

Raw Milk Bacteria Tests – What Do They Indicate?

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Dairy producers know that the quality of milk and dairy products that consumers purchase depends in large part on the quality of milk they produce. While there can be handling problems by processors, distributors, and retailers, the quality of the milk will never be better than it was when produced at the farm. To monitor the milk quality at the farm, regulatory agencies check periodically for somatic cell and bacteria counts, among other things. In addition, milk marketing cooperatives/handlers also check the milk for various things.

Most producers regularly receive information on the somatic cell count, standard plate bacteria count, and the preliminary incubation bacteria count of the milk they produce. However, many producers do not understand what these tests indicate, especially the bacteria tests. Dr. Steven Murphy from Cornell University described in a paper he wrote a few years ago what these two bacteria tests indicate. His comments are summarized below.

The Standard Plate Count (SPC) of raw milk gives an indication of the total number of aerobic bacteria present in the milk at the time of pickup at the farm. Milk samples are plated onto a nutrient media, incubated for 48 hours at 90°F, and then the number of bacteria colonies are counted. The value is reported as number of colony forming units per milliliter of milk. The legal limit of the number that can be in milk is 100,000, but most producers usually have values below 10,000. The most frequent cause of a high SPC is poor cleaning of the milk system (milking units, lines, bulk tank). Another cause frequently found is failing to rapidly cool milk to less than 40°F. Sometimes milking cows with dirty teats, and maintaining unclean milking and housing facilities can be the cause.

The Preliminary Incubation Count (PIC) reflects milk production practices. PICs are generally higher than SPCs, with values more than 3-4 times the SPCs being considered worthy of seeking corrective measures. Values more than 50,000 should be of concern regardless of the SPC values. To obtain PICs, milk samples are held at 55°F for 18 hours prior to plating and counting the bacteria colonies. This process encourages the growth of bacteria that grow well at cool temperatures. High PICs are usually associated with milking cows that have not been properly cleaned prior to milking, or using milking equipment that is not properly cleaned and sanitized. Bacteria that are considered to be natural flora of the cow, including those that cause mastitis, are not thought to grow significantly at the PI temperature. Marginal cooling or prolonged storage times may also result in unacceptable PIC levels. PICs equal to or slightly higher than SPCs greater than 50,000 may suggest that the high SPC is possibly due to mastitis. The PIC of a raw milk supply does not usually indicate the potential quality of a pasteurized product made from that milk.

In summary, these two bacteria tests, as well as the other milk quality tests done on raw milk, serve as monitors for both regulators and producers to use as they attempt to produce the highest quality milk possible for consumers. For more information on production practices to follow to keep SPCs and PICs low, producers should contact their milk handler field representative or other qualified advisor.