UNIVERSITY OF KENTUCKY

COLLEGE OF AGRICULTURE

Extension Division

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CIRCULAR NO. 121

BUTTER MAKING PROJECT
JUNIOR AGRICULTURAL CLUBS

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OBJECT OF THE BUTTER MAKING PROJECT.

1. To teach boys and girls to feed and care for cows before milking.
2. To teach the best method of handling milk and cream.
3. To teach the proper method of churning butter.
4. To teach the proper method of preparing butter for market.
5. To teach the proper method of scoring butter.
6. To stimulate an interest in farm life on the part of farm boys and girls.

REQUIREMENTS.

1. Only members of Junior Agricultural Clubs are eligible for this project.
2. The latest dates for enrollment are October 1 for the fall project and June 1 for the summer project.
3. Each member must feed and care for the cows and for the products of one or more cows of a good dairy breed. The cows may be either grades or purebreds.
4. Each member shall keep a complete record of the feeding, care and management of the cows as indicated in the record book. These records will be used in awarding premiums in the contest.
5. An exhibit of the dairy products must be made at the community, county or State Fair. The result of the exhibit must be entered in the record book.

BASIS OF AWARD.

Largest number of pounds of milk per cow	5
Largest number of pounds of butter made per cow	25
Lowest cost of feed per pound of butter made	15
Largest net return per cow	25
Highest score made in an exhibit at a fair	15
Completeness of record book and story of the year's work	15
	100

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General Directions For Making Farm Butter

CARE OF COWS.

To produce good butter we must start with good cream or milk. The cows which produce the milk must be healthy and normal in every respect, properly fed and stabled. They should not be supplied feeds that will impart an odor to the milk, such as rye, barley, wild onions or ragweed. The cow should be stabled in a comfortable barn that is well lighted and free from drafts.

The cow should be brushed before each milking and the flanks and udder washed with a damp cloth.

CARE OF UTENSILS.

All utensils such as milk pail, cooler, separator, churn, etc., that in any way come in contact with the milk, should be cleaned and sterlized before using. All utensils should be rinsed in cold water, washed in warm water to which washing powder has been added, and then scalded with boiling water. Rusty utensils should not be used as they impart a metallic flavor to the butter.

CARE OF MILK.

Milk from healthy cows usually is of good quality and any odor or flavor that may taint the butter usually gains access to the milk or cream during handling. The milk should be removed immediately from the stable and strained and separated

with a centrifugal separator or by gravity. If the milk is separated with a centrifugal separator the cream may be cooled at once. Never mix fresh warm cream with cream from a previous separation. If gravity separation is practist the milk should be set in a cool place and left undisturbed for 24 to 36 hours, until the cream rises properly, when it can be skimmed with a ladle. The centrifugal separator is more efficient in removing the butter fat from milk and is preferred over the gravity system.

HANDLING CREAM.

There are several ways of handling the cream previous to churning.

First Method: All cream as skimmed should be cooled to 50 degrees F., or below, and kept as cold as possible until a sufficient quantity has been gathered for a churning. Always cool fresh cream before adding it to any other cool cream, and stir thoroly after each addition. When a sufficient amount of cream has been gathered for a churning, raise the temperature to 75 or 80 degrees F. and hold at this temperature until sour or ripe enough to churn. The proper degree of ripeness can be obtained usually by allowing the cream to stand from night until morning, or from 10 to 12 hours. When the cream has soured sufficiently, cool it to churning temperature and hold 2 to 3 hours before churning.

Second Method: Warm your first gathering of cream to 80 degrees F. and hold at this temperature until slightly sour; usually 8 to 10 hours will be sufficient; cool as much as possible and hold at this cold temperature, and add after cooling each succeeding batch of cream, stirring each time. When enough has been gathered for a churning it usually will be sour enough to churn; if not, warm to 80 degrees and hold until sour, cool to churning temperature, hold three hours at churning temperature, and churn.

Third Method: Add one quart of clean, clabbered, sour milk to the first gathering of cream; stir, set at cellar or springhouse temperature, add each successive batch of cream after cooling, and proceed as in the second method.

TEMPERATURE FOR CHURNING.

No fixed temperature can be given as the proper temperature for churning cream. Churning temperature varies with the season of the year, per cent of fat in the cream and degree of ripening of the cream. However, a temperature of 52 to 56 degrees F. in summer and 54 to 62 in winter will give good results where this temperature has been maintained for 2 or 3 hours before churning.

PREPARATION OF CHURN.

The churn should be thoroly washed and scalded with hot water and cooled with cold water. The churn should be sweet. This usually can be obtained by rinsing the churn with lukewarm water immediately after removing the butter and then cleaning with washing powder and scalding. The scalding water will clean the pores of the churn and will also cause it to dry rapidly.

THE AMOUNT TO CHURN.

The amount of cream to churn is about one-third the capacity of the churn. Less than one-third full or more than half full does not give the best results. It is better to make two churnings than to overload a churn, as an overloaded churn does not give sufficient agitation to separate the fat properly from the milk serum. The result is that a large percentage of fat is lost in the buttermilk and the churn gain is greatly reduced.

COLORING.

A uniform yellow color is desirable. To obtain this color artificial coloring must be used sometimes. The amount to use varies with the season. In summer no artificial coloring is required, but as high as 20 drops per pound of butter may be required in winter. The coloring should be added immediately after the cream has been put into the churn and before the churning process starts. As no fixed rule can be given for the rate of coloring experience will soon teach the desired amount demanded by your trade. Use only a good grade of vegetable coloring.

CHURNING.

The churning process is mechanical, and cream will churn only when sufficient agitation is brought about to cause the fat globules of the cream to unite. The churn should be turned uniformly and moderately fast, with the barrel type churn about 60 to 70 revolutions a minute. When conditions are proper, butter should break in 30 to 35 minutes. The process should require at least 25 and not more than 45 minutes. Too rapid churning results in a loss of fat in the buttermilk, but nothing is gained by having the temperature so cool as to require 45 minutes to churn. At the beginning the churn should be stopped once or twice, after three minutes of churning, and the plug removed to allow the escape of gas formed in the early part of the churning process.

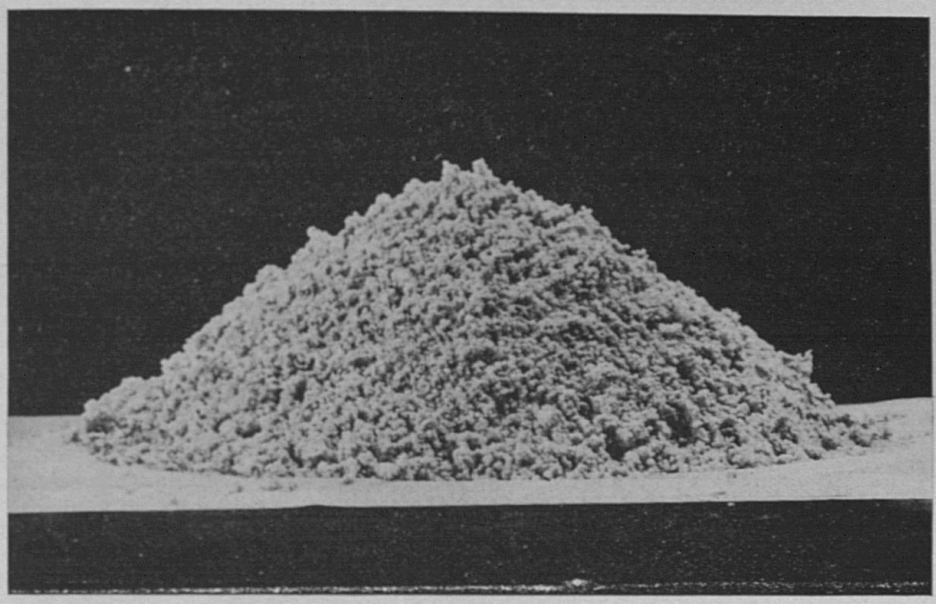
STAGE TO STOP THE CHURN.

The cream should be watched carefully thru the little glass window provided for that purpose in the cover of the churn, and the churning continued until the cream begins to break and the glass becomes clear. If no glass is provided in the churn the process should be watched carefully by removing the top or cover and whenever the granules reach the size of a pea the churning should be stopped and the buttermilk drawn off. Avoid overchurning, that is, allowing the butter to gather into large lumps before stopping the churn. It is difficult to drain buttermilk from overchurned butter without using a large quantity of wash-water, which injures the butter. The buttermilk should be drained thru a strainer to catch the small granules of butter.

WASHING THE BUTTER.

After the buttermilk has been drawn off, pour into the churn as much cold water as there is of buttermilk. The temperature of the wash-water should be 2 to 4 degrees colder than the temperature of the cream when churned. Extremes of temperature should be avoided. The churn should be re-

volved 15 or 20 times in order to wash the butter. Draw off the wash-water. If the water appears milky the process may be repeated, but one washing usually will prove sufficient. Too much washing will remove some of the delicate flavor of the butter.



1. A mass of granular butter as it appears after drawing off the buttermilk and before working the salt into it.

SALTING.

Wash the butter worker and prepare to salt the butter. Scald the worker, rinse it with cold water until it becomes cool and spread the butter over it. The cut shows the proper granular condition of the butter when it is placed on the worker, ready for the addition of salt. Salt should be added at the rate of one ounce to each pound of butter, but the amount will vary with the saltness desired by the market. The salt should be sprinkled uniformly over the entire mass of butter. Add a portion of the salt and work it in, then sprinkle on the remainder. This will insure an equal distribution. The best grade of flaky dairy salt should be used as it dissolves quickly. Keep the salt in a cool dry place. It absorbs odors and imparts them to the butter.

WORKING THE BUTTER.

Working the butter should be done by pressing the pile of granules with the lever until the butter is in a flat mass. This should then be folded over upon itself and the flattening process repeated. The working of butter distributes the salt and expels the excess moisture. It is better to work the butter and allow it to stand ten or fifteen minutes and then rework. This will insure an equal distribution of the salt and prevent mottles.

It should never be worked until the butter takes on a greasy appearance. The amount of working varies with the condition of the butter. Cold and very firm butter requires more working than when it is comparatively soft.

PRINTING AND WRAPPING.

In printing the butter the rectangular one-pound printer shown in the cut below is the best one to use. Care should be exercised to have the printer filled solid. This can be done by grasping the printer with both hands and pressing it repeatedly on the mass of butter. After the butter mold is packed completely full, the butter at the bottom of the mold is cut off smooth with the paddle. The print is pushed out on a sheet of heavy parchment butter-wrapping paper and neatly wrapped. The pound of butter should be enclosed in a neat carton and kept in a clean, cool place until ready for market.

UTENSILS FOR GOOD BUTTER MAKING.

The separator affords the greatest advantage in gathering cream for farm churning, as the per cent of fat can be easily regulated. Thin cream does not churn well and for that reason the separator should be regulated to deliver cream testing about 30 per cent butterfat. Less butterfat will be lost in the skim-milk than from any other method of separation.

The type of churn should be the barrel, swing or box churn. They are free from wheels, paddles and dashers which make it difficult to churn the butter to a granular condition.

The butter worker shown in the cut is the lever type, with a triangular table on three legs. There are other good types also. The kind required will depend upon the amount of butter made.

The rectangular butter printer, similar to the one in the photograph, should be used, as it makes a neat package which can be packed easily for shipment.

The farm butter maker should have a good dairy thermometer, several straight ash paddles, a buttermilk strainer and an accurate scale to weigh the salt and the butter.

Milk pails should be of the sanitary covered-top pattern.

2. Utensils for Making Butter.

SCORE CARD FOR BUTTER.

		Scale	Score	Remarks:
I.	Texture	25		
II.	Flavor	45		
III.	Color	15		
IV.	Salt	10		
V.	Package	5		
		100		

Scored by.....

1. Texture (25 points). The texture of the sample of butter should be observed before it has become softened by the warmth of the room. The butter should be firm and waxy to the pressure of the thumb, free from surplus moisture and the brine should be clear and not milky. The body should not be greasy, tallowy, spongy or sticky.

The granular texture of the butter should be exhibited when it is broken. The broken ends should resemble broken steel. The butter should maintain its form, even at ordinary temperature.

Defects of texture are caused by the following improper methods of churning and working: A soft greasy body and lack of grain are caused by churning and working the butter at too warm a temperature, and also by overworking and over churning. Too much brine is left in the butter if it is not worked sufficiently. Milky brine is incorporated in the butter when it is gathered in large lumps in the churn and when the dasher is used.

II. Flavor (45 points). The flavor should be clean, mild, rich and creamy with a pleasant aroma. Some of the common faults of flavor are as follows:

Flat or light. In this case the butter lacks flavor. This usually is due to insufficient development of lactic acid in ripening.

Rancid of curdy. This undesirable flavor is caused by churning old or overripe cream.

Unclean. This flavor usually is due to stable contamination or the use of unclean utensils.

Weedy. This flavor suggests weeds which the cows have eaten in the pasture.

Stable flavor. This unpleasant flavor is due to contamination with the foul air of badly ventilated stables.

III. Color (15 points). The color should be uniform throut the sample of butter.

Mottled color. This is uneven or streaked condition of the butter, usually due to an uneven distribution of the salt or the use of wash-water that is too cold.

Light or dark color. The shade of color to be desired will depend upon market requirements. The butter is light in color when the cows are on dry feed in the winter and is of the most desirable golden color when the cows are eating green grass in the spring.

IV. Salt (10 points). The amount of salt to be employed will be determined by the wishes of the consumer. The salt must be distributed evenly and thoroly dissolved. It is better to work the salt into the butter after it is taken from the churn; then allow the salt to dissolve for thirty minutes and then give the butter a second working to incorporate the salt thoroly. The salt in the sample of butter should not be gritty. In Kentucky the usual requirement is ¾ of an ounce of salt per pound of unsalted butter.

V. Package (5 points). The package should be neat, clean and free from finger prints. A brick-shaped package is preferred. The edges should be straight and sharp. High-grade parchment paper should be used in wrapping the butter. Oiled or tissue paper sticks to the butter and should not be used. It is sometimes desirable to use cartons in which to wrap the butter in addition to parchment paper.

RULES AND INFORMATION FOR BUTTER MAKING PROJECT.

1. Each member who enrolls will be required to make butter according to the instructions furnished by the Dairy Section of the College of Agriculture, University of Kentucky, Lexington.

2. Each member will be required to send one-half pound of average butter for every churning until the butter reaches the required score and once per month thereafter, so as to reach the Dairy Section by the 15th of each month.

3. The butter will be scored and a complete report will be sent to each member each month.

4. A complete report of each churning from which samples are taken is required to be made on blanks furnished by the Dairy Section.

5. The sample of butter, less the amount needed for sampling, will be sold at the best price obtainable, and the proceeds returned to the member.

6. When the butter of any member has reached the score of 90 points on two successive churnings the name of the member will be put on the honor roll at the Dairy Section.

7. When members are put on a roll, they will receive special one-pound "4-H Brand" cartons furnished by the Dairy Section at cost, plus postage. These cartons will have printed on them a statement of the quality of the butter so that it can be put on the market in such shape that the consumer may be sure of obtaining a high class product when purchasing the "4-H Brand."

8. If the score of any member does not reach 90 points any month another sample will be required immediately. If this sample does not come up to the required standard the member will be prohibited from using the "4-H Brand" carton until the product again reaches the required score in two successive months.

9. Each producer will be given a number and this number will be on the cartons supplied so that any poor butter sold in such cartons may be checked, and anyone found using cartons when not entitled to do so will be prohibited the use of cartons permanently.

10. The Dairy Section and the dairy specialists will aid the members in establishing a market for first-class butter where necessary.

11. In order to facilitate the work of sending samples, marketing the butter, etc., it is well, whenever possible, to have several members live close together.

12. Whenever possible the extension specialists will meet with clubs and give aid by talks, demonstrations, etc.

——Further information may be obtained from your County Agent or Home Demonstration Agent or by writing to Dairy Section, College of Agriculture, University of Kentucky, Lexington, Kentucky.

FARM BUTTER ENTRY BLANK.

Fill out this blank as carefully and neatly as possible and return to the Dairy Section, College of Agriculture, University of Kentucky, Lexington, Kentucky.

This information is not to be used by the judge before scoring but is to be used after scoring in making comments on the method of making.

Name ..... Postoffice .....
County ..... Express office .....
Kind of cows..... Number of cows.....
What kind of hand separator..... Lbs. cream churned.....
How long was cream held before churning?.....
What temperature was cream held?.....

Was a starter used?..... Kind of starter.....
Was cream rich or thin?..... Was cream sour?.....
Kind and size of churn used.....
Amount of color used..... Approximate fullness of churn .....
Temperature churned..... Time of churning.....
Size of granules (larger or smaller than grain of corn).....
Temperature of buttermilk when drawn off.....
Temperature of wash-water.....
How was butter worked?.....
How was salt added?..... Amount.....
Condition of butter from churn (whether hard or soft, and whether dry or watery) .....
Number of pounds of butter from churn.....
In what shape is butter sold? (print or bulk).....
Is butter sold to regular customers?.....

Butter should be shipped to reach Lexington not later than Friday evening of the week in which it is sent. If churning is done on Friday or Saturday, hold sample in cold place and mail the first part of following week.

DIRECTIONS FOR SENDING SAMPLES TO DAIRY SECTION FOR SCORING.

Take a pound print of butter and cut in two. Take one of the half pound pieces and wrap it in a fresh piece of butter parchment; write plainly upon this paper the name and address of the member sending the sample. Wrap in three or four thicknesses of newspaper and put into a small, light box, similar to a chalk box. Do not use a cigar box or a box that has an odor.

The box should be a little larger than the sample of butter so that additional paper can be placed all around the sample.

The name and address of sender should be written on a plain piece of paper and placed inside the box.