**Experiment Name: Determination of fat in milk by Gerber method.**

**Introduction:** The traditional standard reference method for fat analysis is based on either weight or volumetric determination. There are many analytical methods for the determination of the fat content of milk; the Gerber test is widely used all over the world.

**Principle:** The Gerber method was developed and patented by Dr. Niklaus Gerber of Switzerland in 1891. Milk fat is separated from proteins by adding sulfuric acid. The separation is facilitated by using amyl alcohol and centrifugation.

**Equipment and materials:**

1. 90% Gerber Sulphuric acid (density 1.807 – 1.812 g/ml at 270C, colorless).
2. Amyl alcohol.
3. Butyrometers: 6%, 8% and 10% scales depending on fat content.
4. Stoppers and shaker stands for butyrometers made from a suitable grade of rubber or plastics.
5. 10 ml Acid pipette for sulphuric acid (with rubber suction device).
6. 10.75 ml Gerber pipette for milk.
7. 1 ml pipette for amyl alcohol.
8. Centrifuge, electric or hand driven.
9. Water bath at 65 + 20C

**Procedure**

1) Use the 10 ml acid pipette to transfer 10 ml of sulphuric acid into the butyrometer.

2) Fill the 10.75 ml pipette with milk and deliver the sample into butyrometer.

3) Add 1 ml of amyl alcohol using the 1 ml pipette and close.

Shake the butyrometer in the shaker stand until no white particles are seen and invert it a few times.

4) Put the butyrometer in the water bath 65 degree for 5 min.

5) Take it out and dry with a cloth, put it in the centrifuge, placing two butyrometers diametrically opposite, centrifuge at maximum speed for 4 minutes.

6) Transfer the butyrometers, stoppers downwards into water bath for 3-10 minutes.

7) Bring lower end of fat column on to a main graduation mark by slightly withdrawing stopper.

* The colour of the fat should be straw yellow;
* The ends of the fat column should be clear and sharply defined;
* The fat column should be free from specks and sediment;
* The water just below the fat column should be perfectly clear;
* The fat should be within the graduation.

**Interpretation:**

Note down the upper and lower scale readings corresponding to the lowest point of fat meniscus and surface of separation of fat and acid. The difference between the two readings gives the percentage by mass of fat in milk. The reading has to be done quickly before the milk cools. The butyrometers should be emptied into a special container for the very corrosive acid-milk liquid, and the butyrometers should be washed in warm water and dried before the next use. Fat testing is often carried out on composite or random samples in order to reduce time and costs involved in testing.

**Result:** Fat ………. %