



To receive milk the following tests are important:

1. Direct microscopic somatic cell count (DMSCC). Determines the quality of raw milk.

Apparatus

- a. Binocular microscope with oil immersion objective and mechanical stage
 - b. Micro-syringe calibrated to deliver 0.01 mL of raw milk
 - c. Bent point needle to spread smear
 - d. Drying device for slides
 - e. Staining jar with lid
 - f. Stage micrometer
 - g. Hand tally
- Supplies
- h. Microscope slides with 11.28 mm diameter areas
 - i. Immersion oil
 - j. Levowitz-Weber milk smear stain

2. Titratable acidity, for determination of lactic acid percentage in raw milk. Indicator of the quality of raw milk. Suitable for milks, ice creams, cultured products and dry products.

Apparatus

- a. Acidity tester kit (glass) from Kimble Chase or Weber Scientific (non-glass)
 - b. Small white beaker or cup
- Supplies
- c. 0.100N sodium hydroxide neutralizer
 - d. 1% phenolphthalein indicator

3. Antibiotic residue test kit that meets FDA specifications. All raw milk must pass.

During processing and for finished product the following tests are important:

1. Microbiological count traditional methods (alternatively a plate loop method or an approved film method is sometimes used). Can be used for all dairy products.

Apparatus

- a. Refrigerator
- b. Colony counter with lit grid plate
- c. Incubator capable of 32°C
- d. Balance sensitive to 0.1 gram minimum with good quality weight set for calibration
- e. Media storage jars or flasks
- f. Thermometers NIST certified with 0.5° accuracy
- g. Water bath capable of 45°C
- h. pH meter readable to 0.1 pH
- i. Hand tally
- j. Pipet aid
- k. Autoclave (may be optional)
- l. Freezer (may be optional)

Supplies

- a. Standard Methods Agar for general cultivation and enumeration
 - b. Violet Red Bile Agar for cultivation and enumeration of coliforms
 - c. Sterile Pipets, 1.1 mL, 2.2 mL or 11 mL
 - d. Sterile pre-filled dilution bottles
 - e. Petri dishes, 100 x 15 mm nominal size
 - f. Microbiologically suitable water
2. Pasteurization efficiency testing. Determines if a dairy product is fully pasteurized, the most critical *safety* part of a Hazard Analysis Critical Control Point (HACCP) plan. Can be used with milks, cheese, ice cream and cultured products.

Apparatus

- a. Fluorophos[®] alkaline phosphatase (ALP) instrumentation and supplies from Advanced Instruments or Chemiluminescent ALP instrumentation and supplies from Charm Sciences.
3. Butterfat analysis. For product standardization and producer payment. Various methodology or instrumentation may have varying suitability for specific dairy products.
- a. The Gerber or Babcock traditional acid digestion methods requiring a number of pieces of apparatus including a centrifuge and water bath.
 - b. Electronic analysis. All instruments can test raw and pasteurized milk. Laboratories will need to review manufacturer specifications to discover what types of dairy products can be tested. Instrumentation is available from a number of sources including Weber Scientific, Advanced Instruments, Bentley Instruments, Perten Instruments and Foss. Many of these instruments will also give you other quality parameters including
 - i. Protein
 - ii. Lactose
 - iii. Solids not fat
 - iv. Density