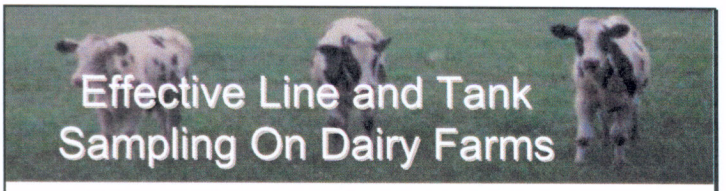
1



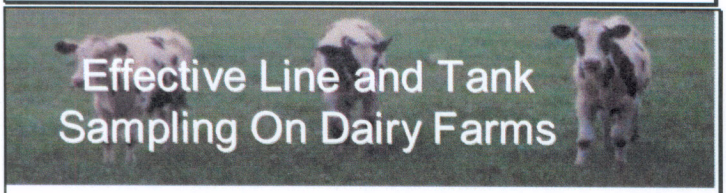
Effective Line and Tank Sampling On Dairy Farms

Darrell L. Bigalke
Environmental Dairy Microbiologist
President, QMI® – Quality Management, Incorporated

www . qmisystems . com

426 Hayward Ave. No., Oakdale, MN 55128
Tel: 651-501-2337; Fax: 651-501-5797
Email: info@qmisystems.com

2

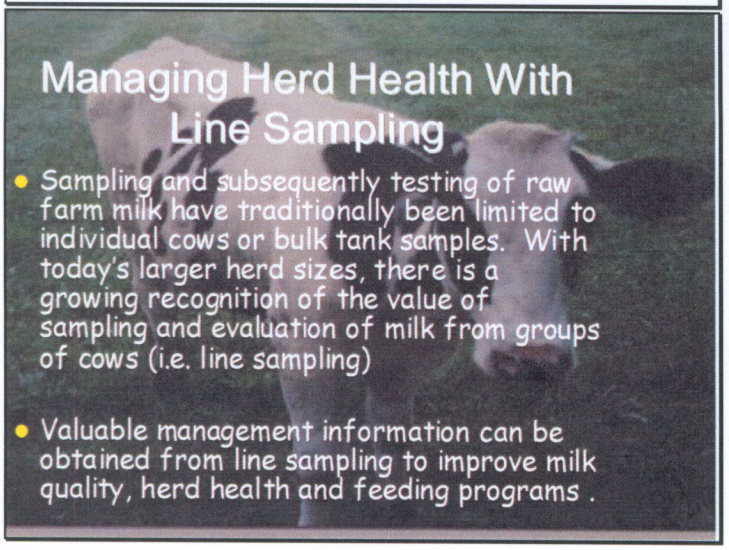


Effective Line and Tank Sampling On Dairy Farms

Key points:

- Your test is only as accurate as your sample
- **Line sampling** of cow groups is necessary for:
  - component analysis of milk for feeding program management
  - bacteriological and somatic cell counts monitoring
  - specific bacteria cultures assessment
- **Tank sampling** is necessary for accurate testing of milk to achieve bonuses and maximum profits
- Be proactive, not merely reactive .

3



Managing Herd Health With Line Sampling

- Sampling and subsequently testing of raw farm milk have traditionally been limited to individual cows or bulk tank samples. With today's larger herd sizes, there is a growing recognition of the value of sampling and evaluation of milk from groups of cows (i.e. line sampling)
- Valuable management information can be obtained from line sampling to improve milk quality, herd health and feeding programs .

4

Veterinary PathoBiology Study # 1 Scope

The University of Minnesota Departments of Clinical and Population Medicine, Pathobiology, and Animal Science studied the accuracy of milk line sampling for dairy farm milking systems

Journal of Dairy Science (J. Dairy Sci. 85-1468-1475)

- 42 paired milk line and bulk tank samples were collected from 21 herds.
- The line samples were obtained with the QMI® Aseptic Elbow Sampler positioned at a location past the plate cooler in the milking equipment.
- Along with line samples, bulk tank samples were collected.
- Both sources of samples were evaluated for various milk components and bacterial cultures .

5

Veterinary PathoBiology Study # 1 Results

- Data from samplers for milk fat, true protein, milk urea nitrogen, other solids and solids not-fat for both line and bulk tank samples indicated no statistical differences in line samples and bulk tank samples
- This suggests that the QMI® Line Sampling System is a sampling method that yields accurate results for milk component testing
- Test results are only as accurate as the sample .

6

Veterinary PathoBiology Study # 2 Scope

Researchers at the University of Minnesota also evaluated the accuracy of the QMI® Line Sampling Elbow for somatic cell counts and bacterial cultures for

- S. agalactiae
- S. aureus
- S. (non-agalactiae)
- Coliform
- coagulase-negative staphylococci

Journal of Dairy Science (J. Dairy Sci. 85-2192-2196)

7

Veterinary PathoBiology Study # 2 Results

- Neither a numerical or statistical difference existed between samples of milk obtained from the QMI® Aseptic Elbow Samplers and Bulk Tank Samplers
- Good to very good agreement existed between milk line and bulk tank samples for bacterial counts when categorized into low, moderate or high levels
- Excellent agreement existed between the two sample types in determining whether a herd was positive or negative for either S. agalactiae or S. aureus
- Results from these studies suggest that the strategy of milk line sampling is an effective monitoring tool to achieve proper management for milk quality and herd health .

8

Veterinary PathoBiology Studies

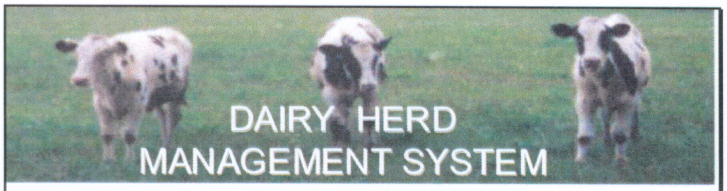
- The studies point out that the QMI® Aseptic Sampling System is an inexpensive, timely and accurate method of obtaining information that will help improve dairy herd management programs
- Since test results are only as accurate as the sample, the QMI® Sampler is a valuable asset to any dairy farm .

9

QMI ® Sampling Benefits

- Aseptic – obtained in a way that does not contaminate the product or the sample
- Results = well managed herd
- Satisfactory component analysis
- Rapid response to bacterial problems
- Effective sampling results in accurate testing, which leads to bonuses and maximum profits .

10



DAIRY HERD MANAGEMENT SYSTEM

Cow Group Sampling

Bacteriological Monitoring

Somatic Cell Count Monitoring

Component Analysis

Assure Quality And Maximum Profits

11

BACTERIAL HAZARDS TO HERD HEALTH

- S. agalactiae
- S. aureus
- S. (non-agalactiae)
- coliform
- coagulase-negative staphylococci
- others .

12

Your Test Is Only As Accurate As Your Sample

- QMI's pre-sterilized, aseptic system prevents contamination during sampling, assuring accurate bacterial counts and reliable results
- QMI® Samplers are pressure and temperature safe, allowing proper cleaning and sanitizing .

13

Dairy Farm Feeding Programs Should Be Managed By Proper Line Sampling of Cow Groups

- Line sampling elbows with tri-clamp connections offer hassle-free installation
- The QMI® Sampling Bags allow timed sampling of cow groups, assuring accurate composite samples, which are necessary for component analysis of milk
- Accurate analysis of milk is required for proper feeding program management .

14

QMI ® Line Sampling of Cow Groups For Herd Health

Necessary for:

- Bacteriological count to manage quality
- Somatic cell counts to manage quality
- Specific bacteria culture identification to assure effective treatment programs

15

QMI ® Tank Sampling

- Necessary to assure bonuses and maximum profits
- Prevents inaccurate high counts caused by contaminated sampling
- QMI's sanitary design is 3A authorized
- QMI's system is made with FDA approved food contact material .

16

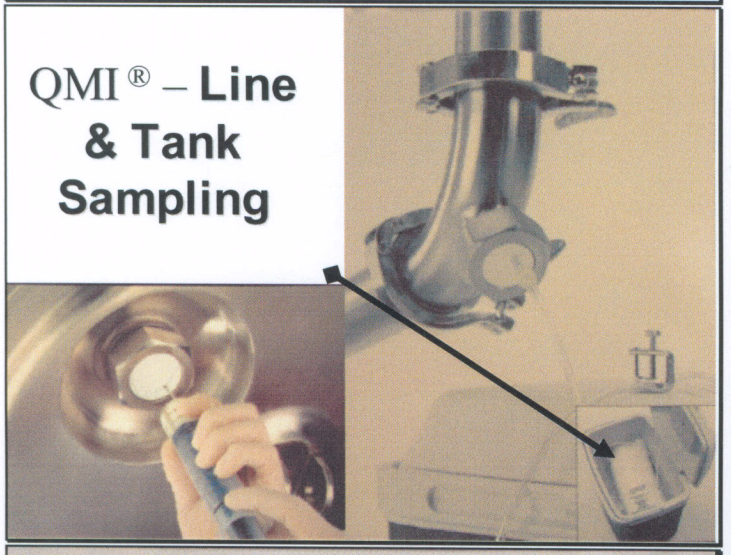
QMI ® Aseptic Sampling System

The QMI ® System allows you to have confidence that your sampling procedure will not jeopardize your test results

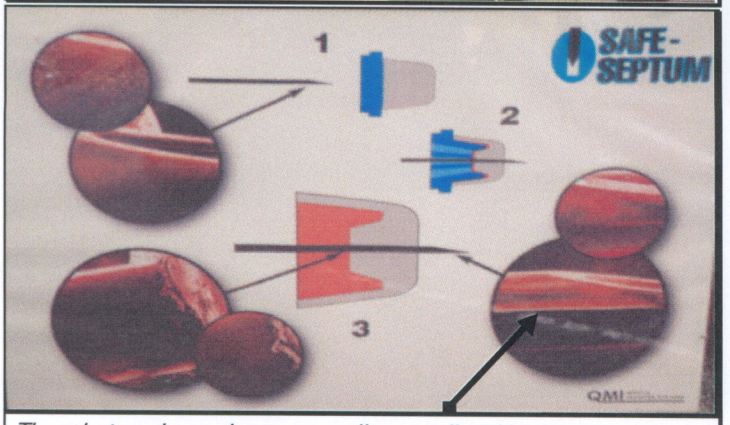
- Samplers are pre-sterilized.
- Aseptically designed.
- Used world-wide in more than one thousand dairy processing plants.
- QMI has a twenty year history of satisfied customers.
- QMI's system is proven in validation studies to be effective when used according to the QMI ® SOP (standard operating procedures) .

17

QMI ® – Line & Tank Sampling

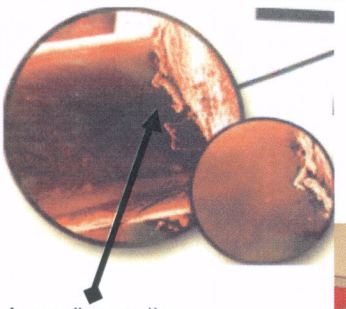


18



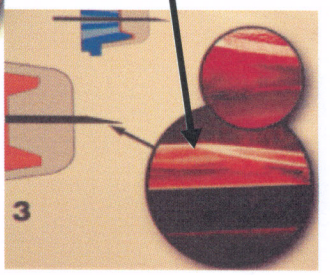
The photos above show a sampling needle with electron scanning microscopy (ESM).
In this validation study, a deliberately contaminated needle emerges from the QMI ® system free of bacteria.

19



A sampling needle photographed with ESM show that the wall of the QMI system fits very tightly around the barrel of the needle and excludes bacteria from the injection .

In a validation study, a deliberately contaminated needle emerges from the QMI system free of bacteria.



20

QMI's Current Research

- QMI® – Quality Management, Incorporated conducts on-going research in various aspects of dairy farm sampling.
- For up-dates, ask for QMI's Newsletter. Send your mailing information to QMI by email: info@qmisystems.com, by mail: QMI, 426 Hayward Ave. No., Oakdale, MN 55128, or call: 651-501-2337.
- Visit QMI's website: www . qmisystems . com

This is the end of the presentation on *QMI's EFECTIVE LINE AND TANK SAMPLING ON DAIRY FARMS*

The next four slides give detailed installation and use instructions for using the QMI ® Aseptic Sampling System with the QMI ® Composite Bag .

21

Proper Use of the QMI ® Aseptic Sampling System:

1. Install a QMI ® Tri-Clamp Elbow (or Weld Elbow) at a convenient sampling location. We recommend locating it after the plate cooler, if present, and that the elbow be in a downward or bottom placement along the line (to prevent drawing a sample from airspace inside a line).

2. Place the QMI ® Aseptic Sampler into the stainless steel seat on the QMI ® Elbow. After installing the Sampler, hand tighten the nut and then give it an additional ¼ to ½ turn with a wrench. This will prevent leaking.

3. Sanitize the surface of the Sampler with alcohol prep or other sanitizer. Then insert a needle through the white plastic cover at one of the dimples above a needle-guide channel in the Sampler. Slant the needle toward the center of the Sampler along the needle-guide channel. If resistance is felt, the angle is not proper. Each sampler has seven (7) needle-guide holes which provide seven (7) sterile locations for sampling.

22

Proper Use of the QMI® Aseptic Sampling System (continued):

4. After sampling, remove the needle from the sampler and place the shield over the needle to prevent injury. Remove the shielded needle from the tubing by turning it to the left and properly dispose of the needle in a sharps container.

5. Cover the stainless steel nut with the orange Dust Cover to protect the Sampler when it is not being used.

6. After seven (7) samples have been taken, remove and discard the Aseptic Sampler. Then replace it with a new Sampler, shipped sterile in a sealed packet.

23

Proper Use of the QMI® Sampling Assembly Bag:

1. Place the bag into a container of ice or ice water to reduce or eliminate bacterial growth during the sampling process.

2. Using the QMI® Flow Control Clamp, adjust the flow for the proper rate of filling the bag during sampling.
We recommend 3 to 5 mls per cow and 500 to 1500 ml total sample per group.

3. The needle should have been covered with the shield immediately after taking the sample to prevent injury and the shielded needle removed from the tubing by turning it to the left and properly disposing in a sharps container.

24

Proper Use of the QMI® Sampling Assembly Bag (continued):

4. Mix the milk inside the bag and pour the proper amount into a shipping container.

5. Please be aware that each QMI® Sampling Assembly Bag is shipped sterile and is intended for a single use.
Each QMI® Aseptic Sampler also is shipped sterile and will accommodate collecting seven (7) samples per Sampler.