SPECIAL.

Issued December 18, 1914.

U. S. DEPARTMENT OF AGRICULTURE.
OFFICE OF THE SECRETARY.

ADVANTAGES OF DAIRYING IN THE SOUTH.

Prepared in the Dairy Division of the Bureau of Animal Industry.

In many sections of the South a one-crop cotton-growing system prevails. Certain evils produced by this system are very forcibly demonstrated on many farms, among which are (1) a cash income but once a year, (2) an unequal distribution of labor throughout the year, and (3) impoverishment of the soil.

DAIRYING PROVIDES A STEADY CASH INCOME.

A one-crop cotton-growing system forces a great many farmers either to borrow money with which to make the crop or to buy supplies on a time basis. High rates of interest must be paid. The merchant who furnishes the supplies also frequently does business on borrowed capital. What the South needs is not the abandonment of cotton growing, but the weaving into the farming system of something that will in itself be profitable and also furnish ready cash throughout the year. Dairying meets these requirements. It is adaptable to the conditions of the large and the small farmer, whether he owns or rents the land.

Dairying, properly conducted, is a profitable business and a safe and steady line of farming affected less by uncertainties of weather extremes or late seasons than many cropping systems. It is a cash business, furnishing a sure and reliable income, puts the farm on a cash basis, and thus saves the high rates of interest paid for money on short loans and the high prices charged for supplies bought on credit. On a large proportion of the farms in the South small herds of good dairy cows will furnish enough ready cash to finance the making of the cotton crop and at the end of the year leave the money

NOTE.—Intended for farmers in the cotton belt who desire to diversify their farming because of the economic crisis which adversely affects the cotton crop at this time.

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received from the cotton as a clear cash profit. Such a plan, more than anything else, will eliminate the old lien system, which keeps many farmers one year behind.

DAIRYING EQUALIZES THE DISTRIBUTION OF LABOR THROUGHOUT THE YEAR.

Dairying furnishes profitable employment for labor and equalizes the distribution of labor throughout the year. The gathering of bedding, hauling of manure, repairing of fences, etc., furnish paying work for the farm hands at seasons when, on account of wet weather, help is not needed in the cotton fields or when steady work is scarce or lacking altogether. With cash coming in every week or month a better class of labor can be employed.

On farms where there are children of 8 years and older dairying furnishes them with profitable employment which does not interfere with their attendance at school. They can assist in milking and other work before and after school and in this way contribute materially to the income of the farm.

DAIRYING IMPROVES THE SOIL.

Dairying furnishes large quantities of manure for the cotton fields and thereby returns to the land about 75 per cent of the fertilizing value of the crops which the cows have consumed. Likewise the cottonseed meal, so largely used as a nitrogenous fertilizer, is one of the best milk-producing feeds and loses only a small percentage of its fertilizing value when fed to cows. Every garden spot in the South is a monument to the value of manure.

A good system of dairy farming rests upon crop rotation, which in itself restores fertility to the land, for the raising of feed is necessary to the profitable keeping of cows, and the best feeds for them are the leguminous crops, such as soy beans, vetches, lespedeza and other clovers, velvet beans, alfalfa, etc. These crops are preeminently soil builders, since they gather nitrogen from the air. Nitrogen is the most expensive element of fertilizers, and it is a valuable part of a ration for dairy cows. The rotation of crops and the manure from the cows continually going to the land will soon double the production of cotton per acre and at the same time decrease the fertilizer bills. This increased production will enable the farmer to raise on a smaller area of land as much cotton as, or more than, he does at present.

DAIRYING PROVIDES A MARKET FOR FEED CROPS.

Dairying furnishes a good home market for all the feed crops which can be grown on the farm. In rural districts and small towns the local markets for most of these crops are very limited, and often-

times the comparatively small amounts possessed by the farmer make it unprofitable to transport them to the larger markets. This is especially true if the roads are bad. In such cases dairy cows furnish the means for converting these crops into finished products which are easily transported and which bring good prices.

Dairying also enables the farmer to utilize for feed and bedding large quantities of roughage, such as straw, corn stover, shucks, and coarse and weedy hay, which can not ordinarily be sold in the market.

Often two crops can be grown on the same land in one season. By growing such crops as corn, sorghum, pea vines, etc., after the wheat, oat, or rye crop has been cleared off, excellent feed crops can be provided at minimum cost of growing, because of the small amount of cultivation necessary. These crops can be preserved in the silo, and thus the cows are provided with good succulent feeds for winter feeding and when pasturage is short. With roots, leguminous hay, silage, stover, straw, and the cottonseed meal obtained by exchanging cotton seed, all the feed for the cows is raised on the farm.

OTHER ADVANTAGES.

Climatic conditions in the South are favorable for dairying. Less expensive buildings for the protection of cattle are required than in colder climates. This reduces the expense for care and housing. The long grazing season and the many excellent grasses which grow luxuriantly make it possible to produce milk, butter, and cream at a low cost for a large part of the year.

The scarcity and high price of good dairy cattle are other attractive considerations, for after a farmer has become established in the business the sale of surplus cattle can be made a source of considerable income and profit.

The skim milk obtained from a herd of cows is one of the best supplementary feeds for hogs and poultry. These two lines of live stock furnish profitable cash side lines and naturally go hand in hand with dairy farming.

Large quantities of condensed milk, butter, cream, and cheese must now be purchased in other sections. The South can produce these at home. If the supply is constant and the quality good, southern dairy products will find a ready market at profitable prices.

Dairying, properly conducted, will restore fertility to the southern farm and equalize the distribution of labor throughout the year. It will put the southern farm on a cash basis, so that the cotton crop, free from all liens, can then be sold for cash whenever it will bring the highest market price.

The following publications giving further information may be obtained free on application to the Department of Agriculture, Washington, D. C.:

Farmers' Bulletin 55. The Dairy Herd: Its Formation and Management.
Farmers' Bulletin 349. The Dairy Industry in the South.
Farmers' Bulletin 509. Forage Crops for the Cotton Region.
Farmers' Bulletin 541. Farm Buttermaking.
Farmers' Bulletin 578. The Making and Feeding of Silage.
Farmers' Bulletin 589. Homemade Silos.
Farmers' Bulletin 602. Production of Clean Milk.

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SPECIAL.

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U. S. DEPARTMENT OF AGRICULTURE,

OFFICE OF THE SECRETARY.

FEEDING THE FARM COW IN THE SOUTH.

Prepared in the Dairy Division of the Bureau of Animal Industry.

FEED THE COW LIBERALLY.

In the cotton-growing sections of the South, where comparatively few cattle have been kept and where they have not been regarded as a source of profit, the idea has become prevalent that profitable cattle are those that consume little feed. It should be remembered, however, that the feed they consume is used for two main purposes, (1) to support the body and (2) to produce milk. Each one of these things requires a certain amount of feed. If just enough feed is given to support the body, there is nothing left for the production of milk. Cow feeds generally are worth much more in the form of milk, cream, and butter than in the form of feed, and the cow that can convert the most feed into the most of these products is the most profitable.

The cow is an animal that requires a large amount of feed, especially roughage; therefore quantity is one of the first and most important principles of feeding.

PASTURE AND ROUGHAGE.

Cows do best and produce the largest quantity of milk in early summer, when grass is abundant. Grass is the best feed known, and when possible cows should have plenty of it. If pasture is limited, forage crops, such as corn, sorghum, millet, and the like, should be planted to supplement the pasture and assure plenty of green feed during the growing season.

Green, juicy feed, besides producing large quantities of milk, keep the cow's digestive system in good condition; consequently, some such feed in winter is desirable. Patches of rye or oats near the barn furnish grazing at times, but can not be depended upon to furnish all the cow needs every day from the appearance of frost until spring opens.

NOTE.—Intended for farmers in the cotton belt who desire to diversify their farming because of the economic crisis which adversely affects the cotton crop at this time.

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A constant and dependable supply of juicy feed for cows can be obtained in turnips, rutabagas, or carrots. These roots can be fed to cows without injuring the taste of the milk, provided they are fed immediately after milking.

Since cows require it, and roughage is the cheapest feed and one that every farmer can produce on the farm, cows should be given all of this material that they will eat without waste. Such hays as pea-vine, vetch, soy bean, and other legumes are the best dry roughage for feeding, but the grass hays, shucks, and coarse hays of the farm are also good. The coarser hays are eaten more readily if mixed with the better hay.

If a man has 10 cows or more the cheapest form in which juicy feed can be furnished for winter feeding is silage. Silage spoils on exposure to the air, and with less than that number of cows it can not be fed off rapidly enough to keep the top layer in good condition.

GRAIN FEEDS.

With plenty of roughage and rutabagas or turnips the cow will keep in good condition throughout the winter and produce a fair flow of milk, but she can not consume enough of these bulky feeds to furnish all the food elements necessary to produce the largest amount of milk, consequently some very rich feeds which are not bulky must be added. Such feeds are bran, cottonseed meal, shorts, and corn meal. Just what grain or meal is best to give a cow depends upon the kind of roughage she gets. Pea-vine, vetch, clover, soy-bean, and velvet-bean hay are among the best roughages. Therefore if the cow gets plenty of such hay she will not need much cottonseed meal and bran. When the cow has all the pea-vine, soy-bean, clover, or vetch hay and turnips or rutabagas that she will eat, a good mixture of grain and meal to give her is:

One part by weight of wheat bran;
One part by weight of cottonseed meal.

Grass hay, shucks, straw, and the like contain comparatively little of the elements found in cottonseed meal, bran, and such feeds, and when these roughages are fed, more cottonseed meal will have to be used to furnish the elements the cow must have to produce the largest amount of milk. If grass hay, shucks, straw, and rutabagas or turnips form the roughages, a good mixture of grain and meal to feed is:

One part by weight of wheat bran;
Two parts by weight of cottonseed meal.

The grain mixture is the most expensive part of the feed, and should be given to the cow in proportion to the milk she gives. About 1 pound of either of the mixtures mentioned should be fed

for each 3 pounds of milk produced. For instance, if the cow gives 12 pounds of milk, she should receive 4 pounds of the mixture. More of the mixture can be added if it will make the cow give enough more milk to pay for the extra feed.

Cottonseed meal is one of the best milk-producing feeds, but it is very rich and if fed in too large quantities may injure the cow. To avoid this it is well to mix bran or some light, bulky feed with it. If cottonseed meal is the only meal or grain fed, and the roughage contains no green feed of any kind, about 4 pounds of cottonseed meal a day can be fed without injury. By feeding turnips or any other green feed the meal may be increased to about 6 pounds a day.

Corn meal is an excellent feed to mix with cottonseed meal, but usually it is too expensive to feed profitably. If corn sells for more than 60 cents a bushel it probably will not pay to use it as cow feed.

PLENTY OF FEED IS BETTER THAN STOCK POWDERS.

The use of stock powders and patent stock feeds is a very expensive and wasteful practice. When a cow is well she needs no medicine or stimulants, and when she is sick she needs to be treated for the particular ailment she has. The lean, rough-haired, hollow-eyed condition of many cows is not always due to sickness, but generally to lack of feed or to effects of ticks. If a cow receives plenty of pea vine, soy bean, vetch, or clover and the other feeds mentioned in this circular, she will need no condition powders of any kind. When free from ticks and plenty of feed is given and she is not in good condition, then she requires special treatment by some one who knows how to treat such cases.

GOOD CARE IS IMPORTANT.

In addition to good feed, the cow must have good care in order to make the greatest profit. Exposure to cold winds and rains greatly counteracts the effects of good feeding. Stalls in which the cows are kept should be free from large cracks that admit cold wind in drafts. Ventilation is needed, but the air should be admitted through windows or openings high enough from the ground to prevent the wind from blowing on the cows. The stall must not become wet and miry with manure or from the rain. It should be kept dry and well bedded with leaves, straw, sawdust, or other available material. This will not only keep the cow clean and make her comfortable, but will afford a pleasant place to milk in. The bedding will also add to the amount of manure that can be carried to the fields.

The cow is a nervous animal and should be treated gently and kindly. If she steps on the milker's foot, or slashes his face with her

tail, or kicks when her teats are pinched, she should not be kicked in return; and if the feed-room door is left open and she goes in, she should not be beaten for it. A careful milker rarely suffers injury by the cow, and she will respond readily to care, patience, and kindness on the part of the milker. Rough treatment is expensive, for it reduces the milk flow.

For further information on the feeding of cows write to the Department of Agriculture, Washington, D. C., for Farmers' Bulletin 22, The Feeding of Farm Animals.

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U. S. DEPARTMENT OF AGRICULTURE.

OFFICE OF THE SECRETARY.

THE FEEDING AND CARE OF DAIRY CALVES.

Prepared in the Dairy Division of the Bureau of Animal Industry.

FEEDING THE COW DURING PREGNANCY.

The feeding of the dairy calf should begin before it is born. Too many dairymen practice very scant feeding of pregnant dry cows, and as a result weak, puny calves are dropped which from birth are handicapped in their development and are difficult to feed and care for. It is false economy for any dairyman to withhold feed from a cow under such circumstances, as this is likely to affect unfavorably the future welfare of the calf as well as later milk production by the cow. While the demands upon the cow at this time are perhaps not quite so great as when in full milk production, there is nevertheless a severe strain upon her and she should be fed liberally so as to be able to produce a strong, well-developed calf and so that she may be in good condition to give a large flow of milk.

TEACHING THE CALF TO DRINK.

In nature the calf sucks the cow until it can support itself. In modern dairy farming, however, the value of butterfat and whole milk forces the dairyman to separate the calf from the cow soon after birth. The milk produced by the cow for the first few days (colostrum) has properties which put the calf's digestive system in good working order. It is therefore necessary that the newly-born calf have this milk. It is a good practice to let the calf suck the cow for about 48 hours after birth, but if weak and poorly developed it may be well to let it suck for several days to gain strength.

The longer a calf remains with the cow the harder it is to teach it to drink, but it is usually a simple matter to teach a good robust calf to drink if taken when not more than 2 days old. Before this is attempted the calf should be kept from the cow for about 12 hours;

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it will then be very hungry. About 2 quarts of its mother's milk, fresh and warm, should be put into a clean pail and held in front of the calf, which will sometimes put its nose into the pail and drink without coaxing. In most cases, however, it will be necessary to let the calf suck the fingers and by this means gradually draw its nose into the milk. The fingers should be removed carefully as soon as the calf gets a taste of the milk. It will oftentimes take its nose out of the milk in a few seconds, and if so the operation will have to be repeated. Patience is necessary. Usually after the second or third feeding the calf will drink alone. Occasionally a calf is stubborn and its nose has to be forced into the pail; in such cases it should be straddled and backed into a corner. The nose is then grasped with one hand, two fingers being placed in the mouth and the nose forced into the milk, when the calf, by sucking the fingers, will draw the milk up into its mouth. The fingers should be gradually removed and this operation repeated until the calf will drink alone.

TIME OF FEEDING AND QUANTITY OF MILK TO BE FED.

When a calf is young it is best to feed it three times a day, as nearly eight hours apart as possible; but many successful feeders feed only twice a day. The calf must be fed regularly and in equal quantities. It is impossible to give a rule which will apply to all cases, for some calves have greater appetites than others, grow faster, and therefore should have more milk. The working capacity of the stomach of the calf is small, and during the first few weeks more troubles are caused by feeding too much milk than by feeding too little. As a rough guide to the inexperienced feeder the following is suggested:

First week. Feed a 60-pound calf 4 quarts a day of its mother's milk, warm from the cow.

Second week. If no digestive troubles appear and the calf is thrifty, increase the feed to 5 or 6 quarts of whole milk a day. This does not need to be its mother's milk.

Third week. Feed as for second week, except that 1 quart of skim milk is substituted for 1 quart of the whole milk.

Fourth week. Same as third week except that one-half of the milk should be skim milk and one-half whole milk.

When the calf is 1 month old it may receive all skim milk provided it is thrifty. The amounts can be increased gradually until it is 3 months of age when it should be taking 8 to 10 quarts a day.

The foregoing rule for feeding applies only to a calf weighing about 60 pounds at birth. It may be varied according to weight and the vigor of the calf. Experience will soon teach the feeder how to vary the amounts. Larger calves will need a little more milk. When skim milk is used instead of whole milk some feeders attempt to feed

more of it, because they think that the extra amount given will compensate for the loss of the fat. This is entirely wrong. No more skim milk should be fed than if whole milk were used, but the fat removed from the milk should be replaced by grain, as is pointed out in another paragraph.

HEATING MILK FOR CALVES.

While the calves are young the milk should be heated to blood heat (90° to 100° F.). When 2 or 3 months of age calves will do well on cold milk, provided it is of the same temperature, or practically so, at each feeding. The important thing is that the milk be of the same temperature at each feeding. Dirty or old milk should not be given.

GRAIN TO FEED WITH MILK.

A little grain should be fed as soon as skim-milk feeding begins, in order to replace the butter fat removed in the cream. Two parts, by weight, of cracked corn and one of wheat bran make a good grain mixture which every farmer can readily secure and requires no special preparation. The calf should be taught to eat this grain by sprinkling a little of it in the feed box right after feeding the milk. No more grain should be fed than the calf will clean up readily.

ROUGHAGE AND PASTURAGE.

The calf should be supplied with plenty of roughage, preferably clover, alfalfa, or pea-vine hay; but if these are not available, mixed hay, bright corn fodder, or shucks may be used. This roughage should be kept before the calves in a rack or a box where it can be kept clean and fresh by renewing each day. The calf, when it is a week old, will begin to pick at this, and at one month of age will be taking a considerable amount. As in feeding grain, cleanliness is of great importance.

The calf will do well on pasture, and if this can be provided convenient to the buildings he will be able to get the greatest part of his roughage in this way.

CLEANLINESS NECESSARY IN FEEDING CALVES.

Cleanliness is one of the most important factors in feeding young calves. Clean feeding pails, troughs, and stalls are safeguards against digestive troubles. Milk should be fed only in clean pails, which should be washed and scalded after each feeding. All feed boxes should be kept clean. Special care should be taken to prevent meal from fermenting in the corners of boxes. Fermented or moldy feed will often upset the digestive system of a calf and endanger

its life. No more grain should be fed than will be cleaned up in a few minutes. The bedding in calf stalls becomes wet very quickly. The calf should by all means be kept dry, and it is therefore necessary to keep the stalls well bedded at all times.

SCOURS IN CALVES.

The principal difficulty in raising calves is scours. This trouble is usually due to mistakes in feeding—dirty milk, dirty pails, sour milk, fermented grain, irregular feeding, overfeeding; almost any mistake in feeding is liable to bring about this trouble. The first thing to be done in such cases is to reduce the feed about one-half and see that it is fresh and clean in every respect. Oftentimes this will be all that is necessary, and then the calf can be gradually brought back to full feed. If the trouble is serious and persistent, give the calf 2 to 4 tablespoonfuls of castor oil in milk as a physic, and two to three times daily a mixture of one part salol and two parts subnitrate of bismuth in doses of 1 to 2 teaspoonfuls, depending upon the severity of the case and the size of the calf. If scours is general and persistent, it will be well also to disinfect the calf stalls with compound solution of cresol, or some other good disinfectant. (See Farmers' Bulletin 480, "Practical Methods of Disinfecting Stables," which may be obtained from the Department of Agriculture, Washington, D. C.)

If calves begin to scour in one or two days after birth and the discharge is white, acute contagious scouring is probably the trouble and will require the most thorough disinfection and the prompt services of a competent veterinarian.

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OFFICE OF THE SECRETARY.

MARKETING BUTTER AND CREAM IN THE SOUTH.

Prepared in the Dairy Division of the Bureau of Animal Industry.

Most of the surplus butter from the farm cow in the South is exchanged for groceries at the country store. On account of poor quality, unattractive packages, and irregular supply, the prices received for this butter are very low. Bulletins explaining how the housewife can make good butter and how to put it up in attractive packages may be obtained without cost by applying to the Department of Agriculture, Washington, D. C.

Purchasers of butter like to buy from persons who can furnish it the year round. Usually the market for farm butter is oversupplied during the summer season. This is because cows generally freshen in the spring and thus furnish a greater supply of butter throughout the summer, when grass and green feed are abundant, than at any other time of the year. For this reason the price of butter is lowest in summer and highest in winter. To take advantage of these conditions farmers should have their cows freshen in the fall; this would tend to equalize the supply of butter throughout the year.

MARKETING BUTTER.

In many cases no great effort is made to find a good market for the farm butter. Too often near-by grocery stores are regarded as the only market possibility. Boarding houses, women's clubs, hotels and restaurants, and private families, not only in the home towns but in surrounding towns, should be canvassed and a sample of the butter exhibited. In this way a good market for farm butter may be secured if the butter is of good quality and can be supplied regularly.

The frequency of delivery will depend upon the demand of the trade. Often the farmer or some member of his family can without inconvenience deliver the butter to the purchasers. When those who have butter to sell can not deliver it to distant purchasers they should investigate the opportunities offered by the Parcel Post Service.

NOTE.—Intended for farmers in the cotton belt who desire to diversify their farming because of the economic crisis which adversely affects the cotton crop at this time.

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SPECIAL MARKETS FOR CREAM.

Cream obtained by running the warm whole milk through a cream separator is a very convenient form in which to market the product of cows. Less equipment and labor are required for this method than if butter is made.

For handling cream it is necessary to have a separator, shipping cans, some appliances for heating water to wash utensils, and some means for cooling the cream.

Cream if not properly cared for is easily spoiled. Directions for taking the proper care of milk and cream are described in another circular which is sent free by the Department of Agriculture.

Since the fat is its most valuable part, cream is usually sold according to the pounds of fat it contains. For determining the percentage of fat in cream the Babcock test, which is a simple process, is used. Small samples of cream are tested and the percentage of fat shown is multiplied by the weight of the cream from which the sample is taken. For example, if a sample of cream from a can containing 40 pounds is found to test 25 per cent, the pounds of butterfat are found by multiplying 40 by 0.25, which is 10 pounds. The persons buying the cream generally do the sampling and testing.

Hotels, restaurants, railroad eating houses, soda fountains, and ice-cream manufactories offer markets for fresh, sweet cream. Such markets require a high-class product of uniform quality and a dependable supply delivered at regular intervals. This makes it necessary for farmers who supply such markets to have good transportation facilities.

SELLING CREAM TO CREAMERIES.

The market for cream within reach of the largest number of farmers is the creamery. This furnishes a constant demand for cream, whether in large or small quantities. There are three ways of getting cream to the creamery or shipping point:

1. Each farmer may haul his own cream.
2. Farmers in a community may take turns in hauling their cream.
3. A man may be employed to haul all the cream regularly and each farmer may pay for this service according to the amount of cream he sells.

The third method is on the same principle as the rural free delivery of mail matter. Under this system the hauler at regular intervals comes to the farmer's door, gets the cream, and takes it to the creamery or shipping point. The cream is weighed, sampled, and poured into a can in the wagon. The samples and records of weights are sent to the creamery. Routes may be established close to the creamery, and the cream delivered direct, or they may be estab-

lished at distant points and the cream delivered to a central station for shipping to the creamery. Subroutes may radiate from points on the main route and thus cream can be collected from a wide area.

In communities in which interest in selling cream is just being aroused and where there is not cream enough produced to pay for having it collected each day, the cream can be kept from day to day and collected twice a week in winter and three times in summer. Where this is practiced the farmers must either use ice to keep the cream as cold as possible, or place the cans in cold water from the spring or well. Unless extra care is taken to produce the cream in the most cleanly manner, and unless it is kept thoroughly cold at all times, this method is not advisable.

The shipping of cream compels the farmer to have a separator. The cost of the separator is often discouraging to the man who has only two or three cows, and who, but for this expense, could sell a small amount of cream. This, however, need not prevent the purchase of a separator, as some companies sell their machines for a small cash payment, the remainder to be paid in monthly or bimonthly installments. This enables the farmer to let the cows pay for the separator.

Again, in the case of several farmers living near one another, one separator, centrally located, can be used by all. The central separator offers a splendid opportunity for landowners to encourage their tenants to keep cows. Even if the tenants have only small quantities of milk, it will bring more money in the form of cream than if the milk were churned and the butter sold. Carrying the milk to the separator is also less trouble than making the butter.

In sections where cream can be marketed, routes operated in some such way as described are to be commended, provided the cream is produced and handled properly, as they enable the farmer to procure a steady cash income from his cows by providing a market at his door.

This circular is intended for distribution in sections of the South where special efforts are being made to encourage dairying in the cotton-growing sections, therefore some of the practices recommended here may not be advisable for sections where dairying is an established industry.

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U. S. DEPARTMENT OF AGRICULTURE,

OFFICE OF THE SECRETARY.

MAKING FARM BUTTER IN THE SOUTH.

Prepared in the Dairy Division of the Bureau of Animal Industry.

A large percentage of the milk and cream produced in the Southern States is made into butter on the farm. The butter produced is variable in quality and color and is marketed in packages of all shapes and sizes, and for these reasons does not find good markets. Better markets could be secured for southern-produced farm butter if it were properly made and put into attractive packages. The following practical suggestions will be of assistance in improving the quality and appearance of the butter:

SKIMMING THE MILK.

Experience has shown that in general practice the churning of whole milk results in butter of poorer quality and in greater losses of butter fat in the buttermilk than if cream is churned. It is therefore best to skim the milk and churn the cream. The best way to skim the milk is by means of a separator. A farmer who has only two or three cows but no separator may put the milk into deep, narrow cans (shotgun cans) and set them in cold water, and when the cream rises it can be removed with a shallow spoon. Where this system is used it usually takes about 12 to 18 hours for all the cream to rise. Care should be taken to keep the milk cold, in order to make the cream rise rapidly. The old method of setting the milk in shallow pans should not be used, as the cream does not rise so completely as when set in deep cans in cold water; furthermore, the quality of the cream is not so good and there are more vessels to wash and care for.

QUALITY OF CREAM.

To produce farm butter of good quality it is essential that the cream be clean. Another publication, The Production and Care of

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Milk and Cream, tells how to produce clean cream. The cream should be held as sweet as possible until time for it to be ripened for churning.

RIPENING THE CREAM.

As soon as the cream is skimmed it should be cooled and kept cool until enough has been collected for churning. In adding cream from time to time the newly separated cream should be cooled to the temperature of the old, as warm cream causes souring to set in. Cream ripening or souring for churning should begin 18 to 24 hours before churning time. When ready for ripening or souring the cream should be warmed and held at a temperature of about 70° F. until it has a mild, sour flavor and a smooth velvety appearance when stirred. This cream can be either warmed or cooled by setting into a basin of hot or cold water, as the case may be. Sweet cream should never be added to cream that is ready to churn.

STARTER.

In cold weather and at times when it is difficult to get the cream to sour, the addition of sour cream, or sour buttermilk, may be made to hasten souring. The milk used to hasten souring is known as a starter. Care should be taken not to add sour milk of bad flavor to cream, as it will cause the butter to have the same bad flavor.

COLORING THE BUTTER.

The natural color of butter varies considerably from almost white to a deep yellow, but a light golden yellow is usually preferred by consumers. During fall and winter, and in some instances during the entire year, it may be desirable to add artificial butter color to insure a uniform color. The material used for coloring should be a vegetable product which is perfectly harmless; this can be obtained at or through drug stores. Color should be added to the cream just after it has been put in the churn. The proper amount to use can easily be learned by experience.

CHURNS AND THEIR CARE.

Some form of churn having no dasher, such as the round or barrel-shaped type, should be used. Churns of complicated make should not be used, as they are hard to keep clean and have no advantage over other types of churns. Before use the churn should be rinsed in boiling water and then thoroughly cooled with cold water. After churning is completed it should be rinsed with cold water, thoroughly washed in hot water, and then scalded and set in a clean

place, exposed to sunshine and air until needed. All utensils such as ladles, molds, and bowls, or workers used in connection with churning should receive similar treatment.

CHURNING.

For different conditions the best temperature for churning can be obtained only by experience. The temperature should be such that the butter will come in about 30 minutes after churning begins. When churned for a shorter time than this a large part of the butter-fat is left in the buttermilk. Churns advertised to require only three to seven minutes of churning should be avoided. Hot or cold water should never be put into the churn for making the cream colder or hotter. When this is necessary the cream should be set in a basin of hot or cold water and frequently stirred. The churning should be stopped when the butter is in particles about the size of a pea. These particles should not be gathered, but the buttermilk should be drawn off through a strainer. Cold water should then be added to the butter granules, the churn gently agitated, and the water drained off. This should be repeated until the water is clear as it runs from the churn. Buttermilk is washed out and not worked out of butter.

SALTING AND WORKING THE BUTTER.

Butter may be salted and worked in a butter bowl. If several pounds are made at each churning, a hand worker is desirable. Salt should be added to the butter at the rate of about 1 ounce of salt to each pound of unsalted butter, although the amount of salt depends upon the demand of the consumer. Butter should be worked until the salt is evenly distributed. If any grittiness is noticeable when tasted, it is evident that the butter is not sufficiently worked. The butter should be worked and handled with a ladle and never touched with the hands.

Another evidence of insufficient working is a streaked or mottled appearance a few hours after the working has been completed. Overworking should be avoided, as it makes the butter greasy or salvy.

PREPARING BUTTER FOR MARKET.

Butter should be molded into square prints and wrapped in parchment paper. In addition to this, placing the butter in pasteboard boxes or cartons, which can be obtained at small cost, will protect it from bruises and finger prints. Round molds should not be used, as in that form it is inconvenient to wrap and handle the butter. The name of the butter maker placed on the wrapping paper or cartons is a good method of advertising.

Methods of marketing farm butter are described in another circular which may be obtained on application to the Department of Agriculture.

EQUIPMENT FOR MAKING BUTTER ON THE FARM.

Churn.
Butter worker or butter bowl.
Butter printer (1-pound square print).
Scales or spring balance for weighing butter and salt.
Dairy thermometer.
Parchment paper.
Pasteboard boxes or cartons.
Butter ladles.
Strainer.

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SPECIAL.

Issued December 31, 1914.

U. S. DEPARTMENT OF AGRICULTURE,

OFFICE OF THE SECRETARY.

CONVENIENCES FOR HANDLING THE FARM COW AND HER PRODUCTS.

Prepared in the Dairy Division of the Bureau of Animal Industry.

An improvement in the conditions under which cows are kept on the average farm will greatly lessen the labor required in their care,

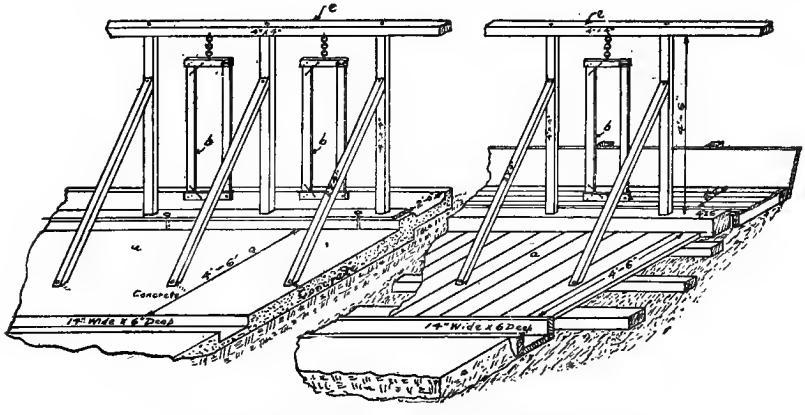

FIG. 1.—Arrangement of concrete and wooden stalls for cows.

make it more pleasant, and at the same time cause the cows to produce more milk.

COW STALL.

The cow must be kept in clean, comfortable quarters in order to produce the largest quantity of milk and butter. The essentials of such quarters are:

1. Plenty of light.
2. Plenty of fresh air, with no drafts.
3. Convenience.
4. A floor that can easily be kept clean.

NOTE.—Intended for farmers in the cotton belt who desire to diversify their farming because of the economic crisis which adversely affects the cotton crop at this time.

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Figure 1 shows a diagram of a simple and convenient arrangement of cow stalls. The cow stands on the platform (*a*) with her head through the stanchion (*b*), which is used to tie her in the stall. The gutter is to catch the droppings and urine, keep them out of the way of the milker, and also to prevent the cow from becoming soiled when lying down. The stanchion shown in figure 2 takes the place of a rope or halter. It is hung in the frame (*e*) with a few links of a chain at the top and bottom, which allow it to swing and be comfortable for the cow. The stanchion is fastened to the sill, which forms the back of the trough. One side of the stanchion opens on a pivot, closes in a slot, and is held fast by a wire loop or a pin placed in a hole bored through the top of the stanchion and piece that opens. The bottom of the feed trough is 2 inches higher than the platform upon which the cow stands. The floor of the feed trough and stall should rest flat on the ground. Concrete is preferable for the platform, gutter, and feed trough, but sound, smooth boards or plank can be used. A wooden floor must be kept in repair so that liquid will not leak through and puddle underneath and cause bad odors. A lean-to can be fitted up with this stall and made a very clean and convenient place to keep cows. Where barn room is scarce, the cows can be kept in these stalls at night

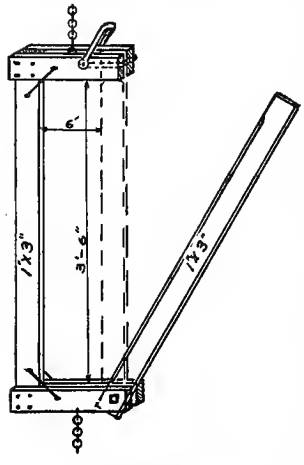

FIG. 2.—Detail of stanchion for holding cow.

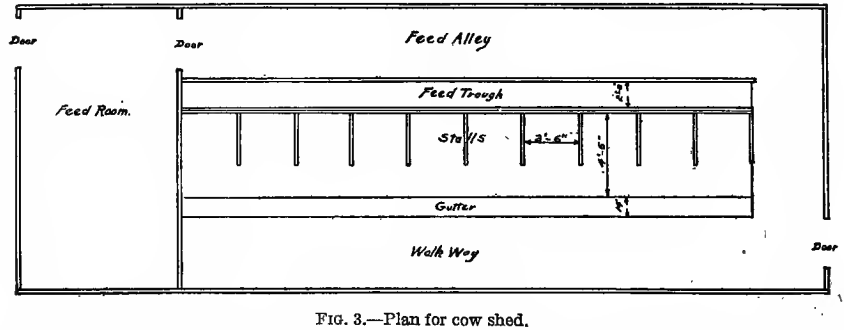

FIG. 3.—Plan for cow shed.

and in cold, bad weather with no discomfort to them. When this is done, plenty of bedding, such as straw, leaves, etc., should be put on the floor of the stall. Figure 3 shows a convenient arrangement for a shed or lean-to.

CALF STANCHION.

All calves when a few days old should be taught to drink milk, as this makes their handling less troublesome, and if a clean, warm stall equipped with stanchions for confining them while eating is provided, their feeding will be no more trouble than feeding pigs.

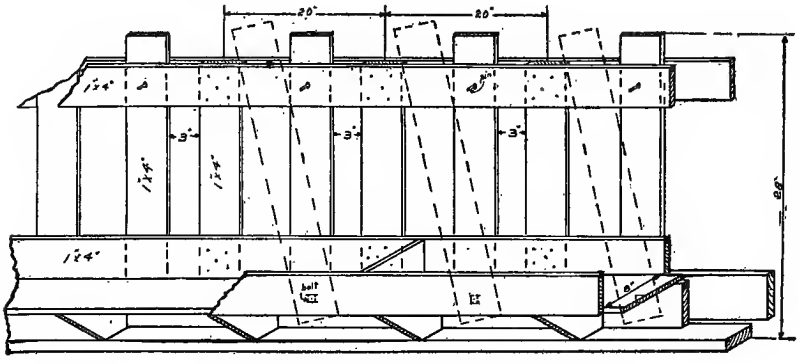

FIG. 4.—Stanchions for confining calves.

Figure 4 shows how these stanchions are made. A circular on the subject of feeding calves can be obtained by writing to the Dairy Division, Bureau of Animal Industry, Department of Agriculture, Washington, D. C.

MILK CANS.

Milk and cream from even a few cows can be much more conveniently handled in regular milk cans than in the shallow pans and wide-mouth buckets commonly used. Figure 5 shows a convenient can for collecting the milk at the barn and transferring it to the house.

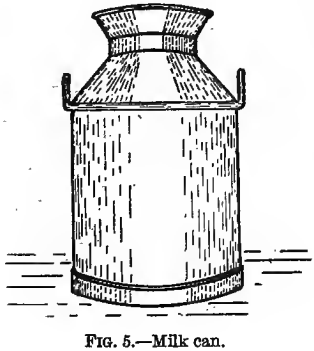

FIG. 5.—Milk can.

These cans may be bought in various sizes. For handling cream and skim milk where separators are used, or even where cream is set to sour for butter making, the "shotgun can," shown in figure 6, is very convenient. It can be easily covered and set in water and is convenient to handle.

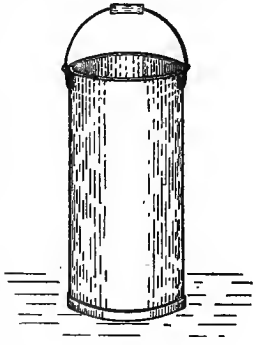

FIG. 6.—"Shotgun can."

MILK ROOM AND COOLING BOX.

Where even a few cows are kept, a separate room for handling the milk should be provided to relieve the oftentimes overcrowded kitchen. Well houses frequently have a room which, with the addition of a

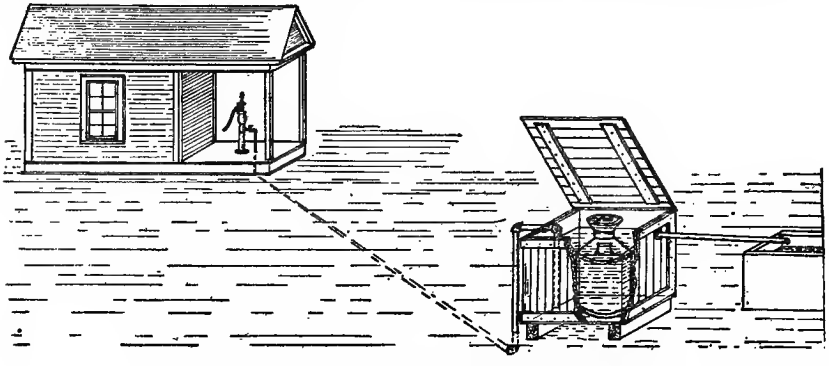

FIG. 7.—Arrangement for milk house and milk-cooling box.

concrete floor, shelves, and windows, makes a very convenient milk room.

A very great help in keeping milk and cream cool in summer can be had by placing a tightly covered box, protected from the sun, between

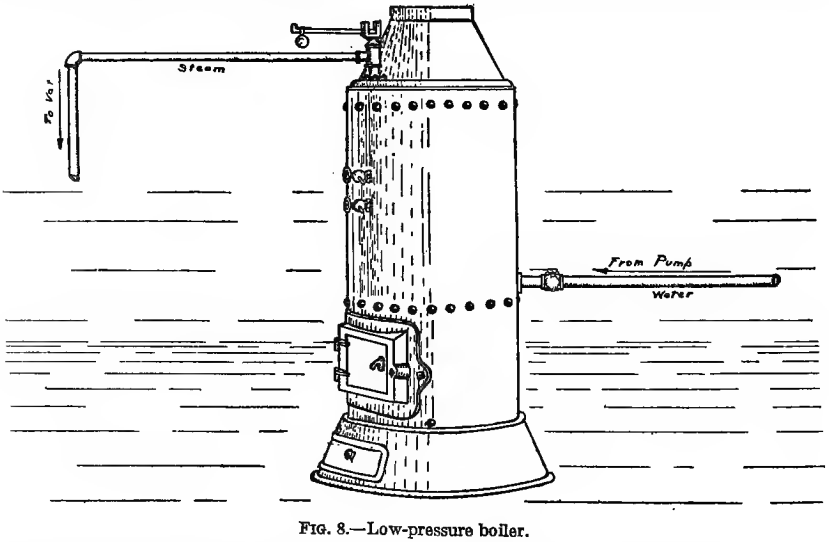

FIG. 8.—Low-pressure boiler.

the well and the horse-watering trough in such a way that each addition of water to the trough will pass through the box, and thus freshen the water. Figure 7 shows such an arrangement.

WATER HEATER.

One of the greatest conveniences on the farm where cows are kept is some means for heating an abundance of water for washing the milk vessels. Where a considerable number of cows are kept, heating water by means of steam from a small, low-pressure upright boiler, such as is shown in figure 8, is desirable, but on the small farm a stove with a basin fitted into the top (or it may be separate from the top) can be purchased cheaply and will serve the purpose, provided the water is properly heated. Water can be pumped from the well directly into the basin. In order to avoid heating the milk room and to do away with smoke and ashes, the water heater should be placed immediately outside the milk room, and if elevated the water from it can be run into the washing vat. Figure 9 illustrates such an arrangement.

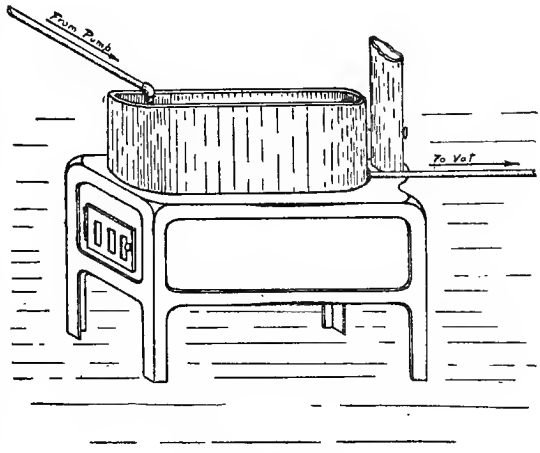

FIG. 9.—Water heater.

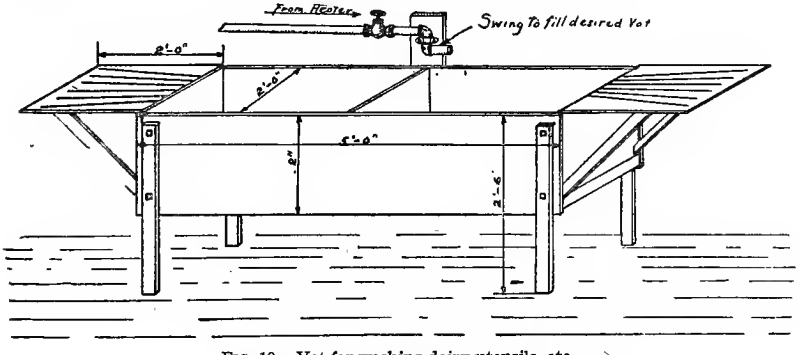

FIG. 10.—Vat for washing dairy utensils, etc.

EQUIPMENT FOR WASHING UTENSILS, ETC.

Some equipment is necessary in which to wash utensils used in handling milk. A vat similar to that shown in figure 10 is very convenient. One end of the vat can be used for washing and the other for rinsing and scalding.

Fiber brushes for washing milk utensils should replace the common dishrag, as they do better work and are more easily kept clean.

On every farm where as many as four or five cows are kept a cream separator is advisable, as it will reduce the labor required in handling the milk from cows more than any other one thing.

A refrigerator or ice box is desirable upon every farm where either a few or many cows are kept if it is practicable to secure ice for use in summer.

All the things mentioned above are practical, and their use will greatly lessen the labor required in handling cows and their product and at the same time enable the work to be pleasantly done, thus making the keeping of cows a congenial line of farm work. All the equipment, except the cans, brushes, heater, and separator, can be made on the farm at small cash outlay by anyone at all handy with tools.

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SPECIAL.

Issued December 31, 1914.

U. S. DEPARTMENT OF AGRICULTURE.

OFFICE OF THE SECRETARY.

THE PRODUCTION AND CARE OF MILK AND CREAM.

PREPARED IN THE DAIRY DIVISION OF THE BUREAU OF ANIMAL INDUSTRY.

A large portion of the milk and cream produced in the Southern States is sold in the form of butter. Much of this is of poor quality and therefore is sold at low prices. One of the principal causes of the poor quality of this butter is poor milk and cream, and it is the purpose of this leaflet to point out how a better quality of milk and cream may be produced.

THE COW.

To make good butter it is necessary to have clean milk from clean and healthy cows. Milk from unhealthy cows is not a safe article of food, even though there is no visible dirt in it. Special attention should be given to the condition of the udder, and any milk which appears slimy, ropy, or otherwise abnormal should not be used.

The body of the cow should be kept free from mud and manure. The hair on the flanks and udder should be clipped, as long hair favors the accumulation of filth. When the cow is kept in the stable the bedding should be clean and dry and used in sufficient quantities to keep the cow comfortable.

THE STABLE AND BARNYARD.

The stable should be well lighted, well ventilated, and so constructed that it can be easily kept clean. It should have a hard, nonabsorbent floor, without cracks where filth can collect. Dust or cobwebs should not be allowed to accumulate on the walls and ceiling, and it is a good plan to whitewash the walls and ceiling of the stable at least once a year. Manure should be removed at least once a day. The manure pile should be some distance from the stable; hog

NOTE.—Intended for farmers in the cotton belt who desire to diversify their farming because of the economic crisis which adversely affects the cotton crop at this time.

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houses, privies, and poultry houses should be far enough away so as not to contaminate the stable air, and the barnyard should be well drained so that there will be no mudholes. A clean yard is a great help in keeping the cows from becoming soiled by mud and manure. The yard should drain away from the buildings, and manure should not be allowed to accumulate in it.

FEEDS AND FEEDING.

The odor and flavor of milk are very readily affected by certain feeds, such as rape, cabbage, turnips, and silage, and such feeds should not be given immediately before milking. If fed after milking they will not taint the milk. When the pastures are overrun with garlic or wild onion the cows should be removed from the pasture three or four hours before milking. Moldy and decayed feed and such other feeds as may injuriously affect the cows' health and the character of the milk should be carefully avoided. Dusty hay should not be fed immediately before milking, nor should the cows be bedded at this time, as either of these operations will cause a circulation of dust in the stable which will affect the cleanliness of the milk. It is important that the water, of which the cow needs an abundance, should be fresh and pure.

UTENSILS.

All utensils which come in contact with milk should be made of smooth, durable material which can be easily cleaned. Utensils of wood and crockery are apt to be porous; it is impossible to clean them properly, and they should not be used in handling milk. Vessels made of heavy tin are good. The joints should be well closed with solder. All rusty utensils should be discarded.

All milk utensils should be thoroughly washed after each time of using and scalded with boiling water, special care being given to strainers made of cloth. Milk utensils should not be used for any other purpose than that for which they are intended, and when not in use should be kept in some place free from dust and odors and screened so as to protect them from flies. Improperly washed utensils acquire a bad odor and cause warm milk placed in them to absorb this odor; dirty utensils also cause the milk to sour quickly.

All vessels used in handling milk should be rinsed with cold or lukewarm water and then washed in hot water containing some good washing power, such as sal soda. Soap is not desirable for washing milk utensils. Fiber brushes are much better than rags for washing purposes, as they are more easily kept clean and do better work.

After the utensils are washed thoroughly they should be rinsed in scalding water and inverted on a rack in a clean place, screened from flies, but exposed to fresh air and sunshine, and allowed to remain there until required for use.

Strainer cloths should be thoroughly washed and boiled each day.

One of the most important things in the production of milk and cream of good quality is the care of the utensils in which they are handled. Utensils can not be properly cleaned without an abundance of boiling water. Equipment for furnishing this water is absolutely necessary where milk and cream of the best quality are produced. For a description of this equipment see the special leaflet on "Farm Conveniences for Handling the Cow and her Product."

MILKING.

Before milking the cow's udder and flanks should be wiped off with a damp cloth to remove any dust and loose hair which might fall into the pail. The milkers should milk with dry, clean hands, and should practice cleanliness in every respect while handling the milk.

CARE OF MILK AND CREAM.

Milk, whether to be sold in its natural state or to be separated, should be removed from the stable immediately after milking. If it is not to be separated it should be cooled at once to a temperature of 50° F. or lower and held there until disposed of.

The separator will produce cream of better quality than is possible with any other means of separation. If a separator is used, it should be thoroughly washed and scalded after each time it is used. If the milk is to be hand skimmed, it should be put into "shotgun" cans for the cream to rise, and the cans should be well covered to keep dust and insects out and be kept in a room free from odors. This is better than putting the milk into shallow vessels.

Thin cream sours more quickly than rich cream. With a rich cream there is also less bulk to handle, more skim milk for feeding purposes, and the cream is in better condition to make into butter. It is desirable to skim the milk so as to produce a cream containing between 30 and 35 per cent of butter fat. A great advantage in using a separator is that the richness of the cream can be easily regulated. Cream sours very readily at temperatures above 50° F.; hence it should be kept as much below this temperature as possible.

If warm cream is mixed with cold cream, the whole mass is warmed thereby, and souring will follow more quickly; therefore the newly separated cream should be cooled before adding it to the cream on hand. A thorough stirring each time newly separated cream is added

to other cream will bring the whole mass to an even temperature throughout.

The cream should be kept in a clean, well-ventilated place, in order that odors may not be taken up by it. If cream is sold to the ice-cream or retail trade, it should be delivered daily. If sold to the creamery, it should be delivered at intervals so frequent that it will reach the creamery in good condition. If properly cared for, cream need not be delivered oftener than twice a week in the winter and three times during the summer. Cream cans should be protected with blankets during delivery in the summer months, to prevent a marked rise in the temperature of the cream.

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