

In using the nine-inch bottle a specially constructed machine is required, which is more expensive than the ordinary tester. The nine-inch bottles are more expensive than the six and one-half-inch bottles, and breakages are more frequent, not only when whirling the bottles but also in handling, since the longer bottle is more easily overturned.

The nine-gramme bottle has an advantage over the eighteen-gramme bottle in that nine cubic centimetres of water are mixed with the nine grammes of cream, which tends to give a clearer reading.

Which bottle one shall use is largely a matter of preference on the part of the operator, as any one of the three will give satisfactory results if the work is properly done.

To secure uniform results all bottles used in any plant should be made of uniform construction, all made to test the same weight of sample and with uniform graduation and diameter of bore.

SOURCES OF ERROR IN MEASURING CREAM FOR TESTING.

As pointed out previously the Babcock test is based on weight and it is simply for convenience that the sample is measured with the pipette in testing milk. The pipette delivers approximately the same weight of milk from time to time. Several factors, however, tend to render measuring of cream by means of a pipette inaccurate. These are:—

(a) *Variation in richness of cream.*—Cream may test as low as 15% of fat or as high as 50%. As the per cent of fat in cream increases, the weight of a given volume decreases. Therefore a pipette, which will measure a sample of the proper weight from a low testing cream, will measure, from a richer cream, a sample that will be too light.

(b) *Gas and Air in the cream.*—More or less gas due to souring or other fermentations is present in cream. The heavy body of the cream tends to retain these gases in the cream and therefore reduce the weight of cream which will be measured by a pipette. This will not have so great an influence if the cream is warmed before the sample is measured with a pipette, as the warming reduces the body of the cream so that the gas will, to a great extent, escape.

This is illustrated by the following table which also illustrates the difference between the results obtained when the scale is used to weigh the sample as compared with measuring with the pipette.

The different samples of sweet cream were tested using both scales and pipette and were then allowed to sour in tightly stoppered bottles, after which they were again tested while cold, using both scales and pipette. The samples were then warmed to 100° F. and tested using the pipette.

TABLE.

	Sweet Cream.		Sour Cream.		
	Scales.	Pipette.	Cold Cream.		Warm Cream.
			Pipette.	Scales.	Pipette.
A	31	39	(No test.)	41	39
B	36.5	34.5	33.5	36.5	34
C	32	31.5	31.5	32	31.5
D	34	32.5	32	34.5	32.5
E	36.5	35	34	34.5	35.5
F	32	31.5	31	30	31.5
G	35.5	34.5	34	36	35
H	30	30	29.5	30	29.5