

COOPERATIVE EXTENSION WORK
IN
AGRICULTURE AND HOME ECONOMICS
STATE OF OKLAHOMA

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HOME DAIRYING

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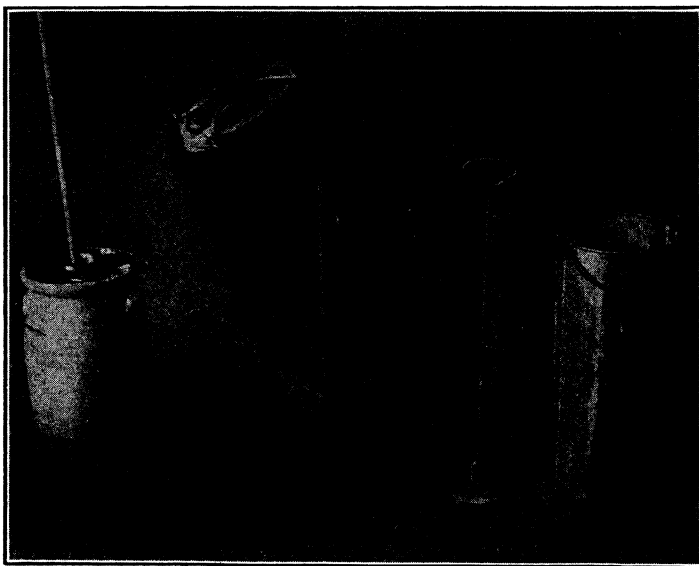


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CALENDAR OF WORK

January

Make high quality butter for the home
Start home dairy record
Clean and adjust separator

February

Use a gallon of milk to family of five daily
Cream whipping demonstration
Remodel building or construct milk house

March

Prepare cooling tank
Home Butter-making demonstration

April

Make a steam sterilizer
Prepare buttermilk
Cream grading demonstration
Change oil in cream separator

May

Cottage cheese making
Have herd tested for Bang's Disease
Prepare special dairy dishes

June

Continue Home Dairy Record
Have well water tested
Avoid weed flavors in milk

July

Home ice cream-making demonstration
Use fly spray on cows

August

Study and demonstrate judging of dairy products
Demonstrate the making of show butter
Exhibit dairy products at community fair

September

Show butter and dairy products at fair
Adjust cream separator
Use a quart of milk daily for each child

October

Conclude Home Dairy Record
Use dairy products in school lunch
Test the cream separator

November

Hand in reports
Study shelter for dairy cows
Prepare cheese dishes

December

Plans for New Year's work
Continue sheltering and winter care of the herd
Christmas dairy dishes

HOME DAIRYING FOR FARM WOMEN AND 4-H CLUB GIRLS

JOHN W. BOEHR
Extension Dairyman

Introduction

Many problems arise in the work of the farm woman relative to handling dairy products. In this bulletin there will be suggestions for the care and handling of dairy products so that the highest quality may result. The methods of making various dairy products on the farm will be explained. Use of such dairy products will be encouraged for the health as well as the economy of the farm family. Some marketing hints will be given, but the main purpose of this bulletin is not directed to assist in the sale of a large volume of dairy products. The main purpose is to help the farm family in their problems of handling, caring for, and making of dairy products, and the use of these in the home.

In the past much has been said about the profits from a dairy herd. Indications are that the next few years will not insure such a big profit as we enjoyed the years immediately following the European war but that the main attention will be centered on the home and the relation of dairy products to the comfort, health, and welfare of that home. This will apply to the one-cow dairy farmer and the tenant farmer as well as to the homes with more head of cattle. The discussions on dairy sanitation are given for the purpose of encouraging the farmers to recognize the fact that dairy products must be handled not only with ordinary cleanliness, but under conditions of strictest dairy sanitation. This is true because dairy products are very easily contaminated by odors, contact with other foods, utensils or dust while other foods under similar conditions would remain wholesome. In brief, dairy products are most valuable as human food, and at the same time most easily contaminated.

The methods outlined are not necessarily the most modern, but they are such as fit into the average farm home. The points in mind for equipment are strictly economical so that the tenant farmer may make use of the equipment as outlined in this bulletin; yet great care has been taken to recommend equipment which is sanitary, with all possible labor-saving devices, and at the same time low cost.

In connection with the farm women's club work regular demonstrations are outlined in home dairy work. Women interested in this work are termed demonstrators. Farm women who wish to line up in this work should conform to the following requirements: Keep at least two dairy cows so that the supply may be constant throughout the year, and reserve at least one gallon of milk daily for a family of five. This should furnish a quart a day for each child and at least a pint for each adult. No close restrictions need be made, but the milk may be used as a drink or in prepared

dishes. Butter should be used at the table three times daily. This of course should be dairy butter and not butter substitute. An endeavor should be made to use other dairy products in harmony with the demonstrations outlined in this bulletin.

Clean Production

On the farm there should be housing and equipment so milk may be produced under fairly comfortable conditions and in a sanitary manner. No equipment or housing need be expensive, but the principles of cleanliness should be watched from every angle.

Barns or milking sheds are often the source of the first contamination of milk. These places should be well lighted, ventilated without direct drafts over the cattle and be floored so they can be kept clean. The liberal use of lime will be a great help not only in sanitation but in keeping away flies.

Cows should be handled in a way conducive to the production of high-class milk. Before we speak of the sanitary phase we must mention the fact that the farmer's family needs protection against diseases which may be injurious to man. Our state is tuberculin free and we should keep it clean. Another disease called contagious abortion brings on a condition in milk which makes it unsuitable for a drink but leaves it in a satisfactory condition for cooking purposes. Great care should be exercised so that cows are protected against this disease. The way it usually is brought into the herd is through a purchased cow which is diseased. One other disease in cows makes milk unsuitable for drinking purposes. Do not use milk from cows affected by garget. (This causes the cow to give lumpy milk at times, and occasionally bloody milk.) The best way to handle this is to dispose of the diseased cattle.

Thus far we have assured ourselves of the health condition of the cattle, now we may consider the cleanliness of the cow. A cow's flanks and udder should be brushed and then wiped off with a damp cloth before milking. This will help in the clean production of milk. The milker should have clean habits as well as clean hands and clean clothes so that the milker may not be a source of contamination to the milk.

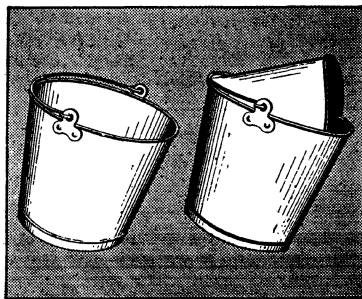
Now we come to the utensils which are very common causes of milk souring and spoiling. The method of cleaning these will be handled in a demonstration outline just a little later. However, before we leave this subject we should say a word about the well and well water. Water that is used to clean and rinse milk utensils should be good well water and may be tested at the A. and M. College free of charge. The well should be of the closed type, should have a good tight cement platform, and drainage should be directed away from the well.

Milk straining is essential on the farm, although milk with sediment can not be purified completely by straining it. However, straining will add greatly to its keeping qualities, cleanliness, and the appearance of the dairy products.

Different types of strainers vary greatly in their effectiveness in keeping the milk reasonable clean. One made entirely of metal, including the little screen, is most easily cleansed but least effective in **straining milk**. A second type, where cheese-cloth is used in straining, is more effective, but it is very difficult to sterilize cheese-cloth. The rule is to wash it thoroughly and boil it for 15 minutes before using it a second time. Without a doubt the strainer with cotton pads in it is by far the best. The cotton discs are used just once and then are discarded. The most complete straining is done by this type of strainer and no contamination is caused because the cotton is not used again.

Utensil Cleansing

The equipment needed for this work includes washing powder, cold water, hot water, brushes and a home-made sterilizer. The sterilizer can be made for \$3.80. (This might vary slightly with location.) It is made up of three parts—A roasting pan, a cover for this pan, and galvanized iron box which fits over the entire pan. This roasting pan may be 20 inches long, 14 inches wide, and 3 inches deep. The cover may be constructed partly of galvanized iron, fitting it tightly over the pan. Immediately over the galvanized iron an asbestos layer may be used as an insulator. Over the

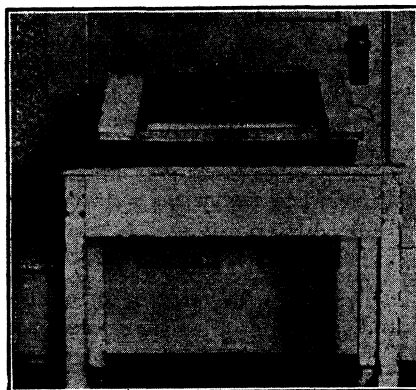


Hooded Bucket Keeps Sediment Out of Milk
(Courtesy of International Harvester Co.)

asbestos is placed a galvanized iron frame with a tube in the center so small vessels may be sterilized. The illustration will show the process of constructing this. Over this entire pan and tube there should be a metal box which must be a little larger in dimensions than the pan and may be constructed as high as necessary. This may be used for sterilizing parts of the cream separator as well as some utensils.

The use of this is simple. It may be placed on a two-burner stove, with two quarts of water in it, and in just a few minutes steam will be generated to sterilize milk bottles as well as utensils on a farm. This makes a very effective, medium-priced piece of equipment which will add much to the high quality of the butter and dairy products used on the farm or prepared for market. In cleaning milk utensils we have in mind the destruction of not

only the unclean substances and the removal of the oily substances as well as other impurities, but we think of the destruction of little organisms which cause milk to sour and spoil and which can not be destroyed by ordinary cleanliness.



A Small Steam Sterilizer

To insure good flavors and long keeping quality for dairy products more than ordinary care and cleanliness is required. Milk and its products take on odors, flavors and contamination much quicker than most other foods. Really the greatest and most common sources of the contamination are the buckets, cans, separators, crocks, pans or milk utensils.

STEPS IN WASHING MILK UTENSILS

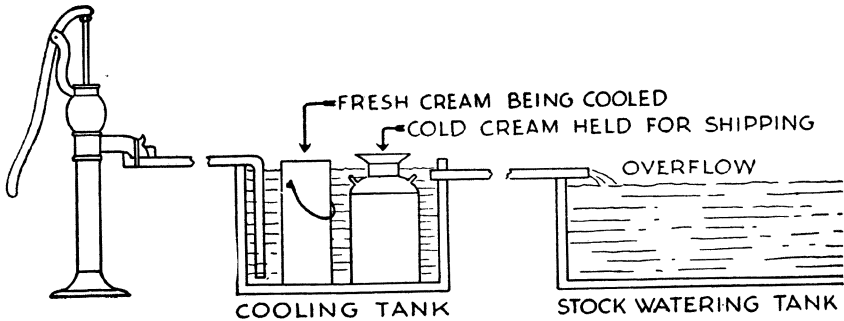
1. With cold or lukewarm water remove the milk and other substances from the inside as well as the outside of the utensil. (Hot water will cause milk to "cook on.") This first step will save washing powder and keep the water to be used with powder clean for a longer period of time.
2. Scrubbing with hot water and washing powder is the next step. A wash brush, or preferably a dairy utensil brush is much better than a cloth. It also reaches the parts of buckets and utensils that cloth cannot reach.
3. Rinse in hot water.
4. Place in sterilizer and steam for 5 minutes or more. Do not place lids on cans or assemble the separator till all parts are entirely dry. It is important to have all utensils dry from the effects of the heat in the sterilizer, and no wiping should be necessary. Instead of steam, chlorine solution is very effective, more convenient and cheap as a disinfectant.

Milk houses are not found on many farms, and in this bulletin we shall not urge tenant farmers or land owners to spend a large sum in building a modern milk house. However, if enough milk is handled, or a small building is found on the place which could be remodeled into a sanitary milk house, it would be of great advantage for the care of milk, separation, keeping dairy products separate from other foods and the screening out of flies more effectively. The essentials of a milk house are good light, sanitary floors, walls and ceiling (if possible, concrete floors), good ventilation, screened windows, and nearness to water supply.

Storage

We may be ever so careful in producing good dairy products, yet on the tenant farm and on many other farms it is difficult to take care of dairy products. In storage we need cleanliness, a cool temperature and protection against dust and other contamination.

An excellent plan has been used by farmers who have springs, wind-mills for pumping water, or just ordinary wells. A cooling tank is built to provide the necessary protection for cream, milk and butter. The plan as shown in the illustration involves a few pipes and a barrel or small tank. This should be cut down so the cans may reach the bottom. The intake pipe should be so arranged that it enters the tank and by a bend in the pipe delivers the water near the bottom of the tank. However, the pipe that takes the water out of the tank should drain from the surface of the tank. This is done simply because cold water has a tendency to settle, while warm water rises, if it is not disturbed by agitation. If a well is handy the cold water may be added several times during the day. It will certainly make a great difference in the quality of the cream and other dairy products. This tank should also have a good cover to protect the contents against the hot sun as well as any sediment.



Cooling Tank Plan

(Courtesy of Blue Valley Creamery)

Storage may be secured in caves or cellars, or even underground cooling tanks; however, in this sort of cooling equipment all dairy products are subject to musty or stale flavors unless great care is taken to clean up the surroundings.

In the storage of cream two rules are very important in addition to cleanliness, keeping it cool and protecting it against odors. First of all, we must not add fresh warm cream to the storage can partially filled with cool cream. This starts a fermentation and destroys the good quality of the cream. To avoid this we must have two or three cans in the cooling tank—one can which contains the cream for buttermaking or for the market, and another one for the cooling of freshly separated cream. A third can may be used to contain butter and a few vessels filled with the milk and cream to supply the immediate needs of the family. A second feature needs watching. The cream in the storage can should be stirred about three times each day to keep it from separating out too much or becoming lumpy.

Separation

In handling dairy products there arises the need of separating the cream from the milk. The skim milk is usually used for either the making of cottage cheese, for cooking, or as feed for livestock. The cream in turn is used for sweet cream on the table, for buttermaking, or for a sale product. Many kinds of separators have been used, with various results. Space does not permit description and recommendations along the line of separators. However, we shall discuss two methods—hand-skimming and mechanical separation. In hand-skimming we have more labor, a practical impossibility of securing sweet cream under average farm conditions, and a rather heavy loss of butterfat in the skim milk. The ordinary separator eliminates the waste and separates the milk as soon as it has been produced, so that a good quality sweet cream may be obtained and practically all the butterfat skimmed from the milk; so we find that even with a few cows a separator will pay in the average farm home.

The care of the separator is very important. First of all, this affects the quality of the product. Second, the life of the separator will be doubled by proper care. Third, losses may occur in the use of the best separators unless the machine is properly cared for and adjusted. To help our farm folks in managing a separator properly, as to cleanliness it can not be said that an unwashed separator may be tolerated. A few reports have been circulated that certain separators need not be washed as often as other kinds. This is folly. After the skimming of each milking the separator should be thoroughly cleansed. First of all the separator should be flushed, as instructions teach all the users of the machines. Next comes the proper cleaning and sterilization of the parts, especially those within the bowl, as outlined in the utensil cleansing paragraph.

To increase the efficiency and the length of usefulness of the separator the machine should be properly oiled and the oil should be changed in types of machines where this is necessary. This is just as important as changing the oil in an automobile. This should be done at least every three months when separators receive ordinary use. In addition to being lubricated, all separators should be placed exactly level on the floor and fastened properly. If the bowl does not balance it should be properly adjusted by a skillful service man.

The cream screw should be adjusted so that the cream will test between 30 and 35 percent in winter and 35 to 40 percent in summer. It is folly to try to adjust a machine to secure a 50 percent test on cream, or higher. Even the very best and most perfectly constructed machines will lose a little butterfat if the test goes near 50 percent. In addition to the avoidance of this loss we find that 35 percent cream is best for buttermaking as higher testing cream is too thick and makes churning difficult. In addition to having the separator level, with an adjusted bowl and the cream screw properly adjusted, there should be a careful study of the adjustment of all other parts. Finally, the cleanliness of the machine throughout and the careful handling of the separator will not only increase the length of its usefulness, but better skimming and a cleaner product will result. There is a record of a machine being used 21 years without any perceptible loss and with good, dependable service, due to its care and proper adjustment.

Milk

On the farm and in the city homes there is great need of carrying out the recommendations given earlier in the bulletin. A quart of milk a day for each child, and at least a pint for each adult should be the standard. The value of milk as a food may be summed up in a few statements: Milk is a perfect food, and contains a balance of parts to make it the **One Perfect Food—Milk**. The protein in milk builds muscles and many other parts of the body. The carbohydrates and fats are the energy foods and are needed continuously. The mineral content of milk is unusually important, because mineral is lacking in most foods that are used in the home. The building of teeth and bones in children and the retaining of strength in the bones and teeth of adults is possible by the daily use of milk. This is not all. In late years it has been discovered that there are certain life promoting, growth promoting, and disease resisting substances called vitamins. Milk is a leader in this very important food substance. People who have studied nutrition always love to see a child drinking plenty of milk at each meal. Furthermore, they realize that adults will have much less trouble with their teeth and be much stronger physically when they use milk every day in their diet. On the farm where hard labor is required it is important to use this highly digestible, very nutritious food—**MILK**.

In a few cases it is found that milk is not relished as a drink, and there it can be recommended that dairy dishes be prepared which are made up in parts of milk. Generally there is no necessity of pasteurizing milk on the farm, but in a few cases where health conditions in the herd are considered, or where children feel an unfavorable reaction from raw milk it is easily possible to use ordinary cooking utensils and a thermometer to pasteurize milk at home successfully. This can be done in a double boiler, using the thermometer constantly and heating the milk up to 145°F., holding it there 30 minutes, and cooling it as quickly as possible after that. This will destroy practically all harmful germs in the milk, if such should be found in this most useful food. In addition to this, it will increase the keeping quality of the milk, which is an important point in a nursery.



Girls Demonstrate Dairy Dishes

Sweet Cream

It is very important to have a combination of foods, like fruits with whipped cream, or other foods in which cream is an important part. In the beginning, let us realize the importance of the care of sweet cream so that it will be really sweet, slightly glossy, and properly aged to whip successfully. The care simply involves, as stated before, sanitary production, clean separation, immediate cooling, and proper storage. The whipping of the cream usually brings up some difficulties unless these requirements are fulfilled. First, the cream should test better than 22 percent and up to 32 percent for most successful whipping. The age of the cream should be 24 hours or older to whip to the greatest advantage. The cooler the cream the more easily it whips and the longer it will retain its fluffy condition; so that

rules are simply these: Secure cream that is around 30 percent in test, aged 24 hours, if possible, and as cool as possible—at least 50°F. (which can be secured in a cooling tank on most farms).

The use of sweet cream on cereals as well as in other forms of food adds to the flavor as well as to the nutritive value of almost any food. Sweet cream is added to the various drinks used at a family table, and in every case adds to the flavor and to the food value.

Butter

The food value of butter is very much like that of milk, only stronger in some vitamins. Butter is a food which should be used in the home during all three meals daily. It is used on bread ordinarily and also in the cooking of various foods. Many statements are being made concerning cheaper oils and fats, but when considering quality and food value farmers and others may use butter much more freely and still be on a sound economical basis. The disease resisting qualities of butter are much stronger than those of most other foods. In considering the making of farm butter a few hints will be given on producing market butter. Home buttermaking will be outlined in this bulletin in demonstration style so that the different steps may be followed on the farm as well as in the giving of demonstrations.

First. Great care should be exercised in the sanitary production of milk from the healthy cows which are properly fed and cared for. An excess of cottonseed meal fed to cows will make crumbly butter. The feeding of cows on acorns, oak leaves, wild onions, ragweed, bitter weed and several other feeds will make bad flavored milk and undesirable butter.

Second. The separation of the milk immediately after being milked, and by the use of a thoroughly cleansed separator will be a great help toward securing cream for high quality butter. The immediate cooling of this cream before pouring it in the storage can is necessary.

Third. The storage of cream in a clean, cool, covered vessel to which cold cream only is added, and which is stirred three times daily, is an important step. The temperature should be below 50°F., if possible.

Fourth. Ripening of cream is done to make churning a little easier and to add flavor to the butter. If cream is ripened satisfactorily for churning it is slightly sour, glossy, and a little thicker than sweet cream. If cream is kept at about 70°F. for 12 hours it usually ripens. If cream does not sour satisfactorily a pint of clean sour buttermilk or sour milk, usually called "starter," may be added to 3½ gallons of cream. Stirring from time to time will help cream ripen and will keep it smooth.

Fifth. Filling the churn. Before this is done all the rules should be carried out in properly cleaning the churn, as outlined in the chapter on utensil cleaning. No great advantage exists in favor of any type of churn. The dash churn, the barrel churn and the daisy churn all make good butter when properly operated, however the dash churn is at a disadvantage on the labor side of churning. After the churn is prepared and the cream is at a temperature of from 55°F. to 60°F., depending on the season of the year, the churn should be filled less than half full. In filling a churn too

full we find that the expanding cream will overflow the vessel. Furthermore, it makes churning more difficult. The use of a floating dairy thermometer is necessary to ascertain the proper temperature.

Sixth. Coloring. During all the seasons of the year it is highly desirable to have the same color in butter. By the use of ordinary butter coloring as sold on the market this can be done without any injury to the butter and without danger to any person using the butter. Furthermore, it is in harmony with the Pure Food Act to use butter coloring. If Jerseys or Guernseys are kept no coloring is needed during the grass season, but up to 20 drops per gallon of cream should be added when the cows are on dry feed. For Holsteins and Ayrshires a little coloring is necessary during the entire year. This may vary from 10 drops to 35 drops to the gallon of cream.

Seventh. Churning. In about 20 minutes the action of the churn should gather the butterfat into granules and separate it from the buttermilk. Churning is really gathering the butterfat globules, forcing them to merge and form granules. The best rule is to churn until the granules are the size of wheat or small peas, which should indicate the conclusion of the churning process. Difficulties may arise in securing butter. The following factors make churning difficult: Cream too cold; cream too thin or too thick, (35 percent butterfat giving best results); cream too sweet; churn too full; ropy fermentation of cream obtained from ropy milk; the breed of the cow—quick churning being in favor of the smaller breeds; cows being far advanced in the lactation period, making churning difficult; or feeds like cottonseed meal and timothy hay. When churning comes too easily or too quickly it is usually caused by the high temperature.

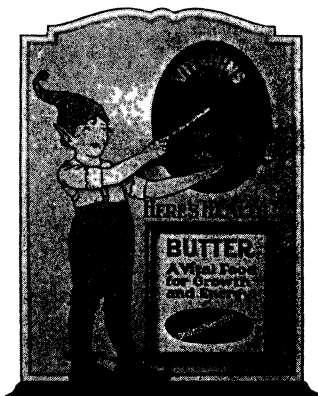
Eighth. Washing the butter. After the buttermilk is drawn off an equal amount of water at the temperature of 60°F. is put into the churn to wash out the buttermilk. The purpose of this is to remove the milk which will sour quickly when mixed in the butter. If the first washing leaves the water quite clear a second washing is not necessary, but usually a second washing, using the same quantity of water, will remove most of the buttermilk. Too much washing will remove some of the fine flavor from the fats in the butter and should be avoided.

Ninth. Salting the butter. In most types of churns the butter is removed after washing, and the salting is the next step. About $\frac{1}{4}$ of an ounce of salt is usually added to a pound of butter. Highly soluble salt will dissolve more evenly than ordinary salt. Dry salt sprinkled on butter often causes a mottled or flaked condition in the butter. For this reason salt may be moistened with clean water and then mixed with the butter.

Tenth. Working butter. There are three purposes in working butter: first, to mix the salt evenly in the butter; second, to work out some of the moisture or water. (Good butter should hold about 16 percent of water, which is a normal quantity.) This with 80 percent butterfat, 3 percent salt, and 1 percent curd makes up the different parts of butter. The third reason for working butter is to make it a nice uniform mass of butter.

Two difficulties confront us in working butter. First, to overwork butter means to destroy the grain of the butter, which makes a salvy greasy butter. This is less digestible and less palatable than butter which is not overworked. Second, in working butter it may become too warm and thus destroy its grain and texture. So, we must not overwork butter, and we must keep it cool while working.

Eleventh. Packing the butter. Even for home use it is highly desirable to have butter in convenient packages or prints. The ordinary one-pound brick-shaped print which is used on the market can be easily made on the farm. This should be wrapped in a vegetable parchment paper which can be secured at any creamery.



Butter a Health Food

Twelfth. Storage of butter. After butter is printed in these convenient bricks it may be stored in a can in a cooling tank just like cream. For a regular demonstration of buttermaking the following equipment is necessary: One-half gallon 30 percent ripened cream, 3 gallons cold water, churn, thermometer, strainer, 1 oz. butter color, 1 oz. salt, butter working bowls, butter paddles, butter printer, parchment paper, cartons, tablespoons, 3 towels, 3 bowls, 3 glasses, 1 dish pan, 10 pounds of ice in summer, Farmers' Bulletin No. 876.

Buttermilk

The value of buttermilk in the home is appreciated in a few cases, but this drink could be used much more extensively to a great advantage. The food value is nearly the same as that of milk with the butterfat remove, but something has happened to give buttermilk an added value. Its slightly sour flavor makes it a very wholesome drink, highly digestible, and very agreeable to the digestive organs. Buttermilk has a cooling and invigorating effect and is used very extensively in hospitals where people are rebuilding their strength. On the farm this drink is usually valuable because hard

labor makes it necessary to stimulate proper digestion and reconstruct the body effectively, as buttermilk will do.

There are three kinds of buttermilk in use and farmers will be interested in at least two of these. One is ordinary buttermilk—called lactic acid buttermilk. This name is given because lactic acid is formed in the buttermilk. It is excellent food and aids digestion. Another kind is the Bulgarian buttermilk. This is slightly stronger and is used very extensively in the sick room. To make this on the farm one may purchase the Bulgarian culture from the creameries or from a creamery supply house. On the package there are directions as to how much of the culture to use to a given quantity of sweet clean milk—skim milk or whole milk. Many people who do not like ordinary buttermilk enjoy Bulgarian buttermilk. This is much harder to prepare than ordinary buttermilk. Farm women as well as other homemakers will be interested in a new kind of buttermilk which is used for food in the nursery. Many babies are now fed on this new product which is called "Acidophilus." This culture was first isolated in Yale University but now can be secured in many creameries. In cases where there are babies suffering from digestive disturbances this special kind of buttermilk has been used quite successfully.

The care of buttermilk determines the value of this product. If all the foregoing rules are carried out zealously buttermilk will be very good as taken from the churn. However, it is possible to make buttermilk from skim milk which is sweet and has a little bit of buttermilk added to it. When this is stirred and kept in a cooling tank good buttermilk may be thus secured in a period of from 12 to 24 hours. Keeping the buttermilk cool, will, of course, lengthen its usefulness. Good buttermilk should be nice for two or three days if properly cooled and cared for.

Cottage Cheese

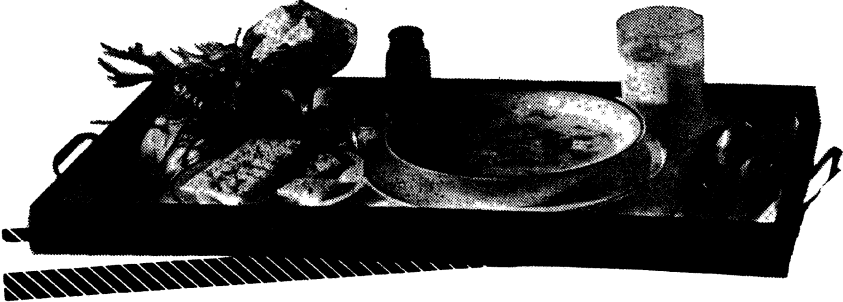
The value of cottage cheese as food has never been fully realized, but in addition to being a delicious food it is very high in food value. We might truthfully say that cottage cheese is the substance of milk with the liquid, which contains very little value, drawn off. Of course the butterfat is lacking, but this may be supplied through sweet cream and butter while the cottage cheese supplies the protein for the family table. If there is an abundance of skim milk it can be easily made into nutritious and valuable food. (In the references you will find Farmers' Bulletin No. 1451 mentioned. This will outline a large number of cottage cheese dishes, which will enable the family not naturally relishing this food to use it for the sake of its food value and the extremely low cost of the product.) In the summer there is often a surplus of milk and a shortage of meats. During the time cottage cheese may be used to replace part of the protein foods that are not at hand.

The steps in making good cottage cheese and in demonstrating the products are:

First. The production of milk in a sanitary manner from healthy cows properly fed and cared for, as stated in the chapter on buttermaking.

Second. The separation of this milk by the use of a sanitary separator to avoid any bitterness or off flavors in the skim milk.

Third. Setting. Three methods are used in preparing sweet skim milk for cottage cheese. One is to allow it to sour naturally. This is satisfactory in many ways, but it takes it much longer than it does by the use of some additional starter. Another disadvantage is the possibility of developing bitterness by allowing milk to wait for curdling. The temperature for setting should be 75°F. However, very much good cottage cheese is made



(Courtesy of Southern Ruralist)

Dairy Dishes

in just this way. A second method is to add some clean sour milk or buttermilk at the rate of one pint to 3½ gallons of sweet milk. This will hasten the curdling and often prepares a better quality curd for cottage cheese. In a few cases the addition of rennet is made to prepare rather sweet cottage cheese for the use of healthy people as well as people in the sick room. To 3½ gallons of sweet milk a pint of starter is added, as well as ¼ tablet of rennet. This hastens the curdling process and produces a rather sweet cheese.

Fourth. Cutting the curd. Many advantages are found in doing work systematically by the use of the butcherknife in the cutting of the curd for cottage cheese. The whey drains out a little more quickly, and a somewhat greater amount of cheese is realized when the curd is cut. When the curd is stiff enough so that on separating it the crevice is at once filled with whey we are ready to cut the curd. A good way is to cut with butcherknife so that the curd is in one-inch slices. Next cut across to make visible one-inch squares, then cut across in the third dimension as nearly parallel to the bottom of the pan as possible.

Fifth. Warming the curd. A great mistake is often made by placing the curd on the stove and allowing it to cook. This makes a crumbly indigestible cheese. In the double boiler system this curd should be warmed to 110° or 120°F. if a little dryer cheese is wanted and held there for 20 minutes, stirring it very gently. The thermometer should be used constantly in this process.

Sixth. Drainage. By the use of ordinary cheesecloth the whey can

be drained off in a period of from 10 to 30 minutes. After the whey stops dripping it is usually a sign that the curd has drained sufficiently.

Seventh. Washing. To remove the extra whey and firm the cheese a little cold water may be dashed on the curd. If $3\frac{1}{2}$ gallons of milk are used for the making of cheese a quart of cold water is satisfactory measure.

Eighth. Salting. To salt cottage cheese properly an ounce of salt is usually required to four pounds of cheese.



(Courtesy of Farm Journal)

Serving Cheese Dishes

Ninth. Working. For a highly digestible cheese, not much working is necessary. A flaky cheese is most desirable. Very often no sweet cream is needed in this process. Many nutrition specialists urge that cottage cheese be used in a protein food and not be mixed with sweet cream, which of course will add the fats and carbohydrates. However, if desired, on the farm $\frac{1}{4}$ pint of sweet cream may be added to cheese made from the standard $3\frac{1}{2}$ gallon measure of skim milk.

Tenth. Packing. For farm use as well as for the market it is best to have cottage cheese in standard packages. The round ice cream boxes are considered standard packages for cottage cheese for the market, although, for the farm it may be stored in several glass or stone dishes to be kept in a cooling tank. The greatest difficulty with cottage cheese, when handled in a cleanly manner, is the sourness and the bitterness which result from too high temperatures.

The equipment used in making cottage cheese in a demonstration is as follows:

Three and one-half gallons sweet skimmed milk, 1 pint of starter (clean sour milk), 1 tablet of rennet, cheese coloring, 1 oz. salt, dairy thermometer, 1 yard cheesecloth, 4 one-pound cartons, (pint ice cream cartons), 3 table-spoons, 2 towels, 3 bowls, 3 cups, 1 butcherknife, stove for heating, string, 2 dish pans, Farmers' Bulletin No. 1451.

Yellow Cream Cheese

Spread cheese is in greater demand than ever before. It is a softer cheese and varies only slightly from American cheese. It has a high moisture content. The digestibility is higher in spread cheese than in the hard cheese. Recently a formula has been worked out so a spread cheese may be made on the farm. This has been named yellow cream cheese.

The advantages of this cheese are as follows:

1. It can be made in 40 minutes, after which it is ready to be eaten.
2. No curing process is necessary.
3. It requires 5 foods found in practically all homes. Only cheese coloring is needed in addition to the 5 other ingredients.
4. Heating it pasteurizes the product, and makes it a safe food.
5. No equipment is needed except that found in the average farm home.
6. It is one of the most economical foods in the home.
7. The food value is very high.
8. The cheese is very palatable and highly digestible.
9. This cheese may be used as a sandwich spread, in salads as well as in cooked or baked dishes, just like American cheese.

The disadvantages are:

1. The keeping quality is low and the cheese should be used within 5 days in the summer and 2 weeks during the winter.
2. Unless a rather dry cottage cheese is used with very thick sour cream in making the cheese, it will be too soft to slice.
3. The flavor is too mild for most palates.

Method of Making Yellow Cream Cheese:

Prepare a rather dry cottage cheese from at least a gallon of milk. Hold this milk at 70°F. till firmly clabbered. Still better, add clean flavored sour

milk at the rate of one-fourth pint to the gallon of separated or whole milk. Hold at 70°F. for about 12 hours to get the milk clabbered. Cut the clabber with a butcher knife into inch cubes. Warm this in a hot water bath to 110°F. stirring it. Hold for 20 minutes. Drain off most of the whey. Then wash the curd with cold water using about the same amount as whey drained off. Drain this fairly dry by placing a weight on the cheese while draining. When drained, work the cottage cheese through a fine meshed screen to break up all the particles. Take a quart of pulverized curd, one level teaspoon soda, one half pound of butter, and mix thoroughly. Place in a double boiler and melt slowly. Heat slowly till a smooth consistency is obtained, stirring constantly. If the mixture becomes ropy or the butter separates out, continue heating and violent stirring. Remove from stove, add $\frac{1}{2}$ pint of thick sour cream, two teaspoons salt, and enough cheese coloring to make it look like American cheese. Mix well and pour into a bowl. Cool it, and it will be ready to be used. It may be stirred occasionally when cooling, to avoid separation. After cooling the cheese may be warmed to improve the texture. When cooling it, beating will increase the smoothness.

Hard Cheese

Only a very small quantity of hard cheese is used by the average family in the United States, the average person using about 4½ pounds per year, however in our section of the country we use much less—possibly two pounds per person per year. It is true that we are not naturally a cheese consuming people. At the same time many farm women as well as others understand the great food value of hard cheese, commonly called American cheese. It has a very high protein content, as well as carbohydrates, and fats making the cheese one of the most highly concentrated dairy products. Cheese may be used on the table as a protein food or may be used in salads and various dishes.

Many farm women are interested in the making of American cheese on the farm. A surplus of milk during a few months of the year makes it possible to produce a cheese at a very low cost from the milk. Another advantage is seen in the making of cheese on the farm in the fact that much more cheese is consumed when it is made at home. Many families use no cheese unless it is prepared in their own home. A few disadvantages to preparing it in the South, and especially in the Southwest, should be mentioned, as they account for the fact that no American cheese making demonstrations are given by the dairy specialists. The first disadvantage is that the surplus usually comes in the spring and early summer when the farm family has all the work it can possibly do and no time remains for the manufacturing of cheese. A second disadvantage is the fact that if cheese is made in the early summer, conditions are unfavorable to curing the cheese. Warm weather has a tendency to produce gas, and this makes a poor quality cheese. Another disadvantage is the equipment price, which is rather high for the successful making of good cheese on the farm. In our demonstration outline we are mentioning just the equipment which is usually kept on farms where a little American cheese is made for home use. With this small

amount of equipment only a rather skillful cheese-maker can hope to secure a satisfactory product.

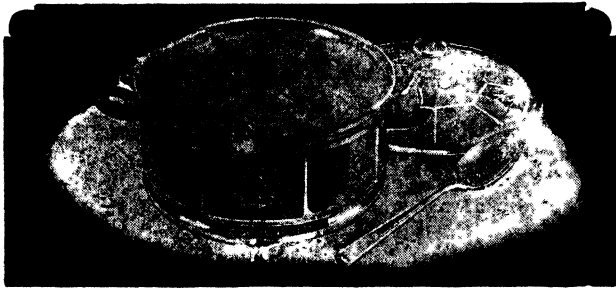
The following steps are required for the making of American cheese: (The instructions in this demonstration outline will be suitable for 100 pounds of milk—12 gallons.)

First. Use clean, whole sweet milk, produced from healthy cows.

Second. Warm the milk to 86°F., using the thermometer constantly.

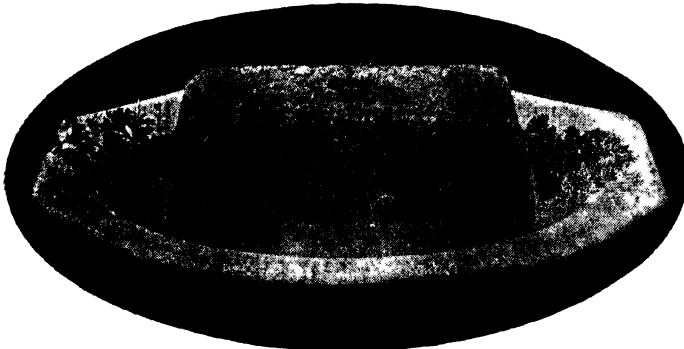
Third. Cheese coloring should be added to give the cheese its characteristic appearance. One-half teaspoon to 100 pounds of milk is sufficient. Butter coloring is not satisfactory for this purpose.

Fourth. Add rennet which has been dissolved in a pint of cold water—one tablet is sufficient for the 100 pounds of milk. Stir the rennet into the milk so it will be thoroughly mixed. Keep the mixture at a temperature of 86°F. for 30 to 35 minutes.



(Courtesy of Farm Journal)

Salmon En casserole with $1\frac{1}{4}$ cup American Cheese



(Courtesy of Farm Journal)

Lima Bean Loaf with $1\frac{1}{2}$ cup American Cheese.

Fifth. Cut the curd when it is at the right stage of firmness. To test this one may place the finger in the curd and raise it slightly. If the curd splits smoothly without leaving particles on the finger it is considered ready to be cut. The cutting may be done as explained in cottage cheese-making. However, curd knives which are sold by creamery supply houses are much more satisfactory.

Sixth. Heat the curd, stirring it so the cubes will not stick together. Hold it at a temperature of 100°F. 15 to 20 minutes. In addition to the separation of the whey it is necessary to develop a slight sourness in the curd. This is determined by touching some of the curd to a hot iron. When being pulled away from the iron fine silk-like threads from $\frac{1}{4}$ to $\frac{1}{2}$ inch long are formed when the curd is soured enough to press. The testing of the curd as to firmness may be done by pressing some of it between the hands. When released the pieces should fall apart at once and show no tendency to stick together.

Seventh. Place on drain rack, watch the curd so it will not stick together and keep it warm. By the hot iron test we determine when it is sufficiently drained to be salted.

Eighth. Salting. When the curd forms strings $\frac{3}{4}$ to 1 inch long it is ready to be salted. Three ounces of salt are used for 10 pounds of curd.

Ninth. Pressing the curd is done after the cheese has cooled down to 85°F. For this purpose the cheese hoops which are not very expensive should be used.

Tenth. Completion of the pressing is done by taking the cheese out of the temporary hoop dressed in cheesecloth, and fitting it securely in the cheese hoop. Full pressure may be applied for 24 hours.

Eleventh. Curing the cheese in a room with a temperature from 50°F. to 60°F. is a step which is very essential. Too warm a temperature will make a soft cheese. For the first two weeks the cheese should be turned daily. After that it may be turned twice a week. When cheese has cured for two weeks it may be dipped in paraffin which is heated to a temperature of 240°F. When the cheese is six weeks old it is usually ready for food.

Equipment needed—A boiler which fits in a tub to be used on a double-boiler system, cheese coloring, 100 pounds of milk, stove, rennet, curd knives, iron, cheese hoops, cheesecloth, press.

Ice Cream

In the average farm home we find that many farmers prepare their own ice cream for picnics, entertainments, and holidays. Again we shall quote the nutrition specialists and say that they recommend this food not only for holidays and special occasions, but that it be used in daily diet. It is not a luxury, but a truly substantial, highly digestible food.

The method of making ice cream at home, or giving it as a demonstration, may be outlined for a one-gallon freezer as follows:

First. To prepare a raw mix, first beat the whites of three eggs, and the yolks slightly in a separate dish. While this is being done the dissolving of two level tablespoonfuls of gelatin in one-third cup of warm water may be started. (This may seem strange to folks on the farm, but gelatin is an extremely digestible, useful food and gives smoothness and body to the ice cream. As it costs 2 cents to the gallon it may be recommended without any reserve.)

Second. Mix the whites and yolks of eggs and add two cups of sugar while this is being stirred constantly. This will make a partial solution of the eggs and sugar.

Third. Keep stirring this and add a quart of whole milk.

Fourth. This may be stirred and the dissolved gelatin added.

Fifth. If a golden colored ice cream is desired, 20 to 60 drops of cheese coloring may be added. However, this may be omitted because it does not add to the food value of the ice cream but just gives it a yellowish, rich looking color.

Sixth. Stir in a teaspoonful of vanilla extract.

Seventh. Whip a quart of 30% cream and add to the mixture, stirring it well. Before this is poured into the freezer it would be a good plan to keep half a cup of the mixture for testing and studying the relations of the various flavors in the mixture.

Before this is poured into the freezer we must be absolutely sure that the freezer has been very thoroughly scrubbed, as taught in the chapter on utensil cleaning. In addition to this the freezer should be thoroughly scalded out before using, because any impurity in the freezer could be a source of contamination for the people eating the ice cream. In a few cases poisoning has resulted from carelessness in this respect.

Eighth. The mixture should be poured into the freezer so that it is filled up about one-half or three-fourths full. Do not fill up the freezer with the mixture because it will expand and raise the lid. While the ice is being crushed the freezer should be turned continually to keep the parts of the mix from settling.

Ninth. One measure of ice cream salt should be mixed with eight measures of crushed ice in a tub. Then the mixture of ice cream salt and ice should be placed in the freezer bucket while the crank is being turned continually. The top of the drain hole should be on a level with the lower rim of the lid which covers the ice cream mix and should be open so salt water cannot run into the mix.

Tenth. To secure a nice smooth ice cream the freezer may be turned slowly until freezing commences. After that it should be turned rapidly. After freezing has progressed so that it turns hard the lid should be wiped and removed, the paddles taken out, the hole stopped up in the freezer lid and the lid placed back on the cream.

Packing. In some cases the water is all drained out and a fresh ice mixture added to harden the ice cream. This, of course will make a little

firmer cream. However, more of the "1 to 8" mixture should be added and the ice cream then should harden from two to twelve hours.

This recipe has been tried many times and has proved very successful. The ice cream has a good body, a nice texture, good flavor, and can be produced at a low cost.

For a demonstration the following equipment and supplies are needed: twenty-five pounds ice, 1 quart 30 percent sweet cream, 1 quart 4 percent sweet milk, 5 pounds ice cream salt, 1 gallon freezer (not vacuum type), 2 tablespoons gelatin, 1 ounce vanilla extract, 2 cups sugar, 3 eggs, $\frac{1}{2}$ teaspoon table salt, 1 ounce cheese coloring, 1 gallon hot water, 1 gallon cold water, 1 quart measure, 2 teaspoons, 4 tablespoons, 4 bowls, 2 dish pans, 1 wash tub, 1 sack for ice crushing, hammer, 4 glasses, egg beater.

Two additional ice cream recipes have been tried and have proved quite successful: For one gallon of ice cream the following recipes may be easily prepared in the home. An uncooked mix may be improved by using gelatin to increase smoothness and body in the ice cream. Flour is used in cooked mixes instead of gelatin. The quantity of mix when ready to freeze will be nearly 3 quarts. While freezing, it will expand to approximately a gallon of ice cream.

Vanilla Ice Cream (Cooked)

2 c. sugar	1 qt. milk
2 level T. flour	20 to 60 drops cheese coloring
$\frac{1}{4}$ t. salt	1 t. vanilla extract
3 eggs	1 qt. cream

Mix sugar, flour and salt; add beaten eggs and milk. Cook in double boiler, stirring for 20 minutes or until slightly thickened. Remove from stove, and when cold add coloring, vanilla and whipped cream. Freeze by using 1 measure of ice cream salt to 8 of crushed ice mixed and packed into freezer. Pack for two hours.

Fruit Ice Cream, Pineapple Favorite

4 slices canned pineapple chopped fine	2 level T. gelatin
2 lemons	$1\frac{1}{2}$ c. hot water
1 c. pineapple juice	1 c. sugar
$1\frac{1}{2}$ c. whipping cream	2 c. milk
2 t. pineapple extracts	4 egg whites beaten

Put pineapple into a bowl, add strained juice of lemon and pineapple. Then add whipped cream and extract. Dissolve gelatin in water with sugar. When cool strain into mixture. Add milk and egg whites. Freeze and pack for 3 hours.

JUDGING DAIRY PRODUCTS

To teach more fully the value of dairy products, to encourage the importance of high quality in these foods, to encourage the demonstrators and to help build up the dairy products exhibits at the county and state fairs, we shall help in grading, standardizing, and judging these foods. The work will be a guide to produce, serve in the home, sell and exhibit quality products. The result will be beneficial. More dairy products will be used in the home which adds to the health as well as to more economical living of the family. Marketing will be easier and more profitable. Keener competition at fairs will stimulate greater interest in the work of home dairying.

HOW TO SCORE BUTTER**Score Card**

Flavor 45%; Body 25%; Color 15%; Salt 10%; Package 5%. Total 100% for perfect score.



Dairy Lunches Satisfy—Children should acquire the milk-drinking habit

Method. Take the pound print of butter, examine the package, open it and cut it with silver knife about half way through the pound. Break this part of the pound of butter which is attached to the knife, so a distinct break will show the grain of the butter. In smelling and tasting the flavor may be determined. Creamy, pleasant flavors are desirable. Rancid, bitter, stale and other undesirable flavors cut the score. The body should show a texture like broken steel. It should not be salvy or greasy. The color should be a golden straw color. Salt content must be mild. The package should conform to requirements in the Home Butter Making instructions.

HOW TO SCORE CHEESE

Score Card

Flavor 45%; Body and Texture 30%; Finish 15%; Color 10%.

Method. Break the cheese and taste it. The flavor should be characteristic to the kind of cheese judged, but should not be too sour, bitter, weedy, rancid or tallowy in flavor. The texture should be fine and uniform. The body should not be waxy, pasty, crumbly, gritty or watery. Color should be in conformity with the kind of cheese judged, but should not be mottled, streaked or showing white specks. In appearance we look for a neat package, smooth, firm and even cheese.

HOW TO SCORE MILK

Score Card

Bacteria 45%; Flavor and odor 25%; Sediment 10%; Acidity 15%; Bottle and cap 5%.

Method. This is a more difficult score card because the exact score of milk requires a bacterial count and sediment test. However, the tasting of milk will expose most defects. Examining the container, smelling the milk and looking for sediment will help determine the quality. The flavor is determined by tasting the milk. It should be sweet, pleasant and palatable. Sour, weedy, strong, flat or cooked flavors are undesirable. No sediment should be visible when the bottle of milk is held up, slightly tilted and the examination is made for sediment in the bottom of the bottle.

(Cream may be graded as outlined in Cream Grading.)

HOW TO SCORE BUTTERMILK

Score Card

Flavor and odor 45%; Thickness (viscosity) 25%; Appearance and color 15%; Visible dirt 10%; Container 5%.

Method. Pour out a half glass of buttermilk and watch the thickness, color, appearance and possible traces of impurities. Taste and smell the buttermilk. The flavor should be mildy sour, clean and pleasant. Over-sour and sharp flavors are undesirable. A medium, smooth, even thickness is most desirable. No off color or uneven appearance is permissible. Visi-

ble sediment or dirt is a very unfavorable factor in buttermilk. The container should be glass or stone ware, but not made of metal.

Equipment and material for judging dairy products. A pound of butter, pound of cottage cheese, pound of American cheese, quart of milk, quart of buttermilk, three silver knives, 6 teaspoons, 6 water glasses, 6 white china plates, Dairy Products Score Cards.

PRODUCING CREAM FOR SALE

On the farm it is usually the practice to keep skim milk for poultry and stock feed and to sell cream. As mentioned in an earlier chapter, we are facing a period of moderate prices for dairy products. A few points in the economical production of cream for sale will be given.

First. We should realize that more economical production is necessary. There are very conclusive figures on record showing that most of the cows in our state produce butterfat at a feed cost ranging from 30 to 34 cents per pound. The following hints will be helpful along this line: (a) Keep only high producing cows which have a butterfat record of over 250 pounds per year. Other cattle can not produce butterfat at a profit under average farm conditions. (b) On the farm there should be a feed production program so two tons of alfalfa or other legume hays are produced for each cow, in addition to the grain feed and pastures. (c) The handling and managing of the herd, including the housing, watering, protection against flies, keeping the herd healthy and giving the cows more than ordinary comforts, as we consider the accommodations for livestock, should be given attention.

Second. In addition to this cheaper production of butterfat it is important to continue the watching of the separator so that no losses occur.

Third. It is a dollars and cents proposition to consider genuine cleanliness in cream production.

The superstition that sour cream tests higher than sweet cream is a menace to cream producers. The truth is that when cream sours it does not become richer, but it becomes more unsatisfactory for the market of good butter. If nothing but sweet cream were delivered to the creameries and butter could be manufactured from this product an increase of 7 to 10 cents per pound could be realized for butter from sweet cream. In short, if all cream were sweet and wholesome we could add several millions of dollars to the value of the dairy products in Oklahoma each year.

In many states they have a four-day delivery plan. Under this system a farmer delivers a can of cream and a tag is attached to the can with a date stamped on it. If the can of cream is returned within four days, as indicated by the date on the tag, a 3 cent bonus is given on quality. In states where this has been carried out there has been a wonderful improvement in the quality of butter. This simply teaches us that farmers should deliver cream at least three times a week during summer, and twice a week in winter.

The following system of grading cream in Oklahoma may be given as a demonstration and should teach us how to produce Grade 1 cream:

METHOD OF GRADING CREAM:

1. Pour each sample from its container into a glass and back into the container.
2. Smell each sample.
3. Taste each sample, unless the odor classifies certain samples as grade three.
4. Butterfat tests on each sample should be recorded from cream station records.
5. Market grades on containers, using the following scale:

Grade 1.

1. Must be clean
2. Palatable
3. No undesirable odor
4. Not lumpy
5. Sweet or slightly sour
6. Test over 25 percent fat

Will make good butter and bring highest prices.

Grade 2.

1. Must be clean
2. Palatable
3. No bad odors
4. Slightly lumpy
5. May test under 25 percent

Will make fair butter and should bring 3 cents less than Grade 1, according to Oklahoma laws.

Grade 3.

1. Stale or
2. Yeasty or
3. Foamy or
4. Cheesy or
5. Musty or
6. Dirty or
7. Putrid or otherwise objectionable as a food product.

The sale of Grade 3 is unlawful, according to Oklahoma law.

RECORDS OF HOME DAIRY WORK

While this bulletin is prepared to assist the farm women, farmers and others interested in home dairying it is also intended to be a manual for home dairy demonstrators. The plan of demonstration work is to select farm women in the county who are willing to carry out a demonstration for a year. This includes handling of milk and dairy products in the home, attending and giving home dairy demonstrations as outlined in this bulletin, applying standard methods in the preparation of dairy products in the home, keeping certain records and making a report.

The record is divided into three parts, a production record, a report of the dairy products used in the home, and a sales record. In the production record it is of great importance for the demonstrator to know how many cows were in milk during each month of the year. If March, April and May show the greatest number in production it will at once indicate a weakness in the farm system. This is the season of the year when dairy products are most plentiful and causes cheapness on the market. Furthermore this is the season of the year when the farm family is extremely busy at work in the fields. Another disadvantage of cows freshening in the spring is the fact that they will soon go dry when the hot July and August weather brings on burned up pastures, extreme heat and an abundance of flies. On the other hand, if the greatest number of cows freshen in September, October and November, or the fall season, this will at once indicate that production is on a more economical basis.

The gallons of milk produced each month should be recorded, and may be figured by multiplication of the average daily gallons by the days in the month. This is valuable information to the farm family along the same line as the number of cows in milk. The next record is the gallons of cream produced each month. This is a slight duplication, because it is really included in the gallons of milk. However it will be an index to show the great value of keeping cows on the farm. The pounds of butter for each month should be recorded. This will show the production of butter and will be checked against the amount used in the home. Finally, the pounds of cottage cheese are to be recorded. This alludes to the use of some skim milk for human food.

The record of dairy products used in the home, including gallons of milk, gallons of cream, pounds of butter, pounds of cottage cheese, and gallons of skim milk, is very valuable to show variation from month to month. In a well regulated home dairy this should not vary to any marked degree, but it might be slightly higher in the winter months than in the summer months. The reason for this is that during cold weather more of the carbohydrate foods are required. In this part of the record it is very important to give the total value of the products used. This should be figured at farm prices and not at store prices. These figures will show that between 20 percent and 30 percent of the food used in many homes originates from milk.

The sales record is very easy to keep because it just enumerates the dairy products and gives the value which, of course, is the price received for the product.

After the report is kept for a few months the demonstrator can make a check on her progress. The sum of the products used at home and the sales should total the production record. This often will not be the case as there are losses of dairy products, but this record will be very helpful to show whether there is a loss or not.

In a supplementary report there are some hints on progress made on the farm. The question is asked whether the following improvements were made: Cooling tank built, sterilizer prepared, milk house constructed, windows screened wherever milk is produced or handled, churning equipment secured, herd tested for disease, exhibit results, number of demonstrations given, and finally the cost of the improvements.

CONCLUSION

The following poem was selected by Miss Jessie Hoover who was active in the Bureau of Dairy Industry in Washington so long, and teaches us a valuable lesson.

A Modern Dinner Pail

Aunt Lizzies's come to visit us,
And my, but she is smart,
'Most everything I ask of her
She knows it all by heart.

She's taught us all the health rules,
What foods to eat and why,
And if we don't like certain foods
She coaxes us to try.

So we have lots of vegetables
And cereals, as we should,
I never knew until she came
That oatmeal was so good.

And when she packs my dinner up,
I tell you, she knows how,
For fruit and nice thin sandwiches
Make lunch attractive now.

Some days she puts a custard in
That's just as smooth as silk;
And sometimes small crisp cookies, too;
But always—GOOD FRESH MILK.

She puts this in a bottle,
Or in a pint fruit jar;
She says that MILK, a quart a day,
Helps keep us up to par.