Binding

# The CREAM-BUYING STATION

By H. A. RUEHE

## *A Guide for the Operator*



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# A GUIDE FOR THE OPERATOR OF THE CREAM-BUYING STATION

By H. A. RUEHE, Professor of Dairy Manufactures

BUTTER utilizes more of the total milk production than any other manufactured dairy product. Each year about 1.7 billions of pounds of creamery butter are produced in the United States, and in normal years, Illinois produces more than 75 million pounds of that total. The commercial butter industry, therefore, is an important cash market for the agricultural industry not only of the state but also of the nation.

Separating milk on the farm and marketing the butterfat as cream are common practices in most states, especially thruout the grain-producing areas, where dairying is carried on as a sideline to the production of grain and livestock. In normal times approximately 85 percent of the total creamery butter produced in the United States is made from farm-separated cream; and about 75 percent of the creamery butter produced in Illinois is made from this type of cream.

Since the marketing of cream involves many people and many conditions, it was essential that certain official standards should be formulated for the control of this important phase of the dairy industry. Only in this way could consumers be assured of getting quality butter.

Illinois and many other states have therefore passed laws and made regulations controlling the sale and purchase of cream to be used in butter manufacture; and the *Federal Food and Drug Administration* has adopted regulations and standards which directly affect butter shipped beyond state lines, and the cream from which it is made.[1]

## HIGH-QUALITY CREAM WANTED

Creamery butter is sold in the trade on its own merit as represented by its score or grade. Since the greatest demand is for the better grades of butter, these grades sell at the highest prices. Manufacturers can therefore pay better prices for the high-quality butterfat needed to make quality butter.

Full cooperation of producers, buyers, and haulers is necessary if the market is to get a steady supply of high-quality cream.

[1] See pages 22 and 23 for Illinois cream-grading regulations.

Cream must be clean, wholesome and free from extraneous matter to be legal; it must be fresh and of good flavor to produce high-scoring butter.

Altho there are several methods used in purchasing farm-separated cream, most of such cream is obtained thru cream-buying stations. When it is purchased in this way, the butter manufacturer makes his contact with the producer thru the manager of the station; and the success of the enterprise depends in large measure on the intelligence, personality, and integrity of this individual.

## A SUCCESSFUL BUYER

To make a success of his job, the manager of a cream station must have keen appreciation of the sanitary methods necessary for handling perishable food. He must not only put forth every effort to operate a clean establishment but must also influence others to maintain high standards of sanitation. He must have a complete knowledge of everything that has to do with cream-buying. He must know how to make accurate tests for fat and quality and how to grade cream. He must be able to recognize defects in specific cream deliveries and to advise producers how to eliminate such defects.

Finally, it is essential that every station operator be familiar with state cream-grading laws and with the regulations of the *Food and Drug Administration.*

## A GOOD BUYING STATION

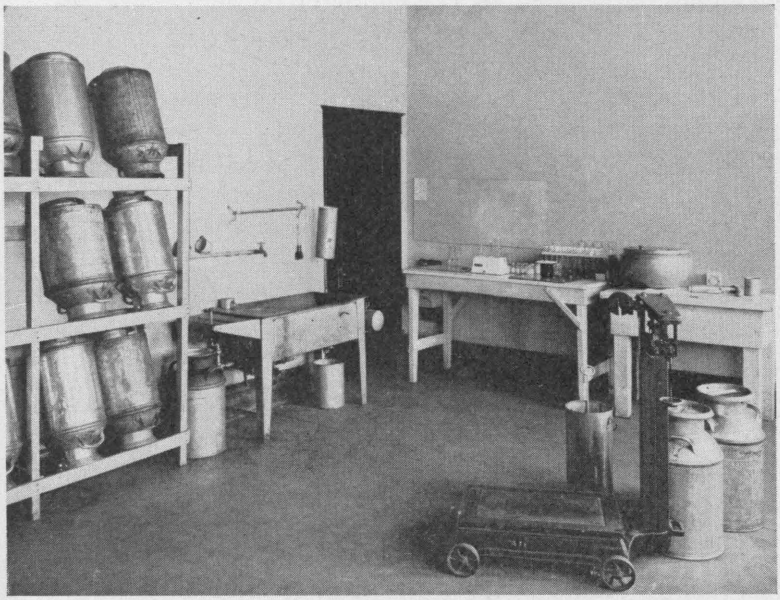
The location and the general appearance and arrangement of the cream-buying station are of the utmost importance. Even the most efficient operator will be seriously handicapped by a building that is inconvenient and insanitary.

**Building.** The building selected should be as attractive and in as good repair as any business establishment in the community. If possible, it should be close to the business district and should have a good place for patrons to park their cars. It should be at some distance from railroads or factories, so that soot and cinders will not be a problem.

**Rooms.** The rooms in which the cream is received for purchase should be large enough to permit the usual volume to be handled in an efficient and sanitary manner. They should have floor space of not less than 120 square feet. They should be well

lighted and ventilated, with all openings effectively screened against insects. Window glass should be kept clean.[1]

**Floors and walls.** The floors should be of nonabsorbent material that is easily washed and kept clean. Cement floors provided with good drains are recommended. Walls and ceilings should be of a tight, smooth construction that can be washed



**A WELL-ARRANGED CREAM-RECEIVING STATION.** Note location of can washer, tester and testing equipment, platform scales, and can rack. Cleanliness and freedom from objectionable odors are two prime requisites for a cream station.

frequently. No articles except those needed to handle and test the cream should be in the cream rooms at any time, either on the floor or on the walls.

**Hot water.** Since a continuous supply of clean, hot water is essential, good water-heating equipment must be provided.

**Cooling equipment.** Some satisfactory method of cooling cream is also needed. While mechanical refrigeration is best, a cooling tank or nozzles that spray cold water over the cans are also effective.

[1] See pages 24 and 25 for copy of "Interpretation of the Illinois Sanitary Food Law as Applied to Cream Stations."

**Relation to other rooms.** If the buying rooms adjoin a room or building in which poultry or other produce is handled, they should be separated either by a tight partition which will keep out dust and undesirable odors, or by a vestibule equipped with tight-fitting, solid, self-closing doors. *No poultry or other farm produce should be weighed or handled in the cream-buying rooms at any time.*

**Testing equipment.** A cream-buying station must also have proper equipment for weighing, sampling, grading and testing the cream. This will include:

| | | |
|---|---|---|
| Platform scales | Thermometer | Babcock testing equipment |
| Can washer | Sample jars | Sediment testing equipment |
| Can brushes | Test-bottle brushes | Mold-test equipment |
| Can rack | Water bath | Sediment-test display board |
| Grading sampling rod | Can seals | |
| Cream stirrer | Washing powder | |
| Rubber scraper | | |

**Office equipment.** For the office a calculator, cream-station sign, price sign, report books, shipping tags, way envelopes, etc., are necessary.

## GRADING THE CREAM

When the building and the equipment are in order, the operator of the station is ready to buy cream.

The first step is to examine each can and grade it, keeping in mind two things: (1) the qualities in cream that make for high-quality butter, and (2) the legal requirements concerning cream-grading. Illinois regulations, which are based on the state cream-grading law, define four classes of cream as follows, and require that all cream bought for buttermaking be placed in them:

"(1) **Sweet cream** is cream smooth, free from undesirable odors and flavors, clean to taste, is practically free from sediment or extraneous matter, and the acidity of which calculated as lactic acid, does not and has not exceeded 2/10 of 1%.

"(2) **First-grade cream** must be clean, smooth, free from undesirable odors and flavors, clean to taste, must not be excessively sour, and must be practically free from sediment or extraneous matter, and not too old for such classification, and contains not less than twenty-five percent (25%) butterfat.

"(3) **Second-grade cream** is any cream lower in quality than first-grade cream yet fit for human consumption, cream which is lumpy, contains undesirable flavors and odors and

yet is not unpalatable or does not contain extraneous matter in excess of *No. 3 Official Illinois Standard Sediment Guide.*[1] Second-grade cream shall be purchased at a price at least 2c below that paid for first-grade cream.

"**(4) Illegal cream** is cream classified under the official "Illinois Standard Cream Sediment Guide" as containing extraneous matter in excess of No. 3, or cream that is cheesy, dirty, moldy, metallic, musty, putrid, rancid, decomposed or that contains oil, kerosene or other foreign substance or is foamy. All cream classified as illegal shall not be offered for sale or purchased."

An alert operator will not stop with the prescribed laboratory tests when he grades his patrons' cream. He will use his senses of sight, smell, and taste also. He will be able to *see* whether the cream is dirty, foamy or lumpy; whether it has the color of good, fresh cream, and whether there is caked, dry cream on the sides of the can. By *smelling* a can of cream he will be able to detect many off-flavors such as a kerosene, onion, or putrid flavor. By *tasting* the cream he will detect other off-flavors.

Cream should always be tasted before it is purchased. For this test a grading rod is used to dip up a generous sample of cream. With a little practice a good operator can learn to recognize many of the flavors that cause cream to be graded as *Second Grade* or *Illegal,* such as feed flavor, oily flavor, onion, garlic, and so on.

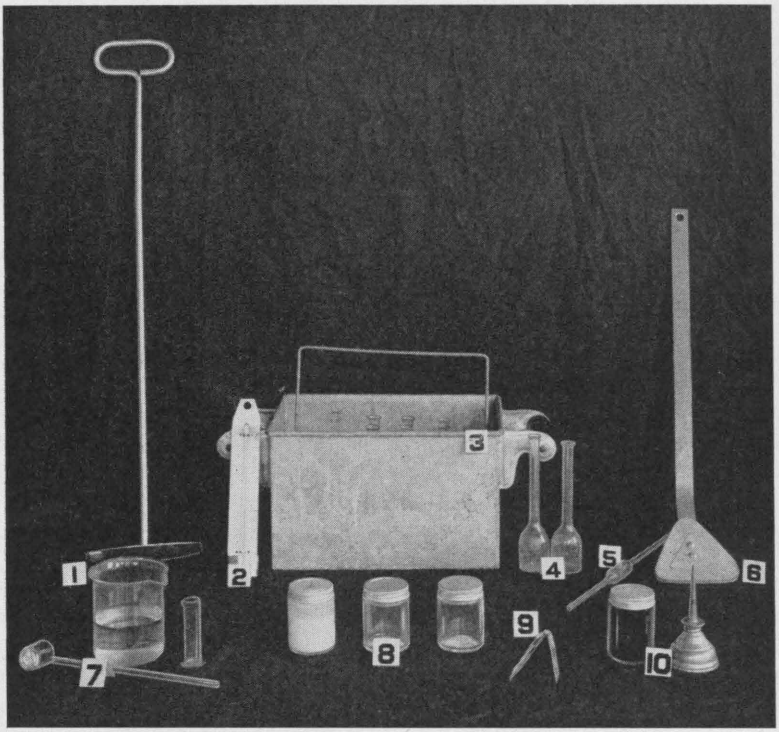
## SAMPLING THE CREAM

After the cream has been examined and graded, those lots that meet the requirements of the Illinois law and of your station are sampled for the butterfat test and for the sediment test if that test is to be made.

**Mix cream thoroly.** Before taking a sample, mix the cream in each can thoroly. Care spent at this point will prevent trouble in the rest of the testing operations.

The richer cream tends to rise to the top of a can; lumps may have formed as the cream soured; and there is likely to be a considerable amount of heavy cream sticking to the sides of the can. All this means that the percentage of fat in the cream in one part of the can may be very different from that in another. The only way, therefore, to get a truly representative sample is to mix the cream thoroly before taking the sample.

[1] See page 15.




**EQUIPMENT FOR MAKING THE CREAM TEST:** (1) Cream stirrer that can also be used for sampling. (2) Thermometer for use with (3) the water bath, where test bottles are placed after they have been centrifuged and before they are read. (4) Bottles in which cream is placed for testing. (5) Pipet for adding cream to test bottles. (6) Rubber can-scraper for getting last of cream from cans. (7) Dipper for acid, beaker containing acid, and an acid measure. (8) Jars in which samples of cream are placed for testing. (9) Dividers for measuring fat column on neck of test bottle. (10) Jar of glymol, and a small oilcan for adding glymol to tests.

To get a complete mixture, stir the cream with a vigorous boiling motion until it is smooth and uniform in texture. Scrape sides and shoulder of can with stirrer, and make sure that these scrapings are mixed thoroly with the rest of the cream. *Time and patience are absolutely essential for this operation.*

**Take large enough sample.** Take at least 1½ ounces of cream as a sample for the butterfat test. This much is needed in order to provide enough for the Babcock test and have enough left in the sample jar to meet the requirement of the state law for a sample to be held for 24 hours. If the sediment test is to be made, take another 2-ounce sample for that purpose.

## MAKING THE BABCOCK TEST

Every can of cream purchased must be tested for butterfat by the Babcock method. For this test the following equipment is needed:

- Acid measure
- Babcock centrifuge
- Dividers
- Pipets
- Red reader, or glymol
- Sulfuric acid
- Sample jars
- Cream 9-gram test bottles
- Test-bottle brushes
- Thermometer
- Torsion cream-test scales with 9-gram weight
- Water-bath pan

**Prepare sample for testing.** First set the bottles containing the samples of cream in a pan of warm water (110° to 115° F.). Leave them there until they are warmed to a temperature of 90° to 100° F. Then mix the samples by pouring them back and forth from one sample jar to another several times, until the cream appears smooth and well mixed. If the samples are to be kept any length of time before they are tested, cover them tightly to prevent evaporation.

**Weigh one sample at a time.** See that the scales are balanced on a level, solid shelf and that the shelf is fastened securely to the wall away from drafts of air. Under station conditions it is best to weigh one sample at a time.

Place the empty test bottle in the left-hand holder and balance the scale carefully *with the bottle on it.* This is done by moving the counterweight back and forth until the point of balance is found.

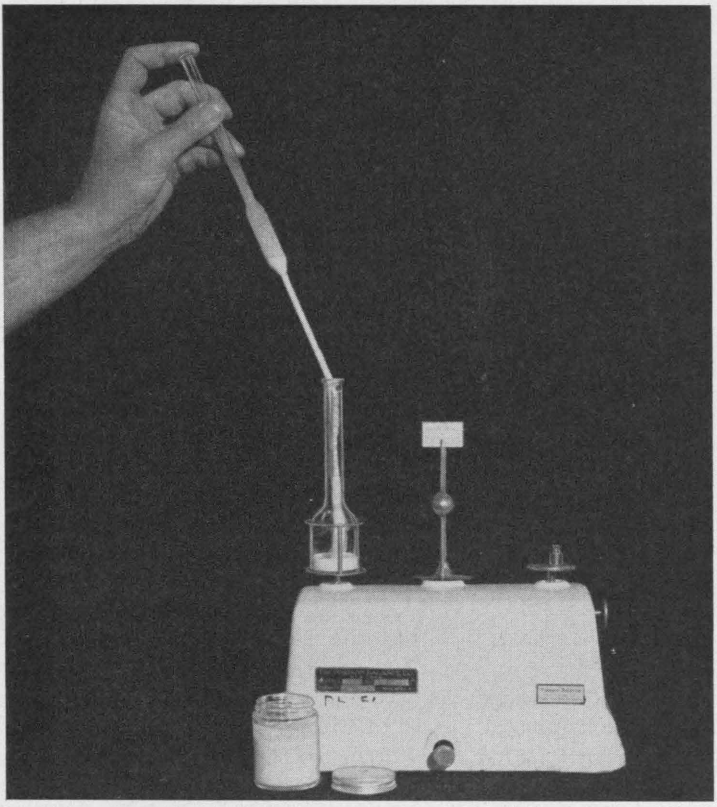
Put the weight on the right-hand pan. Then with the pipet transfer enough of the thoroly mixed cream to the test bottle to bring it again into *exact* balance. Since a drop or two of cream too much or too little will result in an inaccurate test, this operation must be done with great care.

If a number of samples are being tested, it is usually best to weigh them all before going on with the next step. *Be sure that each test bottle is properly numbered.*

**Precautions:**

***Since empty test bottles vary in weight, the scale must be rebalanced each time a different bottle is used.***

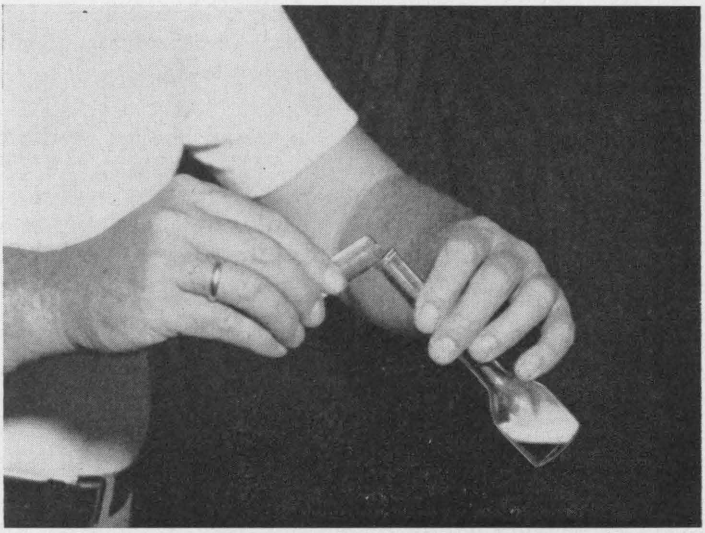
***When bottles are placed on or removed from the balance pan, always lock the scale. In fact all manipulation of the pans should be done with the locking device and not by touching the pans. Never move a scale from one place to another without first locking it securely.***



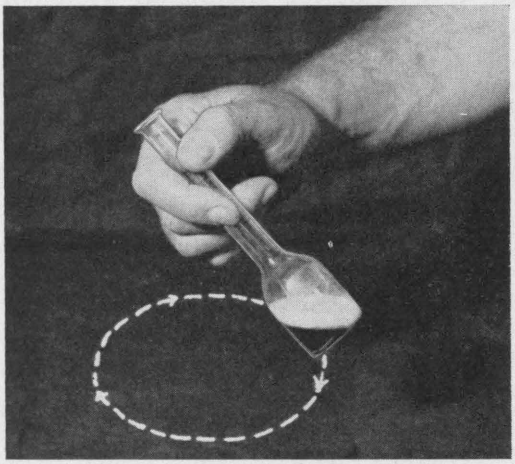
**TRANSFERRING CREAM TO TEST BOTTLE WITH PIPET.** First balance the scale with the bottle on it. Then add the cream very carefully. A drop or two too much or too little will mean a faulty test.

**Adding the acid.** When testing 9-gram samples of cream, add about 9 cc. of sulfuric acid to each sample. The sulfuric acid should have a specific gravity of 1.82 to 1.83 and should be at a temperature of about 70° F. when used. By holding the test bottle in a slanting position and slowly rotating it, the acid can be made to flow down the side of the neck and wash any adhering cream into the bottle. The amount of acid needed may vary considerably. The color of the mixture after the acid is added and mixed is the best guide to the proper amount.

As soon as the acid is added, mix the sample thoroly by grasping the neck of the bottle as tho it were a pencil, and rotating the base in about a 6-inch circle. Do this until the sample has turned



**While adding acid, hold test bottle in slanting position and keep turning it.**



**Mix acid and cream by grasping test bottle as shown here and rotating the base in about a 6-inch circle.**

a dark chocolate-brown, indicating that the acid has completed its action on the solids-not-fat.

Retard further action by adding enough hot water (180° F.) to bring the contents up to the base of the neck of the bottle.

When hard water is added to the acid mixture, some foaming may take place. It is therefore best to add a few drops of sulfuric acid to the water to soften it. The sample is now ready to be whirled in the tester (the centrifuge).

**Whirling samples in the tester.** Place the bottles in the tester in such a way that the load will be balanced. Then run the machine for 5 minutes at the speed indicated by the manufacturer.

Let the machine stop gradually, and add enough hot water (180° F.) to bring *all* the fat up into the marked portion of the bottle neck. Be careful not to add so much water that the fat will extend into the lip of the bottle or over the top.

Then whirl the bottles for 3 minutes.

To insure an accurate test, have the temperature in the tester high enough to keep the fat in the sample melted. In steam machines the exhaust steam will usually supply the heat needed. Many electric testers have a heating device which will keep the tests warm.

**Temper fat column before reading.** Cream test bottles give an accurate reading only when the temperature of the fat column is between 130° and 140° F. Therefore, to insure correct results, temper the fat column before reading it. This may be done by letting the bottles stand for 5 minutes in a water bath at 130° to 140° F. See that the water comes up to the top of the fat column. Remove the test bottles from the bath one by one just before you read the test.

**Add glymol to top of fat column.** After the fat is tempered and just before reading the test, add a few drops of colored mineral oil (called glymol or "red reader") to the top of the fat column. This will destroy the curve (the meniscus) at the top of this column.

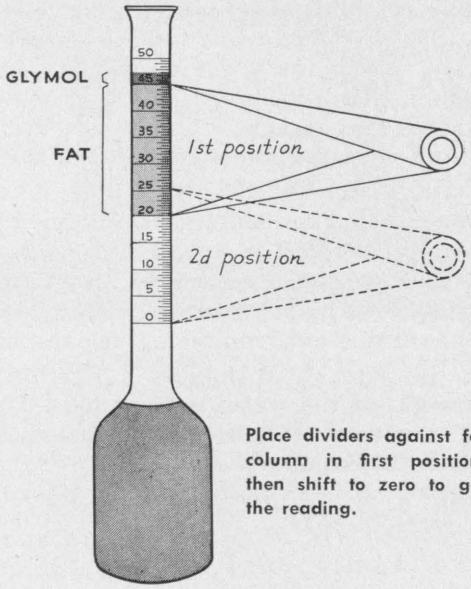
The glymol should be added drop by drop so that it will run down the neck of the bottle and not mix with the butterfat.

**Measure fat column with dividers.** The fat column is measured most easily with a pair of dividers. Place the dividers against the column, as shown on page 13. Then move them so the lower leg of the dividers is at zero. The top leg will then point to the reading. **Be very careful not to change the spread of the dividers when moving them to the reading position.**

After taking the reading it is well to measure the fat column again to make sure that the first reading was correct.

In reading the test, always hold the neck of the bottle in a vertical position and have the point of the reading on a level with your eye.

Record the test immediately.




**Causes of defective tests.** When a finished sample is taken from the tester, the fat column should be clear and have an amber-yellow color. There should be no foreign material at either the top or the bottom of the column.

It is not possible to explain here all the causes of defective tests, but the following list suggests the more common ones.

**Columns too dark**

1. Temperature of cream or acid too high
2. Too much acid
3. Too strong acid
4. Water not added soon enough

**Columns too light**

1. Cream too cold
2. Acid too cold
3. Too little acid
4. Acid too weak
5. Water added too soon
6. Temperature of tester too low
7. Sample not whirled enough

**Light-colored foreign material in fat column**

1. Acid too weak
2. Not enough acid
3. Acid or cream too cold
4. Water added too soon, not giving the acid time to dissolve the curd
5. Improper mixing of acid and cream in test bottle
6. Test bottles not properly cleaned before being used

**Dark foreign matter at bottom of fat column**

1. Acid too strong
2. Too much acid
3. Acid or cream too warm
4. Water not added soon enough
5. Acid and cream not mixed immediately after all the acid was added
6. Incomplete mixing of cream and acid

**Calculating the result.** The reading just obtained gives the *percentage* of fat in the cream. The *pounds of cream* multiplied by the *percentage of fat* gives the *pounds of fat* in a shipment. The *pounds of fat* multiplied by the *price per pound* paid for it will give the total amount due a patron on a given shipment of cream.

**Example:** Suppose Mr. **A** delivers a 5-gallon can of cream and the net weight of the cream is 39 pounds. The cream tests 41 percent. The amount of butterfat in this cream is then 39 pounds $\times$ .41, or 15.99 pounds.

If the price of fat is 35 cents a pound, the can of cream is worth \$.35 $\times$ 15.99, or \$5.60.

## MAKING THE SEDIMENT TEST

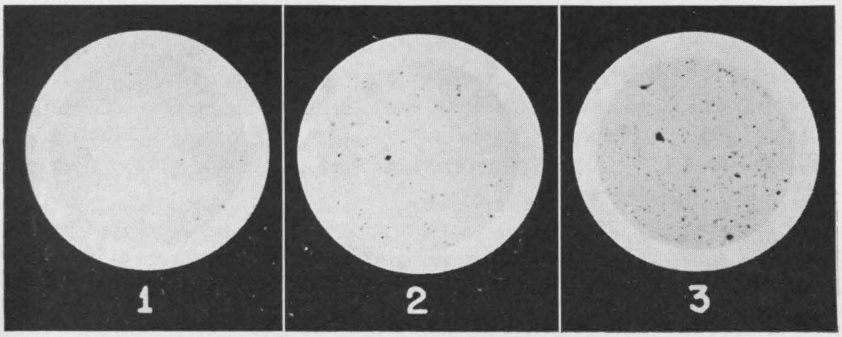
The Illinois cream-grading law requires cream buyers to test each seller's cream during each calendar month at least once for extraneous matter, or to make such other tests for quality as shall be prescribed by the Director of Agriculture.

Quality tests must also be made on the first purchase of cream from a new patron. If this first test shows cream to be either *Second Grade* or *Illegal* according to the official sediment standards, all future cream from this patron must be tested at each delivery until it tests either *First Grade* or *Sweet.*

**Equipment for sediment test.** Every station operator must know the approved tests for extraneous matter and must have the following equipment for the tests:

Sediment tester of approved type
Sediment testing disks
Cards for mounting sediment-test disks
Sediment-test comparison chart
Sample bottles
Mixing cup of 8-ounce capacity or more
Ingredients for making testing solutions
Display board for sediment-test disks

**Preparing the solution.** The solution for making sediment tests must, of course, be entirely free from sediment and extraneous matter. Water, baking soda, and ammonia frequently contain some materials that do not dissolve. When this happens, the read-




**ILLINOIS STANDARD CREAM-SEDIMENT GUIDE.** Stirred cream having more sediment than No. 3 must be rejected. When actually grading cream, buyers should use an official copy of this guide, issued by the Division of Foods and Dairies of the Illinois Department of Agriculture. This picture merely shows what the guide is like.

ing will not be correct. It is well, therefore, to run check tests on the solution to make sure that it is free from sediment. Filtering the solution thru a test pad before using it is a good practice.

**Making the test.** The following test has proved satisfactory under Illinois conditions:

**1.** Take a 2-ounce representative sample of cream from the producer's can after stirring the cream thoroly.

**2.** Take 6 ounces of water which is free from sediment. Place in mixing cup. Add ¼ to ½ teaspoon of baking soda. Add this solution to the 2-ounce cream sample.

**3.** Heat the mixture to 160° F. Do not let the temperature rise above 165° F. because of the chemical changes that will take place in the solution. The best way to control the temperature is to place the can containing the mixture in a kettle or bucket of hot water, thus providing in effect a double boiler. (This gives better results than adding the hot solution directly to the cream.) Stir the mixture thoroly while heating. Allow 2 minutes for the curd to dissolve.

**4.** Assemble the tester by placing a filter disk between the two gaskets in the bottom of the tester.

**5.** Pour the mixture into the top of the tester. Place the cover on top to make it air-tight. Then apply *gentle* and *steady* pressure with the bulb or pump until the mixture has all passed thru the filter.

**6.** Unscrew the bottom of the tester. Take out the disk and place it on the patron's card to dry.

*Optional — ammonia method.* Another test that can be used if preferred is the ammonia method. Place the 2-ounce sample of cream in an enameled or granite cup or a glass beaker. Add ½ teaspoonful of ammonia water (28% ammonium hydroxide). Stir the mixture of ammonia water and cream thoroly; then add 5 ounces of hot (180° F.) filtered water, continuing the stirring while adding the water.

**Displaying disks.** In order to comply with the Illinois cream-grading law, sediment-test disks must be mounted on a display board, and this board must be where state inspectors and the public can see it.

**Interpreting the test.** Cream may be purchased as *First-Grade* cream if it has no more sediment than is shown in Disk 1 of the state standard and if it meets all other qualifications. Should the tests show more extraneous matter than is pictured in Disk 1 but not more than in Disk 3, the cream is graded as *Second Grade* regardless of other qualifications. If the sediment tests show more extraneous matter than in Disk 3, the cream must be rejected notwithstanding any other good qualities it may have.

## CARE OF CREAM IN THE STATION

Illinois regulations require that cream bought at the station shall be sent to the creamery at the close of each buying day. It is the responsibility of the station operator, however, to care for the cream properly thruout the buying day in order to prevent any deterioration in its quality. Above all, the cream must be kept cool and protected from flies and all other sources of contamination.

Mechanical coolers are the most efficient means of keeping the cream cool, but if the volume of business does not warrant investing in a cooler of this type, water cooling tanks or spray nozzles fed by continuous running water are good alternatives.

When running water is not available, wet canvas or burlap thrown over and around the cans will hold the cream fairly cool, especially when the weather is warm and dry. As such cooling depends on the rapid evaporation of the water in the covering, it is not effective in damp, muggy weather.

## CARE OF STATION EQUIPMENT

Good housekeeping at a cream-buying station and good care of the equipment are of first importance.[1] Special care must be given certain pieces of equipment that are used in weighing and testing the cream.

**Platform scales.** The best scales for weighing cans of cream are the platform type. Such scales are accurate and sensitive, and should always be carefully handled. Since the atmosphere where they are used is heavy with moisture, the parts must be protected from corroding. If they are not well protected, the scales will become sluggish and inaccurate.

The serious trouble that station operators sometimes have because of errors in weighing may be largely avoided by taking the following precautions:

1. Wipe the beam and weights *daily.*
2. Examine the scale at the beginning of *each day's operation* to make sure it is in balance. Test the scale several times each day to see that it stays in balance.
3. At *least once each month* take the platform off and rub the knife edges carefully with a piece of fine emery cloth or sandpaper. Clean all working parts and put the scale into perfect working order.
4. Keep the platform *dry.*
5. Set the scale *level* on a solid foundation.
6. *Never* use oil on a platform scale.
7. Keep the scale beam *locked* except when weighing.

A scale cared for in this way will retain its sensitiveness and do accurate weighing for an almost indefinite period.

**Cream scales.** The cream scale is the station's most delicate apparatus. Scales of the torsion type are now generally used for weighing samples of cream. Properly handled, a good cream scale will last for years. Carelessly handled it can be ruined in a short time. Exposure to dirt and rough handling are the usual causes of disorders in this important and sensitive piece of apparatus.

To get the best results with a cream scale, as with any scale, it must be set level on a solid foundation. The shelf that supports the cream scale should be fastened to the wall. This will remove

[1] See page 26 for *Cream Station Inspection Report* used by the Illinois Department of Agriculture, Division of Foods and Dairies, when making inspections of cream-buying stations.

the effect of jarring floors, which are often a cause of errors in the weighing of cream samples. The shelf should be only large enough to hold the scales. A three-sided shield arranged to surround the scale and prevent drafts of air from affecting its accuracy is advisable. A box for this purpose can be bought, or one can be easily made from a small packing box.

Never place cream scale on the same table with the tester. The vibration of the tester during centrifuging will cause errors in weighing.

**Testing weights.** The small weights used in testing cream are usually of the 9-gram size. These weights are not always accurate. When there is any doubt about them, they should be checked by the field man or the central office.

Always keep these weights free from dirt and grease, as any accumulation will add to their weight and cause errors. Also take care not to drop them or chip them in any way. Wipe them frequently with a clean, dry, soft cloth.

**Test bottles.** Inaccuracies in testing are frequently caused by test bottles not being washed free from fat before they are used. A dirty bottle may increase the test ½ to 5 percent. The following method of washing bottles will clean them thoroly.

Empty the bottles as soon as the tests are read; that is, before the fat has had time to solidify in the neck. Then wash them immediately.

Fill a pail about two-thirds full of water just warm enough to be used comfortably; add 2 tablespoonfuls of some good washing powder or soap chips. Take as many bottles as can be held conveniently in one hand; immerse them in the pail of alkaline water and let them partly fill. Shake thoroly and pour the first rinsings into the drain; then place bottles in pail again and wash one by one with a bottle brush.

After all the bottles have been washed, empty the pail and refill it with warm, clean water, using no washing powder. Rinse the bottles thoroly in this water. Invert and let drain.

**Pipets and sample jars.** Wash these with a solution of washing powder, rinse, then let drain and dry.

## CARE OF THE CREAM CANS

**Washing patrons' cans.** In Illinois cream stations are required by law to wash producers' cans before returning them. This requirement was made because the equipment at the station for washing and sterilizing cans is usually far better than on the average farm, and because clean cans are absolutely essential for the delivery

of a good grade of cream. Clean cans and clean utensils also make for a clean station; and a clean station cannot fail to improve producers' standards of cleanliness.

Suggestions for handling patrons' cans:

**1.** Rinse each can with lukewarm water.

**2.** Wash cans with hot water containing some good dairy detergent. When a can washer of the jet type is used, have the water at least 180° F. *Do not use soap.*

**3.** Rinse the cans thoroly with hot water. If steam is available, invert the can over a steam jet for at least 30 seconds.

**4.** After rinsing, invert the uncovered can immediately on a drying rack so that it will drain and dry. Remember that drying is as important as washing in making cans fit for dairy products. Drying keeps the can "sweet" and retards rusting.

**5.** Never use towels or cloth to wipe the inside of a cream can.

**Care of station's shipping cans.** Empty shipping cans received from the creamery should be hauled from the depot immediately upon their arrival. When the cans have reached the cream station, remove the covers and invert the cans on a rack. Just before filling them with cream rinse them with clean water.

Cans are an important part of the investment of the creamery industry; and the station operator can do much to see that they are fit receptacles for cream and are not damaged by careless handling or lost by careless shipping directions. Dented cans are difficult to clean. Rusty cans should not be used since they are not only hard to clean but also give the cream a metallic flavor.

Cans deserve much more attention than they often receive.

## SUGGESTIONS FOR PATRONS

Cream producers, and even some station operators, do not seem to realize the quality of cream that is needed to produce good butter. The fact is that even with our improved methods of butter manufacture, poor cream will not make good butter.

No one is in better position to influence cream producers to deliver a better quality of cream than is the station operator. By knowing the farm practices that affect cream quality and passing suggestions on to patrons who need them, he can help them build up the quality of their cream. Following is a list of the practices that most operators will have opportunity to suggest to some of their patrons.

**1.** Milk only healthy cows. Cows with tuberculosis, Bangs disease, or mastitis do not produce milk fit for human consumption.

**2.** Keep cows clean and wipe off their udders before milking in order to prevent dirt and other foreign matter from getting into the milk. Massaging the udders while cleaning them will stimulate the cows to give more milk if the cows are milked immediately after the treatment.

**3.** Use covered milk pails which are clean and free from milk-stone and rust.

**4.** Milk with clean dry hands.

**5.** Strain the milk thru a clean single-service cotton filter pad.

**6.** Remove all milk from the barn immediately, and separate it at once while it is still warm.

**7.** Set the separator so that it will skim cream that will test 35 to 40 percent in winter and up to 45 percent in summer.

**8.** Wash, scald, and dry the separator and all utensils immediately after using them. The separator bowl may be dried in a warm oven, tho the oven should not be so warm that it will melt the tin on the bowl parts. Setting utensils in the sun is a good practice, as the sunshine helps to destroy germs.

**9.** Keep all utensils and separator parts dry and free from flies and dust when not in use.

**10.** Cool the cream immediately after skimming it by setting the can in cold running water. A good way to do this is to build a cooling tank where the water that is used to fill the stock tank will run thru it.

**11.** After the cream has been cooled, keep the can tightly covered.

**12.** Never mix warm cream with cold cream — cool it before mixing it with previous skimmings.

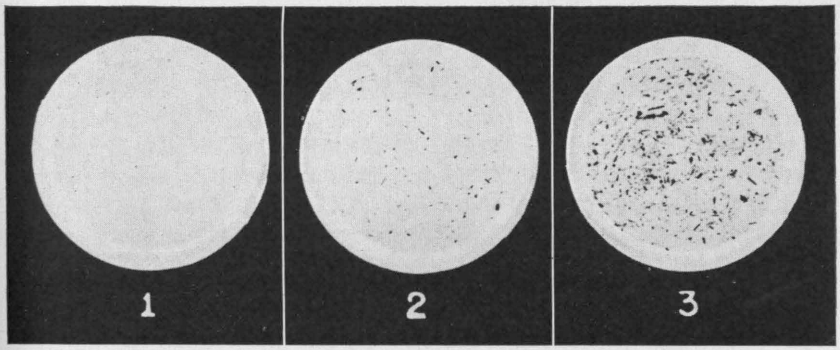
**13.** Do not let the cream freeze in cold weather.

**14.** Stir the cream at least twice a day; this will keep it smooth and free from lumps. Use a clean metal stirrer. A wooden paddle is insanitary.

**15.** Deliver cream frequently, at least twice a week in winter and three times a week in warm weather.

**16.** Use containers and utensils made specifically for milk and cream. Be sure they are clean and sterile before using them. Do not use rusty or makeshift containers such as lard or sirup pails. (The use of sirup pails is illegal in Illinois.)

**17.** It is best not to use water-dilution separators. They do not skim efficiently and they produce a thin cream of poor quality.




**ILLINOIS STANDARD MILK-SEDIMENT GUIDE: BOTTOM-OF-CAN SAMPLES.** All milk sold in Illinois for human consumption must meet high standards of cleanliness. Buyers must reject all that has more sediment than shown in No. 3. The Division of Foods and Dairies of the Illinois Department of Agriculture is charged with the enforcement of this regulation and will supply official copies of the guide.

## (Appendix A)

# ILLINOIS CREAM-GRADING REGULATIONS

Promulgated by the Illinois Department of Agriculture for the enforcement of the Illinois Cream Grading Law relating to grades of cream for buttermaking

Pursuant to the authority given by "An Act for the Grading and Sale of Cream," Illinois Revised Statutes, Chapter 56½, Paragraphs 20a, 20b, 20c, 20d, 20e, 20f, the following rules and regulations for the enforcement of said Act are hereby adopted and promulgated:

**1. The Superintendent of the Division of Foods and Dairies** and his subordinates shall be charged with the enforcement of said Act and shall exercise the authority therein conferred.

**2. All cream** offered for sale by producers shall be weighed, tested, graded and recorded.

**3.** [**Cream grades** — for description of four prescribed grades see pages 6 and 7 of this circular.]

Cream samples and can rinsings must be kept in a separate container properly labeled. This is to be classified as illegal cream unless it grades No. 2 or better at the time it reaches the churn.

**4. Each purchaser of cream** shall keep sweet, first- and second-grade cream in separate containers, each container to be properly labeled showing the grade of cream, the source and date of purchase of same.

**5. Sediment tests:** Each purchaser of cream shall make a sediment test on the cream of each patron at least once each month, except where mold tests are being made with the same frequency they shall be accepted in lieu of sediment tests during the months of April, May, June, July, August, September and October. Tests on regular patrons delivering sweet cream or first-grade cream shall be run between the first and fifteenth day of each month. On new or irregular shippers, tests shall be made the first day of delivery. If any such tests show that any seller's cream is second grade or illegal, all future deliveries by such seller shall be tested until such time as the test shows the cream to be first-grade or sweet cream.

**6.** Sediment tests shall be made with the Illinois or other similar tester. The mold test shall be made by the original or modified Parson's method.[1]

**7. Display test pads:** Sediment or mold disks must be dated and identified with the name and address of the patron and placed on a special display board in all cream-buying stations, creameries or other places in which cream is purchased from producers. The display board shall be in a conspicuous place for examination by inspectors and the public. Not later than eight days after the close of each calendar month

[1] Directions for making mold test should be obtained from the creamery to which cream is being sold.

all posted disks shall be sent to the creamery purchasing the cream, except disks from direct shippers and route cream shippers which shall be sent direct to the producer. Creameries receiving such disks shall immediately send to the station a receipt showing number of disks and the date received.

**8. Milk or Milk and Cream Testers' Licenses** must be posted in a conspicuous place for examination by the public in the room where milk and/or cream is tested.

**9. Prices:** Each cream buyer shall post daily in a conspicuous place so as to be plainly visible from the street, in each creamery, cream station, truck or vehicle or any place used for the purpose of buying cream in numerals not less than 2″ in height, the price offered for first-grade cream. No price other than that posted shall be paid for any grade of butterfat purchased, except that nothing in these regulations shall be construed to deprive the buyer of the right to meet legitimate competition, but second-grade cream shall always be purchased at a price at least 2¢ below the price paid for first-grade cream.

**10. All samples used** in determining the amount of butterfat in cream shall be kept on hand in tightly closed jars, dated and identified by the name of producer for a period of at least twenty-four hours after the close of a buying day, for examination by inspectors.

**11. Adequate and complete records** shall be kept for a period of ninety days, showing the following facts concerning each purchase:

a. Name of producer or shipper.
b. Date of delivery.
c. Quantity delivered including weight and test of butterfat.
d. Grade or grades assigned.
e. Price, or prices paid including cancelled check.
f. Creamery to which cream is sold.
g. Receipts for disks sent to buyer.

Each purchaser of cream shall keep on file a copy of his buying report, which has been sent to the creamery, for a period of ninety days.

**12. Rejected cream:** A separate entry on buying record shall be kept of all cream rejected as Illegal, giving the date the cream is offered for sale, name of owner or patron, gross weight, size of container and reason for rejection.

**13. Containers:** Cream shall not be bought or sold in containers which do not comply with the Dairy Products Container Law or containers other than standard milk or cream cans approved by the Division of Foods and Dairies.

**14. All records** shall be kept in a place which is readily accessible to inspectors of the Division of Foods and Dairies.

**15. All the requirements** of the Illinois Food Law and Sanitary Food Law must be complied with in the producing, handling, transporting, storing, testing and grading cream for buttermaking purposes.

## (Appendix B)

# INTERPRETATION OF THE ILLINOIS SANITARY FOOD LAW AS APPLIED TO CREAM STATIONS

(By the Department of Agriculture, Division of Food and Dairies)

### Light, drainage, plumbing and ventilation of establishment

1. The room where cream is uncovered, poured or sampled shall be of such size as to permit orderly and sanitary handling of cream, thereby maintaining its purity and wholesomeness.

2. The room in which a cream station is operated shall be properly and adequately lighted and ventilated. Ventilation shall be considered adequate provided there are no odors or condensation in the room.

3. Waste water from washing of cans and utensils shall be disposed of in a sanitary manner. Proper plumbing shall be installed where drains are available.

### Care of room — removal of refuse — clothing of employees

1. The sidewalls, floors, ceilings and furniture shall at all times be clean and sanitary.

2. All equipment shall be in good repair, free of breaks, open seams or corrosion, and shall be thoroly cleaned daily after all cream has been received.

3. All equipment with which cream comes in contact shall be subject, immediately before each usage, to a bactericidal treatment such as steam, hot water not less than 180° F., a chlorine solution of at least 50 parts per million, or such other method approved by the division.

4. No articles or equipment shall be in the cream room except those necessary to the proper handling and testing of cream.

5. Acid containers must be plainly labeled and protected.

6. All persons coming in contact with cream or milk products, containers or equipment, shall wear clean garments and shall have clean hands.

### Sidewalls, ceiling, and floor — construction and care

1. The sidewalls and ceiling shall be of tight construction and painted a light color.

2. Floor shall be cement, tile laid in cement, wood of tight construction, or other suitable material which can be flushed and washed clean with water at the close of each day's operations.

### Doors and screens

1. All windows and doors shall be properly screened. Doors shall be self-closing to prevent contamination by flies.

2. Where a door connects with other rooms in which contaminating merchandise is handled, a vestibule with a tight-fitting solid self-closing door shall be provided at each end to safeguard the cream room from contamination by dust and undesirable odors.

**Toilet rooms and lavatories**

1. Adequate toilet facilities shall be conveniently located, separated and apart from the cream room.

**Expectoration — washing hands**

1. No operator, employee or other person shall expectorate on the equipment or floors.

2. Durable, legible signs shall be posted conspicuously in each toilet or washroom directing employees to wash their hands before returning to work.

3. Smoking in the cream room shall not be permitted, and a "No Smoking" sign shall be conspicuously posted.

**Sleeping in work room**

1. No person shall be permitted or allowed to sleep in the Cream Room.

**Contagious or venereal diseases**

1. No operator or employee who is infected with any contagious or venereal disease shall work in a Cream Room.

**Persons receiving cream to wash cans**

1. Each cream station must be equipped with a satisfactory method of cleaning patrons' cans, including steam or hot water.

2. Brushes and suitable cleansing agents must be used. Rags or cloths are not permitted.

3. A can rack on which to drain, dry and air cans shall be provided in the cream station.

4. No cans shall be returned to the patron unless thoroly cleansed.

5. Surplus cans shall be kept inverted on the can rack and rinsed before using.

6. Rusty and non-standard cream containers or lids shall not be used in the handling of cream into or out of the cream station.

**Maintaining quality of cream purchased**

1. Adequate facilities shall be provided in each cream station to keep cream cool, thereby safeguarding its quality.

2. Cream shall be sent to the creamery at the close of each buying day.

**Illinois Food Law**

Attention is called to the following sections of the Illinois Food Law, Chapter 56½, Illinois Revised Statutes, and to the fact that each cream station in Illinois must be operated in strict accordance with the provisions of this law: (20a) License for using milk or cream tester; (20b) Cream — definition, grades, sale; (20c) Separate container for each grade of cream; (20d) Tests by buyers of cream, display test pads; (20e) Prices for butterfat, posting; (20f) Samples used in testing cream, keeping; (20g) Cream buyers' records.

## (Appendix C)

# CREAM STATION INSPECTION REPORT

(Department of Agriculture, DIVISION OF FOODS AND DAIRIES,
39 South LaSalle Street, Chicago 3, Illinois)

Name of Concern..... Address.....

Owner or Operator..... Tester License No.....

Sir: An inspection of your station was made today and you are notified of the violations marked below with a cross (X). If these violations are not corrected within ..... days, you will be called to a hearing to show cause why your tester's license should not be suspended or revoked and the station closed.

.....
Superintendent

### CREAM ROOM

Location: Sanitary surroundings.....

Size adequate..... Proper structure..... Clean.....

Floors: tight construction..... adequate drainage.....

Walls: smooth..... painted..... clean.....

Ceiling: smooth..... painted..... clean.....

Windows: clean..... openings screened.....

Well-lighted..... Ventilated.....

Toilet facilities..... Hand-washing sign.....

Freedom from flies..... Smoking prohibited.....

### EQUIPMENT

Can washer adequate..... clean.....

Torsion scales: clean..... work properly.....

Nine-gram weight: clean..... accurate.....

Platform scale: clean..... Can rack (used).....

Glassware: clean..... Water bath (using).....

Sediment tester clean..... Red reader (using).....

Can and bottle brushes: condition.....

Thermometer (using)..... Babcock tester clean.....

Cooling equipment adequate..... Temperature cream.....

Condition of cans: inside..... outside..... covers.....

Bactericidal treatment before usage.....

### OPERATIONS

Sediment pads posted..... identified.....

Prices displayed..... No. 1 price..... No. 2 price.....

Buying in illegal containers.....

Cans returned clean..... Cans rinsed before using.....

Cream grading accurate..... Separate container used..... Properly tagged..... Tasting rod used..... Stirring rod used..... condition.....

Are rinsings and cream samples shipped?.....

Are samples held 24 hours?..... Containers.....

Do samples grade with grade assigned?.....

Babcock tests accurate..... Number of samples checked.....

### RECORDS

Show name..... date..... quantity..... test..... grade..... price..... Rejected cream record complete..... Number of rejections previous 30 days.....

Do checks agree with records?.....

Does creamery pay by grade?.....

Receipts on hand for discs sent to creamery..... Number of patrons.....

Creamery purchasing cream..... Address.....

Buying days..... Time cream is picked up after close of buying day.....

REMARKS:.....

Date..... Time..... Inspector.....

This report received by .....Owner or Operator

**AN INSTRUCTION CARD**, giving briefly the essential steps in testing cream, will be sent on request. It is suitable for hanging on the wall near the testing equipment. *Address* Agricultural Extension Service, College of Agriculture, Urbana, Illinois.

CREAM STATION OPERATORS who desire to do their job in the best possible way will find in this circular specific instructions for making an accurate cream test, directions as to the proper care of station equipment, and suggestions that will help some of their patrons improve the butter-making quality of the cream they deliver.

Assuming a well-located, clean buying room and the right equipment, the interest and skill of the operator become of first importance in the successful operation of a cream-buying station.

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