DECEMBER 13, 2019

DEPARTMENT OF AGRICULTURE

BULK MILK HAULER REFERENCE MATERIALS

STUDY GUIDE FOR NEW AND EXPERIENCED BULK HAULERS

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Section 1: Rules, Regulations, Licenses & Permits

Purpose

This manual is intended to be a reference for new and experienced bulk milk haulers. As bulk milk haulers you have a high level of responsibility to not only your employer, but also the producers whose milk you collect as well as the Minnesota Department of Agriculture (MDA) Dairy Inspection Program. When you collect samples, you are a delegated representative of the MDA as the samples you collect can be used for regulatory actions. Every time you step foot on a farm or in a plant, you represent yourself, as well as your employer.

Definitions

Bulk Milk Hauler/Sampler – A person responsible for the collection of official samples for regulatory purposes, including those that are related to reinstatement/clearing samples at dairy farms, and who may transport raw milk from a dairy farm and/or raw milk products to or from a milk plant, receiving station or transfer station and who has in their possession a permit from the MDA to sample raw milk and/or raw milk products. This person is evaluated at least once every 24 months by a state regulatory agency.

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

Bulk Milk Hauler Evaluation (Permit) – An on-farm inspection of the bulk milk hauler/sampler's milk sampling procedures. This must be completed at least once every 24 months.

Bulk Milk Hauler and Sampler License – The license required and issued by the MDA to all evaluated and compliant bulk milk haulers/samplers.

Rules & Regulations

In general, bulk milk haulers are regulated by:

- The **Pasteurized Milk Ordinance (PMO)**. Specific sections that apply to bulk haulers include Appendix B: Milk Sampling Hauling and Transportation and Section 6: The Examination of Milk and/or Milk Products.
- **Minnesota State Statutes**. Specific sections include 32D.03: Bulk Milk Hauler and Sampler License and 32D.04: Milk Tank Trucks.

The PMO outlines the requirements bulk milk haulers must perform and the items to be evaluated during an evaluation by a local dairy inspector. Minnesota State Statutes require bulk milk haulers to possess a valid Bulk Milk Hauler and Sampler License and to be responsible for the milk tank truck they are using.

Licenses vs. Permits

In some instances, the terms “licenses” and “permits” are used interchangeably. However, in the case of bulk haulers and samplers they are **not** interchangeable. This can be confusing because you are required to possess both, but the expiration dates are often different. To help keep these separate, we refer to the evaluation as your permit; this is a separate thing from your license.

License

The Bulk Milk Hauler and Sampler License is the physical license card you will receive once you have completed all requirements to become a licensed bulk milk hauler. It is issued by the State of Minnesota, and all bulk milk haulers who are collecting official samples from dairy farms are required to have one. The license is held by the individual and is not transferable (this means it cannot be shared).

When you receive your first license (the **initial** license), it will be good for the remainder of the year in which the license is issued. For example, if you are licensed in May, the initial license is good until December 31st of that year. When you renew your license, your renewed license will be good for two years beginning on January 1st of that year and will expire in 24 months on December 31st.

To maintain the license, you must remain in good standing with the state. This means that you must meet all the license and evaluation requirements. Most importantly, you must be evaluated at least once every 24 months and pass the evaluation. It is **your** responsibility as a bulk milk hauler to contact your local inspector and set up a time to complete your evaluation. If you remain in good standing, renewal forms will automatically be sent to you or your employer. If you let your license expire for a period of 2 or more years, you will be required to meet all the requirements of a new bulk milk hauler again.

License fees are $60 for the initial license and then $60 for the renewed two-year license. This fee covers the time of the inspector performing the evaluations as well as the processing of the license itself. The chart below provides more information on late fees and expiration dates:

	Expiration	**Fee**	**Late Fee**
Initial License	December 31 of the year in which it is issued	$60	Not Applicable
Renewal	December 31 of the second year from the date of issuance (2-year license)	$60	$30

What happens if you do not keep your license current?

Because your license allows you to take official regulatory samples, it is very important to keep your license current. If you are not licensed, you are unable to take official samples. If you continue to sample with an expired license (or no license at all), any samples you take could be deemed invalid, and your load may be rejected by the receiving plant. If a sample you take results in a positive result (antibiotics present), you may be held responsible.

Evaluations (Permits)

The Bulk Milk Hauler Permit (form 2399a) is issued after an evaluation of your milk sampling procedures by an MDA Dairy Inspector. These evaluations must be performed at least once every 24 months. However, if a local dairy inspector randomly meets you on a farm or receives a complaint, they can choose to perform an evaluation at that time even if you are not due for an evaluation.

As noted above, it is up to the bulk milk hauler to contact a local dairy inspector to set up a time to complete the evaluation before the 24-month period is up. Your evaluation is due within 24 months of the date of your previous evaluation. License renewals are due at the end of the year. Most likely your evaluation will be due at a different time than the license renewal. Do not wait until you receive a letter stating you will not be receiving your renewal until you complete an evaluation to schedule an evaluation with your inspector.

If the evaluation becomes overdue, you are no longer in regulatory compliance and any samples you collect from a dairy farm could be deemed invalid and your load rejected at the receiving plant.

Reciprocity

Bulk milk haulers must be licensed in **each** state where they are collecting milk and/or sampling. For example, if you are a bulk milk hauler picking up milk from farms in Minnesota and Iowa, you are required to have a valid Minnesota Bulk Milk Hauler and Sampler License and an Iowa Bulk Milk Hauler License.

In Minnesota, we accept bulk milk hauler evaluations performed in other states. For example, if you have a current and passing evaluation from a dairy inspector in Iowa you can send it to the MDA office and this will be used as your official evaluation; you will not need to be reevaluated in Minnesota, but you will need to be licensed in Minnesota.

You can send a copy of your current out-of-state evaluations by email to dairy.results@state.mn.us or by fax to 651-201-6116.

Updating Your Contact Information

If your contact information changes, please notify your local inspector or email dairy.results@state.mn.us with the updates. Any of the following updates should be shared with the MDA:

- Address change
- Phone number change
- Name change

Sharing your updated contact information ensures that you receive all written communication from the MDA in a timely manner including license renewals and letters notifying you of expiring evaluations.

New Bulk Milk Hauler Evaluation and Licensing Procedures

The following steps outline the typical process that a new bulk milk hauler **not** currently licensed to haul milk in any other state will go through to become licensed in Minnesota.

1. Prepare for the Exam and Evaluation

If you are reading this reference manual, you are probably preparing to take the exam. If you are a new hauler, it is very important to take some time to review these procedures and requirements so you will be familiar with hauling and sampling requirements prior to taking the exam and getting evaluated. Remember, during this period you cannot haul or sample milk yourself if you haven't been licensed.

2. Complete the Written Exam

Each potential bulk hauler must pass a written exam which consists of questions specific to your job. This exam is required by the PMO and is administered by your local dairy inspector. You must obtain a score of 70% or higher to obtain your license. If you do not pass on your first attempt, you may retake the exam, but you must pass the exam before you can be licensed.

3. Complete your Evaluation

Once you have passed the exam you will be evaluated on bulk milk hauler sampling procedures. More information on what will be evaluated is coming in a later section of this reference material. Again, you must satisfactorily complete the evaluation and exam prior to being licensed.

Form 2399a

A copy of the form used to evaluate bulk milk haulers is found in Appendix B of this reference manual. There are two main sections used to evaluate bulk milk haulers: Hauler Sanitation Procedures and Bulk Milk Sampling Procedures. **Hauler Sanitation Procedures** covers the hauler and that their hands, equipment, clothes, etc. are clean and not going to contaminate the milk they are sampling. **Bulk Milk Sampling Procedures** covers the actual methods used by the bulk milk hauler to pick up the milk and the equipment they are using.

4. Complete the License Application and Pay your New License Fee

After you have passed the exam and evaluation, your dairy inspector will work with you to complete the Bulk Milk Hauler and Sampler License application. Upon completion of the

application, you or your employer will need to provide a $60 check to pay the license fee. Please note the license fee must be paid by check (personal or cashier's). Cash is not accepted. The inspector will submit the check and the application to our licensing department. In return, you will receive a receipt; this will serve as your temporary license until your official license arrives. Your receipt number will be your temporary license number. Usually this number looks something like: REC A #####. You should record this number anytime you are asked for your bulk milk hauler license number until you receive your official bulk milk hauler license number. Once the licensing department has received your application and check they will mail you your official license card.

How long is your new license good for?

Again, the initial license is only good for the remainder of the calendar year in which it is issued. This applies even if your new license is issued near the end of the calendar year. For example, if you are licensed December 1, you will almost immediately be sent a renewal since the initial license is only good for the remainder of December of that year. The exception to this rule is for licenses issued after December 15th; those licenses will be good until the following December 31st. For example, if you are licensed December 16th of 2019, the initial license will be good until December 31st of 2020.

Section 2: Enforcement and Compliance with the Regulatory Requirements

During evaluations, the inspector will observe your procedures and assess your compliance with the regulatory requirements. You are expected to comply with the requirements on an ongoing basis; each time you haul milk and/or collect a sample you should meet these requirements. When the requirements are not met, enforcement actions may be taken against a bulk milk hauler's license and/or permit. These actions could include reinspections, license revocation, permit suspension, and/or administrative penalties (fines).

Reinspections

Reinspections will be required if the inspector observes five or more violations during the inspection or if a critical violation occurs. Critical violations include, but are not limited to, the following:

- Visibly soiled hands and/or equipment coming into direct contact with the milk;
- Scooping up the milk sample with the sample vial, instead of using the sample dipper;
- Bulk milk hauler causing contamination of the milk with chemicals or other harmful substances; and
- Refusal to correct a violation during an evaluation such as not putting a sample into the cooler.

Reinspections allow the bulk milk hauler time to review their sampling practices, make necessary corrections, and be reevaluated. The reinspection must take place within 30 days of the original inspection; It is up to the bulk milk hauler to schedule the reinspection with their local dairy inspector. If all previous violations were corrected during the reinspection and no additional violations were observed, then no further action is required. If the violations were not corrected, additional enforcement actions may be taken.

Permit Suspensions

As a bulk hauler, you have a permit (which is represented by your copy of your evaluation). This permit may be suspended if there is a valid public health reason to do so. These actions are reserved for situations where an urgent public health issue exists. For example, if there is reason to believe that a bulk hauler has contaminated milk during the hauling or collection process, their permit may be suspended. This is not a permanent revocation; the permit may be reinstated once the conditions which led to the suspension have been corrected.

License Revocations and Administrative Penalties

If a bulk milk hauler does not pass the reinspection or is caught tampering with official samples or intentionally contaminating milk, additional enforcement actions will be taken. Most often,

an administrative meeting will be held with the MDA Dairy Compliance Officer, the local dairy inspector, and the bulk milk hauler. The meeting will review the violations that have occurred and what needs to be done to correct the issues. Usually an opportunity for correction will be provided; however, if an agreement cannot be made or adequate correction cannot be assured, the MDA can revoke your bulk milk hauler evaluation (permit) and/or license. In other cases, an administrative penalty (fine) of up to $1000 per violation, per day can be charged to the bulk milk hauler.

Section 3: Bulk Milk Pickup Tankers

It is the bulk milk hauler's responsibility to make sure that the bulk milk pickup tanker used to collect or transport milk is clean and maintained in good repair.

Sanitation

All bulk milk pickup tankers must be washed and sanitized at an **approved** dairy wash facility at least once every 24 hours while in use. If a bulk milk pickup tanker is used for multiple loads a day, it does not have to be washed between each load, but it must be washed and sanitized at least once in those 24 hours. The following scenarios would require a wash and sanitization immediately before picking up the next load:

1. A bulk milk pickup tanker that tests positive for antibiotics;
2. Hauling Grade B milk then picking up Grade A milk;
3. Hauling conventional milk then hauling organic milk;
4. Hauling non-dairy, animal grade or inedible product; and
5. Hauling raw product then hauling pasteurized product.

The PMO also requires that if a washed and sanitized bulk milk pickup tanker sits empty (or is not in use) for 96 hours or more, it must be re-sanitized prior to picking up the next load.

The tanker and all its parts, including the pump, must be taken apart at the time of cleaning. It is also a good practice to check that all parts of the tanker are in good repair.

Dairy plants will refuse your load if you do not wash and sanitize your tanker at the required frequency.

Wash Tags and Charts

When you wash at an approved dairy wash facility, you are required to identify the truck and sign or initial the wash chart legibly at the facility. This documents who washed the tanker and when it was washed so that it can be checked in the future if there are issues. The procedures to identify the wash on the chart can vary by plant. In some cases, the plant personnel will complete the wash chart information for you.

At the wash facility, you also receive a wash tag. According to the PMO Appendix B Section VI Milk Tank Truck Permitting and Inspection, this wash tag must show the following information:

- Plant name and number;
- Who washed and sanitized the tanker;
- What sanitizer was used;
- The date and time the wash was performed;
- The product last hauled; and
- Seal numbers.

The wash tag must remain on the tanker outlet valve or with the bulk milk pickup tanker until the tanker has been rewashed and sanitized. The approved dairy wash facility keeps the old tags on file. The only exception for the requirement to have the wash tag is if you **only** pick up, drop off and wash at the same plant. This exception is given because the records will always be at that same facility and can easily be checked to see when you last washed.

Inspections

Bulk milk pickup tankers must be inspected once every 12 months per Minnesota State Statutes. It is the bulk milk hauler's responsibility to arrange a time for a local dairy inspector to inspect the bulk milk tanker when it is empty and clean. Minnesota has reciprocity with the surrounding states and will accept the passing inspections completed in other States if they have been performed within 12 months. An inspector may also inspect your tanker at any time or in response to a complaint or other concern. It is important that your tanker is kept "inspection-ready" at all times in terms of cleanliness, records, and repair.

Sealing the tanker

The seals on a bulk milk tank truck signify that the milk on the truck has not been tampered with. It is important that the seals on the tanker match the paperwork. It is the hauler's responsibility to ensure there are seals on the tanker prior to delivering the milk to the plant.

Accidents

Living in Minnesota, you are no stranger to the fact that we have bad weather, and roads can be treacherous at any time during the year. Poor roads and driving conditions come with an increased chance for accidents. If you have an accident, you should be prepared to respond appropriately and protect the safety of the milk.

See Appendix A of this reference manual for a one-page fact sheet that outlines the appropriate response procedures. You can take this with you in your truck and have it available for a resource to use in the event of an accident.

Section 4: Equipment You Need to Perform Your Job & Meet the Regulatory Requirements

Bulk milk haulers must always have the following items on hand to perform their jobs and meet the regulatory requirements:

- **Thermometer** – You must have a calibrated thermometer available for use. It needs to be **accurate to +/- 2°F and calibrated every 6 months** by a certified lab.
- **Sample Vials** – You must have enough vials to collect at least one sample at each stop and a temperature control for each load. Store the vials in a sealed bag or container with a lid to keep them clean and protected from contamination until they are used.
- **Cooler/Rack/Ice** – A cooler that is in good repair, meaning that it has a lid and no cracks, is essential to ensure you can transport the official samples to the lab at the proper temperature. You must also have a rack to keep the sample lids out of the ice water and minimize the chance that the samples will become contaminated on the way to the lab or plant.
- **Sample Dipper** – A sample dipper can be a reusable metal long handled dipper or a single service sampling tube. The dipper must be stored in a clean sanitizing solution. Other alternatives to the standard sample dipper can be used, such as single service pipettes, but these methods must be approved by the regulatory agency prior to use.
- **Sanitizer** – Sample dippers must be transported in a sanitizer solution with a proper concentration. The concentration requirements for the sanitizers commonly used are listed below:
    a. **Chlorine:** 200 ppm
    b. **Iodine:** 25 ppm
    c. **Others:** see the requirements in 40 CFR 180.940
- **Test Strips** – You must have test strips available for the type of sanitizer you are using at the time of evaluation. For example, if you are using chlorine sanitizer, then chlorine test strips must be available. Or, if you are using iodine sanitizer, then iodine test strips must be available. Test strips do have an expiration date.
- **Pen/Marker** – A working pen or marker is needed to mark the vials with the required information.
- **Paperwork for the plant** – Completing the bills of lading for the plant are the responsibility of the bulk milk hauler.

Section 5: Managing Records and Paperwork

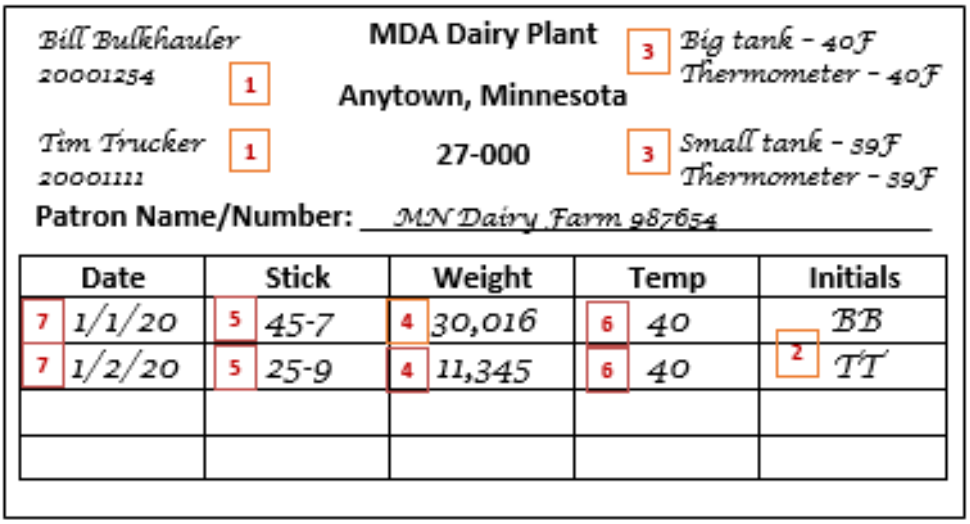
Haulers must manage two main types of records as a part of their job responsibilities and to meet the regulatory requirements. **Farm records** are used to collect information about the milk and collection conditions. **Plant records** are used to document shipping and product information. More details on these records are included below. It is your job to ensure that all paperwork is accurate, legible, and filled out completely.

Farm Records

In general, the milk pickup or collection record on each farm must contain, at a minimum, the following information (PMO Appendix B, Section I, 3):

1. **Bulk hauler license number** – Each hauler that picks up at the farm must record at least once on each record. If the farm record has one month per sheet, the license number must be recorded once per sheet. If the farm record has three months per sheet, the license number would still only need to be recorded once per sheet.
2. **Initials of the bulk hauler** – Record for each pick up.
3. **Documentation of tank temperature checks** – A check must be performed on the farm bulk tank thermometer by a licensed bulk milk hauler at least once per month on each tank using a calibrated thermometer.
4. **Weight** – Record the pounds of milk picked up each time the milk is collected.
5. **Stick Reading** – Record for each pick up.
6. **Temperature** – Record the temperature of the milk at each pick up.
7. **Date** – Record for each pick up.

Each farm's records may look slightly different and may contain information in different places. The example below illustrates what a farm record with multiple haulers and multiple bulk tanks could look like; the boxed numbers (1-7) correspond to the numbers in the list above:



Bill Bulkhauler 20001254 [1]

MDA Dairy Plant

Anytown, Minnesota

27-000

[3] Big tank - 40F Thermometer - 40F

Tim Trucker 20001111 [1]

[3] Small tank - 39F Thermometer - 39F

Patron Name/Number: MN Dairy Farm 987654

Date	Stick	Weight	Temp	Initials
[7] 1/1/20	[5] 45-7	[4] 30,016	[6] 40	BB
[7] 1/2/20	[5] 25-9	[4] 11,345	[6] 40	[2] TT

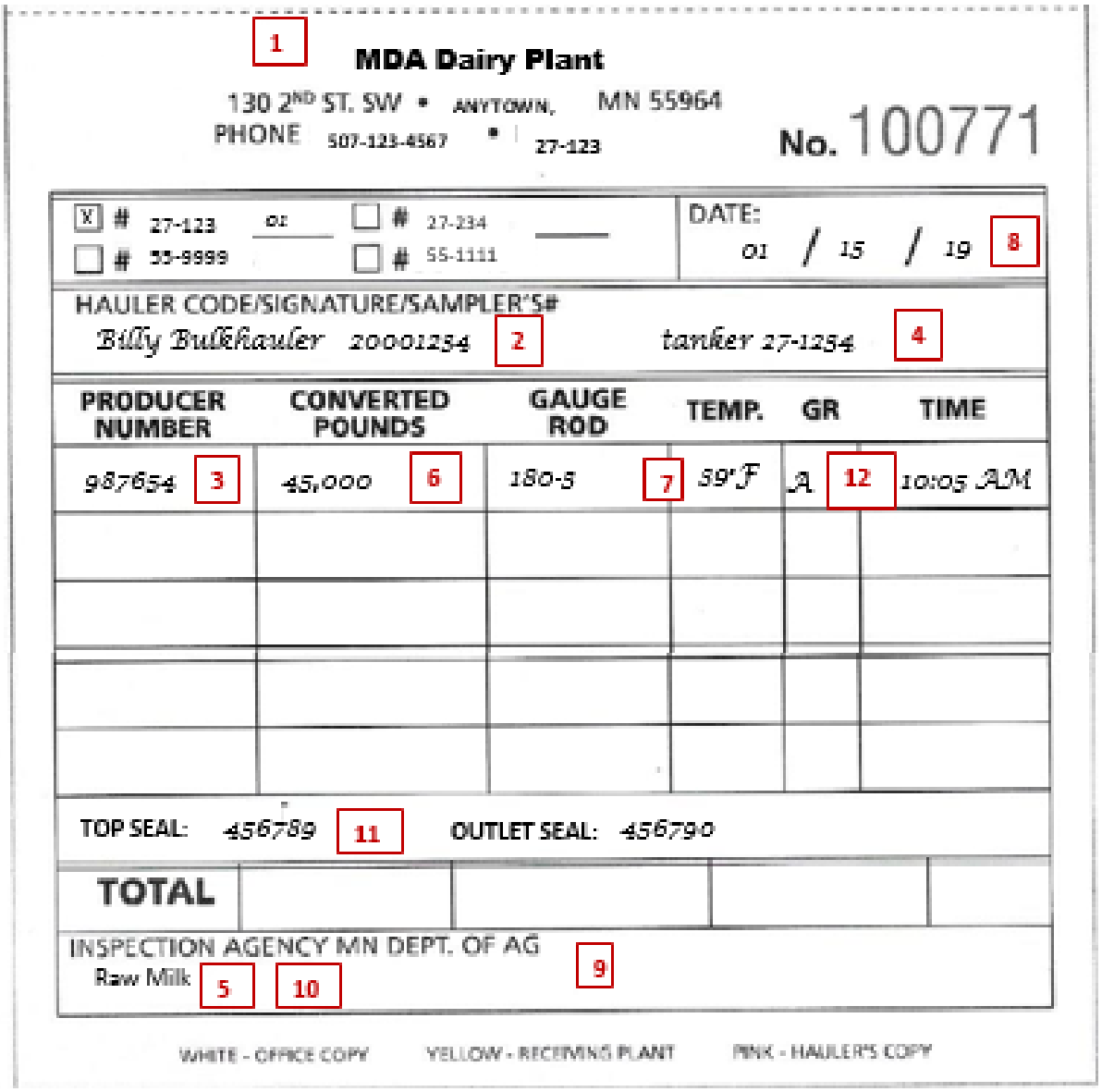
Plant Paperwork – Bills of Lading

Each plant has a **different** bill of lading but in general must all contain the following information (PMO, Appendix B, Section VI):

1. Shipper's name, address and permit number, IMS BTU number;
2. License identification of the hauler;
3. Point of origin of shipment (farm name and permit number);
4. Milk tank truck identification number;
5. Name of product;
6. Weight of product;
7. Temperature of product when loaded;
8. Date of shipment;
9. Name of supervising regulatory agency (the MDA);
10. Whether the contents are raw, pasteurized, or cream;
11. Seal number on inlet, outlet, wash connections, and vent; and
12. Grade of product (A or B)

The examples on the next few pages represent a sampling of completed bills of lading. It is important that you fill them out **completely, accurately, and legibly because these are regulatory records that are used to track milk receiving and transport.** The boxed numbers (1-12) correspond to the numbers above.

Bill of Lading Example 1



1

MDA Dairy Plant

130 2ND ST. SW • ANYTOWN, MN 55964
PHONE 507-123-4567 • 27-123

No. 100771

☒ # 27-123 01 ☐ # 27-234 ____
☐ # 55-9999 ☐ # 55-1111

DATE: 01 / 15 / 19 — 8

HAULER CODE/SIGNATURE/SAMPLER'S#
Billy Bulkhauler 20001254 — 2

tanker 27-1254 — 4

PRODUCER NUMBER	CONVERTED POUNDS	GAUGE ROD	TEMP.	GR	TIME
987654 (3)	45,000 (6)	180-5 (7)	39°F	A (12)	10:05 AM

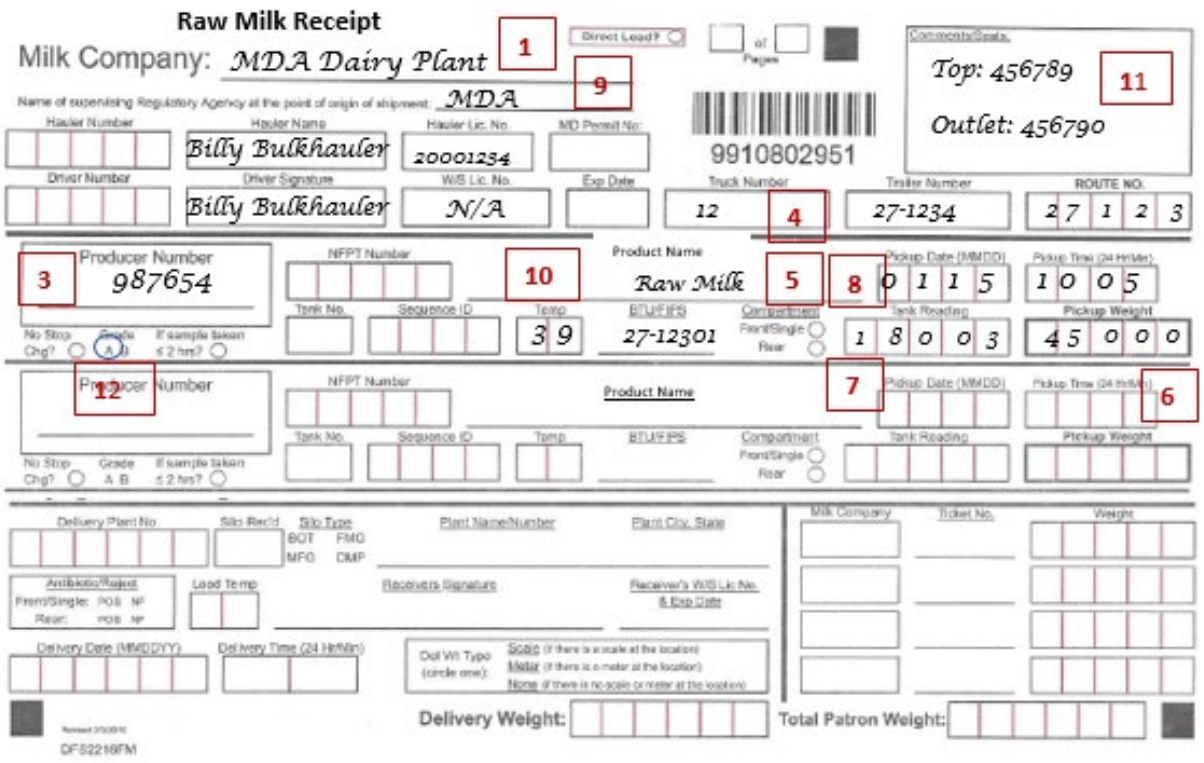
TOP SEAL: 456789 — 11 — OUTLET SEAL: 456790

TOTAL				

INSPECTION AGENCY MN DEPT. OF AG — 9
Raw Milk — 5 — 10

WHITE - OFFICE COPY YELLOW - RECEIVING PLANT PINK - HAULER'S COPY

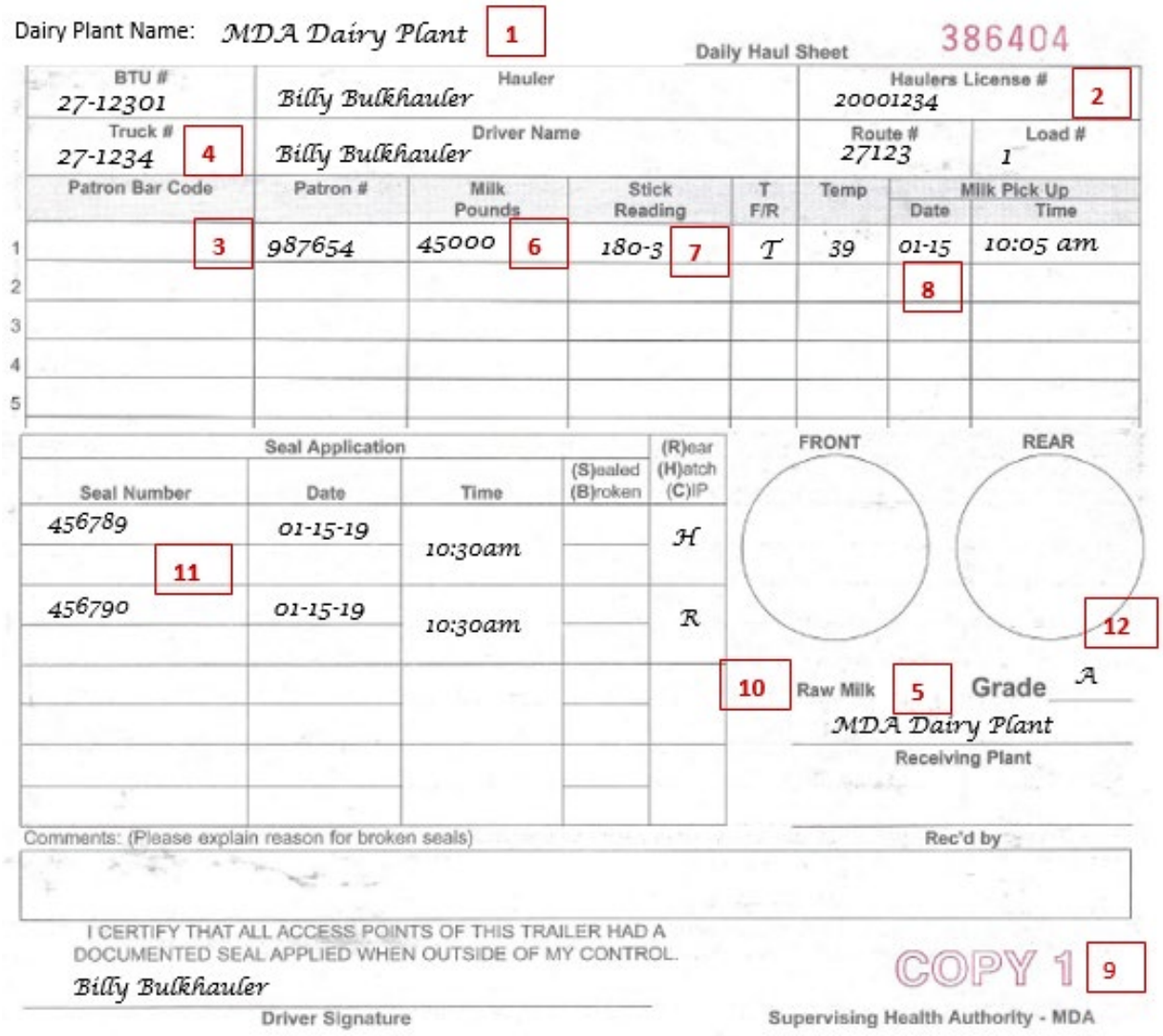
Bill of Lading Example 2



A few notes:

- If there are not enough boxes for your bulk hauler license number or other information, you may have to write numbers over the boxes.
- There may be additional information you will need to fill out; your employer or the plant representative will help you with what information to put where and where to find it.

Bill of Lading Example 3



Dairy Plant Name: MDA Dairy Plant 1

Daily Haul Sheet 386404

BTU #	Hauler	Haulers License #
27-12301	Billy Bulkhauler	20001234 2

Truck #	Driver Name	Route #	Load #
27-1234 4	Billy Bulkhauler	27123	1

	Patron Bar Code	Patron #	Milk Pounds	Stick Reading	T F/R	Temp	Milk Pick Up Date	Milk Pick Up Time
1	3	987654	45000 6	180-3 7	T	39	01-15 8	10:05 am
2								
3								
4								
5								

Seal Application				
Seal Number	Date	Time	(S)ealed (B)roken	(R)ear (H)atch (C)IP
456789 11	01-15-19	10:30am		H
456790	01-15-19	10:30am		R

FRONT REAR 12

10 Raw Milk 5 Grade A

MDA Dairy Plant
Receiving Plant

Comments: (Please explain reason for broken seals)

Rec'd by

I CERTIFY THAT ALL ACCESS POINTS OF THIS TRAILER HAD A DOCUMENTED SEAL APPLIED WHEN OUTSIDE OF MY CONTROL.

Billy Bulkhauler
Driver Signature

COPY 1 9

Supervising Health Authority - MDA

Please note:
Many plants use pre-printed stickers for their patron information. If this is the case, you may need to pick up stickers from the farm or plant and put them on your bill of lading. In this example, the patron bar code comes from a sticker at the farm.

Section 6: Accepting or Rejecting Milk

As a licensed bulk milk hauler, it is up to you to follow all procedures correctly to determine if the milk at the farm is suitable for pick up. This is very important and should not be taken lightly.

Rejection Criteria

The following scenarios describe situations where you will need to decide whether to reject the milk, or at the very least, contact someone to help you determine the appropriate action to take.

Milk in barrels or vessels other than a fully operating bulk tank or bulk milk tanker – If you arrive at a farm where milk is stored in 55 gallon drums or other containers other than the bulk tank, you should not pick up the milk in the barrels or other containers. This may happen when a producer runs out of room in the bulk tank or is saving milk aside for some reason. There are several reasons to reject this milk including, but not limited to:

- Barrels have no cooling capacity, so the milk could be too warm;
- Barrels are not food safe, and you don't know if they have residues of the previous contents which could be transferred to the milk;
- Barrels are not equipped with agitators, so it is not possible to obtain a representative sample of all the milk in the barrels and bulk tank for official or antibiotic testing; and
- It would be very difficult to collect the milk in a sanitary manner.

Excessive debris floating in bulk tank – If you observe foreign matter such as oil, grease, excessive straw or dirt floating in the tank or a red tinge (blood), you should not pick up the milk. The excessive dirt or debris has contaminated the milk, and pasteurization or milk filters are not enough to solve the issue.

Warm milk – If you arrive at a farm where the milk in the bulk tank is warmer than 45°F, you should not pick it up unless the farm has finished milking within the last two hours. In that case, the milk can be picked up if it is 50°F or less. At minimum, the milk cannot be picked up until at least 20 minutes after the end of milking.

Off odors – The odor of the milk is a good indicator of the conditions to which it has been exposed. If the milk smells off when you arrive, there is a good chance it was exposed to conditions that have tainted the milk. Off odors also mean there is an off flavor in the milk that will not be removed with pasteurization or any further treatment. It is important that you know which off-odors are cause for rejection. Appendix C provides more information on the off smells/flavors found in milk.

Farm Conditions – If you arrive at a farm where the farm conditions are unacceptable (dirty equipment, excessively dirty milk house or milking barn, sick cows, etc.) it is your responsibility

to contact someone. You can contact the field representative or the local dairy inspector. If you wish to remain anonymous you can call the MDA general line at 651-201-6300, and state you have a complaint and would like to remain anonymous.

Other – There are many other scenarios where you will have to make a judgement call on whether to collect the milk. Remember you are the initial screener of milk, and if you pick up unsuitable milk it can contaminate a whole tanker load which in turn can contaminate a whole silo at the plant.

Rejection Procedures

If you observe a scenario like those mentioned above and believe the milk needs to be rejected, contact the farm's field representative. Work with them to make the decision and determine what will need to be done with the milk.

Partial Pickup Procedures

A partial pickup occurs when you pick up only a part of the milk that is in the bulk tank. There are some situations where this may be required or asked of you. Be aware that the requirements for doing partial pickups are very specific. According to the PMO Section 7 Item 18r, there must be a continuously operated, properly functioning 7-day recording device on the bulk milk tank at the farm to allow partial pickups. The tank must also be emptied at least every 72 hours, so the bulk milk tank can be properly washed and sanitized. If the bulk tank does not have a 7-day recording device, you must return and pick up the remainder of the milk before the next milking at the farm.

On many farms the bulk milk hauler is asked to be responsible for maintaining the 7-day temperature recording charts. At a minimum, these charts must be changed every 7 days so the recorded temperature lines do not overlap. The person changing the chart must write their initials, the date, and the farm patron number on the chart when it is changed. The charts must also be kept on file and available for review for 6 months.

Timing of your Milk Pickup

Establishing a routine for collecting milk from the dairy farm at a regular frequency is very important. It becomes difficult to ensure the bulk milk tank at the farm is properly cleaned and sanitized if you pick up the milk at irregular frequencies. When factors that are out of your control occur, such as poor road conditions or severe weather, you may be required to alter your routine. Be sure to communicate this to the producer so that cleaning frequency requirements can be met, and storage options can be made available or assessed.

Please note, milk must be picked up at least once every 3 days unless prior approval from the regulatory agency has been granted.

Section 7: Pickup Procedures

Remember, you cannot pick up milk until at least 20 minutes have passed since the completion of milking. The following steps should be taken when picking up milk from a dairy farm.

1. Observe the milk

You will need to use several of your senses when observing milk prior to picking it up. First, as soon as you open the top on the tank, smell the milk. Milk easily picks up off odors in the environment, so it is important to smell it to ensure there are no off flavors present in the milk. A single bulk tank with an off odor can spoil a whole tanker load or silo of milk. Any off odors from the environment can easily be carried over to the finished product as an off flavor. A few common off flavors and odors are further defined in Appendix C of this reference manual. If there is any question about an off odor in the milk contact the field or plant representative **before** you start pumping the milk into the bulk milk tank truck.

Secondly, look at the milk. Normal milk color ranges from a bluish white to golden yellow. Check for any visible debris such as dust, dirt, insects, blood, chemicals, oil, or other abnormalities. If foreign matter is found, it indicates poor milking practices or milk that may have been collected from sick cows. If you do find excessive debris or bloody milk, contact the field or plant representative **before** you start pumping the milk into the bulk milk tank truck. Other things to look for include butterballs floating on the surface (caused by excessive agitation), frozen milk (caused by too little milk or cooling issues), or foaming milk (caused by excessive agitation).

2. Take the temperature

The temperature of the milk must be recorded at each pick up on the farm weight ticket. Bulk milk haulers can use the reading on the bulk milk tank thermometer if it has been verified against your calibrated thermometer. Milk that is over 45^{o}F must be rejected unless the milk is picked up within two hours of milking, and in this case the blend temperature cannot be over 50^{o}F. Temperatures over 50^{o}F in the tank can be sign that the farm bulk tank is not cooling properly and should be rejected. Some local dairy plants require milk to be less than 40^{o}F, and while this is not a legal requirement, you must follow the receiving plant's requirements.

All bulk milk haulers must have a calibrated thermometer that has been verified to be accurate within +/- 2^{o}F every 6 months. Using this thermometer, the bulk milk hauler must check the accuracy of the bulk tank thermometer at least once a month, and document it on the farm weight tickets.

This calibrated thermometer must be sanitized with your properly prepared sanitizing solution for at least 60 seconds each time before checking the temperature of the milk in the tank.

3. Connect the hose & Wash your hands

After you have observed the milk and taken the temperature, remove the cap from the bulk tank outlet valve and look inside to see if it is leaking. If the outlet valve cap is missing, is dirty or if the outlet valve is leaking, you must first clean and sanitize the outlet valve before you hook up your hose. Once the outlet valve is determined to be clean, connect the bulk milk tank truck hose to the outlet valve. Be careful to keep the hose cap clean and off the floor so it does not become contaminated.

Once the hose is hooked up, be sure to wash your hands with soap and water and dry them with a single service towel.

4. Measure the milk & Record the weight

The bulk hauler is responsible for measuring the milk in the farm bulk tank and recording the weight of milk picked up from the farm. Most farms use one of two options for measuring milk: Sticks or tubes. The following provides more details about using these tools. Be sure to shut the agitator off so it does not turn on while you are measuring the milk as this can influence the reading.

Sticks – Most bulk tanks have sticks with engraved lines on them that correlate to the weight charts found in the milk house. To read the stick pull it out of the holder, clean the area where the milk level is expected to be with a clean paper towel, and insert it completely back into the holder. Pull the stick back out, observe the milk line, and read the stick to the nearest mark. If the reading is exactly between two marks, record the reading at the **even** mark. Record this reading on the farm weight ticket, and then convert the reading to pounds using the conversion chart. Record the weight in pounds on the bill of lading document as well.

Tubes – Some bulk tanks have a clear hose with markings next to it instead of the internal stick. You don't need to remove the tube, just open the valve to let it fill. Let the milk level out, and then take the reading to the nearest mark. If the level is exactly between two marks, record the reading at the **even** mark. Record this reading on the farm weight ticket and convert the reading to pounds using the conversion chart. Record the weight in pounds on the bill of lading document as well. If the tube becomes discolored or worn over time you will need to work with the producer to have it replaced.

Accuracy of Your Measurement

Accurate readings are very important since dairy plants pay their producers based off weights of milk. Accurate readings can only be taken when the surface of the milk is completely still, thus the agitator cannot be running as you measure the milk. Since milk must be agitated prior to taking the sample, it might make more sense to take a sample prior to reading the weight if the agitator is running when you arrive.

There are several other factors that can cause inaccurate readings, including:

- The bulk tank is inaccurately calibrated – If you suspect this is an issue, let the farm's field representative know so they can recalibrate the tank.
- The tank is not level – Let the producer and field representative know.
- Heaving, cracking or settling of milkhouse floor shifting the bulk tank.
- Distortion of the measuring stick or the holder such as a crack or warp.
- Poor measuring techniques – Take your time reading the weight, and be sure you have recorded it accurately.

Steps 4, 5, and 6 may be performed in a different order on different farms depending upon the situation. For more information on the order of steps 4, 5, and 6 see Appendix D of this reference manual. There is also more information on properly reading the stick and chart in Appendix E of this reference manual.

5. Agitate the milk

Agitating the milk for the proper amount of time helps ensure that the sample is uniform. Knowing the proper agitation time will help ensure you end up with a uniform sample. Use the following as guidelines:

- Tanks that have **over** 1000 gallons or 8600 pounds of milk in them must be agitated for **10 minutes**.
- Tanks that have **less than** 1000 gallons or 8600 pounds of milk in them must be agitated for **5 minutes**.

Once you have taken your weight measurements, start the agitator, and set a timer or watch the clock for the required amount of time.

If the agitator is running when you arrive, you still must observe the agitator running for the correct length of time prior to sampling the milk. You may consider taking the sample prior to measuring the milk. For more information on the order of steps 4, 5, and 6 see Appendix D of this reference manual.

6. Sample the Milk

Once the agitator finishes you can start your sampling procedures.

- Make sure your hands are clean and dry.
- Mark the sample containers with the patron number and date. Some plants use preprinted stickers which are available at the farm. These stickers generally contain all required information. If you are using stickers double check that the information is correct.
- Do not sample milk that is frozen, partially frozen, chunky, curdled or churned.
- Remove your sample dipper from its container of sanitizer solution.
- Open the farm bulk tank lid.

- Rinse the dipper at least twice in the milk before taking the sample.
- Open the sample container, being careful not to touch the inside of the container or the inside of the cap with your hands so you do not contaminate it before taking the sample.
- Holding the sample container away from the tank so you do not contaminate the remainder of the milk in the bulk tank, fill the sample container to the required line. Generally, you need at least 2/3 of a vial. If you have extra milk in the sample dipper, dump it down the drain or in the sink, but not back into the bulk milk tank.
- If you are at the first stop of the load, take a temperature control sample by collecting an extra milk sample. Identify the extra sample as the **Temperature Control (TC)**, and list **patron number, date, time, temperature of milk in the bulk tank, and your initials** on the container. A temperature control sample must accompany each set of samples collected until they arrive at the lab. Again, if you are provided stickers at the farm double check that they are accurate.
- Rinse your sample dipper with water prior to returning it to the carrier, so any milk residue left on your dipper does not dilute the sanitizer solution.
- Place the sample(s) into the sample rack in your cooler with ice.

At minimum, at least one sample per tank, per farm, per pickup is required.

7. Pump the Milk & Disconnect the Hose

After you have collected the samples, you can start to pump out the milk from the farm bulk tank. Be sure to close the lid on the farm bulk tank prior to starting the pump to prevent the milk in the tank from becoming contaminated. If the agitator is running during the pump out be sure to shut it off once the milk in the tank gets below the top of the agitator. This will help minimize product loss. After all the milk is out of the tank, shut the pump off and disconnect the hose. If the hose cap has been contaminated be sure to wash and sanitize it before putting it back on the hose.

8. Rinse and Observe the Tank

Rinse the bulk tank with water to help remove milk solids. While you are rinsing it, look inside especially at the bottom and the milk line. Any abnormalities such as the start of buildups or construction issues should be brought to the attention of the producer and the field representative.

Rinse the outside of the bulk tank. Depending on the farm, you may also hook up and start the bulk tank washer. Close the milkhouse door, and shut off the lights when you leave.

Section 8: Direct Load Tankers

Direct load tankers are becoming more common, especially as the size of farms grow. These tankers are parked at the farm, with milk pumped directly into the tanker, instead of storing it in a bulk tank for later pickup. This situation is unique compared to the traditional pickup routes with bulk tank trucks because the driver is not necessarily the sampler of the milk. A Bulk Milk Hauler and Sampler license is not required for the driver to pick up direct load tankers in situations where the dairy plant has a licensed sampler and/or the dairy producer is a licensed sampler.

Sampling of Direct Load Tankers

There are two ways to get a milk sample on the direct load tanker: **in-line sampler** or **a sample taken at the receiving plant.**

In-Line Sampling

An In-line sampler is a device that captures representative samples of the milk as it is collected and loaded into the tanker. These devices must be approved for use on the farm by the regulatory agency (in this case, the MDA). Usually In these situations, the producer or an employee of the farm will be a licensed bulk milk hauler so they can take the sample out, shake it up, and put it into the vial when the tanker gets full. They will also complete the necessary records at the farm.

Sample Collection at the Receiving Plant

If there is not an in-line sampler at the farm, a milk sample will need to be taken at the receiving plant. It is the responsibility of the plant to ensure that the tanker is properly agitated at the time the sample is taken. A permitted (evaluated) sampler must collect the sample at the plant. That individual may be anyone who is permitted to collect official regulatory samples and does not have to be the bulk hauler.

Section 9: Testing the Milk

At the plant and lab, many different tests are performed on the samples you collect. Below are some of the tests that are performed.

State Monthly Quality Tests

Once a month, the MDA requires the plant or lab to run official monthly quality tests on individual producer samples. Results from these tests are reported to the state. The tests included in the official monthly quality tests are: Standard Plate Count (SPC), Somatic Cell Count (SCC), Temperature, and Antibiotics. The samples taken by the bulk hauler are the samples that are used for these quality tests.

Appendix N Tests

For every single load brought to the plant, the receiving or intake lab will test the tanker sample for antibiotics. If the sample comes back positive, a series of confirmation tests are run to determine the producer responsible for the positive result. A trained and certified lab person must run these tests because regulatory action can be taken based on the results. Currently these tests are checking for Beta lactam type antibiotics (penicillin family) and some are run for tetracycline antibiotics. Other types of antibiotic tests are expected to be run in the future.

Loads that are confirmed positive for antibiotics must be disposed of. Contact the field representative for disposal instructions. And remember, you must wash and sanitize your milk tank truck after disposing of the contaminated milk and prior to picking up the next load.

Lab Tests

The plant may choose to run additional tests as they see fit. The plant cannot always run all these tests at their internal laboratory facility so many samples are sent to an outside lab for further testing. Some additional tests may include:

- **Component testing** – Most producers are paid based on components such as butterfat and protein, so most plants run component testing.
- **Bacteria counts** – Several different tests can be used to test for various types of bacteria or organisms, and what the plant chooses to run can differ between months and loads.
- **Antibiotic or inhibitory tests** – Pasteurization cannot remove antibiotics, sanitizer residues, etc. from the milk and the scope of Appendix N testing is limited so the plant may choose to run additional tests to ensure they are not present.
- **Sediment tests** – These tests are used to determine if careless practices (such as not using filters) are happening on farms.
- **Added water tests** – Cryoscope readings can be taken to determine if excess water is present in the milk. If the plant identifies excess water on a test, the plant must report these results to the MDA, and the MDA may take regulatory action on these tests.

Section 10: Procedures at the Plant

Every plant has different procedures to follow when trucks arrive. It is important that you follow all Good Manufacturing Practices (GMPs) required by the plant while you are there. Some common GMPs found at almost all our dairy plants include:

- Hair covering (hats and/or hair nets) are required
- No tobacco use allowed in receiving bays
- No access allowed to restricted processing areas

The following is a general list of what to expect:

- Most plants have a scale to pass over to weigh in.
- Enter receiving bay, some are drive throughs and some you must back into.
- Give your completed bills of lading to the receiving staff.
- The receiving staff will check the paperwork and the seals on the tanker. Leave the milk samples and temperature control bottle with the receiving staff. In some instances, you may have to drop them off at another location. Be sure to keep your samples cold. Your samples may be rejected if the temperature is warmer than 45^{o}F.
- Receiving staff will open the lids on the tanker, check the milk for off odors or abnormal appearance, take the temperature, and pull sample(s) for antibiotic and/or bacteria tests. These individuals are also evaluated for proper sampling procedures once every 24 months.
- Vents must be opened prior to emptying, and filters are placed on all openings on the top of the tanker/milk tank truck.
- Appendix N tests for antibiotics are run by a certified individual; if the results are “not found” (negative), the hoses will be hooked up to the milk pump. In some plants the bulk milk hauler hooks up the hoses.
- Milk is pumped from the bulk milk tank truck to the appropriate silo.
- If you are washing the bulk milk pickup tanker at the plant, the Clean-in-Place (CIP) wash wand is placed into the milk tank truck and hoses hooked up for washing. Be sure the CIP wash wand is not placed into the truck before the milk hose for filling the silo has been disconnected.
- The wash chart must be signed or initialed; in some plants the bulk milk hauler does this, but in others the intake staff do this. A wash tag will be issued, and you will need to attach it to your truck.
- Leave the receiving bay.
- Weigh out on the scale when you leave.

You will need to work with the plants that you unload at to learn their procedures and what your duties are as a bulk milk hauler, and what the intake staff will do.

Section 11: Biosecurity

On the Farm

As a bulk milk hauler, you will likely set foot on several dairy farms over the course of the day. If you are not careful there is the potential that you could spread disease from one farm to another. This section discusses the normal biosecurity measures you should take to prevent the spread of disease. Additional procedures may be needed in the event of a disease outbreak.

Because you move from farm to farm, you must act in a manner that will prevent the spread of disease. On a general level, you should do the following every single day:

- **Be Clean:** Ensure your clothing and equipment are clean, discard waste appropriately, and avoid contact with manure or other animal fluids (such as blood, urine, mucus, or saliva) in the environment.
- **Be Aware:** Observe your surroundings and pay attention to the operations on the farm and in the plant; recognize situations where haulers and their work may contribute to the spread of disease.
- **Take Care:** Ensure documentation is accurate and complete; pay attention to small details as these often make all the difference in whether biosecurity practices are effective in preventing disease.

In addition to being clean, being aware, and taking care, there are a few other things to consider while you are doing your work:

- Learn your farms' biosecurity practices and adhere to whatever reasonable biosecurity requests the farm makes. If the farm requires everyone to wear boot covers provided by the farm while they are there, then you must wear boot covers while you are there.
- Take every measure possible to keep clean during the day. This includes your hands, clothes, shoes, etc. Wash your hands thoroughly and frequently and spray off your boots if they get dirty before getting back into your truck and leaving the farm. If your clothes get dirty do your best to clean them off and if they are excessively dirty you may need to change clothes before stopping at another farm.
- Be careful about where you set equipment such as the sample dipper container or clipboards. If they get splashed with milk or manure, clean them off and do your best to sanitize them prior to going to the next farm.
- Avoid walking through cattle housing areas or anywhere on the farm that it is not necessary for you to be to perform your duties.
- If you arrive at a farm that has a sign posted that says, "No admittance - animal disease outbreak," contact the producer prior to entering the farm as there may be an actual disease outbreak occurring.

At the plant

Most plants have Good Manufacturing Practices (GMPs) in place. As a bulk milk hauler, you must also adhere to these requirements. Each plant will also have its own biosecurity requirements. Some of these requirements may include:

- Passing through foot baths
- Restricted access to processing areas
- Required lab coats, hair nets, beard nets, footwear such as disposable booties, etc.

In general, pay attention to the expectations of the individual plant. Each plant is unique and has designed their system to prevent the introduction of contamination and potential disease agents.

Appendix A: Emergency Bulk Milk Tanker Accidents & Transfers

In the event of an accident or need to transfer milk to another tanker the following items should be considered:

Who do I need to notify?

You must report all accidents and rollovers to:

1. **Minnesota Duty Officer**
   - Contact:
     - Within Minnesota: 1-800-422-0798
     - In Metro area or outside of Minnesota: 1-651-649-5451
   - The Duty Officer will ask for the following information:
     - Telephone number for call backs at the scene
     - Have local officials been notified?
     - Police, fire department, etc.?
     - Date, time and exact location of incident
     - Materials and quantity involved in the accident
     - Responsible party of the incident (trucking company, property or business owner)
     - What is happening or happened, and do you need assistance?
2. The **receiving dairy plant Quality Assurance Manager** to confirm if the product can be received

When do I need to notify?

In the following scenarios **you must notify** the proper personnel:

- An accident where milk is leaking from the bulk milk tanker;
- An accident where the tank on the bulk milk tanker is damaged; or
- If assistance is needed from dairy staff.

In the following scenarios **you may need to notify** the proper personnel:

- Your vehicle broke down (depending on if milk needs to be transferred or not); or
- An accident occurred where milk is not leaking from the bulk milk tanker.

You may transfer the milk if:

- The bulk milk tanker is not damaged;
- The manhole cover and cap are intact;
- The outlet valve is functional and can be sanitized prior to transfer;
- A clean food grade hose and milk tank truck is available to make a sanitary transfer; and
- The transfer can be completed in a sanitary manner.

If the above conditions cannot be met the milk cannot be transferred.

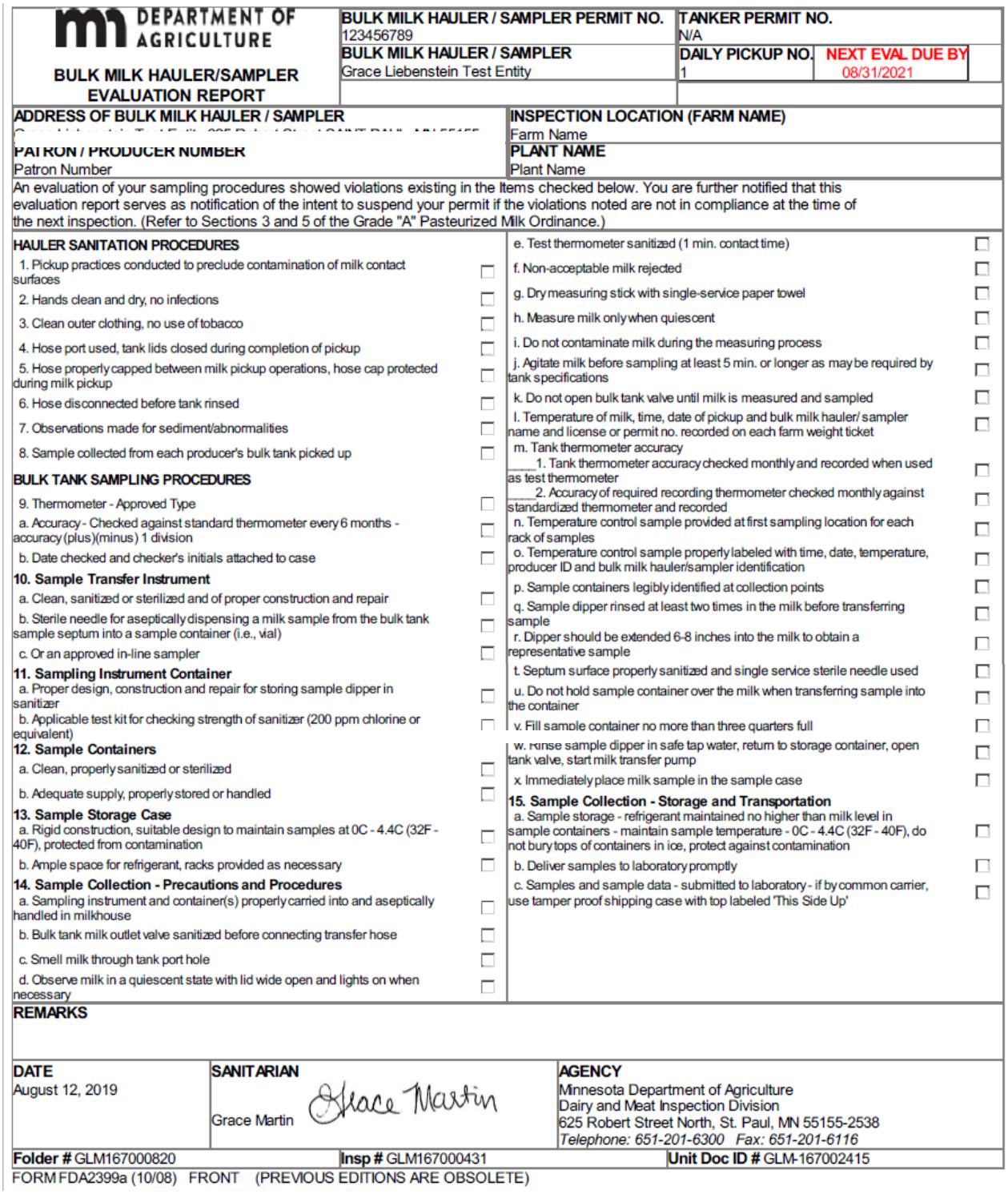
Where can the milk go?

The milk and the accompanying samples can **only** go to a manufacturing grade plant. Once the milk is transferred it is no longer considered Grade A.

Questions?

If you have further questions, contact your local dairy inspector or the Minnesota Department of Agriculture Dairy and Meat Inspection Division at 651-201-6300.

Appendix B: 2399a Bulk Milk Hauler Evaluation



DEPARTMENT OF AGRICULTURE

BULK MILK HAULER/SAMPLER EVALUATION REPORT

BULK MILK HAULER / SAMPLER PERMIT NO. 123456789	**TANKER PERMIT NO.** N/A
BULK MILK HAULER / SAMPLER Grace Liebenstein Test Entity	**DAILY PICKUP NO.** 1 — **NEXT EVAL DUE BY** 08/31/2021
ADDRESS OF BULK MILK HAULER / SAMPLER	**INSPECTION LOCATION (FARM NAME)** Farm Name
PATRON / PRODUCER NUMBER Patron Number	**PLANT NAME** Plant Name

An evaluation of your sampling procedures showed violations existing in the items checked below. You are further notified that this evaluation report serves as notification of the intent to suspend your permit if the violations noted are not in compliance at the time of the next inspection. (Refer to Sections 3 and 5 of the Grade "A" Pasteurized Milk Ordinance.)

HAULER SANITATION PROCEDURES

- 1. Pickup practices conducted to preclude contamination of milk contact surfaces ☐
- 2. Hands clean and dry, no infections ☐
- 3. Clean outer clothing, no use of tobacco ☐
- 4. Hose port used, tank lids closed during completion of pickup ☐
- 5. Hose properly capped between milk pickup operations, hose cap protected during milk pickup ☐
- 6. Hose disconnected before tank rinsed ☐
- 7. Observations made for sediment/abnormalities ☐
- 8. Sample collected from each producer's bulk tank picked up ☐

BULK TANK SAMPLING PROCEDURES

- 9. Thermometer - Approved Type ☐
- a. Accuracy - Checked against standard thermometer every 6 months - accuracy (plus)(minus) 1 division ☐
- b. Date checked and checker's initials attached to case ☐

10. Sample Transfer Instrument

- a. Clean, sanitized or sterilized and of proper construction and repair ☐
- b. Sterile needle for aseptically dispensing a milk sample from the bulk tank sample septum into a sample container (i.e., vial) ☐
- c. Or an approved in-line sampler ☐

11. Sampling Instrument Container

- a. Proper design, construction and repair for storing sample dipper in sanitizer ☐
- b. Applicable test kit for checking strength of sanitizer (200 ppm chlorine or equivalent) ☐

12. Sample Containers

- a. Clean, properly sanitized or sterilized ☐
- b. Adequate supply, properly stored or handled ☐

13. Sample Storage Case

- a. Rigid construction, suitable design to maintain samples at 0C - 4.4C (32F - 40F), protected from contamination ☐
- b. Ample space for refrigerant, racks provided as necessary ☐

14. Sample Collection - Precautions and Procedures

- a. Sampling instrument and container(s) properly carried into and aseptically handled in milkhouse ☐
- b. Bulk tank milk outlet valve sanitized before connecting transfer hose ☐
- c. Smell milk through tank port hole ☐
- d. Observe milk in a quiescent state with lid wide open and lights on when necessary ☐
- e. Test thermometer sanitized (1 min. contact time) ☐
- f. Non-acceptable milk rejected ☐
- g. Dry measuring stick with single-service paper towel ☐
- h. Measure milk only when quiescent ☐
- i. Do not contaminate milk during the measuring process ☐
- j. Agitate milk before sampling at least 5 min. or longer as may be required by tank specifications ☐
- k. Do not open bulk tank valve until milk is measured and sampled ☐
- l. Temperature of milk, time, date of pickup and bulk milk hauler/ sampler name and license or permit no. recorded on each farm weight ticket ☐
- m. Tank thermometer accuracy
  - ____1. Tank thermometer accuracy checked monthly and recorded when used as test thermometer ☐
  - ____2. Accuracy of required recording thermometer checked monthly against standardized thermometer and recorded ☐
- n. Temperature control sample provided at first sampling location for each rack of samples ☐
- o. Temperature control sample properly labeled with time, date, temperature, producer ID and bulk milk hauler/sampler identification ☐
- p. Sample containers legibly identified at collection points ☐
- q. Sample dipper rinsed at least two times in the milk before transferring sample ☐
- r. Dipper should be extended 6-8 inches into the milk to obtain a representative sample ☐
- t. Septum surface properly sanitized and single service sterile needle used ☐
- u. Do not hold sample container over the milk when transferring sample into the container ☐
- v. Fill sample container no more than three quarters full ☐
- w. Rinse sample dipper in safe tap water, return to storage container, open tank valve, start milk transfer pump ☐
- x. Immediately place milk sample in the sample case ☐

15. Sample Collection - Storage and Transportation

- a. Sample storage - refrigerant maintained no higher than milk level in sample containers - maintain sample temperature - 0C - 4.4C (32F - 40F), do not bury tops of containers in ice, protect against contamination ☐
- b. Deliver samples to laboratory promptly ☐
- c. Samples and sample data - submitted to laboratory - if by common carrier, use tamper proof shipping case with top labeled 'This Side Up' ☐

REMARKS

DATE	**SANITARIAN**	**AGENCY**
August 12, 2019	Grace Martin *Grace Martin*	Minnesota Department of Agriculture Dairy and Meat Inspection Division 625 Robert Street North, St. Paul, MN 55155-2538 *Telephone: 651-201-6300 Fax: 651-201-6116*

Folder # GLM167000820 **Insp #** GLM167000431 **Unit Doc ID #** GLM-167002415

FORM FDA2399a (10/08) FRONT (PREVIOUS EDITIONS ARE OBSOLETE)

Appendix C: Off Flavors & Odors in Milk

The following are the odors or off flavors that are most commonly found at the farm:

- Feed
- Weedy
- Rancid
- Barny or Unclean
- Bacterial
- Salty
- Foreign

Feed Flavors

Most green feeds and silage will give the milk a feed flavor if not handled or fed properly. Feed flavors enter the milk through the digestive system, respiratory system, and by direct absorption. Feeding cows silage during or just before milking can cause an objectionable feed flavor in the milk.

Feed flavors generally come off as a sweet smell but can be stronger and unclean smelling if the feed quality is poor. Feed flavors that enter the milk through the respiratory system can usually be detected sooner than those entering through the digestive system.

To control feed flavors the producer should:

- Put cows out to pasture as early in the morning as possible.
- Feed silage after milking rather than before or during milking.
- Keep mangers clean so that the barn will not smell strongly of silage, by feeding what the cows will eat and not excessively more.
- Ventilate the milking barn properly.

Weedy Flavors

Weeds such as bitterweed, carrot weed, ragweed, wild onion, and many others will give an off flavor to the milk if ingested by the cow.

To control weedy flavors the producer should follow good pasture management and control undesirable weeds.

Rancid Flavors

The rancid flavor is sometimes described as bitter, soapy or cowy. It is a pungent odor when extreme. Rancid flavors are caused by normal enzymes (lipase) in milk which alters the milkfat structure, releasing free fatty acids.

There are two types of rancidity in milk: spontaneous and induced. Spontaneous rancidity develops with no apparent activation treatment. It is associated with late lactation, disease (mastitis), feed, and individual cows. These factors appear to make milk more susceptible to the development of rancidity. Induced rancidity requires that milk undergoes certain activation treatments for rancidity to develop.

Factors that contribute to induced rancidity include:

- Excessive agitation with an incorporation of air or foaming of warm raw milk (caused by air leaks)
- Temperature or thermal activation – rewarming of previously cooled raw milk to 50°F or above then cooled to 45°F or below
- Freezing milk
- Excessive growth of psychrotrophs (bacteria which grow at low temperatures)

To control rancid flavors the producer should:

- Prevent unnecessary agitation and pumping of milk.
- Ensure there are no risers present and no air leaks when the pipeline is installed.
- Make sure that the bulk tank has enough cooling capacity to prevent the blend temperature from exceeding 50°F (blend temperature is the temperature of the combination of warm milk added to previously cooled milk).
- Withhold milk from cows in late lactation.
- Avoid holding raw milk for prolonged periods. Milk should be picked up at least every other day if used for Grade A.

Barny/Unclean Flavors

Barny or unclean defects smell just as you would expect - like a dirty barn, cow's breath, or a dirty dish rag. These off flavors are caused by unclean milking procedures, unclean milking equipment, and poor ventilation.

To control barny or unclean flavors the producer should:

- Keep milking equipment clean.
- Follow good milking procedures.
- Ventilate the milking barn properly.

Bacterial Flavors

Many off flavors in milk such as bitter, malty, medicinal, and sour can be attributed to excessive bacterial growth. Poor sanitary practices encourage a buildup of certain types of organisms which can grow at a lower temperature and cause off flavors. Good sanitary practices are essential even with the best cooling methods.

To control bacterial flavors the producer should:

- Keep milking equipment clean and sanitize just before use.
- Follow good milking procedures.
- Cool the milk to 45°F or lower immediately after milking.

Salty Flavors

While you won't be able to smell a salty flavor, it is easily detected by taste. Salty flavors are attributed to cows with mastitis and cows late in lactation.

To control salty flavors, the producer should withhold milk from cows showing signs of abnormal milk and from cows in very late lactation.

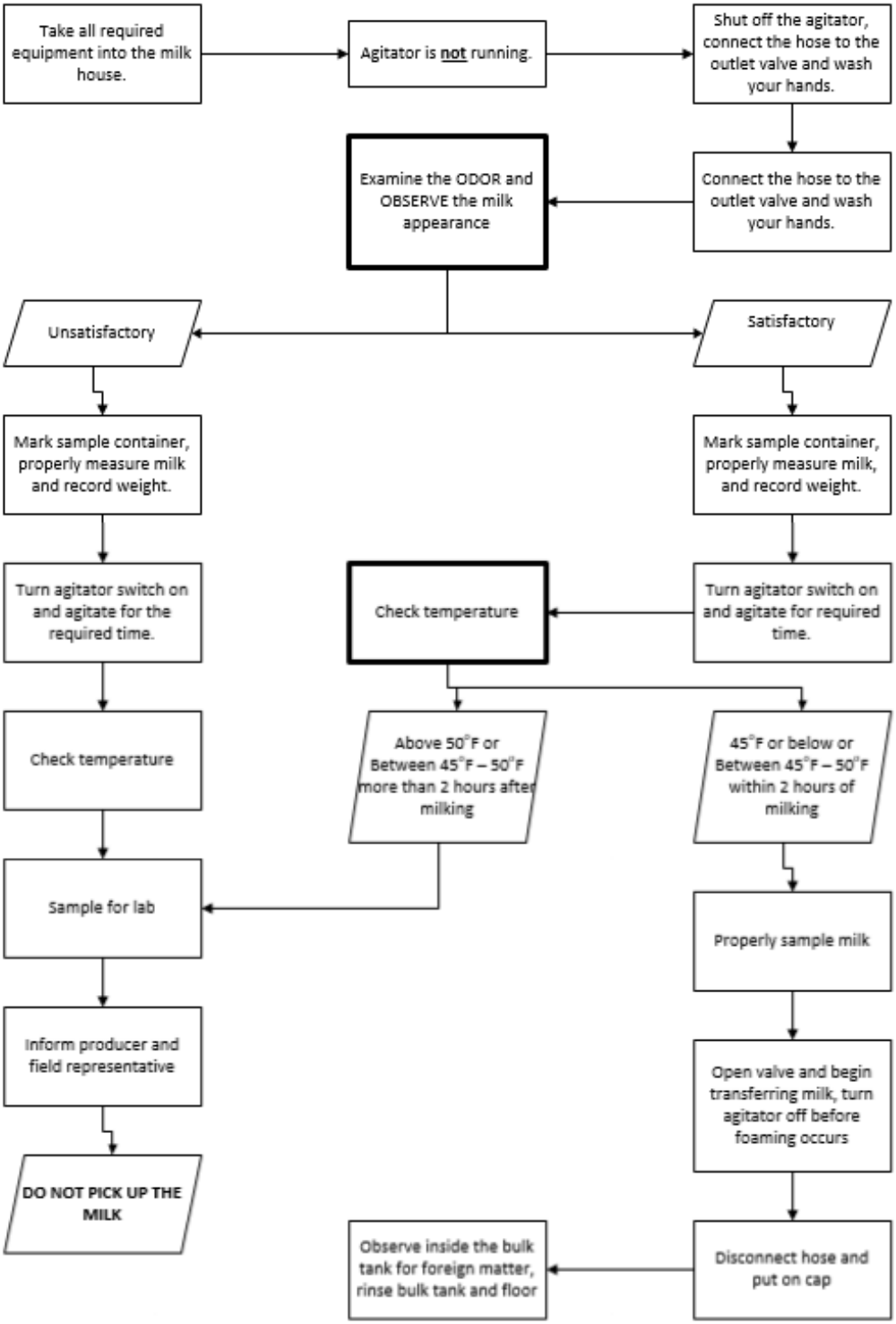
Foreign Flavors

Foreign flavors can often be smelled in the milk as an odor that is not commonly associated with milk such as a chemical smell. Some common sources include sanitizers, detergents, exhaust fumes, cow medications, citrus fruits, paint, fly spray, etc.

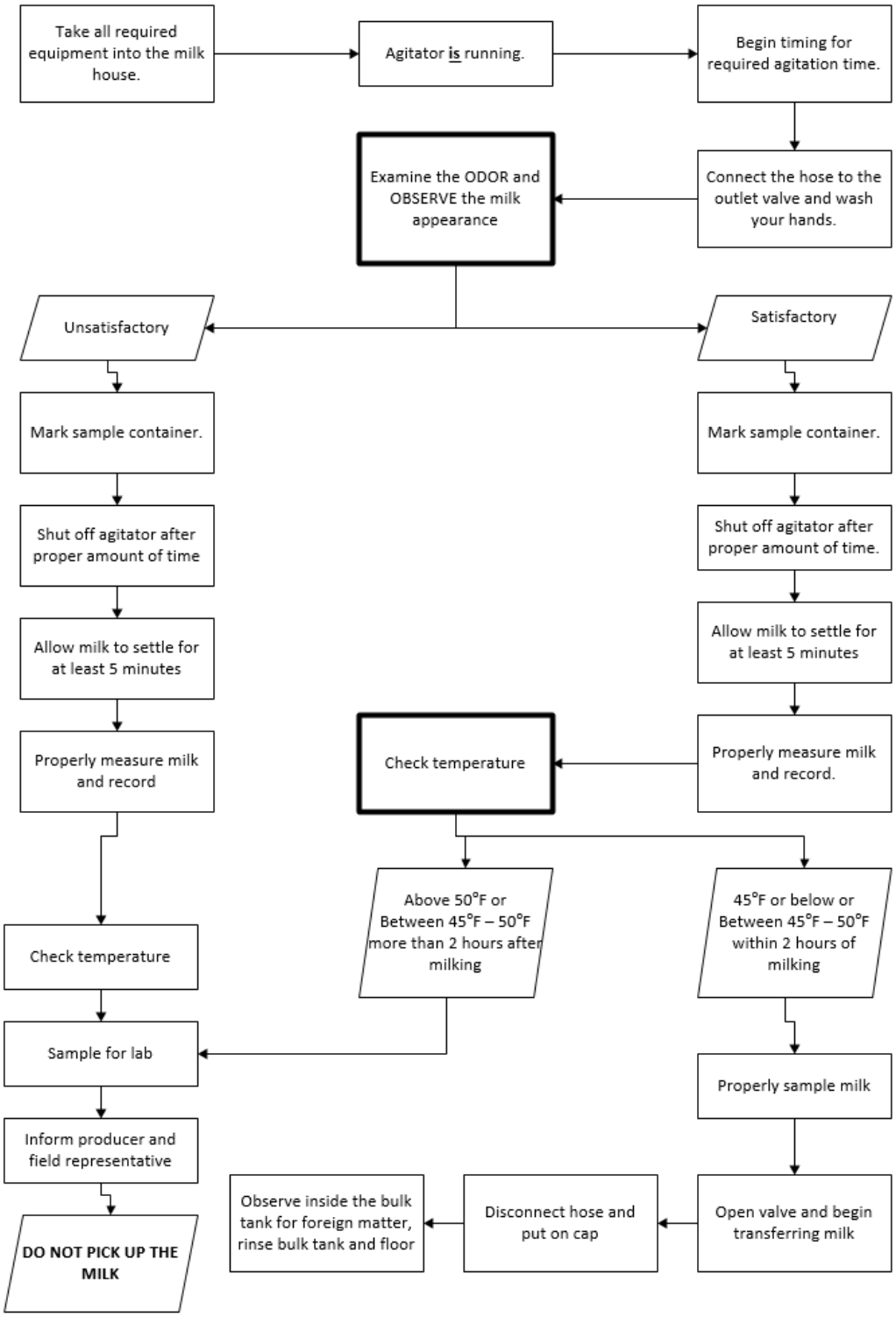
To control foreign flavors the producer should:

- Be careful when handling the above-mentioned materials so that the flavor or odor from them does not make its way into the milk.
- Use chemical sanitizers only in the concentrations specified in the directions.
- Properly ventilate the milkhouse and surroundings.

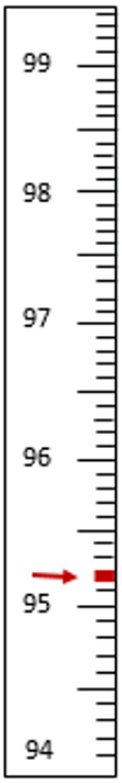
Appendix D: Procedures for Collecting Milk when the Agitator **IS NOT** Running Upon Arrival



Appendix E: Procedures for Collecting Milk When the Agitator **IS** Running Upon Arrival



Appendix F: How to Read a Measuring Stick



MODEL: DKF6000
SERIAL NO: 345984g
CHART IN: LBS OF MILK

DARI KOOL

CM	94	95	96	97	98	99
0	25558	25890	26224	26556	26893	27227
1	25591	25923	26258	26589	26926	27260
2	25624	25957	26291	26623	26960	27294
3	25657	25991	26325	26658	26993	27327
4	25690	26025	26359	26693	27027	27360
5	25723	26059	26393	26726	27060	27393
6	25757	26091	26425	26760	27094	27426
7	25791	26124	26458	26794	27128	27459
8	25824	26157	26491	26828	27161	27493
9	25858	26191	26523	25860	27194	27527

There are two parts to reading a weight from a bulk tank: the chart and the stick, both shown above.

- **The stick** is numbered from the bottom to the top, just like the bulk tank fills. Each line represents a centimeter (cm) and corresponds to a reading on the chart.
- **The chart** shows the large number reading in the top row, and each CM runs below it.

For this example, if the milk line is at the arrow (bolded line):

- The stick reading would be 95-2; and
- The weight reading would be 25957 pounds

Remember, these readings will both be recorded on the farm weight slip.

A few tips and tricks:

- You may have to clean the stick off more than once to be sure you have removed the milk residue to obtain an accurate reading.
- If the milk falls between two lines, always read to the **even** number weight.
- Not all charts look the same, so take some time to learn each farm's chart.