THE GRADING OF CREAM.

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INTRODUCTION.

There seems to be great need for a change in the methods of paying for cream at many creameries, because competition has driven the creamery men into accepting cream regardless of quality, age, or condition. The methods used in the past and the changes which have taken place in the last two decades are responsible for the deplorable condition under which a large percentage of the cream is being delivered to the creameries in some States at the present time.

Previous to the introduction of the centrifugal separator most creameries were operated on either the gathered-cream or the whole-milk Cooley system.

Under the gathered-cream plan, which was the one generally adopted, the milk was "set" in receptacles, usually tin pans or earthen crocks, and the cream allowed to rise. This was skimmed off and held for the arrival of the cream hauler, who was usually an employee of the creamery. In most cases routes were arranged so that the collector started from the creamery in the morning, collecting cream from farmers along one road, and returned another way, arriving at the creamery in the evening with the collection of the day. Collections were made once or twice a week, and enough routes were established to employ all the time of the collector.

This plan was not satisfactory from the standpoint of quality, as the cream in summer always arrived sour, while in the winter months it was usually frozen, especially in the North; and in all seasons it contained the various odors and flavors absorbed from the kitchen, pantry, or cellar. Creameries of those times were not operated on a sound business basis. The system was unsatisfactory to the farmer because of the low price he received for his cream, and the creamery man and the consumer suffered because of the poor quality of butter, which was usually sour or stale and soon became rancid. In those days many people refused to buy creamery butter because the name "creamery" conveyed to them the idea of poor quality and an

undesirable product. Dairy butter was sought and generally preferred to that made in a creamery.

In 1879 the power cream separator was introduced and was soon extensively used. This put the creamery business on a new basis. The farmers delivered daily to the creamery the fresh sweet whole milk, from which the cream was at once separated by power, and the cream, after being properly cooled, was churned into butter that was usually of fine quality. The latter system returned much more money to the farmers than the former; consequently no objection was made by them to hauling the milk to the creamery every day. To this new system is perhaps due the large increase in the number of creameries built from 1885 to 1905, during which time approximately 5,000 creameries were established in this country. The attitude of the consumers toward creamery butter was soon changed from prejudice to praise, and this product gradually grew in favor until it became the standard of the United States.

It is a fact to be regretted that there has again been a deterioration in the quality of some creamery butter, which deterioration can be traced, perhaps, to the introduction of the hand separator. Where the hand-separator system has been adopted the cream is separated from the milk at the farm, only the cream being taken to the creamery. Other things being equal, this cream is of as good quality as the cream from a power separator at the creamery; but unfortunately many hand separators do not receive proper care, and the cream, instead of being cooled and churned at once, is often kept from 3 to 10 days on the farm without any cooling and is allowed to stand where foreign odors and flavors are absorbed. Much of the cream handled in this way is sour and tainted, and only poor grades of butter can be churned from it. The cause of poor creamery butter can usually be traced to the poor cream received.

From information obtained at the principal butter markets it appears that only 7 to 10 per cent of the butter received grades "extras," and the other 90 to 93 per cent must be classed as firsts, seconds, and thirds. Of these grades the last two are not considered of high enough quality to satisfy the taste of the average consumer.

In many creameries there has been no incentive for the farmer to deliver good cream, as the price he received was the same for sour, stale, and putrid cream as for perfectly sweet cream delivered daily. In some localities, however, creameries have recognized the demoralizing effect that such a practice has on their business and many of them have instituted a plan for paying on the basis of quality, with the result that much improvement has taken place in the quality of the raw material received. This has caused a much better grade of

butter to be made, and has resulted in a material increase in the price paid to the farmers for their cream.

COMPARISON OF PRICES OF SWEET AND SOUR CREAM IN 1909.

A compilation has been made of the prices paid to creamery patrons in 1909 for butter fat and the price received for the butter in the two classes of creameries—those receiving sweet cream and those receiving sour cream.

Prices paid for sour and sweet cream and prices received for butter at creameries in Minnesota, Wisconsin, and Iowa in 1909.

State.	Kind of cream.	Number of creameries reporting.	Price paid for butter fat.	Price received for butter.
			Cents.	*Cents.*
Minnesota	Sweet cream	54	31.35	28.57
Do	Sour cream	158	28.81	27.50
Wisconsin	Sweet cream	12	30.83	28.18
Do	Sour cream	48	30.44	27.94
Iowa	Sweet cream	9	31.62	29.45
Do	Sour cream	27	29.58	27.98
Average of 3 States	Sweet cream	75	31.30	28.61
Do	Sour cream	233	29.23	27.63
Difference in favor of sweet cream			2.07	0.98

It will be seen that the difference in price paid to patrons by the creameries is 2.07 cents per pound of butter fat in favor of the creameries receiving sweet cream, or whole milk. This amount is more than sufficient to pay for the expense of hauling the cream from the farmer's door to the creamery.

In 1909 the three States named produced approximately 300,000,000 pounds of creamery butter. Of the 308 creameries reporting on this investigation 75.7 per cent received sour cream and the butter sold for 0.98 cent less than the butter from those creameries receiving sweet cream. If the ratio between sweet and sour cream be applied to the total production of these States it indicates a loss of $2,225,580, at 0.98 cent per pound, but since 1909 there has been a wider range of the prices in the various grades of butter. If butter is sold on grade, the difference, instead of being 0.98 cent per pound, would be about 6 cents, and the loss would be near $10,000,000, as the difference in price of creamery butter between the highest and lowest grades has increased in the last year, and there is now a variation of 6 cents per pound between the grades of specials and seconds.

Of the 71,591 packages (or 4,438,642 pounds) of creamery butter examined on the markets of New York and Chicago in eight months

of 1910 by representatives of this Department, 44.2 per cent graded seconds and below, practically all due to the use of poor cream.

The power to raise the quality of creamery butter lies in the hands of the farmers, especially those who are patrons and shareholders of cooperative creameries, but it will require the combined effort of all the patrons to accomplish the desired results.

EDUCATION OF THE FARMER.

It has been urged that inspectors should be sent through the country to instruct the farmers in the care of milk and cream. This, however, would involve much expense and would likely result in but little good. Through the dairy districts, such as Iowa, Minnesota, Wisconsin, Illinois, Michigan, Ohio, etc., the farmers a few years ago delivered to the creameries clean, sweet milk, which was made into a first grade of butter that brought the highest price. Many of the same farmers are to-day delivering cream a week old. This is not done because of lack of knowledge, but because their cream, bad as it is, is accepted by the creamery. If one creamery does not accept it another will; the farmer, therefore, is simply following the line of least resistance.

PAYING FOR QUALITY.

If the creamery men would pay for cream according to its true value there would be a rapid improvement in the quality. The proportion of good table butter that would grade "extras" would probably reach 90 per cent instead of 7 to 10 per cent, as is now the case. This assumption is justified by the results obtained from the introduction of the grading system in the State of Maine. The dairy authorities in that State inform us that at one time at least 90 per cent of the cream was sour when it reached the creameries, but that within a short time after a system of grading was established by which sweet cream received a premium of 2 to 3 cents per pound of butter fat, 95 per cent of the cream was sweet when it reached the creamery, and this condition still prevails. This simple system of grading has proved to be of mutual advantage to the creameries and their patrons in this section. The latter have received a price for their product several cents above market quotations, while the creameries have maintained a high standard for their finished product.

An investigation of the conditions in Maine has brought out the fact that the farmers are delivering their cream only two or three times a week during the summer months, but, as stated above, 95 per cent is sweet when it reaches the creamery. In fact, a large amount of this cream is used to supply the sweet-cream trade in the cities, and is from 4 to 7 days old when consumed. The secret by

which the Maine farmer keeps the cream sweet lies in the fact that the milk or cream is cooled immediately by being placed in ice water. The result of doing this is generally understood but not often practiced, except on compulsion or when made remunerative to the producer.

BASIS FOR GRADING.

The plan that seems to have been most successful in operation is to make two grades of cream, No. 1 and No. 2.

No. 1 cream must be sweet, with a clean flavor, and for it a premium of from 1 to 3 cents a pound of butter fat is paid.

No. 2 cream may be sour, but must have a clean flavor, and for this grade a straight price based on quotations is usually paid.

Cream that is not clean in flavor and consequently not included in either of these grades is rejected. Good butter can not be made from such cream, and it is not profitable to either the producer or the manufacturer at any price.

The butter-fat content of cream is usually given some weight in grading, as it is desirable that cream may be of the proper consistency for churning without requiring either dilution or concentration. When cream is received at the creamery it is carefully inspected, the two grades being weighed, ripened, churned, and marketed separately. The butter made from the No. 2 cream will usually bring the quotation price, while the butter from the sweet cream, if properly made, will bring a premium over quotations. In this way the creamery can afford to pay its patrons a higher price for fresh, untainted raw material, and so the farmer gets some substantial reward for the care he has exercised. The consumer is always satisfied to pay an extra price for a clean and wholesome product handled under sanitary conditions.

ICE HOUSES AND THE USE OF ICE.

The storage of ice can be made profitable in many parts of the country by using it to keep milk and cream in better condition. Wherever the natural product can be secured the cost of storing is so small that no one need be without ice on this account.

On the basis of a 20-cow dairy it requires about 500 pounds of ice to cool the cream annually produced by one cow. To this amount should be added 500 pounds more for waste, or a total of 1,000 pounds a year for each cow. This amount is sufficient to keep the cream sweet and in good condition, so that for a herd of 20 cows 10 tons of ice would be required. In smaller dairies the waste would be greater and proportionately more ice would be required, while with larger ones a proportionately less amount would suffice.

There are approximately 50 cubic feet of stored ice to the ton, consequently for 10 tons it would be necessary to fill a space 10 by 10 by 5 feet. An ice house for this quantity should be built 12 by 12 by 8 feet, which would allow for 12 inches of sawdust on the sides (sufficient to keep ice under ordinary conditions) and enough space on the top for packing and covering the ice.

From the investigation made of ice houses in Maine, where farmers generally store ice, it appears that only a few or them are built of new lumber. In most cases old lumber, or a discarded building such as an old granary, corn crib, or shed, was used; in fact, any building that will hold sawdust may be used for an ice house. The amount of new lumber required for an ice house holding 10 tons of ice would be about 1,800 feet.

In building a new ice house, or using an old building for that purpose, care should be taken to provide good drainage. The ice should be packed on about 12 inches of sawdust, or if sawdust is expensive, chopped prairie hay or even oat or barley straw that has been well broken in thrashing may be used in place of sawdust. Soft-wood sawdust is better than that from hard wood.

In a small ice house there should be about 12 inches of sawdust between the ice and the walls of the house. Ample ventilation should be provided. The most efficient probably is an opening of a few inches under the eaves. This will allow free circulation of air, but will not permit the rays of the sun to shine on either the sawdust or the ice. The sawdust should be kept well packed on the sides and evenly distributed over the top surface of the ice. Sawdust will keep ice much better when dry than when wet.