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A Note on the Determination of Fat in Milk

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FAT is the most valuable and the most important constituent of milk. It is the criterion of richness of milk and the earliest attempts to control milk quality were based upon the measurement of the fat content.

The usual method of determining the fat content of milk is the Gerber Butyrometer method. The following is the procedure :—

Place the butyrometer tube in the stand with the open end upwards ; run 10 mls of sulphuric acid without wetting the inside of the neck of the tube. Then 11 mls of the mixed sample of milk are allowed to run, gently at first, down the sides of the butyrometer tube to float on the surface of the acid. The pipette is allowed to drain for four seconds and then touched on the side of the tube at the lower end of the neck. *Then 1 ml of amyl alcohol is added*, taking similar precautions against wetting the inside of the neck of tube. The rubber stopper is firmly inserted and the tube well shaken till the curd is dissolved. The tube is inverted several times to see that the acid is evenly mixed after which the tube is centrifuged at a speed of 1100 revolutions per minute for 4 minutes. The percentage of fat is read off by holding the tube to the light at eye-level, making the lower end of the fat coincide with one of the larger graduations on the scale. *The temperature should be between 65°C and 70°C.*

The above method is found in "Dairy Chemistry" by Richmond, "A Practical Course in Agricultural Chemistry" by Knowles and Watkin, "Manual of Agricultural Chemistry" by Ingle, "Bulletin No. 70—Standard methods for the Examination and Analysis of Milk and Milk Products other than ghee" published by the Indian Council of Agricultural Research and "Milk Testing" by Davis. Above are the standard books giving the methods of milk analysis.

All the above authors have specifically stated that 1 ml of *amyl alcohol* should be used. The temperature at which the fat reading is taken is 65°C-70°C. It is noticed that when 1 ml of *amyl alcohol* is added the fat column is, very often, below the graduations of the tube. It is very inconvenient to raise the fat column by pushing the cork in. Sometimes a pair of tongs or even a bench vice has to be used without success. Very often it takes some time and the temperature of the Gerber tube falls.

Amyl alcohol is used only to aid the separation of fat. It was thought that it would be more expedient to add more *amyl alcohol*. The amount of *amyl alcohol* to be added so that the fat column will be within the graduations can be easily judged by experience. This depends on the tube and the cork used. The effect of using 0.5 ml, 1.0 ml, 1.5 ml, 2.0 ml and a suitable quantity which was thought to be convenient were tested on various samples of milk on various days. It was found that the quantity of *amyl alcohol* used was immaterial. The same sample of milk gave the same fat reading irrespective of the quantity of *amyl alcohol* used.

Conclusion : The quantity of *amyl alcohol* need not be 1 ml. Any convenient quantity could be used. The quantity to be used can conveniently be judged by experience.