

Cheesemaking.

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THE REMEDY FOR TOO MUCH ACIDITY.

The acid comes from the whey in the curd, not that outside of it. Where the milk is very ripe, use more rennet and cut finer. In this way we can get the moisture out of the curds faster. If we can get the whey out before the acid develops, the cheese will be all right, but the yield from the milk will not be so great. Draw the whey down early and add warm water. Do not cook the curd from over-ripe milk any higher, as there will be more tendency to mat, and the whey be prevented from getting away. Mr. Publow claimed to have made cheese from milk that actually tasted sour, and the quality was all right; but he did not care to handle such milk on account of the loss in yield. A sour curd should be allowed to mat early. Mill early and add water at 108° to 110° to bring the curd up to 100°. In this way he could take the curd from sour milk and sweeten it. Of course, this plan would not answer if the water was not good. In cases of the early matting and milling, do not let the curd mat again so as to need milling the second time. Cheese from "washed" curds should be salted a little higher on account of the moisture on the particles of curd.

PASTEURIZING.

Objectionable feed flavors could be remedied by pasteurizing. If such milk were taken in, it could be run into a small vat, pasteurized by heating to 160°, stirred for a time and cooled before putting in the vat with the rest of the milk to be made up into cheese. If the curd is well cooked, the objectionable food flavors might cure off. If the acid is developed early in them, there is no chance for the flavor to pass off, and the cheese would not improve with age, as they would do if allowed less acid.

On the whole, the worst fault in the eastern section with the cheese, in his opinion, was the off flavor. This might be caused by rennet, water, salt, or the starter used. If these were all right, it must either be in the milk or the surroundings of the factory, and the maker should trace the trouble to its source. To a fully educated maker, most milk would show some trace of objectionable flavor. To prevent this objectionable flavor developing, we should get the lactic acid fermentation well advanced. If a maker was troubled with tainted curd or pin-hole curd, a starter should invariably be used. This is better than ripening the milk, which some advocate. In ripening the milk, butter-fat was lost that might be retained in the cheese. The taints might increase faster than the lactic acid. He had noticed cases where milk had set for 2 or 3 hours at 86° and did not show any more lactic acid by the rennet test. If such milk had had a two per cent. lactic acid starter added it would have been far better. If a cheesemaker does not understand its nature, a starter is a dangerous thing to use, but it would prove invaluable to the judicious maker. To make a starter, take good clean fresh milk, pasteurize it at 160° and hold it at that temperature from one-half hour to an hour, air it by pouring or dipping, put it in a self-sealer at a temperature of 80°. In from 24 to 36 hours it should curdle. If it makes a nice smooth curd, has a pleasant smell and no gas bubbles are perceptible, it can be used to start a batch of pasteurized milk. Add one per cent. of the starter that has been ripened in the self-sealer, have the temperature of the pasteurized milk about 70 degrees. When it gets perceptibly sour, cool it to 60 degrees or below. Cooling it in this way would prevent the starter getting lumpy. Some makers dilute it with water, which answers the same purpose, but it is better to cool the starter. If water is added, its quality should be above suspicion, as otherwise it might taint the starter. In using this starter in cheesemaking, one to two per cent. would usually be necessary, but if the milk is very gassy it will be better to use as much as three or four per cent. Do not use enough to make the milk work very fast. Milk ripened with a starter would always show more acidity than where no starter is used; consequently, do not ripen it down so low. The lactic acid germs introduced in the medium of a good starter will overcome taints, as more than one fermentation does not usually take place in milk at one time. A bad starter will spoil the best milk. As soon as the starter begins to go off flavor make a new batch. If milk arrived at a factory over-ripe, it was a certain indication that it was kept at too high a temperature, and the patrons should be advised to cool their milk, either by means of cold water or ice. Keeping it in smaller quantities would help where the weather was cool, but if the temperature of the night air did not fall below 80 degrees, it would be necessary to cool the milk considerably below the temperature of the air. Kept at 60 degrees, the milk arrived at the factory in far better condition, the cheesemaker could then control the fermentation and could make a finer quality of cheese and larger quantity. Aeration of milk is of benefit to take off food taints and for cooling when the weather was cool.

SPECIFIC POINTS.

Patrons a long way from the factory were obliged to take better care of their milk than the average patron. To protect milk from rain, use a covered milk stand. Every sugarmaker knew a good quality of sugar could not be made from sap that had been diluted with rain water, and it is reasonable to suppose that the more delicate and highly organized milk would suffer greater injury

after the cans had been rained into. If the aeration of milk could not be carried on where the atmosphere was perfectly pure and where no dust could get into it, he would advise letting your milk go without aeration, and cooling it thoroughly by means of water or ice. In answer to a question about payment by test, Mr. Publow stated that seven factories in the district in which he inspected paid by test, and that the yield of cheese per hundred pounds of milk was higher in these factories than in the surrounding factories where the test was not used. Asked how long a composite sample could be kept in good condition, he stated that he had known of them being kept for three months. Factories paying by test, test once or twice a month. If only once a month, it is necessary to have a cool place in which to keep the samples. One factory that had undertaken the payment by test had abandoned it, but this season was going back to the payment by Babcock test.

Asked how much milk should be taken to make a pound of cheese, Mr. Publow answered that it depended on the richness of the milk, as well as the manner that it had been cared for, and the skill of the cheesemaker. In the factories visited by him it required about 10½ lbs. of milk to make a pound of cheese, taking the average of the whole season. It depended very much upon the condition in which the milk came to the factory, its richness in fat and the way the milk was treated. Time and time again in the Dairy School he had made the following experiment: In a small vat 700 lbs. of milk was placed, after the whey was off the curd was divided into two equal quantities, one-half was sheepskinned down and the other was milled early. He always found that he made from one-half to a pound more cheese out of the half that was "sheepskinned," or piled high, than where the curd was milled early. This might appear at first sight to be a small matter, but it made a difference of one-quarter of a cent per pound in the price of the cheese. The trouble was that too often the milk came in in such condition that it would not stand high piling, and it was necessary to handle it in such a way that the maximum amount of cheese could not be made.



IMP. MARS [275].

First-prize 3-year-old Shire stallion.

OWNED BY MORRIS, STONE & WELLINGTON, Fonthill, Ont.

Patrons would find that by taking better care of their milk a finer article of cheese could be made, and a much better yield secured.

The Babcock Test.

J. C. Huron Co., Ont.:—"Will you in the columns of your valuable paper publish full directions for using the Babcock milk tester?"

[The Babcock test is founded on the fact that the strong sulphuric acid will dissolve all non-fatty solid constituents of milk and other dairy products, and will set free the fat. To conduct the test, one requires a Babcock outfit, consisting of a graduated test bottle, a 17.6 cc. pipette, a 17.5 cc. acid cylinder, and the centrifugal machine. The sample to be tested is first mixed by pouring the milk from one vessel to another two or three times, so that every portion thereof will contain a uniform amount of butter-fat. The measuring pipette, which has a capacity of 17.6 cubic centimeters, is filled with milk by sucking the milk into it until it rises a little above the mark around the stem of the pipette; the forefinger is then quickly placed over the upper end before the milk runs down below the mark. By loosening a little the pressure of the finger on the end of the pipette, the milk is now allowed to run down until it just reaches the mark on the stem. The point of the pipette is now placed in the neck of a Babcock test bottle, and the milk is allowed to flow down the inside of the neck. Care must be taken not to lose any of the milk in the transfer. The test bottle and the pipette should each be held at an angle during the pouring, so as to avoid an overflow of milk from the pressure of air from inside the test bottle. The acid cylinder is now filled to the 17.5 cc. mark with sulphuric acid, of a specific gravity of 1.82-1.83. This amount of acid is carefully poured into the test bottle containing the milk. In adding the acid, the test bottle is conveniently held at an angle so that the acid will follow the wall of the bottle, and not run in a small stream

into the center of the milk. After adding the acid, this is carefully mixed with the milk by giving the test bottle a rotatory motion. When once begun, the mixing should be continued until completed, and care should be taken not to allow particles of curd to enter the neck of the bottle. The chemical action causes the mixture to become hot. After the milk and the acid have been completely mixed, the test bottle is at once placed in the centrifugal machine, or tester, and whirled for four or five minutes at a speed of 600 to 1200 revolutions per minute, the proper speed being determined by the diameter of the tester. This will bring the fat to the surface of the liquid in the body of the bottle. Hot water is now added by means of a pipette or some special device until the bottles are filled up to the beginning of the neck. The bottles are then whirled again at full speed for one minute, and hot water added a second time until the lower part of the column of fat comes within the graduated scale on the neck of the bottle. A final whirling for one minute completes the separation of the fat. The amount of fat in the neck of the bottle is measured by the scale or graduations on the neck. Each division of the scale represents two-tenths of one per cent. of fat, and the space which the fat occupies shows the per cent. of butter-fat contained in the sample tested. The fat obtained should form a clear yellowish liquid distinctly separated from the acid solution beneath it. The bottles should be kept warm until the readings are made. We have given the general system of testing milk with the Babcock test. There are a number of conditions and details to be observed, and which will be acquired by practice. Full directions, with cuts of apparatus, etc., are given in "Testing Milk and its Products," by Farrington and Woll; price \$1 at this office. We supply the book for two new subscribers at \$1 each.]

GARDEN AND ORCHARD.

Hints for Intending Planters.

Those extensive farmers who have in the past set out a few fruit trees, vines and plants, have, as a rule, not done so with the commercial aspect as the primary object. Although they usually have a pleasing surplus in the way of yield, and the receipts from the sale of the same have been most satisfactory, still the object in the outset was to have an abundant supply of good fresh fruit to tempt the appetite and promote happiness and health of members of the family. And there is nothing that will go so far toward bringing about both as an abundance of our domestic fruits. Throughout our country there are thousands of farmers who have not as yet started this little fruit garden, and to those we would say, "Begin this spring." No doubt many will make their first plantings this season, and to those this short article is written.

In the outset, be very careful what you are buying and with whom you are dealing. This is an age of slick, glib-tongued nursery agents and of nursery frauds. Having spent some time in both nursery and nursery offices, I feel satisfied that there is much roguery in the nursery business. However, there are some honest nurserymen. This is the time of the year when nurserymen have a lot of surplus stock to work off their hands, and the agents are supposed to resort to all honest methods for doing it. Often a cash prize is given to the agent that can work off the most of it. This the proprietor will give besides the regular commission. In the majority of instances this surplus stock is made up of varieties with which the farmer who is planting lightly—simply for his own use—should have nothing to do. It will be found that they are either very poor bearers, that they do not come into bearing until they are "old enough to vote," or else, no matter how nice in appearance the fruit may be, it is of a decidedly poor flavor. These facts the fruit-grower has learned by dear experience, and orders lightly of them, and, as a consequence, the nurseryman must get rid of them where he can. Then there is that surplus stock of *frauds* pure and simple. Under this head comes the Russian apricot, mulberry, Prunus Simoni and curculio-proof plums, and curl-leaf-proof peaches. What glowing word-pictures nursery agents have painted of these in the past, and will again in the future, to unsuspecting purchasers. Then, again, there is always a stock to dispose of, made up of trees and plants of small growth. These, many agents will tell you, are just as good as a first-class tree, and that in two years no difference would be seen. If the agent is very anxious to dispose of these at a figure much below the cost of first-class stock, rest assured that you do not want them at any price, for they will prove to be worthless, stunted samples, having few or no roots and fit only for the brush-heap. There is a grade of trees sold as "seconds" by some nurserymen that I would as soon have as the "firsts," but these trees can be readily distinguished from the stunted stock, and, as a rule, agents do not try to almost give them away.

What the farmer wants is varieties that are from moderate to heavy bearers of fruit of fair to good size, of excellent quality, and that come into bearing at an early age. In small fruits: In currants we cannot beat Black Naples and Cherry (red). Raspberries—Cuthbert, Shaffer, Gregg, Souhegan and Kittatinny. Grapes—Morden, Rog. No. 9, Rog. No. 13, Concord and Niagara. In larger