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BABCOCK TEST FOR BUTTER FAT

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DAIRYMAN

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IDAHO EXPERIMENT STATION

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INTRODUCTION

As the farmers of Idaho are realizing the importance and possibilities of systematic improvement of their dairy herds, there comes an increasing demand for information in regard to operating the Babcock test. A great deal has been written about testing milk and a large number of Idaho farmers already use the Babcock test; but enough inquiries have come to the writer to warrant the assertion that the subject is not yet fully understood. Many seem to have the idea that the Babcock test is a complicated, and at best, unreliable affair. This is an erroneous idea and should not be allowed to prevail. The test is simple, accurate and easily mastered by anyone who will but give the matter careful study and attention.

Within the past decade there has sprung up in our public schools a tremendous demand for more agricultural work. Something that will bring the child into closer touch with nature and in a measure make his education more practical. There is every reason why agriculture should be more extensively taught in our schools. It is here that the boys, and the girls as well, receive their first impressions as to what is to constitute their life work. One of the easiest lessons and at the same time one of the most practical and useful lessons to everyone interested in the milk industry, whether it be from the consumers, or producers, standpoint, is the study of the fat content of milk. To teach the farmer boy or girl how to determine the richness of milk is incidentally educating the future dairyman to a higher standard of milk production and, to so train the city child means to interest the future milk consumers in securing a higher standard for the city milk supply.

In response to numerous inquiries from teachers and farmers for information in regard to the Babcock test that have reached this department, and with a desire to aid in every possible way those who are interested in learning how to operate the test, this bulletin has been prepared.

Importance of Sample

It must be borne in mind that the accuracy and value of the test depend not alone on the test itself but quite as much on the proper taking of the sample. If that is improperly done the results are of little value. For example, the writer has known of cow-owners who, when desiring to test the milk of an individual cow, have taken the sample by milking directly into the sample bottle. When it is known that the first part of a cow's milk is largely water and the last part or strippings is very rich in fat, it is self evident that such a sample would yield results of little value so far as determining the actual richness of that particular cow's milk.

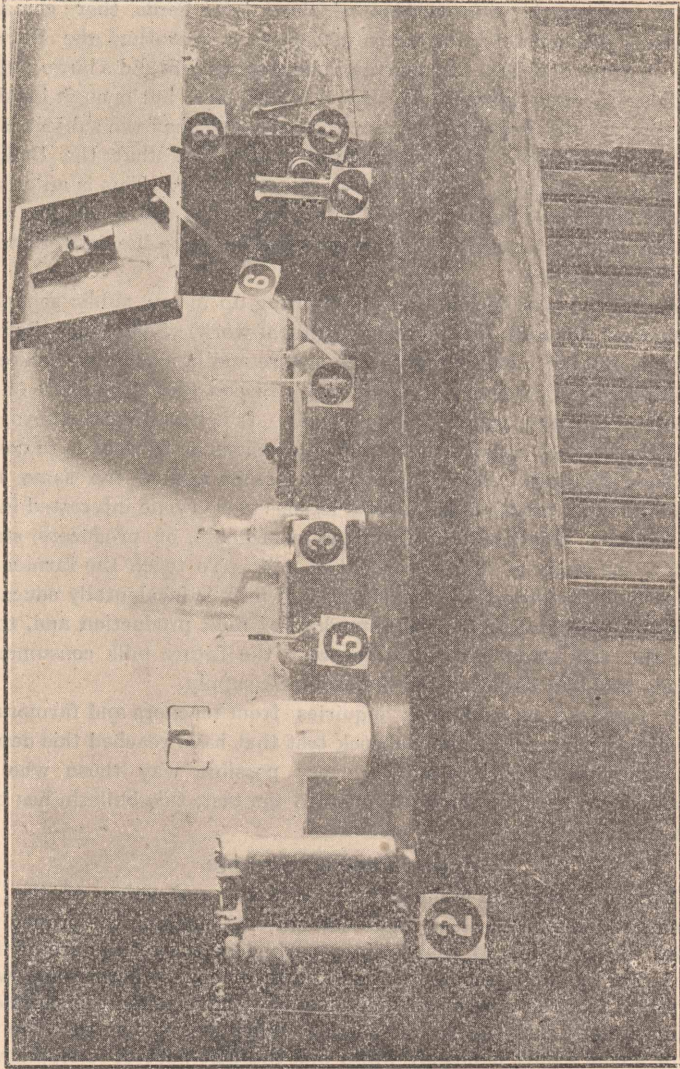


FIGURE NO. 1.—BABCOCK TEST OUTFIT. Milk sample jar; 2 Hand tester; 3 Sulfuric acid; 4 Test bottle; 5 Test bottle showing completed test; 6 Dividers; 7 Test case.

How to Mix Sample

The milk to be tested should be poured from one can into another several times, or carefully stirred with a stirrer until it is of a uniform mixture. The sample is then immediately taken, preferably with a small, long-handled dipper. If the testing cannot be done soon after the sample is taken it must be placed in an air-tight jar and some preservative added to keep it sweet.

Measuring Sample

The Babcock test bottles are graduated on the supposition that an 18

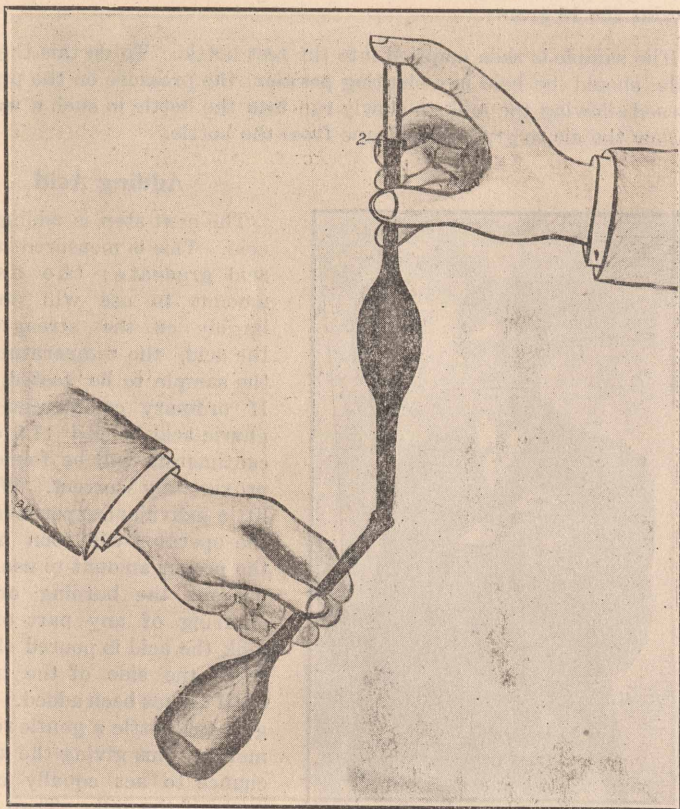


FIGURE 2.—Shows method of holding bottle and pipette while putting milk into test bottle. The pipette is held at an angle with test bottle so as to allow milk to run down on one side and air to escape on other side.

gram sample is taken. Milk varies very little in its specific gravity and a pipette graduated to hold 17.6 cubic centimeters will deliver approxi-

mately 18 grams of milk. When the sample is ready for testing the jar containing it should be placed in warm water and slowly heated to a temperature of about 70 degrees Fahrenheit. Mix the sample well; especially see that any cream which may have gathered on the side of the jar is carefully mixed with the other part of the sample. The measuring pipette is now filled to the mark. This is done by sucking the milk up into the pipette above the mark; the *dry forefinger* is immediately placed over the top of the pipette to prevent the milk from escaping. By gently releasing the pressure the milk is allowed to flow out until level with the mark on the stem of the pipette. The pipette now contains the 18 grams.

The sample is then emptied into the test bottle. To do this the test bottle should be held in a slanting position, the pressure on the pipette released allowing the milk to slowly run into the bottle in such a way as to allow the air to gradually escape from the bottle.

Adding Acid

The next step is adding the acid. This is measured in the acid graduate; the exact amount to use will depend largely on the strength of the acid, the temperature of the sample to be tested, etc. If ordinary commercial sulphuric acid is used 17.6 cubic centimeters will be found approximately correct. With a little individual experimenting the operator will soon notice the proper amount to use. To prevent the burning or the charring of any part of the milk the acid is poured slowly down the side of the bottle until all has been added. Now give the bottle a gentle rotary motion, thus giving the acid a chance to act equally on all parts of the milk. Then let it stand three or four minutes, after which it is given another rotary movement and then placed in the tester. It is always best to hold bottle in such a way that if, accidentally,



FIGURE 3.—Milk bottle is shaken in order to mix acid and Milk. Care should be taken to point bottle away from face.

part of it should spurt out it would not strike the face of the operator.

The bottles are placed in a tester in such a position as to keep the machine balanced. The bottles should now be whirled for five or six minutes at such a speed as indicated on the machine. The machine is now allowed to slow down for the purpose of adding water to the bottles. Enough water is added to bring the contents up to the neck of the bottle, after which the machine is again started and run for two minutes; again stopped and sufficient warm water added to bring all the fat contents up into the graduated part of the bottle. After another whirling of one minute the samples are to be read. It may be well to state that it is preferable to use soft water and that the temperature should be about 120 degrees Fahrenheit.



FIGURE 4.—Shows method of holding bottle and dividers while reading the test.

How to Read Test

To read the amount of fat take out one bottle at a time, hold it upright, the graduated part should be on a level with the eye. The difference between the highest and lowest limits of the butter-fat column is the amount of butter fat expressed per cent direct. Most milk bottles are graduated up to 10 per cent, each large division indicates one per cent of butter-fat. To illustrate the method of reading let it be supposed that the top of the fat column is at 8.5, and the bottom at 4.5, then the readings 8.5—4.5—4 per cent fat. This means that in 100 pounds of this kind of milk there would be exactly four pounds of butter fat.

Color of Test

If the testing has been properly done the butter fat column should be perfectly clear, of a brownish yellow color; the line separating it from the acid should be clear and distinct. Too strong acid is apt to cause black or charred particles to appear in the fat; this same result may also be

due to too high temperature of either the milk or the acid. Insufficient amount of acid or too weak acid, or too low temperature of the milk or the acid may result in a white or cloudy test.

Importance of The Test

Much more complete directions accompany each outfit:—the principal object of this bulletin is to impress upon farmers the simplicity of the test and that there is nothing mysterious or mystifying about it. It is so simple that anyone of ordinary intelligence and willing to give it a little time and patience, can easily master all its details. The Babcock test enables every purchaser of milk to easily and readily determine its butter fat content. When the farmer fully realizes that it furnishes him a key not only for weeding out his unprofitable cows, but for checking up his creamery man as well, he will not be slow to make use of the Babcock test.

Caution

The acid used should be kept in a well stoppered bottle to prevent it from losing its strength. The operator should also bear in mind that the acid is a strong poison and should be kept well out of the reach of children.

