

PART II.

THE GLASSWARE AND MACHINERY OF THE BABCOCK TEST.

4. The Regular Bottles. [Fig. 1.] The regular Babcock test bottle should contain at least 40 c. c. up to the neck. The neck is graduated from 0 to 10 per cent. Each division of the graduated scale represents .04 c. c. Five of those divisions are equivalent to one per cent. of fat, when one pipette of 17.6 c. c. milk is used.

5. The Pipette. [Fig. 2.] The pipette should contain, when filled to the mark, 17.6 c. c. A pipette of this size will deliver a little less than 17.5 c. c. and when of milk of average specific gravity, will weigh 18 grams. The pipette should be accurately calibrated. It can be tested by weighing the amount of mercury necessary to fill it to the mark. The weight of mercury should be 239 grams. Always be sure and buy a pipette marked 17.6 c. c. There are other sized pipettes on the market but they are "fool" pipettes and should never be used.

6. Acid Measure. [Fig. 3.] A glass cylinder with a lip to pour from and a single mark at 17.5 c. c. is the best form for general use.

7. Cream Bottles [Fig. 4.] are the same as the regular bottle except that they have a bulb in the neck capable of holding 10 per cent. of fat.



FIG. 1.



FIG. 4.



FIG. 2.



FIG. 3.

8. Skim Milk Bottles are capable of holding twice the amount of the regular bottle, and when they are used it should be remembered that two pipettes of milk and two measures of acid are delivered. Each division on the scale of the neck on this bottle is equivalent to one-tenth per cent. of fat, instead of two-tenths per cent. as is the case in the regular bottle where only one measure of milk and one of acid is used.

9. Machine for Whirling. There are many different styles of machines, but all operating on the same principle. A machine should be capable of making from 700 to 1,200 revolutions per minute. A small wheel should make more revolutions than a large one.

10. About the Motion. In machines where the motion is transmitted by belt or friction, the adjustment should be kept tight enough to avoid slipping, as otherwise the motion may be much less than is intended, and result in an imperfect separation of the fat.

11. The Acid. Commercial sulphuric acid having a specific gravity of 1.82 to 1.83 should be used. The stronger is preferable. It is very important that the acid used have approximately the right strength. If it is considerably too weak the casein will not all be cut out, and being mingled with the fat will give an unsatisfactory test.

If the acid is only a trifle too weak, the use of a little more may give a good test. If the acid is too strong it will turn the fat to a dark color. A good test may be obtained with too strong acid by using a little less acid. The acid should not be diluted.

12. Weak Acid. If acid is only a trifle too weak you will get good results by warming the milk to 70° or 75° each test. If your acid is so weak that when testing milk at 50° you have a white sediment in the lower end of the fat column, you may get good results by testing the milk at 70° or 75° with the same acid.

13. Boiling Water. Boiling water should be provided for filling the bottles after they have been whirled for the first time, and for warming the contents of the bottles in cool weather. Distilled or rain water is the best for filling the bottles.

MAKING THE TEST.

14. Sampling the Milk. Every precaution should be taken to have the sample represent as nearly as possible the whole lot of milk from which it is taken.

Milk fresh from the cow while still warm and before the cream is separated in a layer may be thoroughly mixed by pouring three or four times from one vessel to another. Milk that has stood until a layer of cream has formed should be poured more times, until the cream is thoroughly broken up and the whole appears homogeneous.

No clots of cream should appear upon the surface when the milk is left quiet for a moment. Milk should not be poured more times than is necessary, as extended mixing in this way is liable to churn the cream forming little granules that quickly rise to the surface. When this occurs it is impossible to obtain a