

The Dairy.

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Butter Factories.

(Continued.)

In the butter factories about Malone, and in the private dairies where the Jewett pan is in use, it is made an essential point to keep the air in the milk-room at 70°, or nearly, while the milk is reduced to 60° or 62°. This difference between the temperature of the surrounding air and the milk, has some advantages and some disadvantages. It favors the rapid and perfect separation of the cream. The cooling, it will be remembered, begins at the bottom of the pan, and works slowly upward, and for some time the cream on the surface and the top of the milk will be warmer than the milk below. As the cream approaches the surface, and becomes relatively warmer than the milk through which it has passed, it expands and becomes relatively lighter, thus hastening its ascent, and keeping it up when it has reached the surface. The rising of the cream is very rapid in these pans. It was apparently all separated in 24 hours, but we had no means of judging, except by the thickness of the cream as it appeared to the eye. Cooling at the bottom of the pan is more favorable to rapid rising than cooling at the top or sides of the vessel. When cooled from the top or sides, the colder milk settles to the bottom, and currents are formed which, in a glass vessel, can be seen slowly moving up and down, and in different directions. The smaller globules of cream, which are but very little lighter than the milk itself, go with those currents, and are retarded in getting to the surface.

In factories where the air was kept ten degrees higher than the milk, it was plain to be seen that the cream was ripening unequally. The top of the cream was exposed to a temperature several degrees higher than the under side, and hence it grew thick, and sour, and stale, before the under side was fairly up, and was yet sweet and thin. After the cream was taken off, and allowed to stand 12 to 24 hours in large pails, it assumed a more uniform condition, but it was clear to us that less difference between the milk and surrounding air would be an improvement to the quality of the butter.

The rule for skimming in all these factories is determined by the thickening of the cream. The upper stratum of the cream becomes thick in about 24 hours, but the under stratum, next to the milk, will then be so soft and thin, that if the finger, reaching down into the milk, is passed through the cream, the under part of it will follow the finger and spread over the space which the finger made bare. When it gets thick clear through, so it will not follow the finger, it is considered fit to skim, as it will then not run through the skimmer. If the milk is kept at 62° and the air at 70°, the cream will get thick in 36 hours. If it is reduced to 60° the air in the milk-room still being 70° it will require 48 hours to acquire the same solidity. This rule, so general in these factories, could hardly be applied in factories where the milk is set in deep pails, as the bottom would not become thick before the top would spoil; nor would it apply where the milk and the air in the milk-room were of the same temperature.

Another point in the Malone factories is to take off the cream with the smallest possible amount of milk. This is done chiefly to save labor in churning, which it certainly does; but it occasions a loss in the quantity of butter, that is of more value than the extra labor of churning, especially where the churning is done by steam or water power, as in these factories the rising of cream in milk is never perfect. The upper part of the milk usually contains so much cream that it will pay to churn one-

quarter of the sour milk for the sake of the increase of butter it will give. Some have the impression that the more milk there is churned with the cream, the more cheesy matter will be carried into the butter. This impression, though supported by some respectable authority, is founded more on theory than fact. The cheesy taste which butter sometimes acquires, depends upon the imperfect working or washing out of the butter-milk more than anything else. The more cheesy matter there is in butter the sooner it spoils; but it happens that all other circumstances being the same, butter from churning the whole milk, not only is greater in quantity, but keeps better, and has a better grain than that made from churning the cream only, but it falls a little short both in color and flavor. Where there are defects in flavor, as of animal odor, taints absorbed from the air, or acquired from the cows eating strong scented food, the more milk there is churned the more will these defects be removed.

The cream is taken off very carefully, and put into large tin pails, in which it stands till it is churned. The skimming is done night and morning, just before the new milk comes in. As soon as the cream is removed the milk is drained off through a tin tube into the sour milk tank by pulling a plug from the bottom of the pan, which is the only labor required for disposing of it. The milk of 100 cows is put in one pan, and a factory of 300 cows fills three pans at

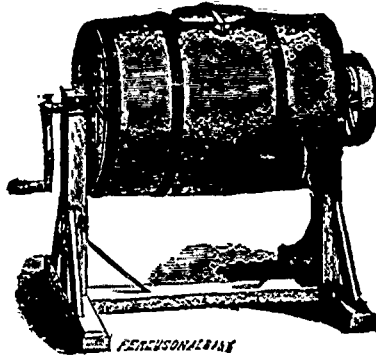


Fig. 1.

each milking, and of course there are three such pans to skim and wash every night and morning. We were in the Cold Spring Factory, in Malone, while the skimming was being done, and were surprised at the facility with which it was accomplished. Two women would skim, run off the sour milk, and wash the pans in 45 minutes easily, the water being ready heated in the steamer or dairy stove. The cream is churned the next morning after it is taken off, part of it standing 12, and part 24 hours, after skimming.

The churning is done, in most of the factories, in rotary churns of the barrel form, that are calculated to hold cream enough to make 100 lbs. of butter. But that quantity is not often churned at once, 30 lbs. being the usual amount turned out of each churn. We give an illustration of this churn, which, with the other illustrations used to-day, has been kindly furnished by Messrs. Jones, Faulkner & Co., dealers in dairy apparatus, of Utica, N. Y.

These churns have a man hole about 8x12 inches, and on the inside are three ribs running lengthwise of the barrel, that are one inch thick and three deep. These serve as buckets to catch the cream and carry it up as the barrel rolls, so that it will drop down and do the churning by striking on the lower side of the churn. These churns rotate at the rate of 40 revolutions per minute, and require an hour to an hour and a half to do a churning. If the cream is thin, or much diluted with milk or water, a more rapid motion is necessary to carry the cream up high enough so that it will fall as it nears the top of the churn. This is deemed the important point in churning; and as the cream is thick or thin, the motion of the churn is made slow or fast, so as to make the

cream drop at the right period. The churning is almost invariably done at 60°, and it is the general practice also not to gather the butter till after it is washed. When it begins to form, cold water enough is put into the churn to reduce the temperature to 58 or 60 degrees; enough, at least, to counterbalance the increased temperature occasioned by churning. When the butter has all come, and is gathered into lumps the size of peas, the butter-milk is drawn off, and water introduced till it is freed entirely from butter-milk. It is sometimes washed in large wooden bowls or trays, and sometimes on the butter-worker.

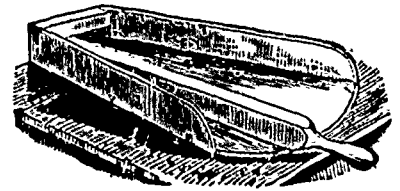


Fig. 2.

When so washed it is taken from the churn while in a granulated form, as it is more easily and perfectly cleansed of butter-milk before gathering.

Butter-workers of the form seen in figure 2, are in use, but they generally use two levers instead of one, as represented in the cut. They are made of birch plank; are about 4 feet long and 40 inches wide at the front end, and 30 at the other, and 28 inches high at one end, and 18 at the other, with sides raised 4 inches. The levers are of different forms, being 4, 6, or 8 sided, and 3½ inches through, and 5 feet long. Such a worker is large enough to work 100 lbs. at a time, and accomplish the work with great rapidity. A man with a lever in each hand will work, wash, and salt 100 lbs. in 20 minutes, so it will be ready for packing. In Orange County, a lever of the form seen in figure 3, are more commonly used, and are much approved for their efficiency and convenience.

The salting is done on the worker. The butter is spread out thin and the salt sprinkled on, and worked in with the levers. Finely ground Ashton and Onondaga factory filled salt are used at the rate of 1 lb. to 16. Sometimes 1 lb. of salt to 18 lbs. of butter is used. As soon as the salt is thoroughly worked in, it is packed at once in tubs and placed in the cellar. The tubs are made of spruce, are widest at the top, and hold about 65 lbs. The covers are made with a rim like a cheese-box cover, and were generally made of basswood. The tubs are prepared at some of the factories by soaking in cold water two days; at others, by soaking and scalding with boiling

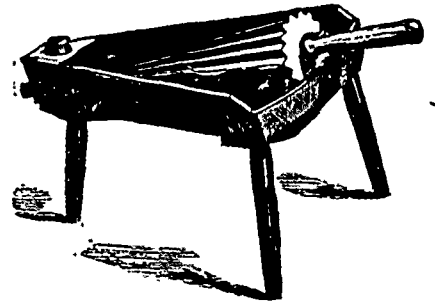


Fig. 3.

water. Before packing, salt is generally rubbed on the bottom and sides. The butter is firmly pressed in with a wooden pestle, till the tubs are filled to within about an inch of the top. Then a piece of fine bleached muslin is spread over the top, and the tubs filled up with salt of the same kind used for seasoning the butter. No coloring is done at any of the factories, which is a fact very much to their credit. The practice of introducing foreign coloring matter into butter never adds anything to its merit, and seldom fails to do positive injury. The color of butter in these factories is regulated by the influence of light. The exact amount of light which contributes to the best shade, has been ascertained by experi-