The Voluntary Shelf-Life (VSL) Program – A free resource for fluid milk processors

**Background and Overview**

The Milk Quality Improvement Program (MQIP) is an extension-based program funded by the New York State Dairy Promotion Order (NYDPO), dairy farmers dedicated to the production, manufacture and distribution of high quality dairy products. Consistent high quality dairy and fluid milk products are essential to allow successful competition with other food and beverage products. A primary focus of the MQIP is the Voluntary Shelf-Life (VSL) Program, which is designed to monitor the quality and shelf-life of fluid milk products through microbiological, chemical and sensory analyses. This **free service, funded by the NYSDPO, is offered to fluid milk processors in NY** who are provided with feedback on the quality of their products and, when requested, assistance in improving and maintaining quality. A specific goal of this program is to use benchmarking of processed fluid milk quality in New York to continue to improve fluid milk quality and safety.

**VSL Testing**

Microbiological, chemical and sensory testing are performed on VSL milk samples throughout shelf-life. Testing typically begins with 48h of processing and testing occurs at 7, 10 and 14 days post-processing (samples from a subset of plants also receive testing at 17 and 21 days post-processing). These tests include:

- Standard Plate Count (all testing days)
- Gram-Negative Bacteria Count (all testing days)
- Coliform Count (first test day only)
- Freezing Point and Butterfat (first test day only)
- Flavor Analysis (days initial, 14 and 21)

Results are reported to participating processors twice throughout the testing period and VSL field team members follow up with processors to answer questions and provide support.
Factors Affecting Fluid Milk Quality

Fluid milk quality starts on the farm where high quality raw milk provides an essential foundation for high quality fluid milk. Farm factors that influence finished product quality include bacterial levels and types as well as sensory properties originating from farm sources.

Practices in the processing facility also impact fluid milk quality, with post-pasteurization contamination the biggest influencer of product quality and shelf-life.

Beyond VSL

The Milk Quality Improvement Program laboratory at Cornell University conducts a variety of applied research projects related to the quality and safety of dairy products. Some examples include:

- The sources and roles of sporeforming bacteria in raw milk and dairy products
- Evaluation of methods for determination of quality of raw milk and pasteurized dairy product
- Utilization of molecular fingerprinting tools to facilitate farm-to-product source tracking and raw milk quality improvement
- Establishment of a database for dairy spoilage organisms & pathogens; development of tracking system for their origin
- Influence of processing parameters on bacterial outgrowth in milk (e.g., pasteurization temperature’s influence on spore-formers)

VSL FAQs

Q: How much does the VSL program cost processors?
A: The VSL program is funded by NY state dairy farmers through dairy check-off and is offered to NY fluid milk processors at no cost!

Q: What organisms are typically responsible for fluid milk spoilage?
A: Fluid milk that is exposed to recontamination in the processing facility is commonly spoiled by Pseudomonas, which can spoil milk by 7 to 10 days after pasteurization. Product not exposed to post-processing contamination (PPC) is likely to spoil due to sporeforming bacteria that reach the PMO limit by 17 to 21 days after processing.

Want more information on the Voluntary Shelf-Life Program? Contact Nicole Martin (nicole.martin@cornell.edu) in the Milk Quality Improvement Program or visit our website https://foodsafety.foodscience.cornell.edu/mqip/

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