CENTER FOR MILK & DAIRY PRODUCT SAFETY

BULK MILK HAULER/SAMPLER MANUAL

2014

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Environmental Health Bureau
Office of Food Protection
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TABLE OF CONTENTS

PURPOSE

This manual is provided as a training tool and an up-to-date reference guide for Maryland Bulk Milk hauler/samplers. The material in this manual addresses rules, regulations, and practices for the State of Maryland only. Topics covered in this manual include proper techniques and procedures for collection, transport and delivery of milk from the dairy farm to the receiving plant. Uniform hauler/sampler methods are essential,in order to assure that the producer, the dairy cooperative, and the milk processor are each treatedequally and fairly. This manual also covers the requirements for milk tank truck inspections. Remember that dairy cooperatives, processors, and plants may have more stringent requirements than those set forth by State and Federal Regulatory agencies.

INTRODUCTION

The bulk milk hauler/sampler has a unique and important role in the dairy industry. The hauler/sampler is one of the most important links between the milk producer and the milk processor. The Center forMilk and Dairy Product Safety recognizes the great responsibility that is involved while being this crucial link. The judgment and actions of the hauler/sampler have a direct impact on the quality of milk that ultimately reaches the consumer. Dairy processors depend on the hauler/sampler's knowledge for quality milk. Therefore, it is important to use proper techniques and procedures to prevent contamination of the milk while grading, measuring, sampling, and pumping. This will also ensure that producers are paid for the exact amount of milk they produce, while processors pay for the exact amount they processors pay for the exact amount they receive. The ability to operate a bulk milk tank truck, alongwith the following list of skills, will ultimately help you become a successful bulk milk hauler/sampler:

- Professionally represent the food industry through personal cleanliness and well-mannered communication. This includes using proper sanitation procedures, practicing good hygiene,

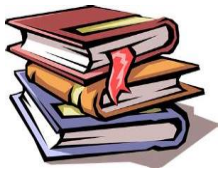
as well as maintaining your vehicle in a satisfactory condition.

- Accurately determine and record the weight of the milk in the farm bulk tank.

- Be the judge of acceptable milk quality and objectively evaluate the milk, before it leaves the farm. Always take the time to observe and smell the milk, before taking and recording the temperature. The quality of milk delivered to the plant depends on how well the hauler identifies and eliminates all unsatisfactory milk before it is pumped onto the tank truck. The hauler/sampler determines which milk will reach the dairy processor and ultimately the consumer.

- Properly collect, identify and care for the official representative milk sample, to be submitted for laboratory analysis. A true sample must be obtained, so that quality and composition tests will accurately represent the contents of the farm bulk tank. If proper procedures are not followed and a mistake in evaluation occurs, the milk may be improperly accepted or rejected. This may result in unsafe or poor quality milk reaching the consumer, or the loss of money for either the producer or processor.

DEFINITION OF TERMS



1. **Bulk Milk Hauler/Sampler:** Any individual who is permitted by a regulatory agency to grade, sample, measure, pick up and transport raw milk and/or raw milk products to or from a milk plant, receiving or transfer station.

2. **Bulk Milk Pickup Tanker:** A vehicle, including the truck, tank and appurtenances necessary for its use, used by a bulk milk hauler/sampler to transport bulk raw milk from a dairy farm to a milk plant, receiving or transfer station.

3. **Dairy Farm:** Any place or premise where one or more lactating animals are kept, and from which a part or all of the milk or milk product(s) produced, are provided for sale to a milk plant, receiving or transfer station.

4. **Center for Milk and Dairy Product Safety:** In the State of Maryland, this office is the regulatory agency responsible for enforcing dairy laws and regulations. The Center for Milk and Dairy Product Safety is part of the Department of Health and Mental Hygiene, Office of Food Protection and Consumer Health Services.

5. **Farm Bulk Milk Tank:** A stainless steel tank located in the milk house of a dairy farm, where properly cooled, raw milk is stored, before it is collected by a bulk milk hauler/sampler.

6. **Milk:** The normal lacteal secretion, practically free from colostrum, obtained by the complete milking of one or more healthy lactating animals (example: cows, goats or sheep).

7. **Milk Pickup Tickets:** A form that is completed by the hauler/sampler at the time of

pickup, and left at the farm. See **Appendix E** for the required information for milk pickup tickets.

8. **Milk Plant:** Any place, premises or establishment where milk or milk products are collected, handled, processed, stored, pasteurized, ultra pasteurized, aseptically processed, packaged, or prepared for distribution.

9. **Milk Producer:** Any individual that operates a dairy farm and provides, sells or offers milk for sale to a milk plant, receiving or transfer station.

10. **Milk Tank Truck:** Term used to describe both a milk pickup tanker and a milk transport truck.

11. **Milk Tank Truck Driver:** Any individual who transports raw or pasteurized milk products to or from a milk plant, receiving or transfer station. Any transportation of a direct farm pickup requires the milk tank truck driver to have responsibility for accompanying official samples.

12. **Milk Tank Truck Cleaning Facility:** Any place, premises, or establishment, separate from a milk plant, receiving or transfer station, where a milk tank truck is cleaned and sanitized.

13. **Milk Transport Tank:** A vehicle, including the truck and tank, used by a hauler/sampler, for transporting bulk shipments of milk from a milk plant, receiving or transfer station to another milk plant, receiving or transfer station.

14. **Milk Transportation Company:** The entity responsible for a milk tank truck.

NOTIFICATIONS TO THE CENTER FOR MILK AND DAIRY PRODUCT SAFETY

The Center forMilk and Dairy Product Safety must be notified when:

- A bulk milk tank truck is involved in an accident that results in milk leakage, spillage, or requires the transfer of milk.
- A hauling company transfers ownership, has a name change, address change, or goes out of business.
- A licensed bulk milk hauler/sampler transfers employment to a different milk transportation company.
- A bulk milk hauler/sampler has a change of address.

(See page 26 for The Center for Milk and Dairy Product Safety contact information).

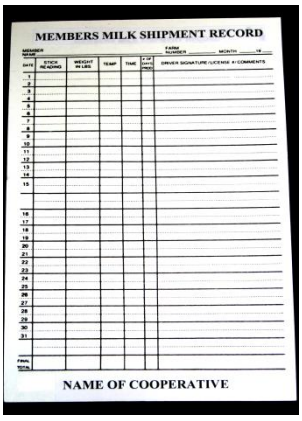
BULK MILK HAULER/SAMPLER SECTION

A. Bulk Milk Hauler/Sampler's Permit

- **All** persons picking up milk from a dairy farm physically located within the State of Maryland and performing the duties of a bulk milk hauler/sampler, are required to hold a valid Maryland Bulk Milk Hauler/Sampler Permit.

- **Any individual that does not have a current Maryland Bulk Milk Hauler/Sampler's Permit is NOT permitted to pick up or sample milk in the State of Maryland.** This includes any relief and/or part-time bulk milk hauler/samplers.

- **<u>Requirements for Obtaining a Maryland Bulk Milk Hauler/Sampler Permit</u>**
  A prospective bulk milk hauler/sampler must:
  - Be employed by a Maryland permitted milk transportation company.
  - Submit a permit application along with the $50.00 permit fee to the State of Maryland, Division of Dairy and Milk Product Safety, <u>before</u> working as a bulk milk hauler/sampler.
  - Obtain on-the-job training: This training includes traveling with a competent, permitted individual, to observe the entire sampling process and learn the routes.
  - Operate a milk tank truck, currently registered with a milk transportation company.
  - Read and understand this manual to prepare for the Maryland written examination and evaluation.
  - Pass a **written examination,** which consists of 40 questions related to the duties of the hauler/sampler. A score of 80 points or more is required to pass.
  - Complete a **Field Evaluation,** which includes a State Milk Control representative's observation of the applicant's milk sampling techniques on three (3) different Maryland farms.
  - **Obtain a temporary field authorization:**
    After passing the exam and evaluation, the Center for Milk Control's representative will issue a "temporary field authorization" to haul and sample milk in Maryland. The applicant will receive a Maryland Bulk Milk Hauler/Sampler permit in the mail. This card must be carried at all times, while performing the duties of the job. **The hauler/samplers name and Maryland permit number must be recorded on each farm bulk milk pickup tickets (i.e. manifest or farm weight ticket/card).**


MEMBERS MILK SHIPMENT RECORD
NAME OF COOPERATIVE

<u>→Important Points to Remember:</u>

- The **permit is valid for one (1) year,** and must be renewed annually. A new permit will be issued every year, if the individual meets all requirements.

- The **field evaluation is valid for two (2) years** from the date of the last field evaluation.
- If the **permit** or the **field evaluation** is not renewed before the permit expiration date, the individual may be required to retake the examination prior to permit renewal. **Picking up milk with an expired permit is a violation of Maryland State Law** therefore, any person picking up milk without a valid permit is subject to enforcement action.

■ **Training**

●It is highly recommended that bulk milk hauler/samplers attend training courses to update their knowledge of current industry standards. Most milk cooperatives hold meetings, and request attendance for the purpose of reviewing necessary requirements and changes.

●Training may be classroom or field-oriented.

■ **Reciprocity Agreement with the State of Pennsylvania:**

An individual who is currently authorized to haul and sample milk in Pennsylvania, and has **fewer than three (3) farm pickups** in Maryland will not be required to complete a MD field evaluation or examination, BUT must apply for and obtain a Maryland permit and provide the following with the application:

●Documentation of a current PA hauler permit, which clearly states the permit expiration date;

●Documentation of a current field evaluation;

●A statement concerning the number of Maryland dairy farms that the hauler/sampler will pick up. If a hauler routinely has three (3) or more Maryland farm pickups, then a Maryland field evaluation must be conducted, even if the hauler/sampler is permitted and evaluated in Pennsylvania.

B. Field Evaluation of Bulk Milk Hauler/Sampler

■**Personal Appearance and Hygiene:**

Bulk milk hauler/samplers are considered food handlers, and should therefore practice good hygiene, maintain a neat and clean appearance, and refrain from tobacco use in the milk house.

- Always use the hand sink to wash hands and wrists thoroughly with soap and warm running water, for at least **30 seconds.**
- Keep hands clean and dry throughout the entire weighing and sampling procedures.
- A milk hauler must be free of any communicable diseases or infected sores on hands/arms.
  - Dry hands with a clean paper towel.
  - Do not use the same paper towel to dry hands and wipe the measuring stick.
  - Do not wash hands in the utensil or 2 - compartment sink.

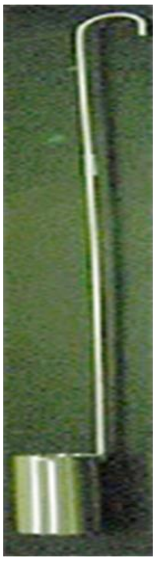
■**Equipment Checklist Prior to Starting Route:**

Hauler/samplers should thoroughly examine their truck, equipment and supplies at the beginning of each day. The following are required in order to perform proper sampling and weighing procedures:

- **Tank Truck** and transfer equipment that have been properly washed and sanitized. The most recent **wash tag** with the wash time and location where the truck was washed must be attached. (Refer to Milk Tank Truck Section).

- **Sample bottles, sterile bags or tubes** that are free from cracks, have a leak proof lid, and are made of food grade material may be used. The sample containers must be protected from dust, dirt and splash. They may be stored in a **clean container with a lid** or in a **clean plastic bag that is tied at the top. Do not** carry sample bottles in pockets.
  (Note: There may be other acceptable storage methods)

- **Sample Case** that is large enough to hold all samples collected, along with an ample supply of ice. The sample case must be of rigid construction, clean, in good repair, and insulated to maintain sample temperature between 32°F and 40°F. Sample racks (flotation racks), must be provided to prevent the sample bottle lids from being submerged in the water/ice mixture. This will help to protect the samples from possible contamination.



- **Sample dipper** or other sampling device:
  - of sanitary design
  - carried on the milk tank truck
  - clean, in good repair and of proper construction (i.e. free of pits, cracks and breaks)
  - stored in the sampling instrument container, with an approved sanitizing solution of the proper strength or sanitized for at least **one (1) minute** before use.

- **Sanitizing agent and sample dipper container**
  - of approved construction (i.e. stainless steel)
  - in good repair (smooth non-porous and cleanable surface, no pits or cracks)
  - top and bottom rubber stoppers in good condition
  - clean,freshly prepared sanitizing solution (See Appendix D for a list of approved sanitizers.

- **Sanitizer test kit**

An applicable test kit for checking sanitizer strength (200 ppm chlorine, 25 ppm iodine, or equivalent), must be carried on the truck at all times. The test kit must match the sanitizing solution used in the sample dipper storage container.

NOTE: Extra sanitizer must be carried on the truck in case of spillage or other unexpected events.

NOTE: Test strips are now available for acid sanitizers (Mandate).

- **Calibrated pocket thermometer**
- An approved type, (metal stem or digital thermometer) with a range of 25 – 125°F is recommended.
- Check accuracy at least once **every six (6) months** against a thermometer certified by NIST (accuracy must be ± 2°F). A NIST traceable thermometer can be used to calibrate hauler/sampler stem thermometers. The **date** the thermometer was checked and the **initials** of the individual who checked it **must be** recorded by one of the following methods:
  - ♦ attach to the thermometer
  - ♦ attach to the thermometer case; or
  - ♦ provide accompanying paperwork.

√To calibrate the thermometer, place the thermometer stem 2-4 inches in a mixture of 3 parts ice, 1 part water; agitate the thermometer stem in the ice water. When the dial comes to rest, it should register 32°F. If it does not read 32°F, adjust the calibration screw until it reads 3 2°F, then calibrate again.

- **Watch or other timing device** to monitor tank agitation time
- **Waterproof permanent marker** to label and identify samples
- **Farm bar code labels,** if used
- **Milk producer's tickets and a pen**

- **Spray bottle containing sanitizing solution** to sanitize the bulk tank outlet valve if the valve is leaking or uncapped

■**Preparation:**

- Verify that the tanker is clean and sanitized, and that the current wash tag is present. Prior to delivering the milk to a processing facility, check tank seals to be sure that none are broken.
- Review the equipment checklist.
- Upon arrival at the farm, transfer milk sampling equipment from the truck to the milk house; Turn on lights.

- Bring the transfer hose into the milkhouse **through the hose port.** Remove the cap from the bulk tank outlet valve. Sanitize the valve if it is open, leaking, or if foreign matter is present.

- Remove the cap from the transfer hose, while preventing contamination of the hose cap, and connect the hose to the tank outlet.
- **Wash hands properly before grading the milk.**

■ **Grade Milk Quality:** Milk must be graded by **temperature, odor,** and **appearance** before it can be accepted.

- **Temperature:** While the milk is agitating, read the temperature on the bulk tank thermometer, then, sanitize the hauler/sampler thermometer in sanitizing solution for at least **60 seconds,** and check the temperature of the milk. Always record the temperature, time, date and hauler's **full** name and MD hauler/sampler permit number on the milk pickup ticket and temperature control (if it is the first sample). The temperature of the milk should be between **32-45°F.**

  Four rules to remember:

  1) Milk must be cooled to 50°F or less within 4 hours of the start of the **initial milking.**
  2) Milk must be cooled to 45°F or less, within 2 hours after the completion of **every milking.**
  3) The product blend temperature after the first milking and all subsequent milkings cannot exceed 50°F.
  4) Milk should never be above 50°F, after the first milking. **If the temperature is above 45° F, do not pick up the milk.**

Each month the hauler/sampler must check the accuracy of the bulk tank thermometer against the hauler's calibrated thermometer. Record both the tank and the calibrated thermometer temperatures on the milk pickup ticket and report any problems. If recording thermometers are used, check the chart for temperature abnormalities since the last pickup.

- **Odor:** Examine the milk for normal odor by smelling the milk through the smallest tank porthole. Do not open the entire lid because the odors will escape into the air and become undetectable. If any off odors are detected, the hauler/sampler must reject the milk, and contact the dairy cooperative and the producer. (Refer to Appendix A – Appearance and Odor).

- **Appearance:** Make sure the tank spotlight is on and/or the area is well lit. Lift the entire lid of the tank. Observe the complete undisturbed milk surface for normal appearance and color. Milk should be free from abnormalities, such as off-color and signs of churning, freezing or excessive foaming. (Refer to Appendix A – Appearance and Odor).

■ **Milk Measurements:**

The milk in the farm bulk milk tank must be **measured before it is agitated.**

If the agitator is running, turn it off and wait for the milk to settle. The milk measurement may only be taken after the surface of the milk is completely motionless.

● Carefully insert the measuring stick into the tank, after it has been wiped dry with a clean single-service towel. It should be clean, dry and free of fat. Remove the stick and read at once; or attach the sight tube to the outlet valve, and allow the milk to enter the tube slowly. (Take the reading only after the foam has subsided). Repeat this procedure until two (2) identical measurements are taken. **Immediately record** measurements on the farm weight ticket.

NOTES:

1. **Do not contaminate the milk** during measurement. Do not re-use the single service towel, or carry towels in pocket, and make sure hands have been washed.
2. Towels used for washing cow udders frequently are impregnated with chemicals. **Do not use them to dry measurement sticks.**
3. If a milk measurement is exactly one halfway between the marks on the measurement stick, read it to the **nearest even number.** If it is not exactly halfway between the marks, then it can be read to the **nearest number.**
4. **Multiple tanks:** If there is more than one farm bulk milk tank located on a dairy farm, each tank must be **separately sampled, measured, and checked for odor and appearance.**
5. If the measuring stick for the farm bulk milk tank is stored **outside the milk tank, it must be sanitized** and completely dry prior to measuring.
6. **Vernier:** Some tanks have a measuring tube on the outside of the milk tank. A slide, called a vernier, is used to determine the measurement of the milk. Slide the vernier to the center of the meniscus (the highest point of the milk, in the center of the tube), read the line on the scale plate that corresponds with the measuring point. If the measuring point is between lines, use the line closest to the measuring point. If the measuring point is exactly halfway between two lines, use the nearest even-numbered line.
7. The hauler/sampler must verify that the serial number on the measuring stick, the farm bulk milk tank, and the conversion chart are the same.

■Universal Sampling Procedures:

For the industry standards to be upheld, the procedures used to collect raw milk samples at the farm must be **done the same way each time.** The use of the "universal sampling procedures" allows for more validity and faith in the sample results collected by industry personnel. The following **milk sampling procedures** must be strictly followed:

- **Agitate the milk:** Proper agitation time cannot be overemphasized. Adequate agitation time is needed foraccurate butterfat and quality sample results.

►Current Standard Methods requires 10 minutes of agitation time for tanks sized greater than 1000 gallons, unless otherwise specified by the tank manufacturer.

NEW REQUIREMENT:

- Tanks that have been standing for more than 30 minutes after filling need to be agitated for at least 15 minutes before they are sampled.
- Tanks less than 1000 gallons should be agitated for 5 minutes immediately prior to sampling if the tank has been filled within 30 minutes of collection of the sample.
- ***If the tank I.D. plate (usually located at the rear of the tank) indicates a different agitation time, use the time found on the plate to agitate the milk.***

For each temperature control sample include:While the tank is being agitated, use a waterproof marker to label each sample with:

- Producer I.D. or bar code (Do not write on the bar code)
- Date of pickup
- Time of pickup
- Temperature of milk
- Producer I.D.
- Hauler/sampler I.D. – MD permit # or hauler initials

- **Collect a representative sample or samples from the bulk tank:**
  1. **Remove the dipper** or sampling device from the sanitizing solution.
  2. **Drain sanitizing** solution from the dipper (DO NOT RINSE DIPPER IN WATER).
  3. **Rinse the dipper** at least two times in the milk to remove any residual sanitizer and water, which may affect the sample results.
  4. With the **agitator running,** open the sample container, being careful not to touch the inside of the container or lid.
  5. **Extend the dipper** into the milk 6-8 inches and **transfer the milk** into the sample container. Do not hold the container over the milk when filling. Do not fill the sample container more than 3/4 full, so that the laboratory can properly agitate the sample.

  6. **Properly close** the sample container, making sure it is sealed and does not leak. When using whirl-pak bags, make sure enough air is trapped inside the bag to properly agitate the sample.
  7. **Close** the lid of the farm bulk milk tank.
  8. **Immediately place** the sample(s) in the sample case in an upright position. Do not

bury the top of the sample container in the ice water.

- **Once the sample has been collected,** the sample dipper must be rinsed free of milk and placed back in the carrying container to maintain sanitization.
- **At the first farm pick up,** a second sample called a "temperature control", identified as "T" or "TC", must be taken. Label this sample with the five items listed above.

- **NOTE: sample** should be taken of **all milk,** even if it is **rejected** or **frozen.** Any detected abnormalities must be noted.

NOTE: <u>DO NOT</u> open the outlet valve of the farm bulk milk tank, until the milk is measured and sampled.

■<u>Pump-out Procedures:</u>

- Once the measurement and sampling procedures are completed and with the agitator still running, open the outlet valve and start the pump. Turn off the agitator when the level of milk reaches the agitator.
- When the milk has been removed from the tank, disconnect the hose from the outlet valve and cap the hose.
- Observe the inside surfaces of the bulk milk tank for sediment or foreign matter and record any observations on the farm weight ticket.
- With the outlet valve open, thoroughly rinse the entire inside surface of the tank with warm water (not hot).
- Never rinse the tank while the hose is still attached.

■ <u>Completing the Pickup:</u>

- Complete all record keeping, including the milk pickup ticket, and leave the milk house in good condition.
- At the last farm pickup, the driver must attach a numbered seal to the inlet/outlet valve, the rear door and, any other point of access that has been opened on the milk tanker. Record the seal numbers.

MILK TANK TRUCK SECTION

A. MILK TANK TRUCK PERMITTING

Each milk tank truck **must have a permit** to transport milk in the State of Maryland. The permit is in the form of a **"MD DHMH" decal (known as the bulls eye),** which is to be placed on the rear of the tank. The truck permit number is printed on the decal to identify the tank. The tank truck decal/permit number is issued to the hauling company by the Center for Milk and Dairy Product Safety, andis renewed annually. **No other type of decal is acceptable.**

- ***New:*** The background of the decal can either be **clear** or **yellow;** other colors are unacceptable (Refer to Labeling section on page 12 of this manual).

B. MILK TANK TRUCK INSPECTION

- The Center for Milk and Dairy Product Safety must **inspect** milk tanktrucks **annually.** Upon passing the inspection, an **inspection sticker**will be placed in the pump compartment or front left side of tanker.
- Milk tank truck inspections shall be conducted in a suitable location, i.e., a dairy plant, receiving or transfer station, or milk tank truck-cleaning facility.
- **When significant cleaning, construction or repair defects are cited during an inspection,** the milk tank truck shall be removed from service until it can be determined that the cleaning or repair violation(s) have been corrected.
- **It is the responsibility of the milk tank truck owner or operator** to maintain current proof of inspection, for each tank truck in use.

C. MILK TANK TRUCK STANDARDS

Inspection results are recorded on a Transportation Inspection Record form. The following items are evaluated during the inspection:

Sampling equipment:

- **Sample storage case** – kept clean and in good repair
- **Sample instrument (dipper)** – cleaned and sanitized
- **The sample instrument container** – kept clean and in good repair; Sanitizing solution maintained
- **Samples -** properly stored to prevent contamination and maintained between **32°F and 40°F**
- **Temperature control sample -** must be present and identified
- **Approved thermometer** - available for use by the sampler. The accuracy of the thermometer must be checked every 6 months against a certified NIST thermometer.**Equipment Construction and Cleaning Requirements**
- The milk tank truck and all appurtenances shall meet **3-A Sanitary Standards.**
- The **interior of the milk tank truck** shall be cleaned after each use and kept in good repair.
- **Appurtenances of the milk tank truck** (hoses, pumps, and fittings, etc.) must be of proper construction, kept clean and in good repair. **The pump compartment of the tank,** (used for storage of appurtenances and sampling equipment), must be constructed to prevent contamination, and kept clean and in good repair.

- **The milk tank truck dome lid assembly, vent and dust cover** must be designed to protect the tank and milk from contamination.

■ **Exterior Condition of the Tank:**

- The exterior of the milk tank truck is properly constructed and in good repair.
- Any defects and/or damage that would adversely affect products in the milk tank truck must be reported to the milk transportation company and corrected.
- Cleanliness of the milk tank truck exterior is evaluated with consideration for existing weather and environmental conditions.

■ **Equipment Cleaning and Sanitizing Requirements**

- The milk tank truck and all of its appurtenances must be cleaned and sanitized:
  - ♦ **at least once every 24 hours,**
  - ♦ **prior to its first use, or**
  - ♦ if a milk tank truck has not been used for **96 hours, it must be re-sanitized**.
- **Note:** It is possible to pick up more than one load of milk within a 24-hour period of time, **provided that the milk tank truck is washed and sanitized at least once during that same period. (This applies to hauler/samplers making 2 or more deliveries to the same processing facility on the same day).**

■ **Wash and Sanitizing Records:**

- **The bulk milk hauler/sampler is responsible** for assuring that the milk tank truck has been properly cleaned and sanitized at a permitted milk plant, milk tank truck cleaning facility, receiving or transfer station. A milk tank truck without proper cleaning and sanitizing documentation must **not be unloaded** until cleaning and sanitizing can be verified.
- **A wash tag** must be affixed to the outlet valve of the milk tank truck after it is washed and sanitized. When the milk tank truck is washed and sanitized, the **previous tag** is to be removed and **stored** at that location, for a period of **15 days.**
- **The following information must be recorded on the wash tag:**
  - ♦ **Identification** of the milk tank truck
  - ♦ **Date and time** that the milk tank truck was cleaned
  - ♦ **The time must include AM or PM**
  - ♦ **Location** where the milk tank truck was cleaned (This information will be verified by the Division of Dairy and Milk Product Safety during an inspection)
  - ♦ **Signature or initials** of the person who cleaned and sanitized the milk tank truck

■ **Labeling:**

- A **milk tank truck** transporting raw, heat treated or pasteurized milk or milk products must be labeled with the following information:
  - ♦ **name and address** of the milk plant or milk transportation company;
  - ♦ **proper seals** (See Biosecurity and Sanitation - Section III of this manual for further details); and
  - ♦ **State of Maryland permit/decal displaying "MD Milk Trans." in a circle around the permit number on the rear of the truck. The letters must be at least 3" in height.**
- All **shipping documents** must contain the following information:
  - ♦ Shipper's name, address and permit number, which must include IMS BTU identification number(s), or the IMS listed Milk Plant Number;

- ♦ Permit identification of the hauler, if not an employee of the shipper;
- ♦ Point of origin of shipment;
- ♦ Milk tank truck identification;
- ♦ Name of product;
- ♦ Weight of product;
- ♦ Temperature of product when loaded;
- ♦ Date of shipment;
- ♦ Name of Supervising Regulatory Agency at the shipment's point of origin;
- ♦ Whether the contents are raw, pasteurized, or in the case of cream, low fat or skim milk, whether it has been heat-treated;
- ♦ Seal number on the inlet, outlet, wash connection and vents;
- ♦ Grade of product

All pertinent information on shipping documents and weight tickets is the responsibility of the hauler/sampler, and is subject to verification by the Center for Milk and Dairy Product Safety.

- **Milk Tank Truck Properly Identified:**
  It is the responsibility of the milk tank truck owner or operator to insure that the milk tank truck(s) in their possession are properly and legibly identified.

- **Proof of Annual Inspection of Milk Tank Truck:**
  When a milk tank truck transports milk and milk products from one regulatory jurisdiction to another, it is necessary to **carry proof of the annual inspection** from a recognized Regulatory Agency.

- **Sample Chain of Custody:**
  When any individual transports samples for official laboratory analysis, a chain of custody may need to be established. As an alternative, a sample case that is sealed as required by the Regulatory Agency may be accepted.

BIO-SECURITY AND SANITATION

Licensed hauler/samplers have an obligation to producers, processors and consumers to practice Biosecurity procedures, and to minimize the risk of the spread of disease or malicious, criminal, or terrorist acts. The following items are important to remember:

- ●Be familiar with and follow each producer's bio-security policies.
- ●Sanitize footwear or wear disposable foot coverings when appropriate.
- ●Limit foot travel to areas between the truck and milk house.
- ●Do not take food or tobacco into the milk house.
- ●Wash and dry hands before handling the measurement stick or taking samples.
- ●Maintain a clean milk truck including the truck interior and floor mats.
- ●Restrict on-farm driving to areas necessary to pick up milk.
- ●Seal and/or lock door and openings when the truck is left unattended.
- ●Paperwork, wash tags and seals should be in a secure area.

- When the tanker arrives at the first farm pick up, the driver must check all seals to be sure that none are broken. The driver then can break and remove the seals on the rear door and outlet valve. The numbers on the broken seals must be recorded.
- At the last farm pickup, the driver must attach a numbered seal to the inlet/outlet valve, the rear door, and any other point of access that has been opened on the milk tanker. Record the seal numbers.
- **Be alert** for any signs of tampering or other malicious, criminal, or terrorist acts.
- **Report** any suspicious activities, threats, or findings to the appropriate law enforcement agencies and the U.S. Food and Drug Administration (FDA). FDA's 24-hour emergency number is 301- 443-1240.

PRECAUTIONS REGARDING MILK PICKUPS

1. The hauler/sampler's **license number** and **full name** are required on the **milk pickup ticket.**

2. Include on the milk pickup ticket the **time,** which includes **AM or PM.**

3. Include the **hauler/sampler's initials or permit number** on the "Temperature Control" sample container.

4. **Pickup Frequency:** Pick up ALL MILK from every dairy farm at least every other day. Milk that is more than two (2) days old is lower in quality. Bulk raw milk must be delivered to the milk processor within 60 hours of the INITIAL milking, and must not exceed 45°F. It is the bulk milk hauler/sampler's responsibility to notify the Regulatory Agency if milk cannot be picked up at least every other day. **NOTE:** The above requirements are for Grade A quality milk. Bulk manufactured grade milk can be delivered to the milk processor within 72 hours of the initial milking, and must not exceed 50°F. **Milk pickup must be continuous;** the interval between sequential farm pickups cannot exceed two (2) hours.

5. **Partial pickups areallowed** only when the milk left in the tank can be picked up before the next milking OR when there is a PROPERLY designed, maintained, and functional 7 day recording device on the tank!

6. **Tank Level:** If the milk in a farm bulk milk tank is not touching the agitator, leave the milk inside the tank and notify the certified industry dairy farm inspector. **Milk that is not agitated cannot be cooled or sampled properly.**

7. The **serial number** on the farm bulk milk tank, the tank **measuring stick,** and the **tank conversion chart,** must all be the same.

8. The hauler/sampler must personally insure that the agitation time for the tank is correct. If the agitator is running when the hauler/sampler arrives at the farm, he must personally observe the minimum agitation time, (10 minutes), before sampling the milk.

9. The milk contact surface of the hose cap must not come into contact with any unclean surface. If this occurs, the cap must be cleaned and sanitized.

APPENDIX A: APPEARANCE AND ODOR

The decision to accept or reject milk is one of the most difficult decisions that must be made. However, this decision is important because poor quality milk from a single milk producer can spoil the quality and flavor of the entire truckload. If the quality of a producer's milk is suspected of being unacceptable, the milk inside the farm bulk milk tank must be rejected. When this occurs, the hauler/sampler is responsible for informing the milk producer and dairy cooperative representative.

1. **Appearance**

Normally, milk is **odorless, mildly sweet in taste,** and ranges in color from **bluish white to golden yellow.** A change in this normal odor or color may result from bacterial growth caused by improper cooling, improper handling practices, or unhealthy cows. When checking the appearance of milk in a farm bulk milk tank, make sure that the tank inspection light is on, or the area above the tank opening has a sufficient amount of light. Lift the lid and observe the entire surface of the milk in the tank. **It should be quiescent (still).** To aid in making the decision about whether to accept or reject the milk, the hauler/sampler should be familiar with the following problems:

a. Bloody milk: Milk and colostrum from animals having mastitis may contain blood. A small amount of bloody milk can give a large quantity of normal milk a reddish color.

b. Flaky milk: Flakes or curd particles in milk may occur as a result of mastitis, souring, or destabilized protein. Milk from mastitic animals may show light flakiness or stringy curd particles. Flakiness due to the souring of milk is usually accompanied by a sour milk odor.

c.Foreign matter: Floating extraneous matter, such as insects, hair, chaff, or straw, is cause for rejecting milk at a farm. The presence of extraneous matter in the milk may be the result of careless handling, improper filtering, opened doors, torn window screens, dusty/dirty conditions, and improper cleaning of the udder, prior to milking. Foreign matter can best be seen once the milk has settled for a few minutes.

d. Churned milk / Butterballs: Visible fat globules may either stick to the side of the farm bulk milk tank or float in the milk. Butterballs are caused by excessive agitation at warm temperatures, either within the farm bulk milk tank or the milk transfer system.

e. Frozen milk: The presence of ice in the milk is an indication that the farm bulk milk tank is malfunctioning, and is cooling the milk to below freezing (3 2^{o}F). The ice will either be floating on top of the milk, or freeze to the sides or bottom of the farm bulk milk tank. Milk that has been frozen may impact the results of laboratory tests.

f. Excessive foaming: The presence of foam in the farm bulk milk tank may be a result of the agitator running too fast, a short fill pipe or air leak in the milk line during milking, or a rancidity problem. Foam is high in fat, and could affect the proper determination of butterfat in milk when tested.

g. Curdled milk: Milk that has soured and appears to clump together is considered "curdled". Curdled milk may have a high bacteria count, and may cause erroneous butterfat and somatic cell results.

2. **Odor**

An important factor in consumer acceptance of dairy products is flavor. Milk flavor control must begin at the dairy farm. It is important that the milk is **not tasted** for off-flavors, because of the potential health risk associated with raw milk. Off flavors in raw milk invariably show up as off-odors as well. Therefore, if off-odors are present with milk, off-flavors are also likely to be present. **"Normal" milk has virtually no odor.** It is important to know what constitutes "normal milk", so that the milk that is collected can be judged with confidence.

If the milk has a serious off-odor or appearance problem, it must be rejected. The dairy cooperative representative should be contacted immediately, so that the cause can be determined and corrected. In the event that the hauler/sampler is uncertain about whether a tank load of milk is acceptable, contact the dairy cooperative representative for guidance, and obtain a milk sample from which a final decision can be made. If unsure about detecting an odor in milk, heat a sample of the milk to approximately 100^{o}F for 2-3 minutes, in a closed bottle (use hot water provided at the sink in the milk house). By increasing the temperature of the milk, any odor that is present will intensify and become easier to detect after the lid of the bottle is opened.

Some common off odors and their possible causes are:

a. Feed: The feed an animal eats may impart a certain odor to the milk. Some feeds will carry through to the milk more noticeably than others. Odors resembling grass, silage, turnips, and alfalfa hay are outstanding examples. Feed odor can be minimized or eliminated by taking the animals off offending feeds at least four (4) hours before milking. It is possible to detect certain feeds in milk if they are fed to the animal 15-30 minutes before milking.

b. Barn-like: This odor is caused when animals inhale foul air due to poor barn sanitation and/or ventilation. Proper ventilation, good sanitation, and proper milking procedures will help to correct this problem.

c. **Foreign:** Any objectionable odor, that may be considered "foreign" to milk, such as sanitizers, fly spray, paint, oil, kerosene, creosote, or any medicinal substance that would render the milk unacceptable or unfit for use. Such an odor may be caused by either direct contamination of the milk, or the absorption of airborne contaminants within the vicinity of the area used for milk storage.

NOTE: If sanitizers are left on dairy equipment, they may be absorbed by the milk and impart a foreign odor. Phenolic compounds used in udder ointment may combine with these sanitizers to form highly objectionable foreign odors, which are detectable at very low concentrations.

d. Garlic/Onion: This obnoxious odor, imparted to the milk when an animal eats garlic, onions, or leeks, is not classified as one of the usual feed flavors described above. The garlic/onion flavor is recognized by the distinctive odor suggestive of its name. It may actually be so objectionable as to render the milk unfit for use.

e. Musty: This odor is suggestive of musty or moldy hay. It may be absorbed directly by the milk, but it is more likely to originate from feed or stagnant water consumed by an animal.

f. Rancid: Rancidity may be detected by flavor, but it is not detectable by appearance, so problems such as butterballs or other visual changes are not likely to indicate that milk is

rancid. Two types of rancidity occur in milk:

1. **Oxidative Rancidity:** Oxidized milk gives off odors usually described as cardboard-like, metallic, or tallow. These odors are usually more noticeable during the winter months, when animals are consuming dry feed. The most frequent cause of oxidative rancidity is the contamination of milk, by small amounts of copper or iron, from milk contact surfaces.
2. **Hydrolytic Rancidity:** Hydrolytic rancidity in milk will give off an odor resembling spoiled nuts. This odor is more noticeable during the winter, when animals are on dry feed, or during late lactation. Agitation of warm raw milk in the presence of air will cause foaming, which will result in a rancid-type odor after a few hours.

g. **Sour:** Sour milk will have a malty odor, which can be found when milk is improperly cooled, resulting in increased bacterial growth. Bacterial growth due to unsanitary milking practices and/or unsanitary equipment may also cause milk to sour. Good sanitary practices and prompt cooling in the farm milk tank will help prevent this problem.

h. **Weedy:** The weed-like odor is not usually included with the other feed odors. It may include odors that resemble plants such as ragweed, bitter weed, or peppergrass, all of which may negatively affect the flavor of milk. This odor can be eliminated or minimized by keeping animals away from weed infested pastures, and by not offering feed containing such weeds until after the animal has been milked.

CHECKING FOR ODORS:

Since the hauler/sampler is unable to taste the milk, one must depend on the detection of **off-odors** that would **indicate off-flavors.** Milk odors will usually gather just below the cover of the farm bulk milk tank.

To properly check for off odors:

- Open a small portion of the tank opening, position your nose close to the opening and smell the milk. Do not open the entire lid, as this will allow the off-odors to escape into the milk house.
- Inhale 2 or 3 times to determine any abnormal odor. Normal milk has virtually no odor.
- If any off-odors are detected, **contact the producer, dairy cooperative,** and/or the **receiving plant.**
- Any change in quality should be brought to the attention of the **producer** either verbally or by recording it on the milk pickup ticket.

The detection of off-odors can be affected by a number of external factors. The bulk milk hauler/sampler should strive to eliminate each of these factors:

1. Milk house odors
2. Gasoline fumes adhering to clothing
3. Smoking immediately prior to checking for odors and/or smoking in the milk house
4. Eating or chewing aromatic candy, tobacco, medicine, beverages, foods, etc
5. Use of strongly scented shaving lotion, soap, or other toiletries

APPENDIX B: CAUSES OF MILKFAT VARIATIONS

The variation in the percentage of milk-fat has a significant impact on the payment that a milk producer receives. The bulk milk hauler/sampler must provide an adequately mixed, reliable milk sample for milk fat analysis. Be sure to follow the proper sampling procedures outlined in this manual. There are several reasons for milk fat variations, some of which the bulk milk hauler/sampler cannot control. These variations are commonly due to:

- Breed of animal
- Age of animal
- Genetic potential of individual animal
- Stage of lactation
- Seasonal changes
- Udder infection
- Type and quality of feed
- Milking procedure
- Health of animal
- Heat periods (estrus)
- Excitement

APPENDIX C: FACTORS AFFECTING MILK QUALITY

1. **Bacteria Count:** Bacteria are microscopic one-celled organisms, which are found on and in all living animals, soil and water (including ponds and wells). Manure, flies, insects, rodents, dirty and unsanitized utensils and equipment may all be sources of harmful bacteria. Because of the widespread presence of bacteria, contamination of dairy equipment must be avoided. Bacterial growth is much greater at room temperature than at 40^{o}F or less. Storing milk samples in an ice and water mixture immediately after collection will help minimize bacterial growth. The amount and type of bacteria found in a milk sample, is a direct reflection of the sanitary conditions and practices that exist on a dairy farm. Contamination can occur while measuring, sampling, and transferring milk. Improper cooling of milk may be a factor in causing high bacteria counts as well. Therefore, extreme care must be taken by the hauler/sampler to minimize any contamination. Only milk that has been properly cooled should be picked up.

2. **Inhibitors:** Medicine and drugs used to treat lactating animals for various infections may leave a residue in the animal's milk. The presence of antibiotics or other drug residues can cause allergic reactions in some individuals; therefore, tests are run to determine their presence of milk.

NOTE: Excess residue from sanitizers used on milk sampling equipment may be detected with these tests. Always rinse the sample dipper at least two times in the milk before the sample is taken.

3. **Sediment:** The presence of sediment indicates unsanitary methods of milking and milk handling practices. Occasionally, a representative from the dairy cooperative may ask the hauler/sampler to perform a sediment test. A screen is used to collect residue or debris at the farm bulk milk tank outlet valve. After the milk has been pumped onto the truck, the screen is checked for the amount and type of residue.

4. **Added water:** Water added to milk, either deliberately or accidentally, is **illegal.** Laboratory tests are used to determine if water has been added to milk before it is received at the plant. For this reason, the transfer hose must be disconnected from the farm bulk milk tank before the tank is rinsed.

5. **Somatic Cells:** Somatic cells are white blood cells that are found in milk. High somatic cell counts in cow milk will indicate that an animal in the herd is experiencing an illness, injury, or is becoming dry. Unless the milk is properly agitated, somatic cells will float to the surface of the milk. To obtain a representative sample, the milk in the tank must be agitated for the correct amount of time.

6. **Improper Sampling Techniques: Failure to follow proper sampling techniques** including insufficient agitation time, improper storage of milk samples in the sample case, and improper sanitization of the milk dipper, may contribute to unreliable sample results. Inaccurate bacterial, somatic cell, and/or butterfat test results, may jeopardize the producer's permit or payment.

7. **Agitation:** Once the milk has been agitated for the correct amount of time, butterfat will begin to rise to the surface of the milk when the tank agitator is turned off. For this reason, the sample must always be taken during agitation.

APPENDIX D: COMMON SANITIZERS

The sanitizer strengths below require a one-minute (60 seconds) contact time to be effective.
Use appropriate test strips to determine sanitizer concentration.

Chlorine	200 ppm
Quaternary Ammonium Compounds	200 ppm
Iodine	25 ppm
Sanitizing Solution from Dairy Plants	Acceptable
Acid Sanitizer (i.e. Mandate)	3.6 – 3.8 pH (must use pH test strips)

APPENDIX E: REQUIRED ITEMS ON MILK PRODUCER PICKUP TICKETS

- Milk Temperature
- Time **(include AM or PM)**
- Date of Pickup
- Hauler/Sampler identification (include company name)
- Hauler/Sampler's signature (Use full name, initials are not acceptable. Please write legibly)
- Maryland Bulk Milk Hauler/Sampler permit number (ex: 24-BT-0000)
- Producer name
- Producer patron number (IBM number)
- Number of milkings
- Milk measurement (stick or sight tube reading)
- Milk weight
- Note quality problems, if present

APPENDIX F: REGULATIONS AND STANDARDS

- Code of MD Regulations (COMAR): 10.15.06, 10.15.09.
- Maryland Health-General, Annotated Code §21-410.
- Pasteurized Milk Ordinance (PMO), 2011 Revision, Section 3 – Permits; Appendix B – Milk Sampling, Hauling, and Transportation.
- The Dairy Practices Council – Guidelines for Farm Bulk Milk Collection Procedures.
- Standard Methods for the Examination of Dairy Products – 17th Edition, Chapter 3: Sampling Dairy and Related Products.

SAMPLE EXAM QUESTIONS

1. Relief and part-time drivers are not required to have a MD Bulk Milk Hauler / Sampler's permit. **T or F**

2. Milk samples collected from a bulk tank must be completely immersed in ice water while being transported to the milk processor. **T or F**

3. A clean sample dipper must be sanitized in a solution of 50 ppm of available chlorine, or an equivalent sanitizing solution, for 1 minute. **T or F**

4. Bacterial growth in a milk sample is controlled by:
   a. Keeping the milk sample in your shirt pocket.
   b. Placing the milk sample on ice at the last stop.
   c. Placing the milk sample in an ice and water bath, immediately after the sample is collected.
   d. Keeping the milk sample in the cab of the truck during the winter to protect it from freezing.

5. Confusion often exists between Federal & State Regulatory standards and Dairy Co-op/Dairy Processor requirements. Which of the following is true?
   a. Co-op Standards replace regulatory standards.
   b. Dairy Co-op/Dairy Plant/Processor requirements may be more stringent than Federal/State Regulatory Standards
   c. Dairy plants may set their own standards of rejection for the temperature of milk, as long as they are less stringent than the Federal/State temperature requirements.
   d. B and C above

6. The temperature control sample must have:
   a. producer ID
   b. time of pickup
   c. hauler's initials or hauler's permit number
   d. all of the above

ANSWERS TO SAMPLE EXAM QUESTIONS

1. **FALSE:** Relief and part-time hauler/samplers' must possess a Maryland Bulk Milk Hauler/Sampler's permit, just like their full-time counterparts. (See Hauler/Sampler Permit Section – p. 3)

2. **FALSE:** Samples should not be completely immersed in ice water. To protect the samples from contamination, do not bury the container lids in the ice/water mixture. (See Collecting a Representative Sample Section p.9)

3. **TRUE:** A clean sample dipper shall be sanitized in a solution of 50-ppm chlorine, or an equivalent sanitizing solution for one minute. (See Section B p. 5; Appendix D – p. 19)

4. Bacterial growth in samples is controlled by:
   c. Placing the milk sample in an ice and water mixture, immediately after the sample is collected. (See Appendix C – p. 18)

4. Confusion often exists between State and Federal legal standards and Dairy Co-op and Dairy Processor requirements. Which of the following is true?
   b. Dairy Co-Op/Dairy Processor requirements may be more stringent than Federal/State Regulatory standards. (See Purpose – p.1)

5. The temperature control label must have date & time of pick-up, hauler I.D., producer I.D., temperature of the milk.
   d. All of the above (See Section B – p. 9)

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