

### The Dairy.

#### Sweet or Sour Cream for Butter?

BY L. B. ARNOLD.

"It is admitted by all that souring is the beginning of decay, and, reasoning upon it, sweet cream ought to make better keeping butter and better flavored butter than sour cream, but practically, in both respects the reverse is true. At any rate, it has always been so in my experience. Can you give me any light on this apparent inconsistency?"

The above quotation from a private letter well expresses what puzzles a multitude of reading and thinking dairymen, and the publication of the answer may have something of interest for some of the dairy readers of the *Advocate*.

In the first place, it is *not* true that the longest keeping butter is made from sour cream, nor is it true that the finest flavored butter comes from sour cream; but it *is* true that under the common practice of converting all grades of cream into butter, the sour-cream butter generally comes out ahead.

The butter fats are not improved by the souring of cream, either in respect to flavor or keeping. It is rather impaired in both these qualities. The Danes have opened a considerable market for butter on the south side of the equator, and the butter they take there is all made from sweet cream, because they find that sour-cream butter will not stand the long journey across the torrid zone. Nor can we safely send our sour butter there. The Danes have that market all to themselves, because of their long-keeping sweet-cream butter. When acting as judge of butter at the Centennial, I had an opportunity of examining quite a number of samples of Danish butter. Among them were several packages which had been exhibited three years before at the Vienna Exposition, nearly all of which were still sound. How long it had been made before the Exposition I did not learn, but it was enough to demonstrate its good keeping quality that it lasted from one exhibition to the other.

The keeping of butter depends more upon the perfection with which it is freed from other matters—particularly casein—than upon the fact of having the cream sweet or sour. The Danish butter was entirely freed from all foreign matter by rendering, and then excluded from the air. The fact that sour-cream butter, treated in the same way, would not stand the torrid zone, furnishes pretty clear proof that it is not benefited by souring. The difficulty with sweet-cream butter lies chiefly in its not being as well churned as sour-cream butter. The former does not churn as easily as the latter, at the same temperature, and the operator generally raises the sweet cream up to a degree that will make it churn about as soon as when sour. Cream which is a little sour will, if the churn is a good one, churn well at 58°. If the rate of speed is such as to bring the butter in an hour, it would take from two to three hours to bring cream taken from milk twelve hours old, which had been refrigerated by ice-water, and only raised to 58° as it was put into the churn. This makes tedious work, and the workman, to facilitate the operation, generally warms the sweet cream up to 62° to 65°, when it will come in about the same time as sour cream. The higher the temperature at which churning is done the more adhesive will be the butter, and the more will the casein, which has become curdled by churning, stick to it. The warmer cream is churned the lighter colored it is, by reason of the adhering casein, and the shorter lived such butter must be, whether sweet or sour, when exposed to a temperature at which changes can occur. In warm churning the larger fat globules, which churn sooner than the smaller ones, will, from

their soft and adhesive inclinations, unite and form into a mass before the smaller ones are churned, and the latter are left back in the buttermilk and lost, unless the buttermilk is churned over again. At a lower degree the gathering would not occur till all was churned. Warm churning, therefore, occasions loss in quantity of product, and an increased amount of casein mingled with the butter, which leads to rapid decay. These are the usual sources of defect in churning sweet, and rather than to endure them it would be better to let the cream sour a little, and churn easily at a low temperature, thereby increasing the product and diminishing the quantity of cheesy matter taken in with the butter. Though this does not make the best grade of butter it is possible to make out of a given quality of milk, it is, perhaps, the best course for the average dairyman to pursue. There is one very marked advantage in souring, provided the change is not carried beyond the first stage of acidity. Souring is infectious. If a churning is made up of different skimmings, some of which are sweet and others varying in sourness, the infection from the sourest portion will strike through the whole mass, and bring the different skimmings all into the same condition of the sourest part, if the mixture is allowed to stand at 60° for ten or twelve hours, thus causing the whole to churn easy and alike. In this way all the churnable cream will be converted into butter, securing the largest possible yield, and a reasonably good quality. It is a circumstance unfavorable to churning sweet cream, especially for single dairies, that a batch of cream made up of a mixture of skimmings of different ages, does not all assume a uniform condition like sour cream. The oldest cream will be the ripest and will churn the soonest, and so down to the newest skimming. If there is much difference between the first and last skimming, there will always be a liability of leaving a considerable part of the newer cream unchurned, and, of course, causing loss. In creameries this objection does not lie against sweet cream. The churning is as regular as the reception of milk, and one skimming usually fills several churns, so that the cream is all alike, or very nearly so. By giving it a good airing and keeping it as long as it can be and remain sweet, the churning will be easy and complete, and the flavor as fine as the milk could make, and the keeping of the most desirable character. Though the finest flavor and longest keeping are developed by thorough airing and churning just before souring, but while it is yet sweet, such a course is not well suited for our modern creameries. Under the practice of deep setting and low refrigeration and rapid creaming, which economy in operating creameries compel their managers to adopt, it is hardly possible to depend on maturing cream properly by airing. Coming from the milk so fresh and sweet, with but a faint exposure while rising, it would require too much labor and room to spread and air it to be practical; besides, it would hardly be prevented from souring before a sufficient airing could be effected. Milk or cream which has been chilled to near freezing, sours very soon upon warming to 60°, as it must be to have airing of any essential value. Airing cream much below sixty degrees is of very little use. If not in every respect the best thing that is possible, a little souring is, therefore, the cheapest and readiest way of preparing cream for the churn, and is the way in which the average dairyman will be likely to produce the best and most uniform results. The great difficulty with souring is that almost everybody sours too much. Just acid enough to be perceptible is all that should be allowed. To go beyond this is to lose rapidly in quantity, quality and keeping as the souring advances.

#### The Yesterday and To-morrow of Butter Making.

BY JOHN GOULD.

It is really an open question whether or not people need educating in respect to betterments in home dairying, or in the direction of massing the crude material in the form of milk or cream; and the production of butter and cheese upon the co-operative plan. In the States, the co-operative system of cheese-making is, in some one of the forms, universal, and farm dairy cheese are now about as rare as are Bob Ingersoll's endorsements of orthodoxy. The wonderful success of the cream gathering plan, not only in the Western States, where it has about superseded all other methods of butter making, but its rapid inroads in older and well established cheese and butter territories, like the Western Reserve, makes it extremely probable that the butter of the future will be made at the creameries almost exclusively. And why not? For to-day (April 19th) dairy butter is selling at 17 cents, and co-operative creamery butter at 30 cents, a difference that is sending cream, in some shape, factoryward with a "rush," for the butter made at home and at the factory, each from milk alike in all its conditions, results in a difference that the dairyman cannot stand, and the matter of manufacture is being as rapidly settled as was the manufacture of cheese after the advent of the factory system in 1863-4.

Under this condition of things, it seems almost useless to take up the question of home creameries for private dairies; and yet it may, if not profitable (for the reader), be of service, for any improvement once introduced begets others, and even "all talk" eventually leads to some innovation upon old customs, and consequent improvement and increased revenue.

The plan of all the cabinet creameries for farm use, as hinted at in the *March Advocate*, is upon one system—rapid cooling of milk, the patents being upon apparatus designed to accomplish the result, rather than upon the principle; hence we find at least 50 different creameries advertised as "all the best," as the circulars will abundantly prove. The specific gravity of milk is but a trifle below the butter fats which it contains, and as cold will soon contract and cause the caseinous matter to become yet more dense, i. e., heavier, much more than fats which are effected but slightly, the principle sought is to reduce this temperature suddenly, and, by this rapid change, throw the cream up by making the heavier matter press into its place, by the simple law of gravitation. The first attempt to do this was, I think, secured by L. L. Hardin, of the States, who employed ice, placing it in a rack over the milk, the cold air thus falling down upon the tall, slender milk cans. The variations then were fast announced, and the Swedish plan of surrounding the milk with very cold water was employed, instead of ice-cold air, as attempted by Hardin. There is no end to the variety of these cans or the principles employed to get the greatest extent of surface acted upon by the water in proportion to the milk. A glance at the illustrations in a dairy journal will give a fair insight into the plans worked out by which to evade each other's patents. One plan is to entirely submerge the can in water; another is to cut a channel through the can so that the water may act immediately upon the centre of the milk; yet another fashions his cans with covers larger than the can and coming well down the sides, so that if the can is placed in water to half its depth the rim of the cover is below the surface, and the milk within is "water sealed." Other cans are so set in double partitioned boxes that ice is placed about the upper half of the can and the lower part of the same can setting in a well of water cooled