or Step. uberis are present in the herd. The number of streps from the quantitative bulk tank culture can be used to estimate the contribution of these organisms to the Total Bacteria count or SPC.

A major source of coliform bacteria in bulk tank milk is transportation of soil from the teats and udders into the milking machine. The Coliform count thus provides an indication of both the effectiveness of cow preparation procedures during milking and the cleanliness of the cows' environment. Coliform counts between 100/ml and 1000/ml are generally an indication of poor milking hygiene. Coliforms will also incubate in residual films left on milk contact surfaces. Coliform counts in excess of 1000 suggest incubation in milk handling equipment. A Coliform count less than 100/ml of milk is considered acceptable for raw milk for pasteurization. In states where raw milk may be sold to consumers, Coliform count must be less than 10/ml. Coliform counts less than 10/ml indicate excellence in both pre-milking hygiene and equipment sanitation.

Another bulk milk test that provides diagnostic value is Lab Pasteurized Count (LPC) or Thermoduric count. Most milk testing labs will do this test if asked but it is not routinely performed in most parts of the country. The LPC test is performed in the same way as the SPC except that the milk sample is pasteurized at 63 C for 30 minutes before plating and incubation. This procedure kills the usual mastitis-causing bacteria (including

coliforms) leaving only those organisms from the environment that can survive elevated temperatures. These types of organisms will grow and multiply in the milk handling equipment if cleaning and sanitation procedures are inadequate. Poor milking hygiene results in an elevation of both Coliform and SPC with a near normal LPC if the milking machine is clean. When milking equipment is not cleaned effectively, both Coliform and LPC will be elevated due to coliforms growing in soil films in the milking machine. Incubation of the milk films in the milking system will elevate SPC, Coliform, and LPC. The LPC should be below 100/ml to 200/ml if equipment cleaning and sanitation are good. A LPC below 10/ ml indicates excellent equipment hygiene.

When the routine bulk tank testing indicates that a problem exists, more detailed tests can be performed to further isolate the source of the problem and recommend the most effective methods to solve it. Strategic sampling of milk in different locations will determine if the location of a cleaning failure and/or incubation problem is: in the milking units, milkline and receiver, in the milk transfer line (including filters and pre-coolers), or in the bulk tank Strategic sampling of milk at different times during the milking process will determine if incubation in the milk handling system is a major source of contamination.