

WHEY BUTTER—COOL CURING-ROOM IN CHEESE FACTORY.

1. Do you think it is a satisfactory and paying industry for the patrons and manufacturer to put in a plant for the making of whey butter?

2. The factory has a capacity of from 40 to 45 cheese a day.

3. What is the usual percentage to the maker for making whey butter?

4. Is there as much strength in the whey for feeding hogs when butter is made from it?

5. Any information regarding whey butter would be thankfully received through the columns of your valuable paper.

6. Is a cold-storage room in a cheese factory of very great value?

7. If so, about how much to the pound of cheese?

8. Can you give full information as to the proper way a cold-storage room should be built? Addington Co., Ont.

M. V. LAKE.

1. The first consideration in the manufacture of whey butter is quality. If it will stand storage and come out with a reasonably clean flavor, it might be all right, but what looks dangerous to us is that large quantities of inferior butter may be thrown on the market. Some of the Montreal exporters claim that whey butter goes off in flavor very rapidly. If this is true, then whey butter would have to be consumed in a very short time after it was made, or heavy losses would occur from attempting to store such butter. The future of the business must be taken into consideration. It has also been said that making whey butter would tend to influence some makers in not being as careful as they might be in handling the curds, since, the more roughly curds are handled, the greater the loss of fat in the whey. Again, it has been said that, in the anxiety to skim all the whey, it might be left on the curd a little too long, provided the apparatus were not properly arranged, and thus have the tendency to make acid whey. Again, it is also claimed by some that it will put temptation in the way of some makers to skim small quantities of milk, adding this cream to the cream of the whey for the purpose of increasing the profits, and exposing them to the stringent law regarding the removal of any fat from milk which is to be made into cheese. However, the latter is hardly likely to occur, since the average cheesemaker is considered square and honest. Profits will depend on the ruling price of finest butter and what can be secured for whey butter. The average loss of fat in the whey in cheesemaking will be from about two-tenths of one per cent. to three-tenths of one per cent. One thousand pounds of whey will then make from 2½ to 3¼ pounds of butter, depending upon the loss of fat in the whey.

2. A factory making forty cheese per day, having an average weight of 75 pounds, would take in about 32,250 pounds of milk, and would make about 3,000 pounds of cheese, provided the yield was 10.75 pounds milk to one pound cheese. Subtracting the pounds of cheese from the pounds of milk, it would leave about 29,000 pounds of whey to be skimmed. This, with an average loss of fat of .25 per cent., would yield about 75 to 80 pounds of butter, depending on the amount of moisture which the butter would contain; 75 pounds of butter, at 20 cents per pound, would equal \$15. The expenses for making this butter would consist in the cost of fuel, for skimming, labor, salt, packages, marketing, interest on plant, and repairs. It would take two separators, with a capacity of 3,500 pounds per hour, at least four hours to skim this amount of whey. Ice, also, would be required for cooling the cream and refrigerating the butter. A small refrigerator would also be a necessity.

3. The percentage which the maker would get for making this butter would depend entirely on his agreement with the patrons.

4. As to value of whey for feeding hogs, a hog is obliged to drink 100 pounds of whey before he takes into his stomach .25 per cent. to .3 per cent. of butter-fat; and, to feed a hog a pound of butter-fat in whey, the hog would have to drink about 400 to 500 pounds of whey. This does not look as if the whey would be relieved of very much feeding value by skimming, although it would depend on the value placed on this small amount of fat for feeding. It is generally conceded that a small amount of fat, either in whey or skim milk, is of relatively more value per pound than is a larger proportion, although, perhaps, the residuum of fat in whey which is used chiefly for hog-feeding would not be so valuable as the same percentage would be in skim milk employed for calf-feeding. Roughly speaking, we should say that one-third to half the value of the whey butter made would represent loss to patrons in the feeding value of the whey; but, as the loss to each patron is slight, the tendency is to overlook it, just as 5 cents collected from each of twenty men is more readily obtained than \$1.00 collected from a single person. Nevertheless, whether perceived or not, such loss exists, and should not be ignored by the patrons.

6. A cool-curing room (not cold storage) in a cheese factory is of great value. Most cheese, if exposed to ordinary curing-room temperatures for more than three days in midsummer, will suffer permanent injury to quality which no future cold-storing will correct. The number of cool-cured cheese are increasing, and are having a marked effect in increasing the market prices and in encouraging consumption.

What Cool-curing Does.—It delays the curing not more than a week or ten days; it effects a direct gain to the patrons by saving from 1 to 1½ per cent. in the shrinkage of cheese during the curing period, or about one-sixth cent per pound of cheese, if cheese is worth 13 cents per pound. It prevents the heated flavor and mealy texture of ordinary-cured cheese in hot weather, and avoids one of the chief defects in a large number of our hot-weather cheese. It helps to prevent the development of bad flavors. It protects the cheesemaker, in some measure, from unjust claims arising from causes over which he has no control, particularly that of heated cheese. It develops the rich "nutty" flavor which is sought after in fancy cheese.

8. Full and entire information as to the proper way of building a cheese-factory cool-curing room will be found in the Dairy Commissioner's Report for 1906, and if the Dairy Commissioner, Mr. J. A. Ruddick, Ottawa, is communicated with, he would only be too pleased to furnish plans and all information regarding the building of cool-curing rooms.

CO-OPERATIVE SHIPMENT OF CHEESE.

Editor "The Farmer's Advocate":

Every salesman of a cheese factory should acquaint himself monthly, at least, with the financial rating of all the reliable firms with whom he expects to do business. He should also consult with his board of directors regarding these firms.

Where cheese boards are organized for the purpose of protecting the patrons' interests in the selling of their cheese, I believe this privilege should be taken advantage of, and the cheese sold only on the boards. Buyers who contract for a season's make at the highest price paid on the board, for some of the leading factories, have the privilege of keeping the prices down a fraction of a cent on the board, in order that they may not pay the highest price to those factories with whom they have contracted.

I do not see why cheese should not be paid for when delivered at the shipping point, as all other farm produce is paid for. This is an industry which is out of its infancy now, and should not be abused by a few men who wish to make a little money out of the farmer by taking advantage of having his cheese at Montreal, or some other shipping point, and then demanding a half cent per pound off, or two pounds per box, as the case may be, for short weight, off-flavor, etc.

It seems to me that, if cheese were all hauled to the shipping point on a certain day, and sold on its merits by auction, and accepted or rejected there, it would be the proper way. This, of course, would demand another system. It would be necessary to have a cold-storage plant where cheese could be kept over from one week to another, and the buyers and salesmen meet weekly and hold their sales.

The case mentioned by the merchant, where they were called upon to make good a check for \$4,000, by the defaulting of their representative, is more than offset by the numbers of factories that lose each year by cheese buyers who fail in the business. There is scarcely one shipping point in Ontario now that is not represented by one or two reliable banking firms, and the excuse, it seems to me, is a very poor one, indeed, for not paying for cheese by check when delivered at the car.

The fourth suggestion offered in your recent article might work out all right were the cheese all inspected at the factory by the buyer or his agent. In some cases, the shipping of cheese with bill of lading attached has been tried, and, when the cheese reached Montreal they have been refused, and a half cent per pound demanded off the selling price, or two pounds per box off in weight; and, of course, the cheese is there on cars, and the seller hundreds of miles away, and what is to be done? Possibly the weather is very warm or cold, and the cheese is apt to become overheated or frozen. There is only one course to pursue, and that is to accept the cheese buyer's offer.

Why could not five or six factories, making a uniform article of cheese, co-operate, and ship their cheese direct through a bank to a reliable firm of commission men in the Old Country, and save the middlemen's profit in this country? This plan has been adopted in this section several times in the fall, when a dispute arose between buyer and seller, and always came out with advantage to the patrons. If it can be done in the fall with a small shipment, why could it not be done in the spring and continued throughout

the season, with weekly shipments in carload lots. Of course, the same vigilance would be required by the salesmen over the buyer, as in the case of our own local buyers.

Northumberland Co., Ont.

PATRON.

THE SOURCE OF MILK-FAT.

Whence comes the fat of milk? is a question which has received a good deal of attention among scientific and practical dairymen. The old school of physiologists taught that the manufacture of organic constituents was a power possessed only by vegetables, but Liebig proved that the fat contained in the milk of the cow was greater than could be accounted for by the fat present in the grass which she ate. An experiment conducted at the Ontario Agricultural College indicated that, for 7.4 pounds fat (estimated) in the grass consumed by two cows, they produced 17.4 pounds fat in the milk. Here we have more than twice as much fat in the milk as was estimated to be in the grass eaten by the cows while on pasture during one week. It seems as if the cows must have been able to manufacture milk-fat from a source or sources other than the fat in grass.

Lawes and Gilbert showed that, for 100 pounds of fat in the food consumed by hogs, they stored 472 pounds of fat in the body, indicating that animal or body fat may be, and probably is, produced from other sources than that of the fat in food consumed.

One authority says, regarding the source of milk fat: "All the evidence we possess goes to prove that the fat of milk is formed in the cells (of the udder) through a metabolism (change) of the protoplasm."

Another says: "The origin of the fat is, without doubt, in a process of fatty degeneration of the cell contents (of the udder). The amount of fat in milk is diminished by an increase of the fat in food. A fatty diet may help the milk secretion, but not by immediate transfer of the fat of the food to the milk."

Another view is: "The fat, in the form of an emulsion, or exceedingly intimate mixture, in particles so fine as to be invisible, is absorbed directly into the circulation, and is carried on with the blood, to be deposited where the exigencies of the system require it. It is carried in large part to the udder, where it is first deposited in the glandular cells of the udder, and is then mingled with the copious secretion known as milk."

Acting on the foregoing theory, an enterprising American a few years ago conceived the idea of feeding tallow to cows, and having them transform this into milk-fat or butter. The supposed discovery created a sensation at the time. If cows were able to transform 10-cent tallow into butter worth 25 cents per pound, dairymen were in a fair way to become millionaires in a short time. The Cornell Experiment Station investigated the so-called discovery, but found that cows were unable to convert any quantity of tallow into butter. If we remember rightly, they did succeed in getting cows to consume so much as two pounds of tallow per cow daily, but the cows produced no more milk or milk-fat than they did on the regular ration.

In some further experiments conducted at the O. A. C., with three different lots of cows, on four different rations, the results were:

	Digestible Fat in Rations.	Fat in Milk.
	Lbs.	Lbs.
No. 1.	5.18	9.40
No. 2.	14.00	13.67
No. 3.	14.70	13.62
No. 4.	6.16	15.94

In these cases, the cows fed on rations containing an excess of fat produced milk containing slightly less fat than was contained in the rations fed, while on the two rations having a moderate amount of fat, the fat in the milk was practically double the amount of fat contained in the food fed to the cows. There is also evidence pointing to the value of proteid compounds, directly or indirectly, for milk production. No. 1 ration contained but 7.28 pounds of proteids, while No. 4 contained 17.08 pounds proteids. This ration (No. 4) gave much better results than did Nos. 2 and 3, although these two rations contained more than twice as much proteid and fat material as did No. 4, thus indicating that it is possible, with some cows, at least, to feed more nutrients than the cow can consume, and this may be a hindrance rather than a help to her. It is one of the finest points in practical cow-feeding to determine how much digestible nutrients may be fed to a cow profitably.

The most exhaustive work done in America on the question of the source or sources of milk fat is that done at the Geneva Experiment Station, New York. Two bulletins have been published (Nos. 132 and 197) on the results of their investigational work. A mass of data has been collected which is somewhat difficult for the