frequently used insulating material is sawdust, most used because in most localities it could, until quite recently, be had for hauling from the mill. Usually the ice house is prepared by throwing last year's sawdust outside some time before ice packing begins and if weather is cold it is left out until warm days threaten the ice. The best results can only be obtained by keeping the insulating material dry. The best method we have triid, or seen tried is that of keeping the sawdust inside. Throw it on boards placed in the attic of the ice house and as storing proceeds keep the outside packed and tramped with the dry sawdust and if any new sawdust must be added let it be on the top. If from green timber it may be partially mixed with some of the dry material and heating be prevented. When spring weather comes give close attention to the ice-house, keeping the sides well packed. If ice is packed in this way each cake comes easily from its place, not having been left to thaw and freeze to its neighbor; there is very little waste on the surface layers and ice may be kept throughout the whole season. We have uncovered the bottom tiers of ice in an ice-house when putting up the next season's supply, almost as well preserved as when placed in storage the previous winter.

When through with our last year's pack we were informed by a butcher of considerable experience that if layers were placed one on top of the other in such a way as to break joints it also added materially to the keeping of the pack. We have not tried this method as yet, but pass it on as one that may be worth trying.

In conclusion we say "if at first you don't succeed try ,try again." Our adequate ice supply adds comfort to the farm home and dairy in ways that those who do not provide it can learn only by experience.

Middlesex Co., Ont. C. M. MACFIE.

# THE DAIRY.

## Methods of Creaming Milk II.

### EVOLUTION OF PAN SETTING.

Editor "The Farmer's Advocate":

When the early settlers came into Canada there were neither pans nor cans for setting the milk, and cream separators had never been dreamed of. The milk was probably set for the cream to rise in wooden troughs, hollowed from a basswood log, similar to the old-fashioned sap buckets familiar to our youth. These were difficult to cleanse, but they were cheap and as soon as they became too foul they could be burned, thus killing the microbes and making a hot fire at the same time. A new milk pan could easily be hollowed from a log with adze or axe.

After the wooden trough probably came, the unglazed crock and pan, made of earthenware. These were a slight improvement on the wooden vessel, but not much, as they were porous and difficult to clean. Next came the glazed crockery-ware, in which the porous pans were coated with a hard enamel making them sanitary, but these were heavy to handle and easily broken.

Tin pans having seams came next, and these were a great improvement over anything previous as they were light and not easily broken. They had one defect, the seams, not to well soldered, collected milk and that was difficult to cleanse properly. Someone happily thought of the plan to press pans from a block of tin thus doing away with seams, and this form of shallow pan continues to the present although some use granite or enamel-ware pans. The objection to these latter is that if the granite or enamel chips, as it will do if a pan falls, there is a spot in the pan very difficult to keep clean. On the whole, we prefer the tin pan pressed from block tin. These pans should be about four inches deep and ten to twelve inches in diameter.

### SHALLOW PAN METHOD.

As soon as possible after the cows are milked, the milk should be strained into the pans, filling to within one-half inch of the top, so as not to spill when handling. A nice, cool cellar, free from odors, having a cement floor, windows screened, and no draft blowing over the pans to dry the cream and make it "leathery," is a good place to set the milk pans for the cream to rise. A pantry or refrigerator containing eatables, or a cellar with vegetables are not good places for pan setting, as the cream absorbs these flavors more or less and the butter is apt to be tainted.

The milk should set quickly—no jarring or disturbing of the milk in the pans should take place. It is for this reason that shelves or "springy" floors are not good for holding pans of milk set for the cream to rise. A cool cement floor is the best place, but one needs to be sure that cats, mice or rats can not get at the milk or cream. One scarcely relishes cream or butter after a mouse has committed suicide in the pan of milk. Flies also and bugs of all descriptions must be kept out of the milk cellar.

In 24 to 36 hours the cream should be removed by loosening it from the edge of the pan with a thin-bladed knife, then allow a little skim-milk to run over one point to wet the pan, which will prevent the cream sticking. Then glide the cream into cream can or crock, taking as little milk as possible. There is a "knack" in doing this which is acquired only by experience. The old-fashioned perforated skimmer of saucer shape should be used only when the milk has become "loppered" or thick, a condition which should be avoided, although a slight "lopper" on the edge of the pan will do no harm.

After skimming, the pans should be emptied, washed first in cool water, then hot water, and be placed out of doors in the air and sunshine for at least twelve hours if this is practicable.

Before using, the pans should be rinsed with cold water to remove dust, and also to prevent the milk sticking, thus making unfavorable conditions for the cream to rise and also for washing.

In winter, so long as the milk does not freeze, the cream will rise on pans even in cold weather, hence it is not necessary to set the pans in a pantry, or on a table near the stove for the cream to rise, as some people imagine.

### DEEP SETTING.

Following shallow-pan setting came deep setting or what some call the "creamer" method—incorrectly called, sometimes, the "creamery" plan. In order to have good results, the can should be about 8 inches in diameter and 20 inches deep, having neither glass nor tap in the side, and a simple cover such as a tin or granite plate. All the fancy frills on these cans mean added expense and extra labor to keep clean, with little or no corresponding advantages.

Immediately after milking, strain the milk into as many cans as may be needed, filling to within half an inch of the top, so they can be handled without spilling.

These should be set in cold water, having the water on the outside as high as the milk on the inside of the cans. A box, barrel, trough, or cement basin may be used for holding the water and cans, and this should be protected from the sun. In most cases, it will be necessary to use ice in the water to cool it properly and keep it cold until the cream rises, which requires from 12 to 24 hours. (We do not, as a rule, favor lowering cans of milk into a well, where the water is used for house or stock, as there is great danger of spilling some milk into the water and spoiling it. A better plan is to pump the water from the well for cooling the milk.)

To remove the cream from deep cans use an inverted, cone-shaped dipper or skimmer, having no wire rim at the top, so that the skimmer will readily go through the cream layer without disturbing it. Fill the dipper, then empty the cream into can or crock until all the cream is removed, when the milk should be emptied from the setting or creamer can, the can washed and put out of doors for a few hours before using. The main point to observe for good results in this method is to have the water cold, and maintained at a temperature of 45 degrees F. or under, but not below freezing (32 degrees F.) until the cream rises. A temperature of 50 degrees F. or above will cause an excessive loss of fat in the skim-milk from deep setting, for reasons which we explained under the theory of creaming.

Dr. Babcock has suggested that low cooling is necessary in order to prevent the formation of what he calls "Lacto-fibrin" in the milk, which entangles the fat globules and prevents them rising. This explanation has not been generally accepted.

### THE CREAM SEPARATOR METHOD.

Since 1876 this method has been growing in popular favor, especially since the introduction of hand power machines, by which a farmer can cream his milk on his own farm as effectively as at a factory, where large power machines are used.

The best place for a cream separator on the farm is in a room adjacent to, but separate from the place where the cows are milked. This room should have a cement floor, sanitary walls, have screens on doors and windows, and the machine and room should be kept clean and free from dust.

The best kind of power is electric, where this is available. A small motor can be driven from an electric light wire, and thus save one person's labor at small expense after installing.

The best time to separate, or cream the milk, is immediately after milking, as the conditions are then most favorable. If separating but once a day, or if the milk is cold, it must be warmed to 80 degrees or 100 degrees F. before creaming.

The bowl should be warmed and wet with warm water before allowing any milk into it. About one pint of warm water should be put into the bowl, when speed is about half up. This is especially necessary in winter. During the run speed must be maintained uniform at that required by the manufacturer, which is usually marked on the handle of the separator. There is need of a simple, cheap speed indicator, showing at what rate the bowl is revolving at any time, because speed is such an important factor in getting good results as we saw in the previous article.

As soon as all the milk has entered the bowl add about one pint of warm water (80 degrees to 100 degrees F.) to flush out the cream. Warm water is better than skim.milk, for the reason that the water is about the same specific gravity as the cream in the bowl, hence displaces it more readily than does skim-milk which is heavier than the cream.

The flushings may be allowed to go into the cream, but the operator should guard against allowing too much of this into the cream pail, which causes the cream to be too thin. As soon as all the cream is out, another pail should be put under the cream spout, or the spout be turned, into the skim-milk vessel, although there is danger of the bowl rubbing on the covers where the turning is not done carefully. This tends to spoil the covers and to throw the bowl out of balance.

All parts of the separator which come in contact with milk should be washed at once after using, and not once a day, or once a week as some practice, so it is said, although we can scarcely believe this to be true. A little soda in the wash water loosens the slime and removes the grease. The slime should be removed onto a piece of paper and be burned, not given to stock or chickens, as there is danger of spreading disease, if it be fed, or is thrown carelessly outside. Disease germs, if present in the milk are found in the bowl slime, or separator "mud."

After washing, the separator parts should go out in the air or sunshine in summer, and be hung near the stove, or other heater in winter. We have strong faith in fresh air and sunshine as disinfecting agents, hence advise dairy vessels to be placed outside whenever practicable.

The cream should be at once cooled in ice-water after separating, and before mixing with the cream of previous separations. Lack in this particular, and not properly washing the machine, together with too low speed are the main weaknesses of the hand separator method of creaming, assuming that a machine of standard make is used and that it is working properly in a clean room.

### SPECIAL POINTS.

1. If the machine vibrates it is probably not level, the spindal may be bent, the bowl is out of balance or the bearings are worn or too tight. A vibrating machine never does good work.

2. If the cream is too thick or too thin adjust the cream or skim-milk screw, and look to the speed and feed.

3. Test the skim-milk to see if "close skimming" is being done. If over .05 per cent. fat is found in the skim-milk and the speed is up to, or slightly above, normal, the probabilities are that the machine is out of order and needs the attention of manufacturer or agent.

4. If milk is found in the frame or bowl casing it indicates improper joint at the junction of the bowl parts, improper adjustment of bowl to the covers, or the milk is allowed into the bowl before full speed is up and before the centrifugal force has made the rubber ring expand to fill the space between upper and lower part of bowl where the joint is made.

5. Should the machine run heavily, use kerosene to clear the bearings and use only a good brand of mineral separator oil—never vegetable oils, such as castor oil, as this gums and clogs the machine.

6. In spite of all our care there are bound to be variations in the fat percentage of the cream, due to irregularities in speed and feed, fat content of the milk and various other things of which we know very little, hence we need not be surprised if the tests of our cream vary as much as five per cent. from one delivery to another, or even from one month to the next, as it is practically impossible to have the cream of uniform test day after day.

Summing up, the shallow pan and deep pan or can methods will produce good cream if we have the conditions right; and we can make as good a quality of butter by these creaming systems as by the modern separator; but where more than five or six cows are kept, a cream separator will be a paying proposition for creaming the milk. However, the separator, and separator cream need some attention, as there are persons who produce poorer cream and make an inferior quality of butter after buying a separator, as compared with before, because they have not observed the necessary precautions, thinking the separator all that was needed.

O. A. C. H. H. DEAN.

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Nothing is more valuable on the farm than a good supply of pure water. There is a shortage of water in many localities this winter, and where this is the case stock often do not get enough to satisfy their requirements. When "good digging" comes next summer new wells should be put down to ensure against a recurrence of this inconvenience and source of loss.