

Dairy.

Churning.

All other circumstances being the same, cream from the milk of the Jersey and other Channel Island cows, in all of whose milk the globules are large, will churn as well at 58° as that from the average native at 60° or from the Holstein at 62°. But the size of the globules varies not only with the breed, but with the individuals of each breed, and with the food used by the cows, and also with the length of time they have been in milk. Then, again, the temperature needs to vary with the relative proportion of liquid to butter in the cream. If we churn the whole milk a certain temperature will be required; if the cream is mingled with half the milk, then we need another and a lower temperature; if only pure cream is churned, then a still lower degree will be better. It will, therefore, in each particular case, be to some extent a matter of judgment and experience as to the temperature to begin with.

The churn itself is an item which enters into successful churning. It should be adapted to the work. The poorest churns—those which operate by friction or merely stirring—will churn cream made up of large globules, especially if from well-fed cows not long in milk, because such cream churns very easily. But when the globules are small, and from cows long in milk, and particularly if the cows are poorly fed, so that the globules are not well filled, the friction churn or stirring machine fails. The butter comes with difficulty and imperfectly or not at all. What is wanted for such cream is successive shocks of strong pressure or percussion, which will operate on the entire contents of the churn at once and alike, such as can be obtained in the old dash churn with a larger dasher, or by lifting the cream and letting it fall with a thud, as when dropping from side to side in a rectangular rotating churn with deep sides, in the direction it revolves, or by the blow given by the cream against the end of an oscillating churn as it suddenly reverses its motion. The large and small globules are all affected alike and come at the same time, which they would not do in a simple stirrer. Owing to the fact that cream is generally made up of large and small globules mixed, stirring machines are commonly inefficient and unprofitable. They churn the larger sooner than the smaller globules, and either leave the latter unchanged in the buttermilk, or if churned till all come, the butter which comes first is worn out, and becomes greasy before the last is churned.

A very common error arises from allowing the cream to become too sour. The excess of acid decomposes the butter fats into fatty acids and glycerine, inclining it to become rosy and stale in flavor, and the stale taste to be transferred to the butter. The churning too is more difficult as the souring increases. Early churning will avoid such faults. It should not be delayed beyond the first appearance of acidity, and it is better, if the cream or milk has been well aired, to churn just before acidity begins. This will secure higher flavor and better keeping quality to the butter, and the churning will be quite as easy. Though it is notorious that in common practice sour cream churns easier than sweet and makes a more desirable butter, yet it is by no means certain that souring the cream adds anything to ease in churning or is any benefit to the butter. Recent observations seem to point to the corrosion of the delicate membranous envelope of the butter globule by the free oxygen in the air as the cause of making the envelope so tender as to be easily ruptured. Cream churns easily, not according to age or sourness, but according to the atmospheric exposure it has received. Facts are also tending to the inference that the fine aroma and flavor acquired by giving the cream some age are due to a similar oxydation of the light oils in the milk, and that the effect upon flavor is finest when the oxydation is pretty rapid, as it is when the exposure is somewhat elevated or not below 60°.

Well-aired, sweet cream, twelve hours old, taken from milk heated from 80° to 120° or 130° and then cooled down to 60° within the twelve hours, churns as readily and makes as fine and better keeping butter than cream lightly soured at forty-eight hours old and taken from milk of the same quality and kept all the time at 60°. Such facts, which have often been noted, and many others of a similar character, go to corroborate the inference that the free oxygen in the air has been doing the work we have all along been ascribing to acidity.

The common observation that sour cream churns easier than sweet does not militate against such a conclusion, because the sweet cream, in the common practice, is taken too soon—before the envelopes of the globules and the flavoring of the milk have been sufficiently affected by atmospheric action. It may well be supposed that the results would be better, both upon the churning and the flavor, when the cream was allowed to stand a little too long, than when taken much too soon. There is a point somewhere between the extremes at which the best results are secured, and facts seem to be fixing it a little in advance of the appearance of acidity. The presence in milk or cream of acid as the product of fermentation is indicative of incipient decay, a condition of things not very likely to contribute to the welfare of such a sensitive product as butter.

One of the largest errors in churning is in doing too much. Not one in a hundred stops when he has done enough. To get the best butter and bring it into the best style for cleansing it of buttermilk the churning should be steady rather than violent, and stop when it has come enough to rise and separate distinctly from the buttermilk, and appear in fine particles or granules, which, though soft, will be nothing but pure butter. Then the whole contents of the churn should be reduced with cold water, or what is better, cold brine, to about 55°, and churned very moderately till the granules become so distinct and hard that they can be handled without sticking together; all the churning needed will be done. After this, it may be washed either in the churn or out, with cold water brine till the liquid runs off clear, when it will be ready for stirring in salt without any working at all. If the churning continues, as is usual, till the butter is all gathered into one or a few lumps, it will inclose so much buttermilk as to require an amount of working, even if done in the most skilful manner, that will materially injure the grain of the butter and make it appear greasy, and lessen its fine flavor and hurry on a stale and strong flavor. All this labor and injury can be avoided by stopping in time, while the butter is in granules, and cooling and washing as described.—[New York Tribune.

Whey—Its Nutritive Value and its Use as Food for Domestic Animals.

There are various opinions among dairymen respecting the value of whey as a food for domestic animals; some holding it in high estimation, while others consider it of little account. Whey is not always uniform in composition, sometimes differing widely in quality at different factories, since if the curds are carelessly or improperly worked, what belonged of right to the cheese goes to enrich the whey; and hence such whey when fed to animals is found to give better results than where more care has been taken in the process of cheese-making. Whey was at one time used quite extensively as a feed for cows in New York dairies, but of late years the practice has been generally abandoned on account of the bad influence which such food has on the milk, rendering it liable to early acidity, to take on objectionable taints, and otherwise causing the cheese-maker trouble in handling the milk, and in injuring the flavor and texture of the cheese. These troubles from "whey-fed cows" are more marked in hot weather and when the whey is fed sour and without being mingled with meal or bran. At many of the factories stringent rules are made prohibiting the use of whey for all cows from which milk is received, and no intelligent and progressive cheese-maker will now recommend it for this purpose.

The chief constituent of value in whey, when it results from cheese properly made, is the milk sugar, which varies from four to five per cent. The fatty and nitrogenous matter together ranges from one to two per cent, according to the care in which the curds are manipulated during the process of cheese-making.

Mr. X. A. Willard, in his large work on "Practical Dairy Husbandry," gives, on page 319, the analysis of fifteen samples of whey, and from which we select two analyses, viz.: No. 1 and No. 15, as showing a considerable variation in the fatty and nitrogenous elements. They are as follows:

	Whey No. 1.	Whey No. 15.
Water.....	92.95	93.10
Butter (pure) fatty matter.....	.65	.14
Nitrogenous substances (caseine) and albumen.....	1.20	.76
Milk sugar and lactic acid.....	4.55	5.31
Mineral matter (ash).....	.65	.69
	100.00	100.00

It will be seen from the above that No. 1 contains a little less than two per cent. (1.85) of fatty and nitrogenous matter, while No. 15 contains less than one per cent. (.90). The difference in milk sugar is also three-quarters of one per cent.

It will be seen from an examination of the tables that water comprises the great bulk of whey, and that the amount of solid matter, and especially its nitrogenous or flesh-forming elements, are so small that the animal, depending upon it as a sole food, would be obliged to consume a very large bulk of the fluid to support life. Its constituents are not in the right proportion to maintain health. This is found to be so in its practical operation; for young pigs do not thrive upon it when it is used as a sole food, and soon die for lack of proper nutriment. And although full grown hogs may live upon it for a time, their flesh becomes watery and it does not make a healthful article of food. Whey is largely fed to swine in many sections of the dairy districts of New York and other States, but it should be used mingled with bran, ship-stuffs or with barley-meal and pea-meal, and then it can be utilized with advantage. It is often fed sweet to calves, mingled with oil meal, buckwheat, flour, or something of the kind, to supply the flesh-forming elements.

We have seen hogs nicely fattened upon whey mingled with bran, or ship-stuffs, the animals appearing to be in high health, and their meat made excellent pork. Barley meal with whey makes solid and nicely flavored pork, and we should prefer these ground feeds as mixtures to that of corn meal.

Whey is often injured for feeding purposes by allowing it to stand too long, or until it becomes too acid, or until it passes on to alcoholic fermentation. Sweet whey, when fed in large quantities, has sometimes caused the death of swine, and especially when fed without being mingled with meal or bran. Caution should be taken in not overfeeding at first.

The albuminous matter contained in whey is in a state of perfect solution, and differs from caseine or curd in not being coagulated by rennet. This is shown by heating the whey to nearly the boiling point, when the albuminous matter rises or separates in flakes. Assuming that the albuminous matter or caseine in whey amounts to nearly one per cent, and the sugar of milk to five per cent., it would be evident that whey has a certain value as food for swine, and is not utterly worthless, as many have supposed. The mistake in its use has been in not combining it with more concentrated food, and especially with meals or ground grains that have a good percentage of albuminoids in their composition rather than of sugar or oil. And this is coming to be understood by our more intelligent dairymen who employ whey as a feed for swine.—[American Dairyman.

BITTER BUTTER.—At the late convention of the Northwestern Dairymen's Association, held at Harvard, Ill., Col. R. M. Littler, of Iowa, in speaking of what he saw of dairymen in England during his visit there last summer, made some very pertinent remarks on this subject, in which he stated the opinion of the English dairymen was that the bitter taste in butter was caused by the serum of the cream. To avoid this they construct their cream jars with a faucet at the bottom, and allow the cream to stand several hours after being skimmed. The serum or bitter water settles at the bottom of the jar by natural gravity, and is then drawn off before the cream is disturbed by being poured into the churn. In this way they are enabled to make butter without any bitter taste. Would it not be well for our butter-makers to try the plan? It will cost but little, and if it can be made a success in England we can do the same in this country. Give it a trial.—[American Dairyman.

We have tried all sorts of mixtures to kill lice on animals and at last have hit on what we think is best; Melt hog's lard or any hot grease, and in it dissolve salt one-third of the bulk of the grease; take as much grease as will be required to smear the animal all over and into the mixture pour kerosene oil and stir it up. Two gills of kerosene would be sufficient for a cow of ordinary size. One application completely cured the most stubborn case of lice on an old hog. It leaves the skin smooth and clean, removing the scurf and healing the irritation caused by the parasites. It is also excellent for galls and sores.