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Quick and Slow Ripening of Cream.

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The experiment reported in Bulletin No. 32 from this Station during the winter of 1895 regarding quick and slow ripening of cream was repeated to determine whether the same results would be found under summer conditions.

Beginning May 15, we took each day, 400 pounds of cream, placed it in a vat, thoroughly mixed it so the percent of fat and the acidity would be the same. We then divided it into two portions, placing 200 pounds in each of the two small vats.

The cream in one was at once cooled by the use of ice until a temperature of 55° F was reached. It remained at that temperature three hours, then heated to 65° and then kept there until sufficient acid was developed. Whenever the souring had advanced sufficiently the cream was cooled for churning.

The cream in the other vat was not cooled, but kept at a temperature of 70° to 75° until sour enough for churning, (from six to seven hours) and then cooled to about 52° at which temperature it was kept until morning, when it was cooled to about 50°, and churned.

We had the acidity of the quick and slow as near alike as possible when churned, but at times one had the advantage of more acid, and at times the other. The butter was placed in numbered tubs and sent to W. S. Moore of Chicago, who gave his judgment on them, by scoring each tub.

In the nine trials, eighteen lots of butter, there was but little difference in the quality of the butter. The scores from the quick ripened averaged almost exactly the same as those
from the slow ripened. What difference there was in scores followed the acidity and not the difference in the method of ripening. We had butter made from both quick and slow ripened that scored 97 on a scale of 100.

In the eighteen lots of butter, the highest score was 97 and the lowest 94.5. One of the highest scores made (97) was on a lot where we used a 10 per cent buttermilk starter, and most of the ripening was done the first six hours. These experiments show then, that under summer conditions there is practically no difference in the flavor of butter from quick ripened and from slow ripened cream, but it is evident that when the cream is ripened at once after coming from the separator there is a considerable saving of time and labor. When quick ripened the cream is cooled but once and then held at a low temperature until churned. The slow ripened must be cooled twice, immediately after separation and again when sufficiently sour, requiring considerable ice to change the temperature of the cream from that of separation to 55°. Then comes the attention and labor of heating the cream to whatever temperature the butter maker considers proper, generally 65° to 68°. Then finally the whole amount of cream is to be cooled the second time for churning.

Another advantage of quick ripening is, that the cream is certain to remain long enough at a sufficiently low temperature to insure firm butter. If a vat of cream is cooled rapidly from a temperature considerably higher than the churning temperature, to the proper point of churning, while the thermometer may show a sufficiently low temperature, the butter is often soft and poor in body.

The fat globules seem to give up their heat more slowly than the milk serum does, and it requires some little time before lowering the temperature of the whole mass of cream exerts its full effect on the fat globules. In general the cream should remain at the churning temperature at least one hour to secure the full effect of that temperature. Under winter conditions the quick ripening has another advantage. As long as the temperature of the cream is higher than that of
the air, any odors will be given off into the atmosphere, but if the milk or cream is cooler than the surrounding atmosphere, odors will not be given off, but if there are any present they will be taken on or absorbed. When cream is kept at a high temperature after separation, the tendency is to give off any odors it may contain. Stable odors, are especially common during winter months, and the high temperature of the quick ripening, and the frequent stirrings necessary to keep the process of ripening even, drives them off before the flavor of the butter is injured.