

Pasteurization.—The object of pasteurization is to kill almost all the germs which the cream contains. It is a matter of heating the cream to a temperature of 140° to 185° F. Twenty minutes exposure in a water bath to a temperature of 140° will produce the required results, but as this process of pasteurizing is not very practicable, unless a very small quantity of cream is to be treated, it will be necessary, in a large creamery, to use some type of pasteurizer in which the process is continuous. As cream will be subjected to heat for only a few moments, the temperature should be raised to 185° in order to obtain the same results as those of the preceding method. When such extreme high temperatures are employed, great care must be exercised and first-class pasteurizers used in order to avoid giving a burnt flavour to the cream. This treatment should destroy the germs of nearly all undesirable fermentations without affecting the taste or the appearance of the cream, or that of the butter. By the use of a good starter a butter more uniform in flavour and in keeping qualities will be obtained.

To obtain the best results from pasteurization, the cream must be cooled as soon and as rapidly after heating as possible and it is of great importance that the pasteurized cream be kept for two hours at a temperature not higher than 50° , so that churning may be done under good conditions. In winter, pasteurization is of the highest importance and becomes almost an absolute necessity, in producing butter of acceptable quality. It decreases the bad effects of the defective feeding of cows, of the contaminated air of the stables, of milking done under wrong conditions and of keeping the milk many days before it is brought to the creamery.

Churning.—The thickness of the cream, the quantity of cream to be churned, and the speed of the churn will determine the length of time necessary for churning. If the rules given above for the treatment of the cream are observed (from 48° to 50° in springtime or at the beginning of the period of lactation of cows, and 50° to 52° at other times) and churning is carried on in a temperate place, it will not take longer than 45 minutes. The temperature at the end of churning varies according to the place in which it is done; generally it is between 54° and 58° degrees, and this should never be exceeded. As a rule the butter will be found to be colder than the buttermilk.

To obtain a butter of delicate flavour and of good keeping quality, churning must be stopped when the granules of butter are about the size of clover seeds. If larger granules are allowed to form, more casein and water will be retained in the butter, and its keeping quality is thereby impaired.

When the churning is completed the buttermilk is immediately drawn off and passed through a strainer so as to retain the butter granules. The buttermilk being very fluid flows away readily, and a draining of half an hour will usually render washing unnecessary. However, if salting and working are to be done immediately after churning a light washing must be given. Water of about 50° F. is added in sufficient quantity to float the butter, and it is drawn off after a few revolutions of the churn. If the purity of the water used cannot be depended upon, it is preferable not to wash the butter. If the butter has been washed, it must be drained for a few minutes after the water has been drawn off and before salting. Otherwise a considerable quantity of salt would be wasted.

Salting.—The quantity of salt to use depends on the requirements of the market. In this respect the process does not differ from the methods practised in the making of ripened cream butter.

The Starter.—In view of the large proportion of starter used in this process, it is of the utmost importance that it should be carefully prepared, but as the directions are not different to what is required for any other process of butter-making, we shall not go into details at this time.

In order that the cream may always have the same degree of acidity at the time of churning the following standard, giving the best results, has been adopted. By means of this standard it is very easy to add to the cream the quantity of starter