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QMI Newsletter

The QMI Probe-Septum

QMI has recently introduced a modification of the QMI Safe-Septum/Aseptic Sampling System.

The QMI Probe Septum allows processors to aseptically place temperature probes, pH probes, oxygen sensing probes and other similar products that measure various perimeters for processing.

The QMI Probe Septum also will facilitate the use of time/temp. recorders that are presently being introduced to the dairy, pharmaceutical and food processing industries.

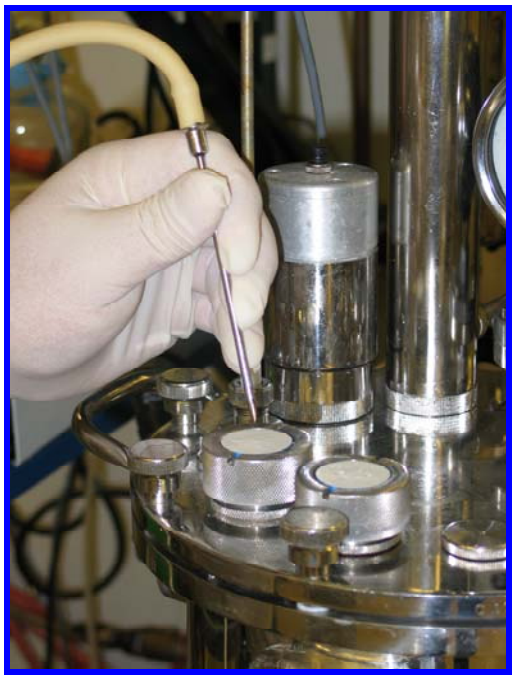
As with the QMI Safe-Septum & the QMI Aseptic Sampling System, the Probe-Septum is pre-sterilized and can be retrofitted easily onto any processing line, fermentation vessel or other closed stainless steel system.

The Probe-Septum also accommodates large needle use. Needles as large as 10 gauge can be inserted into the Probe-Septum to sample or inoculate viscous liquid.

It is designed with one large needle channel in the middle of the Septum which accommodates the large needle or probe. There are also 6 remaining needle channels around the outside of the Septum which will accommodate sampling with an 18 gauge 1 1/2" needle.

The Probe-Septum is made of silicone and is FDA approved for food contact surface material use.

If you would like more information or would like to request a sample of this product, please contact QMI.



Special Points of Interest:

The QMI Probe-Septum Is:

1. Aseptically Designed,
2. Pressure & Temp. Safe,
3. Easily Retrofitted, and
4. FDA Approved for Food Contact Surfaces.

Factors to Consider for Improving the Quality of Market Milk

"Research has shown that the use of the QMI Aseptic Sampling System along with the QMI Composite Sampling Bag proves very effective in monitoring the effects of psychrotrophic spores in fluid milk"

There is agreement among industry leaders, regulatory agencies, academics and others concerned with quality of market milk that post-pasteurization contamination is the major cause of quality defects. There are many sources of post-pasteurization contamination including inadequate cleaning and sanitizing, contaminated water, condensation, engineering defects such as cracked tanks or cracked HTST plates, condensation in compressed air and other sources. Undoubtedly contamination from these sources can result in poor keeping quality, consumer complaints and reduced profits.

In addition, raw milk quality can greatly influence the keeping quality of market milk. Off-flavors inherent in the milk, heat-stable enzymes, and psychrotrophic spore forming bacteria can all influence the keeping quality of milk.

In this Newsletter, we will discuss a procedure that can be used to determine the influence of psychrophic spore forming bacteria on the keeping quality of fluid milk products.

Before the 1970's, little was known about the effects of psychrotrophic spore forming bacteria on milk quality. In the early 1970's Mikolajcik and others at Ohio State University were among the first to point out the potential quality defects caused by psychrotrophic sporeformers. They conducted an extensive study on psychrotrophic sporeformers in market milk. The intent of the research was to determine sources of these organisms, growth characteristics and the spoilage problems associated with psychrotrophic spores.

They pointed out that likely sources of this organism included mud, dust and water on the farm. Secondly, they determined that the spores could survive heat treatment of 176°F for 10 minutes. In fact, they found that this heat activation actually resulted in spores readily germinating and outgrowing in milk.

They also did a survey of 109 raw milk samples where they heated raw milk samples to 176°F for 12 minutes with subsequent storage at 45° F for up to 4 weeks. After 4 weeks of storage, 83% of the samples had psychrotrophic counts greater than 100,000/ml. with 40% of those having greater than 10,000,000/ml.

They concluded that the outgrowth of psychrotrophic spores could result in spoilage of fluid milk.

They pointed out that psychrotrophic spores have been shown to be responsible for off-flavors such as bitter, fruity, rancid and sour. They also found that sporeformers can produce a sweet curdled defect in refrigerated milk.

Mikolajcik suggested a laboratory procedure to monitor for psychrotrophic sporeformers by utilizing 100 - 200 ml. samples which would then be heated to 176°F for 10 minutes. They are then cooled and plated on plate count agar with the plates incubated for 10 days at 45°F. They also suggested that incubating the heated milk samples for 7-14 days at 45°F and observing the flavor, odor and sweet curdling.

Recently, QMI and the University of Minnesota have conducted a survey to determine the effect of psychrotrophic spores on today's milk quality. Table 1 shows the plate counts of samples collected with the QMI Aseptic Sampler and the QMI Composite Bag from the discharge at the HTST. These samples were determined to be free from gram-negative bacteria and were shown to grow out gram-positive (psychrotrophic sporeforming bacteria) in some samples. These samples were taken from two different plants on 6 different days. The results of this study were similar to the Mikolajcik study which shows that psychrotrophic spores can affect today's microbiological quality of fluid milk.

To determine if psychrotrophic sporeformers are affecting the quality of your fluid milk products, we suggest the following procedures:

1. Using the QMI Aseptic Sampling System, aseptically obtain a 2L or 5L pasteurized milk sample using the QMI Composite Sampling Bag.
2. Incubate the bag for 18-24 days (end of code) at 45°F (7°C).
3. Conduct a Standard Plate Count.
4. Identify any bacteria using gram stain procedures or other procedures for samples with counts greater than 10,000,000/ml.

Table 1 - Weekly Counts from Milk Samples Taken at the HTST and stored at 45ºF.

Sample	Dairy	Bag	Volume	Week 1 CFU/ml		Week 2 CFU/ml		Week 3 CFU/ml		Week 4 CFU/ml	
			L	Gram-	Gram+	Gram-	Gram+	Gram-	Gram+	Gram-	Gram+
Date:				3/23/2004		3/30/2004		4/7/2004		4/13/2004	
Day:				7		14		22		28	
3/16/2004	Plant B	A	1.3	<10	<10	<10	<10	<10	<10	<10	<10
Tuesday		B	1.5	<10	<10	<10	<10	<10	<10	<10	<10
				Gram-	Gram+	Gram-	Gram+	Gram-	Gram+	Gram-	Gram+
				3/24/2004		3/31/2004		4/7/2004		4/15/2004	
Day:				7		14		21		29	
3/17/2004	Plant A	A	1.2	<10	<10	<10	<10	<10	7.56×10^4	<10	1.0×10^6
Wednesday		B	1.2	<10	<10	<10	<10	<10	2.33×10^4	<10	1.93×10^6
				Gram-	Gram+	Gram-	Gram+	Gram-	Gram+	Gram-	Gram+
Date:				3/31/2004		4/7/2004		4/15/2004		4/21/2004	
Day:				7		14		22		28	
3/24/2004	Plant A	A	1.2	<10	<10	<10	3.0×10^2	<10	1.41×10^6	<10	1.05×10^7
Wednesday		B	1.2	<10	<10	<10	0.4×10^2	<10	0.95×10^6	<10	3.1×10^7
				Gram-	Gram+	Gram-	Gram+	Gram-	Gram+	Gram-	Gram+
Date:				4/7/2004		4/14/2004		4/21/2004		4/28/2004	
Day:				7		14		21		28	
3/31/2004	Plant A	A	1.2	<10	<10	<10	<10	<10	<10	<10	<10
Wednesday		B	1.2	<10	<10	<10	<10	<10	<10	<10	<10
				Gram-	Gram+	Gram-	Gram+	Gram-	Gram+	Gram-	Gram+
Date:				4/9/2004		4/16/2004		4/23/2004		4/30/2004	
Day:				7		14		21		28	
4/2/2004	Plant B	A	1.0	<10	<10	<10	7.7×10^2	<10	6.7×10^5	<10	2.5×10^6
Friday		B	1.1	<10	<10	<10	5.8×10^2	<10	4.96×10^5	<10	6.5×10^6
				Gram-	Gram+	Gram-	Gram+	Gram-	Gram+	Gram-	Gram+
Date:				4/22/2004		4/29/2004		5/6/2004		5/12/2004	
Day:				7		14		21		27	
4/15/2004	Plant B	A	1.1	<10	<10	<10	<10	<10	<10	<10	6 x 10
Thursday		B	1.2	<10	<10	<10	<10	<10	<10	<10	<10

Utilization of the QMI Composite Sampling Bag to Determine the Effect of Gram-Positive Psychotrophic Bacteria on Dairy Product Quality

Objectives: To determine if gram-positive psychotrophic bacteria from raw milk can grow to large populations, at or before the end of code, affecting dairy product quality.

How the Procedure Works: Raw milk supplies are likely to contain gram-positive spore-forming bacteria. Some of these bacteria are capable of growth at refrigeration temperatures, resulting in curdling and other quality defects. These procedures can indicate the potential for psychotrophic sporeformers from raw milk to affect fluid milk quality.

Procedures:

A. Using the QMI Aseptic Sampling System, aseptically obtain a 2L or 5L milk sample using the QMI Composite Sampling Bag.

B. Incubate the bag for 18-24 days (2 days beyond end of code) at 45° F. (7° C.)

C. Conduct a Standard Plate Count.

Identify any bacteria using gram stain procedures or other procedures for samples with counts greater than 10,000,000/ml.

Interpreting Results:

Counts greater than 10,000,000/ml. would indicate that the psychotrophic thermoduric bacteria present in the milk have the potential for creating dairy product quality defects. These defects may include curdling, bitter flavors and other defects consistent with thermoduric bacteria.

PACKAGED PRODUCTS

7 Port Aseptic Sampler

12 Port Aseptic Injection Port

Biotest Laboratories - Minneapolis, Minnesota

Ensures QMI Products Conform to Specifications

Biotest Laboratories was founded by Gregg A. Mosley in 1988 to provide process validation, consulting and laboratory testing for manufacturers of medical products. Laboratory services include bacterial endotoxin, chemistry (residual analysis), bioburden, sterility, anti-microbial effectiveness, microbial limits and general microbiology.

Quality Management, Inc. (QMI) was the first packaging client to come through the doors of Biotest Laboratories in 1989. As the applications and market for QMI products have grown, so has the longstanding relationship between QMI and Biotest. Related services now provided to QMI include assembly, packaging, labeling and preparation for sterilization and laboratory testing.

Biotest Laboratories became certified to ISO 9000 and later added ISO 13488 and ISO/IEC 17025 as the international recognition of the need for such requirements broadened.

QMI products are assembled and packaged using the same procedures and processes that they use for medical devices. QMI has benefited from Biotest Laboratories's unique processes for cleaning, passivation, measurement, inspection, assembly, packaging and labeling. QMI products are assembled and packaged in conformance to applying quality system requirements. These measures ensure that QMI products are sterile and conform to specifications.

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