Practical Exercise 15

Gerber fat test for milk

Objective: To determine the fat content of milk.

Principle

The milk is mixed with sulphuric acid and iso-amyl alcohol in a special Gerber tube, permitting dissolution of the protein and release of fat. The tubes are centrifuged and the fat rising into the calibrated part of the tube is measured as a percentage of the fat content of the milk sample. The method is suitable as a routine or screening test. It is an empirical method and reproducible results can be obtained if procedure is followed correctly.

Apparatus

- Butyrometer 10% Scale
- 10 ml automatic measure for sulphuric acid
- 10.75 ml pipette for milk
- 1 ml automatic measure for amyl alcohol
- Stoppers for butyrometer

- Gerber Centrifuge (1400± 70 RPM)
- Water bath (65 ± 2OC)

Reagents

- Sulphuric acid (Specific Gravity 1.807 to 1.812) corresponding to a concentration of 90 to 91% by mass
- Amyl alcohol (Specific Gravity 0.810 to 0.812)

Procedure

- Transfer 10 ml of sulphuric acid into the butyrometer by means of automatic measure taking care not to wet the neck of the butyrometer with the sulphuric acid.
- Warm the sample to approximately 27°C and mix thoroughly but do not shake it so vigorously as to cause churning of the fat.
- Allow the sample to stand for 3-4 minutes after mixing to allow air bubbles to escape, invert the sample bottle 3-4 times immediately prior to taking milk for test.
- Transfer 10.75 ml of sample into the butyrometer by using 10.75 ml milk pipette by following the below mentioned procedure.
    - Dip the tip of the pipette in the well-mixed sample and suck in the sample until the sample rises to a short distance above the graduation mark. Close the upper end of the pipette and withdraw it from the sample. Wipe the outside of the delivery tube of the pipette, hold the pipette vertically and run out the milk until the top of the milk meniscus is on the graduation mark.
    - When this is achieved, insert the jet of the pipette into the neck of the butyrometer, holding the butyrometer vertically.
    - Touch the tip of the jet to the base of the neck of the butyrometer and slant the pipette so that the delivery tube of the pipette rests on the top neck. Holding the pipette in this position, release the finger from the other end of the pipette directing the flow of the milk against the wall of the body of the butyrometer.

- When emptying the pipette, take care to have a gentle flow of the milk onto the surface of the sulphuric acid preventing as far as possible the mixing of the two liquids.
- When the outflow has ceased, wait for 3 seconds, raise the pipette and then gently touch the jet of the pipette once against the neck of the butyrometer and then remove the pipette.

➢ Add 1 ml of amyl alcohol into the butyrometer by means of automatic measure and close the neck of the butyrometer firmly with the stopper without disturbing the contents.

➢ Shake the butyrometer carefully without inverting it until the contents are thoroughly mixed, the curd is dissolved and no white particles are seen in the liquid.

➢ Then invert the butyrometer few times to mix the contents thoroughly.

➢ Transfer the butyrometer quickly in the water bath at 65± 2°C and leave it there for not less than 5 minutes.

➢ Take out the butyrometer out of the water bath and centrifuge for 4 minutes. Bring the centrifuge to stop gradually, transfer the butyrometers (stoppers downwards) into the water bath at 65± 2OC and allow the butyrometer to stand for not less than 3 minutes and not more than 10 minutes and take down the reading.

Gerber fat test equipments

10.75 ml milk pipette

Fat test

STUDY QUESTIONS

1. What is the use of butyrometer?
2. What is specific gravity of Sulphuric acid ?
3. What is the use of amyl alcohol in fat test?
4. How much quantiy of milk taken for fat test?
5. What is the scale of butyrometer?