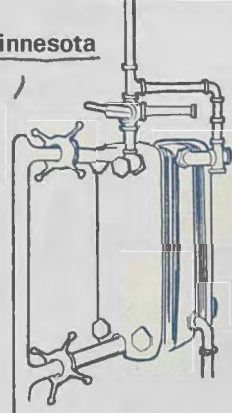
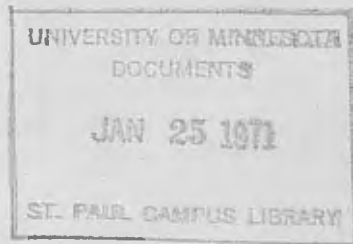


3 MINNESOTA DAIRY PRODUCTS PROCESSOR



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USE OF THE MILKO-TESTER AS AN OFFICIAL TEST

We were asked to extract from the Milko-Tester Operator's Manual, those facts pertinent to the day-to-day operation of the Milko-Tester as an official test procedure for milk purchase in Minnesota. This we have done in the following discussion. We have also added a section on sample preparation.

USE OF THE MILKO-TESTER FOR BUTTERFAT DETERMINATION

The following is a guide for operation of the Milko-Tester as an official method of testing butterfat in Minnesota. It is a condensation of information found in the operator's manual of the manufacturer. The material is intended as a guide for routine, day-to-day analysis. For more detail, consult the manual per se.

CALIBRATION

The foregoing discussion assumes that the Milko-Tester has been properly calibrated. Units should be calibrated when installed. Thereafter, accuracy and precision checks must be made every 10,000 samples. Re-calibration is necessary whenever:

- a) the 10,000 sample check fails
- b) the following parts are replaced, re-built, or adjusted: diluent syringe, syringe check valve, separation valve, pipette, cuvette, photocell, photolamp, stabilizer, or homogenizer.
- c) 20,000 samples have been run through the equipment, or at least every six months. The 20,000 sample calibration is required because of the necessity to overhaul the homogenizer at that stage. If six months elapse before the 20,000 sample limit is reached, the unit must be re-calibrated, no matter how many samples have been analyzed.

START UP PROCEDURE

1. Check meter reading (fat test scale) with power disconnected. The meter must read 9.2% exactly. If it does not, adjust the Milko-Tester by means of the screw located in the center part of the meter (see manual, photo 5).
2. Allow the unit to warm up (plugged in and turned on) for 40 minutes or more before making the first test. (This is necessary only if the Milko-Tester is turned off at the end of a day's use.)
3. Inspect intake filter. Be sure it is unclogged (free of dirt, milk solids, etc.).
4. Force air out of diluent syringe (push in the plunger and let it return to normal setting). Through window in top of unit note whether or not all air bubbles have been expelled.
5. Check diluent level in bottle. Be sure there is enough liquid for proper operation.
6. "Zero" the unit on diluent. That is, make a reading on diluent only. Indicator should read 0. If it does not, make appropriate adjustment.
7. Check the rubber valve at the inlet of the diluent syringe as follows. Remove the diluent tube and filter from the diluent bottle. Hold the filter so that it can be observed and slowly depress the diluent syringe. If valve is functioning properly, no diluent will come back through the filter. If diluent does return through the filter, replace valve and re-check.

SAMPLING PREPARATION

1. Warm milk samples to 100°F in a water bath. Final temperature should not exceed 100°F. Do not mix milk until samples have reached 100°F. Never hold warmed samples more than 30 minutes before mixing and sampling. Water bath temperature should not exceed 100°F when samples are inserted.
2. If cream adheres to the sample container, re-incorporate it by gently swirling or stirring. When necessary, a rubber disc (policeman) may be used to dislodge adhering cream.
3. Mix sample within 30 minutes after reaching 100°F. Mixing procedure may vary with type of sample container, although not necessarily. In glass containers (or in Whirl Paks if desired) mix milk by pouring into a dry container and back into the original at least twice. Or, mix by rocking the sample back and forth six times over a distance of six inches. An air space is essential for this method of mixing. Always be careful to avoid churning.
4. Test the sample immediately after mixing.

TESTING PROCEDURE

1. Place well-mixed samples under the sample pick-up tube.
2. Start homogenizer (Push "start" button). A yellow light will come on.
3. After yellow light goes out, wait three seconds.
4. Depress funnel slide plunger to its full travel; hold it in.
5. Depress diluent syringe plunger to its full travel and release.
6. Gently allow funnel slide plunger to return to its original position.
7. Remove sample. Wipe off intake.
8. Take the reading from the meter immediately after the needle comes to rest. Be sure to align the needle with its mirror image to the rear. Read to the nearest 0.1% (one point).

DAILY MAINTENANCE

After samples have been run and it will be more than five minutes to the next sample, cycle distilled water through the homogenizer. Do this two times. Flush the cuvette (diluent) twice, and return needle to zero.

At the end of the day: (1) repeat above, (2) clean the collecting funnel, stirrer, and all other parts in that area, and (3) clean up any milk spilled during the day.

WEEKLY MAINTENANCE

Once each week, clean the Milko-Tester as follows:

1. Mix two ounces of milkstone remover with two ounces of distilled water and draw this mixture into the unit through the sample tube. Allow to stand in the unit for 15 to 20 minutes, then flush three times with distilled water.
2. Draw diluent into unit by placing a diluent bottle under sample pick-up tube. Allow to stand 15 minutes. Cycle the homogenizer twice using distilled water. Flush cuvette as indicated under "Daily Maintenance" above.
3. Clean or replace sample filter mesh. It may be cleaned by immersion in nitric acid. This will remove organic sediment that has accumulated.
4. Clean collecting tube (below the milk pipette outlet) of encrusted sample. Rinse chips through outlet line.

WEEKLY, BUT AT LEAST EVERY 2,000 SAMPLES

1. Check water level in water bath. Add distilled water if needed.
2. Lubricate funnel slide rails, push-buttons for funnel slide and diluent dispensing syringe, homogenizer bearing, eccentric of gear motor, bearing and slide rail which supports the bearing.
3. Check pilot lamps. Replace if necessary.
4. Check shift value. This is read through the small round window on the left side cover.
5. Check diluent bottle for contamination; replace if necessary. Also check diluent screen, and replace if necessary.
6. Check diluent syringe. If deposits are observed on the inside of the syringe (usually it will appear as a white ring near the end of the piston), remove the unit, disassemble and clean.

RECORD KEEPING

It will be necessary for the Milko-Tester user to have records available at all times for both personal needs and those of the Minnesota Department of Agriculture in carrying out routine inspection work. For this purpose, keep: (1) a calibration record and (2) a daily operational record.

The calibration record should include date, reason for calibration, and calibration data (all analyses made on all samples, both high and low fat, the average of the triplicate analyses and all calculations).

Daily records should include: (1) date, (2) number of samples run, (3) accuracy checks, (4) shift value checks, (5) standardization data, (6) parts replaced, if any, (7) weekly cleaning program on the day set aside for this task, (8) name of operator, and (9) other data deemed necessary to the upkeep and accurate operation of the unit as desired by the operator.

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