Factors that Increase PI Count in Milk

By: Selene Reeves and D. M. Amaral-Phillips, Ph.D.

The goal of any dairy producer is to maximize milk production while producing quality milk. Somatic cell count or SCC is a universal method to determine presence of an infection based on the number of somatic cells within the milk. A low SCC is one measure of milk quality within a herd. However, there may still be evidence of milk quality issues even when SCC is low. The preliminary incubation (PI) count is a unique test that has the ability to detect bacteria that grow in cold environments called psychrotrophic bacteria. By holding milk at 55°F for 18 hours, these bacteria can be detected. If these bacteria are not controlled, milk bonuses can be lost. From a producer standpoint, PI count can be used as a reflection of cleanliness of equipment and cows. Ideally, farms should strive for a low PI (<10,000 cfu/mL). Increases in PI can be linked to the following factors:

**Milking Equipment Water Wash Temperature** – A major contributor to a high PI count is using wash water that is not hot enough when cleaning milking equipment with detergent. Make sure the wash water temperature is between 155 to 170°F at the start. Drain water when wash water temperature reaches 120°F, if not before.

**Acid Sanitation** – The last step in equipment sanitation after using hot water and detergent should be an acid wash to prevent bacterial growth over a longer period of time.

**Rubber Parts** – Rubber parts, i.e. hoses, gaskets, and liners, need to be properly cleaned, air dried and changed on a set schedule as indicated by the manufacturer. Cracks within the rubber parts can house bacteria and lead to a high PI count.

**Bulk Tank** – The bulk tank should be cleaned after each milk pick-up similar to the milking equipment. Wash water with detergent should start washing at greater than 155°F and conclude before the wash water is at 120°F.

**Sanitizers** – An iodine or chlorine sanitizer is recommended to use just before milking.

**Refrigeration** - Poor cooling of milk in a bulk tank will allow psychotropic bacteria to grow. Milk should be down to 40°F within 1 hour of milking for the first milking stored in the bulk tank and down to 36 to 38°F within an additional hour. For subsequent milkings, blend temperature should remain below 45°F and then cooled as for the first milking. Storing milk at temperatures of 33 to 35°F may not completely kill temperature resistant bacteria, but it can significantly slow their growth.

**Cleanliness of Udder** – Teats should be sanitized then wiped with a clean towel until free of dirt and moisture. Various species of bacteria will grow on the udder without proper teat preparation and drying practices.

**Teat Cup Liners** – Liners need to be cleaned after each milking and replaced after the recommended number of milkings.

The goal of PI is to detect hygiene practices on a farm. Therefore, a high PI count can be an indication of improper habits on the farm. Proper sanitation practices in accordance with the list above should be applied to potentially lower the PI count.