Bulk Tank Calibration

Effective November 1, 1997 the farm bulk tank calibration service previously offered by Alberta Agriculture, Food & Rural Development (AAFRD) has been terminated. Although current Dairy Industry Act regulations require that calibration must be done "in a manner satisfactory to an inspector", they do not require that the calibration actually be done by an inspector.

Termination of the free service leaves the industry with two options:

- The present system will continue without an inspector being present, where the processor representative and the producer calibrate the tank.
- A private agency could be contracted to do the calibrations. In B.C., International Dairy Calibrations Ltd. (see bottom of page 3) is the approved calibrator used by Dairyworld Foods.

In any case, producer and processor must formally acknowledge acceptance of the calibration by signing the Farm Bulk Tank Calibration form shown on page 4.

Where a dispute arises between processor and producer, an inspector from the AAFRD Dairy Quality Section will be available to arbitrate. This will usually involve the inspector assisting with a check calibration.

In addition to a requirement for calibration, Dairy Industry Act regulations state requirements for farm bulk tank installation. Current guidelines for installation and calibration are given on pages 2 and 3. Before installing a new tank, call your nearest Regional Dairy Production Specialist (listed on the right). He will visit your farm to verify that your installation plans comply with the regulations.

The cost of miscalibration

Bulk tank miscalibration is not uncommon and in some cases it can result in significant loss of income. Several years ago, B.C. inspectors found that 24 of the 184 tanks they checked were calibrated on the low side, cheating producers by up to 22 litres on each shipment. Of 81 tanks in Alberta surveyed by International Dairy Calibrations Ltd., 43 were out of calibration. Most were out by only 10 or 20 litres, but in one case, a miscalibrated tank cost a producer in Northern Alberta 90 litres per shipment. Assuming bulk tank calibration costs $500 every 5 years, reducing losses by slightly more than one litre per shipment would offset the investment.

Although you will have calibrated your tank when it was first installed, you should consider recalibrating every 5 years. In B.C. this is a statutory requirement. There are several reasons why a tank may become miscalibrated:

- Faulty design - some tanks consistently lose accuracy due to structural fatigue or instability. These can cause the tank to sag or bulge, resulting in lower readings.
- Cracking or shifting of the milkhouse floor can cause the tank to tilt.
- Tampering - although rare, there have been a few instances where producers have deliberately tilted a tank to increase dipstick readings.

AAFRD Dairy Production Specialists

David Croy
Agriculture Centre, Highway 3 East
Lethbridge T1J 4C7
phone: 310-0000 : 381-5834

Jay Adams
Provincial Building, 3rd Floor
4920 - 51st Street
Red Deer T4N 6K8
phone: 310-0000 : 340-7606

Ray Grapentine
Provincial Building
5201 - 59th Avenue
Wetaskiwin T9A 0S7
phone: 310-0000 : 361-1240

Harry Pohl
O.S. Longman Building
6909 - 116th Street
Edmonton T6H 4P2
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GUIDELINES FOR FARM BULK MILK TANK CALIBRATION
(20 Litre Prover Method)

Introduction

By general definition, a farm bulk tank is a large capacity vessel in which varying amounts of milk are measured. This measurement is accomplished by determining in each case the level of milk in the tank and converting the milk level reading into a volume reading by reference to a conversion chart based on a volumetric calibration of the tank.

The farm bulk tank is the commercial measure for a dairyman's product. The bulk tank must be 3A approved. The producer of raw whole milk is paid by the dairy processor for the amount of milk indicated on the conversion chart, based on the level of milk in the tank. Only if this measurement is accurate is the transaction fair to both parties. For this reason, accurate bulk tank calibrations are essential.

Installing the bulk tank

Before a bulk tank can be calibrated, it first must be installed properly. For proper installation the following criteria must be met.

1. There shall be no unprotected light fixture directly over the opening(s) to the bulk tank.
2. The drain valve should be at least 50 centimetres from the milkhouse floor drain. The bulk tank should not be located directly over the floor drain.
3. There should be 90 centimetres of clearance between the bulk tank and other objects on the valve end and the working side(s). The non-working side(s) should have 60 centimetres clearance.
4. The valve end of the bulk tank should be no further than 3 metres from the hose port.
5. The electrical and refrigeration lines should be positioned so that the bulk tank can be raised or lowered during the calibration without causing damage to these lines.
6. All the legs on the bulk tank must be adjustable and touching the floor.

Levelling the tank

1. The bulk tank must be levelled by using one or more of the following: levelling pins, levelling lugs, scribemarks, fisheye level, or a spirit level across the manhole.
2. When the tank is levelled using one of the above, there should be about 1 centimetre per 50 centimetres of slope (1/4 inch per foot) from the back of the bulk tank to the front. This allows for adequate drainage.

Calibrating the bulk tank

Necessary equipment:

- calibration can (20 litre prover);
- Bon Ami (the original, containing no wetting agents or chlorine)
- level
- pipe wrench, jack, and other tools as required
- cement
- calibration forms
- good supply of clean water

Procedure:

1. Check that the same serial number is on the tank, measuring stick, and litre conversion chart.
2. Inspect the calibration can for rust, dents, or foreign material.
3. Wet the entire inner surface of the calibrating can.
4. Clean and rinse the farm bulk tank and allow it to drain 30 seconds after the main drainage has ceased.
5. Close the outlet valve and ensure that it is not leaking.
6. Level the calibration can.
7. Fill the calibration can to read zero at the bottom of the meniscus. All readings must be made with eyes on the same level as the zero mark or line on the calibration can. If there is gas present in the water allow the water to sit until all gas is expelled.

8. Allow a 10-second drain each time the calibration can is emptied.
9. Deliver an amount of water equal to the first check point desired on the conversion chart. (NOTE: chart may specify manufacturers quantity of water for initial stick reading).
10. Clean the measuring stick with Bon Ami and warm water. Dry the stick and apply Bon Ami powder to that portion of the stick to facilitate observing the water line.
11. Read the measuring stick to the nearest graduation. If the milk line is halfway in between, read to the lower whole number. The procedure for reading an external gauge tube is the same. When reading a gauge tube, one's eye should be at the same level as the liquid in the tube.
12. The water line on the measuring stick must be a clean straight line - no fuzziness - no curves. If at any time the reading line changes, the stick must be recleaned.
13. Adjust the legs on the bulk tank so that the desired reading is obtained on the measuring stick.
14. Each time water is added to the tank for a new reading, the water must be motionless before a measuring stick reading is taken. The stick should be lowered straight down and be firmly seated. When any doubt or question arises about a stick reading, repeat the procedure until satisfaction is reached. Caution should be taken to eliminate air leaks in outside measuring devices.
15. Check farm milk tanks at a sufficient number of levels to assure oneself that the chart is accurate. At least two readings must be taken, preferably three.
16. Bulk tank legs shall be cemented to the milkhouse floor after the bulk tank is calibrated.

Recalibrations

Over a period of time, certain factors may affect the farm tank measuring stick readings. The milkhouse floor may settle or shift due to poor installation, ground movement or frost action; the producer may relocate the tank within the milkhouse. The readings may be either higher or lower than the original calibration readings and thus the corresponding conversion chart reading will result in an inaccurate amount of milk being recorded by the bulk driver. The recalibration is carried out exactly as outlined above.

Completing the bulk tank calibration form(see facsimile on page 4)

The Farm Bulk Tank calibration form can be obtained from:

Dairy Quality Section,
Alberta Agriculture, Food & Rural Development
3rd Floor, 6909 - 116 St.,
Edmonton, AB T6H 4P2

To complete the form:

1. Check either:
   - new installation: the bulk tank, new or used, is being calibrated for the first time on the farm
   - recalibration: the bulk tank has been calibrated on this particular farm for this producer before.
2. Both producer and dairy plant representative must sign the form when they are satisfied the bulk tank is calibrated accurately.
3. Copies of the form must be distributed as follows:
   - the dairy producer;
   - the dairy plant representative;
   - the Regional Dairy Production Specialist;
   - the provincial Dairy Quality Section.

If you would rather hire someone to perform the calibration, contact:

Russ Browne,
International Dairy Calibrations Ltd.,
140 - 4001 Old Clayburn Road
Abbotsford, B.C. V3G 1C5
phone: (604)859-4959 fax: (604)859-4969

Typical cost of this service is in the $500 range but cost varies depending on:

- the size of the bulk tank - tanks over 1500 gallons typically take a full day to calibrate;
- whether an initial calibration or recalibration is required - recalibrations are usually less costly;
- travel required.

Alberta

AGRICULTURE, FOOD AND
RURAL DEVELOPMENT
FOOD QUALITY BRANCH

FARM BULK TANKS

INSTALLATION AND CALIBRATION

NEW INSTALLATION ☐ **RECALIBRATION** ☐

1. Installed on the farm of: _____

   Address _____ Patron's No. _____

2. Sold and Installed by _____ And/or _____

3. Previous Owner (if used tank) _____

4. Supplier Representative _____

5. Dairy Firm Purchasing Milk _____ Representative _____

   Address _____

6. Manufacturer of Tank _____ Serial No. _____ Model No. _____

7. Particulars on Check Calibration Tank Capacity _____

NO. OF GALLONS U.S. ( ) IM. ( )	NO. OF LITRES	CONVERSION CHART READING	ACTUAL DIPSTICK READING	DIPSTICK READING AFTER LEVEL OF TANK ADJUSTED

NOTE: 1 U.S. Gal. = 3.785412 litres = 8.60 lbs. 1 Imp. Gal. = 4.546090 litres = 10.32 lbs.

8. How were tank legs sealed and anchored to the floor? _____

9. Is the dipstick marked in metric? YES _____ NO _____

10. Is there a metric chart for the tank? YES _____ NO _____ (Chart #_____)

11. If the water used foamed, was air expelled before readings taken? YES _____ NO _____

12. We the undersigned are satisfied that this tank is at the correct level.

    Producer _____ Dairy Plant Representative _____

REMARKS: _____

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_____ _____

DATE

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