

Dairy.

Salt for the Dairy.

BY L. B. ARNOLD, SECRETARY OF THE AMERICAN DAIRYMEN'S ASSOCIATION.

The very sensitive nature of dairy products renders them peculiarly susceptible to the influence of foreign matter.

Milk and its products—butter and cheese—are such complex and highly organized bodies that the feeblest chemical agencies are sufficient to change the relations of its constituent particles and alter their condition and qualities, and hence their flavor and preservation, and hence, also, their market value. The fats in milk are, in particular, so sensitive in regard to foreign impressions as to feel the most delicate influences. Every change in humidity, temperature and purity of the air, a whiff from a pipe or cigar, or the burning of a kerosene lamp in the milk room, the earthy smell of a cellar, the exhalations from aromatic or decaying vegetables, the slightest contamination of filth of any kind, the gentle jar of distant thunder or the induced electricity of a storm-laden cloud—each makes its impression upon the milk, which shows in the butter made from it.

Cheese is scarcely less susceptible than butter. Every variation in the food, drink or air used by the milk-giving cow, every varying condition, physical or mental, such as health or disease, exercise or repose, grief, fear and solicitude, or undisturbed quiet, is felt by the cheese made from the milk. So with every little change in temperature and manipulation in manufacturing. It is almost impossible for two cheese-makers to make exactly the same product, though they have milk alike to start with, so much do the little differences in working effect the resulting cheese.

It is not strange, then, in view of the extreme sensitiveness of dairy products, that the salt with which they are seasoned and preserved should be expected to modify them by its variations in condition and purity. The degree of fineness should be suited to the purpose for which it is to be used. For butter a fine grain is essential. It is important that butter which is in any degree defectively made (there is very little which is not) should have salt strike through it at once. Delay in this respect means change, and change means injury to the butter. Salt strikes through butter slowly, being only taken up by its affinity for the water in the composition of the butter. Its more even distribution and rapid solution and absorption are promoted by its being finely pulverized.

For cheese great fineness is not essential. Cheese curd takes up salt very readily, owing to the large amount of water in its composition. Green cheese as it comes from the press is generally fully one-third water, and often more. Salt, therefore, so easily penetrates a green cheese that, if it is not very thick, it will soon be thoroughly seasoned by rubbing salt on the outside only. There is even an advantage in having salt rather coarse for salting curd. More less whey is always mingled with the curd at the time of applying salt, and if the salt is very fine more of it will be dissolved and carried off with the whey, which escapes when it is put to press.

The most important question in regard to salt for the dairy is its purity. All the salt of commerce contains more or less foreign matter, and according to the quantity and quality of that foreign matter are butter and cheese affected by its use.

The largest impurity in Canadian salt (and in most others) is sulphate of lime (land plaster), of which it contains about one and a half pounds in a hundred. In butter this does little injury. It is a neutral salt and so sparingly soluble as to require about four hundred times its own weight of water

to effect its solution. The small amount in butter—about ten per cent.—is chiefly taken up by the salt, and there is nothing left for the solution of the plaster, and it remains in the form of a fine solid powder, incapable of imparting flavor or other effect. In cheese it is different. Curd contains water enough to dissolve it, and having become a liquid it is believed to do injury to the flavor and curing of the cheese.

Another common foreign element in salt is chloride of lime or bleaching powder. It has a sharpe acrid taste, and is notably destructive to color.

It is a more powerful antiseptic than common salt, and hence is supposed by some chemists to be a better preservative of butter than salt. Its effect upon butter is not very great, but it is believed, on the whole, to be deleterious. Its action upon cheese is very objectionable. Now that it has become known that the action of the runnet used to coagulate the milk is an essential agent in the conversion of curd into cheese (curing), it is important to avoid everything that injures that agent. Chloride of calcium is very destructive to runnet and the small amount taken into a cheese with the salt is sufficient to so injure it as to retard the curing and make the cheese hard and insipid. In a test made last summer, under Mr. Ballantyne, in seasoning curd from the same vat, a part of it with Goderich and a part with Liverpool salt, the part salted with the Goderich salt was decidedly inferior, the legitimate result of the chloride of calcium in the Goderich salt.

Chloride of calcium is a powerful deliquescent, and absorbs water from the air so vigorously as to soon become moist, or even wet, by exposure to the atmosphere. It is chiefly to the pressure of this substance that some salt will be alternately wet and dry in rainy and fair weather. No salt which drops, or becomes moist and dry with the changes of the weather, is fit to use in the dairy.

Another leading impurity in salt is chloride of magnesium. When separated it is a dry white powder, soluble in water and having a bitter taste, which it imparts to the butter and cheese when present even in very small quantities. It alters the quality as well as the flavor of the butter, and is to be avoided if possible. Though less injurious to cheese than to butter, it is decidedly objectionable, injuring the curing as well as the flavor, and making it every way undesirable.

Two other substances, sulphate of magnesium, or Epsom salts, and sulphate of soda, or Glauber's salt, are often found in common salt. Each of these cathartic medicines imparts its peculiar flavor to butter or cheese, but in so feeble a degree as to be hardly considered objectionable.

It is very desirable for every country to patronize and encourage home industry in preference to foreign, and it would be a pleasure to advise Canadian dairymen to use Canadian salt if it were consistent to do so. But it is not discreet to prop up one industry to inflict a greater injury on another, and Canadian dairymen are therefore advised to get the purest salt they can find, even if they have to go abroad for it.

Of the salt in common use seen last winter in Ingersoll and London, and said to be Goderich, all was damp, and some was dripping, and distinctly flavored with the bitter taste of the chloride of magnesium. No such salt is fit to use in dairy products. Whether all the Goderich salt is thus faulty I do not know. I only speak of what I saw, which appeared more like the Saginaw or Ohio salt than the fine product which the Goderich brine is capable of producing. That as good salt may be made from the brines on the Maitland as the best foreign article the following analysis of Goderich, Liverpool and Syracuse salt, made at the dates given, assure us:—

	1868. Goderich.	1875. Ashton.	1875. Onondaga
Water.....	1.5000	0.7880	0.6280
Insoluble Matter.....		0.6565	0.0264
Sulphate of Lime.....	1.4306	1.2272	0.7217
Sulphate of Magnesia.....		0.0769	
Chloride of Calcium.....	0.0872		0.0473
Chloride of Magnesium.....	0.0313	0.0591	0.0473
Sulphate of Soda.....	97.0300	97.7508	98.5242
Chloride of Sodium.....			
	100.000	99.9674	99.9822

With the same degree of firmness these three samples are all sufficiently pure and equally valuable for dairy use. If the Goderich salt is not now as good as the foreign brands, or as good as the above analysis indicates, it is because the manufacturers have grown careless in their work. It is true that the brine contains considerable quantities of the objectionable deliquescent chlorides, but they are so easily wiped out by the use of bicarbonate of soda that there is no excuse for the appearance of anything more than a mere trace in the finished product.

Grade Cows for the Dairy.

Feed on a large scale if you would improve and maintain the fertility of the farm. Feed good stock if you would be paid for your feeding. Feed grade cows for the dairy, that your dairymen may be profitable, and that when you sell your cows that have dried up you may feed them with profit as beehives. The *Factory and Farm* on this subject says:—

The introduction of thoroughbred stock of all kinds has been conducive of incalculable benefit to the farmer and stock breeder. There are still, however, many farmers who do not realize the great benefit to be derived from the introduction of fresh and high-class blood into their flocks and herds, and who are ready and willing to speak against thoroughbreds, as a class, as being fit only for the more wealthy of the farming community. Yet, how strangely they will act against their own assertions, for when their favorite cows are in season they hunt up the very best animal to breed to, and make use of him in preference to a common one, showing that they practice the opposite of that which they advocate. All of our herds and flocks of thoroughbred animals have been formed or made by the selection of those animals which have most readily responded to the best of care and food, and by following this principle for many years, and by breeding steady to one type, have established breeds which will uniformly produce offspring with the desirable characteristics of the parents.

While thoroughbred cows have, in many cases, proved themselves profitable dairy animals, and, in the hands of good and well known breeders, the calves selling at paying prices, grade cows, produced by coupling a thoroughbred bull with a good native dairy cow, have almost invariably proved themselves superior animals. Some may think it does not pay to buy and keep a thoroughbred bull, but we contend, from an extended experience, that it does. We breed, and have bred, both pure bred and grades, and know whereof we affirm; but it is especially in regard to grade cows—half-bloods—we would now write.

We have repeatedly sold half-blood cows, (Guernseys as well as Jerseys, (both of them butter breeds,) for \$100 each, with their first calves away from them only a month or two. One we sold a little over two years ago cannot be bought for \$200. She has made, by actual measurement, 14 pounds of butter in one week. One fine half-blood Guernsey heifer, which calved Feb. 1st, 1877, made, last month, July, 5½ lbs. of butter in one week, on grass alone, with cream left out to give two persons enough, at each meal, in their coffee and tea. There is a standing offer of \$100 for this heifer, but she is not for sale. We could mention many other instances, but these should be enough.

And now, readers, don't tell me it does not pay, to keep or use a thoroughbred bull, for figures are against you. It does not cost any more to raise a calf from a fine bull than from a poor one, and you are sure of an animal which is worth at least twice as much as a calf raised from a scrub bull. If you have but a few cows, either get one or two neighbors to join in with you in procuring a fine full-blood bull, or else buy one yourself and charge your neighbors from \$3 to \$5 for the use of him,