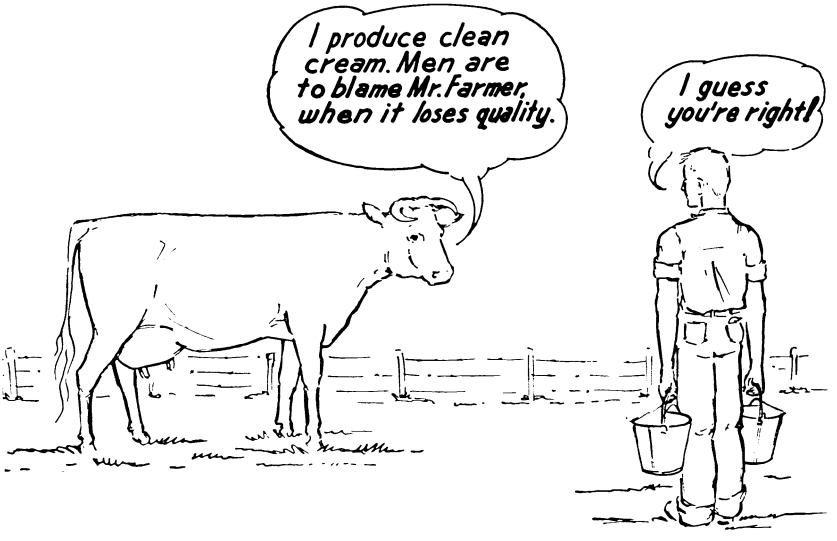
BULLETIN 365-A JUNE, 1941

Better Cream *for* Better Butter



EXTENSION SERVICE
COLORADO STATE COLLEGE
FORT COLLINS

Summary and Conclusions

Dairy products are some of our most necessary foods in the development and maintenance of strong, healthy people. When produced under clean, sanitary conditions, milk and cream give us some of our most delicious, as well as nutritious, foods.

Suggested steps in the production of high-quality cream are:

1. Clean, healthy cows, handled by clean, healthy individuals.
2. Clean barns and corrals.
3. Manage cows so as to avoid weedy and other feed flavors.
4. Clean, sterile utensils.
5. Properly cooled and stored cream. Cool newly separated cream before adding to the cold cream. Store in clean, cold place below 60 degrees Fahrenheit. Protect cream from freezing, bad odors, dust and other extraneous material.
6. Deliver cream frequently, at least every 4 days in winter and every 2 or 3 days in summer. Use container of a size that will be possible to fill within these time limits. There is a definite relationship between size of container, volume of cream produced, frequency of delivery and quality.
7. Ask your cream station operator or fieldman about the quality of your cream.

Neglect or the improper execution of any of the above mentioned items will produce cream that will be questionable.

Remember cream is a **food** and should be produced and handled as such.

Recent action taken by the Federal Pure Food and Drug Administration indicates that producers of cream and milk which is used in the manufacture of butter, cheese, ice cream, and other dairy products are going to be forced to clean up, if they do not do it voluntarily. The voluntary method will be more satisfactory.

Cooperative Extension Work in Agriculture and Home Economics—Colorado State College and United States Department of Agriculture Cooperating—Distributed in Furtherance of Acts of Congress of May 8 and June 30, 1914.

BETTER CREAM FOR BETTER BUTTER

By ELMER J. MEADOWS, Extension Dairyman

Dairy products are one of the most essential foods needed by the human race. Dietitians have proved that. Milk, butter, ice cream, and cheese are universally accepted by consumers as a part of their diet. They realize that butter, ice cream, and other dairy products possess flavor and a delicate sweetness which can be obtained from no other source. The demand for these delicious foods is always good.

For these reasons, dairy products are protected for the consumer by state and federal agencies, and constant watchfulness is exercised in upholding and improving the quality in order that the consumer may be justified in his trust. Improved methods of manufacture and increased standards of quality are constantly being found and applied in every agricultural institution and manufacturing plant.

Regulatory officials are provided to insure further the maintenance of set standards. Every precaution possible is practiced to keep dairy products sweet, wholesome, and palatable and to improve the milk and cream supplies used in their manufacture.

The protection of public health, as far as can be guaranteed by pure foods, is the sole concern of regulatory officials. Of foremost importance to producers and manufacturers is the creation and maintenance of respect and confidence in the minds of consumers.

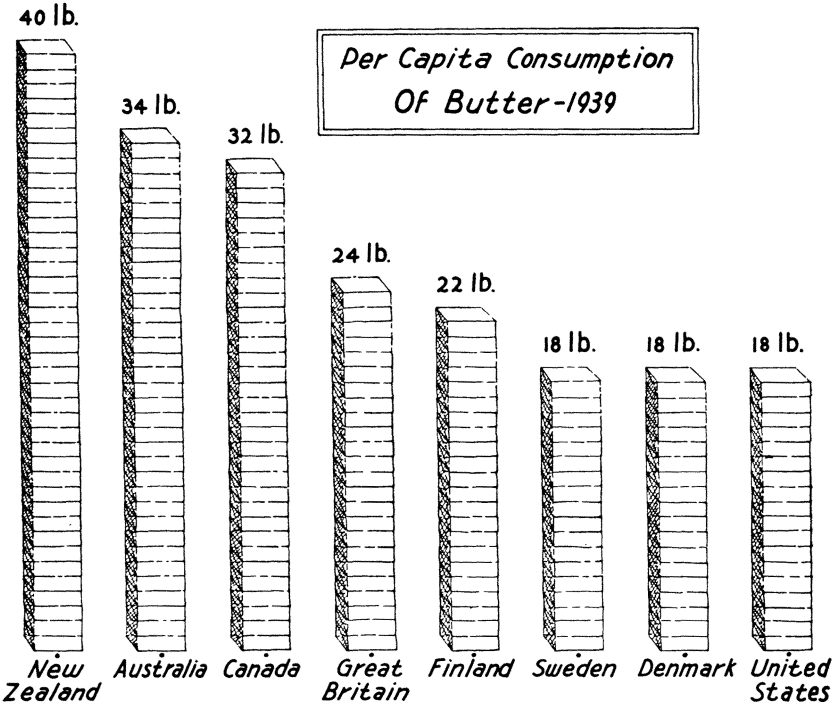
Producer's Responsibility.—The producer is solely responsible for the quality of cream which is received by the manufacturers. Poor-quality cream means nothing but poor butter. This butter will only bring a lower price on the market, and eventually this poor cream, or the effect of it, will be brought back to the farmer in the nature of reduced consumption, or a lower price for his butterfat.

Colorado dairymen produced 18,383,370 pounds of butterfat in 1939, which were used in the manufacture of creamery butter; and 22,696,006 pounds of butter were manufactured from this cream. About 10 percent of the butterfat received was graded as inferior cream and was made into second-grade butter.

This question of improvement in cream quality has been before the creamery industry—both producers and manufacturers—for a great many years. Improvement has been very slow in the United States and much more rapid in other large butter-producing countries, such as Denmark, Canada, and New Zealand. The industry suffers heavily every year due to this low-grade cream.

The consuming public not only pays less for the poorer grades of butter, but it consumes less, which adds to the surplus of dairy products.

Good Butter Increases Demand.—The countries where improvement has been most rapid are using much more butter per capita than where the improvement is slow. Canada's consumption is 32 pounds per capita against the United States' 18 pounds per capita.



At the present time another and even greater reason for the production of better grades of cream lies in the activity of the Federal Pure Food and Drugs Department and the State Dairy Commission in condemning and destroying insanitary cream, butter, and other dairy products. The Federal Department has stated:

> **"Not only are consignments of filthy, decomposed or putrid dairy products subject to seizure, but the shippers are liable to criminal prosecution under the law. It is evident that the objectionable conditions responsible are largely the result of carelessness and neglect in the handling of the cream itself, and that poor quality of the butter is traceable to the unfit character of the cream used in its manufacture."**

During the past few months the Pure Food and Drug Administration has developed a definite test to determine whether unfit cream has been used in the manufacture of butter. This test is based upon the amount of mold mycelia found in the finished product. If the mold count is too high, the butter is condemned, which means almost a complete loss and possibly a heavy fine, or imprisonment, or both. Anyone, from the producer of the cream down to the manufacturer, may be prosecuted for selling, handling, or manufacturing cream which is too high in mold count. Consequently, manufacturers are compelled by law to refuse to buy cream which is high in mold count.

Losses Can Be Avoided.—During the year of 1939 there were 1,454 gallons of cream destroyed in the State of Colorado because it was unfit to make into butter. It is estimated that the loss in the United States is $50,000,000 annually due to poor-quality dairy products, resulting in both lower prices to producers and lower consumption. Colorado producers are fortunate in that climatic conditions are favorable for the production of high-quality dairy products if a few simple precautions are put into practice. The milk as it comes from the cow is pure, provided the animal is healthy. Any contamination is man's carelessness or neglect.

If the cow is healthy, the problem of producing high-quality cream, low in mold count, is a matter of:

Healthy, well-fed cows.
Clean barns and corrals.
Clean, sterile utensils.
Properly cooling and storing milk.
Frequent delivery.

Feed for Production.—Only healthy, disease-free cows can produce efficiently. The feeding of each cow according to her production is recommended for profitable dairying. Practically all feeds can be used for dairy cows, but since roughages make up the greater part of her diet, special attention should be given to the harvesting of these crops so they will make the best of cow feed. Hays and fodders cut a little immature, stored with all the leaves, make much better dairy-cow feed than if they are allowed to mature.

Home-grown grains properly supplemented should be fed in addition to all the roughages they can eat according to production.

Pastures containing wild onion, peppergrass, and fanweed or pennycress should be avoided. Plan to have an early pasture of

winter wheat or rye, then you do not have to pasture your native grasses early in the spring. This practice will cheapen production and give you more total grazing on both native and permanent irrigated pastures. By letting pastures get a good start in the spring, more total feed for the season will be produced.

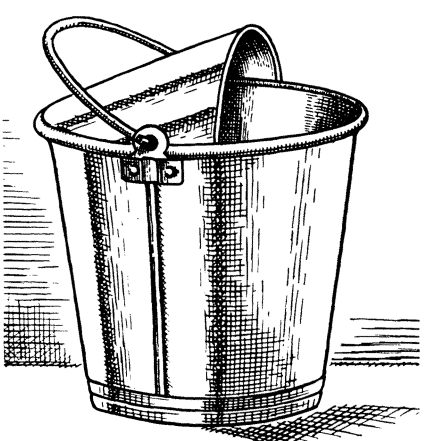
For best-flavored cream, remove the cows from any pasture 2 or 3 hours before milking time. Avoid feed flavors—you don't like them, neither does the consumer. Highly flavored feeds, such as silage, beet tops or beet pulp should be fed immediately following the milking. These flavors will then disappear before the next milking time.

Keep Barns, Corrals, and Cows Clean

Dirty barns and corrals, unclean cows, and insanitary habits or methods during milking, and the delayed transfer of the milk to the separator house are responsible for the largest amount of extraneous matter in the cream. They are also responsible for a "cowy," barn odor which is easily and quickly taken up by the warm milk and which, when made into butter, is often refused by the consumer. (Here again we come back to the fact that when the **consumer** will not buy a product, the price drops fast all the way back down the line to the producer.)

The barn floors and corrals should be kept clean at all times.

Practice Sanitation.—Before each milking the cows' udders and flanks should be brushed thoroughly to free them from any particles of manure, dirt, loose hairs or dust. They should then be wiped with a damp cloth. If this practice is followed, 50 percent or more of the bacteria-infested dirt particles will be kept out of the milk.



The hooded or small-top milk pail helps to keep out dust and dirt.

A small-mouthed or hooded type of milk pail should be used to help keep out of the milk any dirt or foreign matter which might fall from the body of the cow.

The milker's hands should be washed and thoroughly dried before milking. A special pair of clean overalls should be kept for the purpose of milking. Don't allow these overalls to lie around the barn until they "stand alone." Have them cleaned frequently.

Milk strained through cotton disks is cleaner than that which is strained through the ordinary strainer cloth.

These precautions should be followed by straining the milk from the pails through a filter-type strainer as soon as it is drawn. Cotton disks are recommended and can be obtained very cheaply. Use a fresh pad for every milking. Do not use old, soiled cloths; they are full of bacteria and give the cream an unclean flavor. Straining is only a precautionary measure against dirt that might have accidentally fallen into the milk—it is much better to keep the dirt out.

Clean, Sterile Utensils.—Dirty equipment, separators, cans, milk pails, etc., give to the milk and cream a great deal of the objectionable flavors which are transmitted to the butter. Every article which is used in connection with milk and cream production, storage and transportation should be cleaned thoroughly, then treated to kill bacteria through the use of steam, boiling water or a chlorine solution.

It has been found that poorly cleaned equipment increases the mold count considerably. The mold spores are on the unsterilized equipment, get in the cream and start multiplying at once.

The equipment, especially the separator, should be kept in a room which is free from dirt, dust, vermin or foul odors. It should be flushed with cold water as soon as the milk has been run through, and then taken apart and all parts—bowl, cream spouts, etc.—thoroughly scrubbed with a brush (never a rag), using some good dairy cleansing powder and plenty of **hot** water. Avoid the use of common soap. It may cause soapy, fishy or unclean flavors.

After cleaning the parts, scald in boiling water and place

them so they will drain and dry rapidly. Bacteria needs moisture for growth, so clean, dry utensils prevent their living on them.

This procedure should be followed on **all** equipment after **each** and **every** time it is used. In addition, just before using utensils again, a chlorine solution should be used to rinse off any dust that may have settled on exposed surfaces. Make up a fresh rinse solution each time.

Most of the commercial chlorine solutions are satisfactory when made and used according to their directions. The following homemade solution is inexpensive and satisfactory: Dissolve 12 ounces chloride of lime in 1 gallon of water. Dissolve 27 ounces of sal-soda in 1 gallon of water. Pour or syphon the clear liquid from the chloride-of-lime solution into the sal-soda solution. This makes a stock solution. Use it at the rate of ½ pint to 10 gallons of water for a rinse. Store the stock solution in a cool, dark place in tightly closed glass or earthenware containers.

If you are using a milking machine, follow closely the directions of the manufacturer pertaining to operation, care and maintenance of your particular machine. It will prolong the life and maintain the efficiency of the machine.

Another point to remember is that cans, pails, and other utensils which have rough or corroded surfaces, dents, crevices or seams which retain milk or moisture absolutely cannot be thoroughly cleaned, and therefore harbor bacteria.

Watch carefully when oiling separators. Cream has been condemned on account of oil being on parts which come in contact with the milk and cream.

Caution.—Remember that any milk can which has been used for gasoline or kerosene should **never** again be used for milk until it has been retinned. It is impossible to get the odor out of the can.

Handling, Cooling and Storing

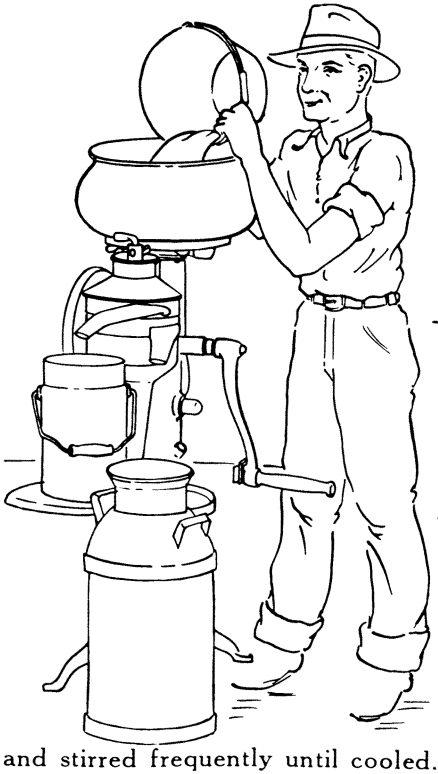
Use Care in Handling Dairy Products.—In handling and storing milk and cream, they should always be protected from contamination by foreign matter of any kind, such as dirt, insects, rats, mice, etc. The presence of such foreign matter constitutes adulteration under the Federal Food and Drugs Act, regardless of mold content.

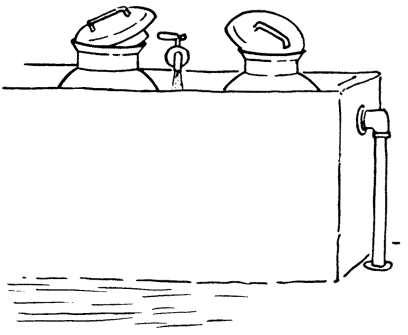
Milk and cream should constantly be kept **cool** when in storage awaiting delivery. This checks the growth of bacteria and mold

and makes for a sweet, well-flavored butter which has a quick sale and large consumption.

Warm cream should **never** be mixed with cold cream; it should be thoroughly cooled immediately after separation before being added to other cream. The storage cream and the warm, newly separated cream must be kept in different cans, and when finally mixed should be stirred until the temperature of the mixture is uniform throughout the can.

Proper Cooling Is Essential.—Several methods of cooling can be used. One, the cream is run from the separator over a tubular or cone-shaped cooler, which is connected with cold, running water. This is the quickest and one of the best means of cooling. In another method, the cream cans—one for warm and one for cool cream—are emers-

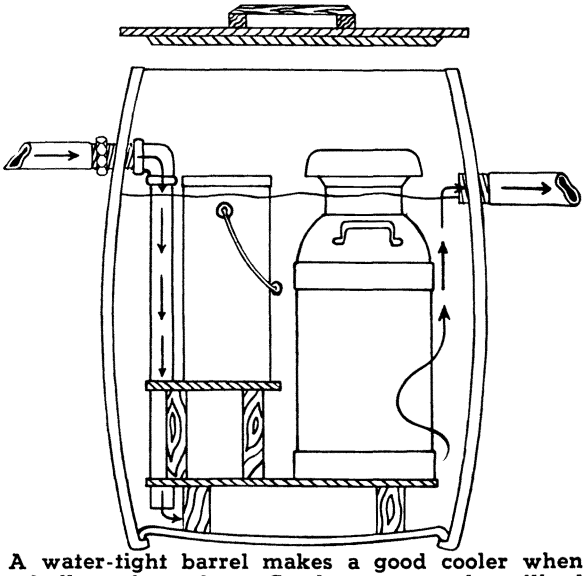




Freshly separated cream should not be added to cool cream until the new cream is thoroughly cooled.

ed in a tank of cold water (running water is preferred) and stirred frequently until cooled. They can then be mixed. All cream held in cooling tanks should be stirred frequently to maintain a uniform temperature throughout the cans.

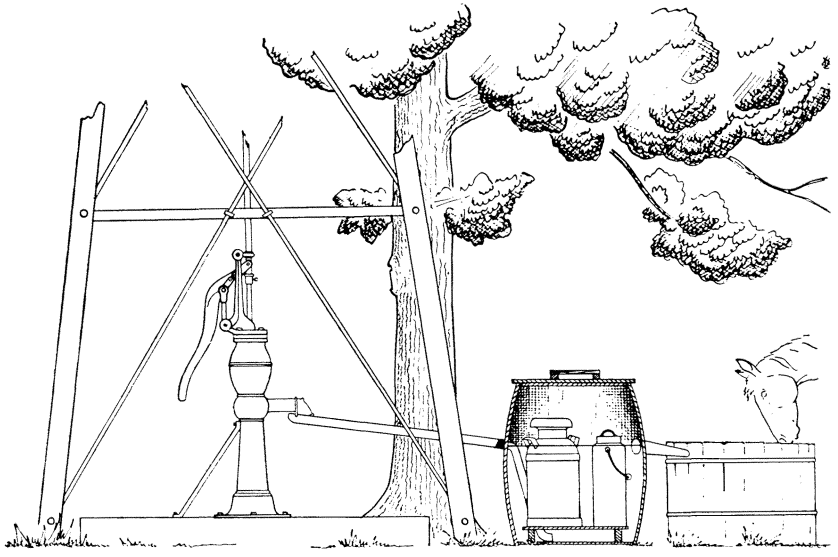
A simple, practical cream cooler can be constructed from a water-tight barrel. Place the barrel between the pump, windmill or water supply and the stock tank. A shaded spot is preferable. The water circulating through the barrel helps to keep the cream cool and in good condition. A movable platform is built to go in the bottom of the barrel, thus allowing circulation under the cans. The inlet pipe is turned down inside the barrel, allowing the



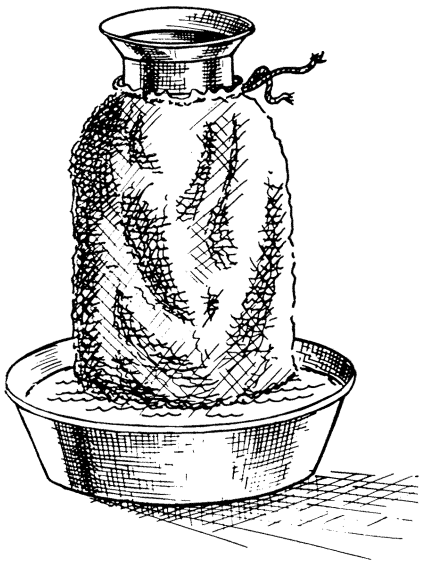
A water-tight barrel makes a good cooler when rebuilt as shown here. Stock water may be utilized for cooling.

fresh water to come in at the bottom. The overflow pipe is set slightly above the shoulder of the cans. The water level is thus kept at a safe distance from the mouth of the can to prevent mixing with the cream, and at the same time all the cream is beneath the surface of the water. When using a water tank for cooling cream, it should always be provided with a cover.

If at all possible, the water used for cooling cream should be running constantly. When this cannot be done, it should be changed often.



Running water will keep the cream cool. If not available, it should be changed often.



A burlap sack placed around a can of cream set in a pan of water will keep the cream cool. Keep the sack wet and place it in the shade, if possible, where there is a breeze.

If it is impossible to have running water through a barrel, another practical method is to place the cream can in a shallow pan, cover the can with a burlap sack long enough to reach well into the pan, tuck the closed end of the sack under the lid handle and fill the shallow pan and the lid with water. Douse the sack with water several times a day to keep it damp. Set the can in a shady place where there is a good circulation of air or a breeze. The evaporation of this water will help greatly to keep the cream cool.

When electricity is available on the farm some form of mechanical refrigeration may be more practical in the long run. Unquestionably, this type is by far the most efficient and satisfactory when it can be had.

If all other steps in the production of quality-cream are adhered to and **cooling is neglected,** you will still have a low-grade cream. Temperatures above 60 degrees Fahrenheit are ideal for bacteria and mold development.

Just as important as keeping cream cool in summer is the protection against freezing in the winter.

Market Cream While It Is Fresh.—Cream more than 3 or 4 days old is apt to have considerable mold, no matter how it has been stored. Old cream takes on a characteristic flavor—even though it is sweet—and this flavor appears after being kept for too long a period. Old cream of this kind makes second-grade butter which consumers do not like and, of course, will buy only because it is cheaper. Use cans for shipping of a size which you can readily fill in at least 3 or 4 days.

Our Colorado law requires: "----Cream which when delivered at the point of shipment is more than 3 days old during the months of May to October inclusive, or more than 4 days old during the

months of November to April inclusive,----is hereby declared to be insanitary----."

Some producers have the erroneous idea that if they let the cream sour first they get more butterfat. You may get a little higher butterfat test, but you have lost weight through evaporation. Consequently, the net result is exactly the same. So don't insist upon souring your cream. The total butterfat is no more and you are undoubtedly selling an **inferior grade of cream.**

When being delivered, the cream should be well protected from dust and contamination and it still is very necessary to keep it cool. The mouth of the can should be covered as a protection from dust and a wet sack should be placed around the can in hot weather. Also, cream should be kept from freezing in winter.

Hauling milk or cream in the same truck with livestock, poultry, gasoline, coal oil, oil, grain or other materials that might contaminate them is **prohibited** by the Dairy Commissioner unless they are carried in separate, closed compartments.

If these simple precautions are followed in the production of cream, the general quality of butter produced in Colorado will advance to a position of respect in the large markets. When this takes place the producer will benefit directly in better prices for his butterfat due to increased consumer demand.

If you are not sure just what quality of cream you are producing, do not hesitate to discuss it with your station operator or fieldman. They are ready and willing to help you produce the highest quality of cream.

Many authorities are of the opinion that unless this job of improving the quality of cream is done on a voluntary basis it will be forced upon us by laws and regulations. The voluntary way will be much more satisfactory.