

# BULLETIN

OF THE

AGRICULTURAL AND MECHANICAL COLLEGE  
OF TEXAS

(In cooperation with United States Department of Agriculture)

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MARCH, 1915

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EXTENSION SERVICE  
BULLETIN B. 4

## THE DAIRY COW

The Production and Marketing of Cream in Texas



ADDRESS:

CLARENCE OUSLEY,  
Director of Extension Service,  
COLLEGE STATION, TEXAS.



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# BULLETIN

OF THE  
AGRICULTURAL AND MECHANICAL COLLEGE  
OF TEXAS

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## IMPORTANT NOTICE

This bulletin contains information that is just as applicable today as it was in 1915, when the bulletin was written .

Comparisons will stand in the same relation now as given in this bulletin, but the reader should remember that prices have changed, and prices quoted in this bulletin do not hold true today.

The list of creameries given in the bulletin is not correct since many of the smaller plants have been replaced by cream stations.

CLARENCE BUSLET  
Director of Extension Service  
DALLAS, TEXAS

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# THE DAIRY COW

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## THE PRODUCTION AND MARKETING OF CREAM IN TEXAS

BY

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### INTRODUCTION.

The importance of the dairy cow as a money yielding investment is not generally appreciated. The prosperity of many sections of our country, as well as several of the countries of Europe, began with a development of the dairy industry. Denmark and Holland owe their prosperity to their recently developed skill in breeding, caring for, and selling the products of their dairy cattle.

Thirty-five years ago Wisconsin farmers were still raising wheat as their principal money crop, but were not progressing financially. Wisconsin turned to the dairy cow and is now the leading dairy state of the union. It is also one of the leading states in the average wealth possessed by farmers. The dairy cow accomplished this result. What, then, are the reasons for the wonderful wealth-producing possibilities of the dairy cow?

First, she assists in diversification by consuming large quantities of coarse feeds and converting them into highly valuable forms of human food.

The next point in her favor is that of farm credit. The farmer's wife who makes butter and sells it each week on the market has a weekly income, and to that extent is independent of the ordinary sources of credit. The farmer who separates milk and cream and sells butterfat has at least a weekly income, and does not need to be accommodated at the store or bank. This point alone with our Texas condition of credit, under which the farmer is paying 10 to 25 per cent for the credit he receives, is sufficient to make the dairy cow an exceedingly valuable ally.

The next point which may be credited to the cow is the matter of fertility. It is a saying of farmers in dairy sections that they must have enough stock to consume the feed which they produce on their farms. Indeed, if a farmer sold only cream, or butterfat, from his farm, he would be selling practically no fertility at all, as a ton of butter contains only 50 cents worth of plant food. On the other hand, when hay, corn or

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cotton seed are sold from the farm, large quantities of fertility go with them. The elements which the farmer pays for when he buys commercial fertilizer are phosphorus, potash and nitrogen. These elements are contained in large quantities in the above mentioned feeds. Indeed, if you multiply the number of pounds of each of these elements contained in a ton of cotton seed meal by the price paid a pound for them when purchased in commercial fertilizer, the value of a ton of cotton seed meal as fertilizer alone would amount to more than \$30. This is given in the table below:

Elements.	Pounds in a ton of cotton seed meal.	Price a pound.	Value.
Nitrogen . . . . .	140	\$ .20	\$28.00
Phosphoric acid . . . . .	60.8	.06	3.65
Potash . . . . .	31.9	.06	1.90
Total . . . . .			\$33.45

When cottonseed meal or other feeds are consumed by the cow and the skimmed milk is fed to the calves and hogs, nearly all of these elements remain on the farm in the form of manure, only so much leaving as is carried off as a part of the bodies of the animals that are sold. Assuming that a certain amount of the value of manure is lost, the following is a conservative estimate of the value of the fertility saved to the farm each year by dairy cattle; and the farmer who keeps accounts should not neglect to give his cattle these credits.

Cows . . . . .	\$18.00 a head a year
Calves (over 1 year) . . . . .	7.00 a head a year
Calves (under 1 year) . . . . .	3.00 a head a year

Another point which may be credited to the dairy cow is that of a source of employment. It is a saying that as much money is made while sitting on a milk stool as in any other way. The dairy cow furnishes employment not only on good days, but also on rainy days; not only on days when one can work in the field but also on days when the ground is too wet to work and in the winter and certain parts of the summer time when under our cotton system there is very little work to do. She helps the farmer to get in more hours of employment. If a farmer worked ten hours a day for the 300 working days in the year, he would put in 3000 hours. Under any one-crop system a farmer can not profitably use all his time on the farm, and idle time is waste. The farmers who have a proper system of diversification and the proper sized dairy herd, are approaching very nearly the theoretical year's work of 3000 hours to the man on farm enterprises that bring in money.

Still another point in favor of the dairy cow may be called a growing bank account. The farmer who starts with one, two or more cows and mates them with a pure bred bull, tests his cows to know their producing ability, and raises heifer calves from his best cows is gradually developing a bank account upon his own farm. This comes about not only from the increased number of cows which he comes to own but through the increased value of each of these cows.

If, then, the dairy cow is so important to the farmer, the question of marketing his dairy products is of sufficient value for an extended discussion. This bulletin deals especially with the marketing of cream. The marketing of cream begins with the care of the cow at the time she is being milked. She should be in such condition as to permit no dirt or dust to drop into the pail. The cream should be separated from the milk with a cream separator, and should be carefully cooled and carefully handled until it has reached its destination at the creamery.

With the better marketing of cream comes the need of organization among dairy farmers. For the purpose of improving the quality of their herds the farmers of each dairy community should organize themselves into bull associations and cow-testing associations. The importance of these cooperative organizations may be illustrated by the attainment of the dairymen of Holland.

The average dairy cow in Holland in 1895 produced 112 pounds of butterfat. Through skillful breeding during a period of twenty years the average production has been doubled. Assuming that the first 125 pounds of butterfat which a cow produces, offsets the cost of keeping the cow, it is readily seen that a cow which gives only 125 pounds of butterfat in a year is worth only what she will bring for beef unless she is mated with a bull of a superior producing strain and thereby bears daughters which will have a higher producing ability than herself. It will also be seen that as all the butterfat produced over 125 pounds a year is net gain, a cow which produces 200 pounds of butterfat is much more valuable than the cow that produces only 125 or 150 pounds.

#### DEVELOPMENT OF CREAMERIES.

The development of creameries goes hand in hand with the development of farm dairying. With the introduction of the cream separator into the State in large numbers about 1905 came a demand for creameries, through which the product of the farm dairies could be sold to advantage. At that time there were only three or four creameries in the State, and very little butter was made, these plants being more milk and ice cream plants than creameries.

Dairying was by no means a popular industry, for the Texas farmer was well satisfied to depend on the one crop, cotton. About this time the ravages of the boll weevil paralyzed the cotton industry and the farmers were obliged to seek a new line of farming. Those who tried dairying found it a pleasant and profitable industry and creameries were in demand. From 1905, when the first local creameries were erected in Texas, the growth of the creamery business has been continuous, three or four well organized plants having been added to the list each year, and the capacity of the old ones enlarged to meet the demands of the growing business.

Texas has today about seventy creameries in operation. This does not mean that just so many local communities are engaged in dairy farming, for these creameries reach out in all directions and gather in cream through as many as 350 cream stations. There are but few counties in the State that do not have farmers who are patrons of creameries.

The present condition of the cotton market (February, 1915), with a low price, brings the farmer face to face with the fact that a one-crop system of farming is not dependable. Many are already seeking information in regard to dairying and creamery building. It is to be expected that in 1915 there will be more creameries organized, more cream separators sold, and more silos erected than in any one past year.

The Texas Dairymen's Association, The Texas Creameries Association, and the Texas Ice Cream Manufacturer's Association are three permanent organizations that have had much influence in hastening the development and improvement of dairying in Texas.

*Promoted Creameries.*—Parties who are considering the organization of a creamery are often confronted by the fact that there are a number of creameries in the State that have ceased operation. This causes them to ask why these plants are idle when there seems to be a demand for more creameries all the time.

Nearly every creamery in the State that has ceased operation was organized by a creamery promoter. The business of the creamery promoter is to organize these plants for the purpose of selling creamery machinery. The only requirement of the promoter is that he get the price he asks for the equipment furnished by his company. He gives little or no attention to the number of cows that are available in the territory. There are few, if any, localities in the State that have a sufficient number of cows to furnish the necessary raw material for the operation of a creamery. Where a creamery is put in and made successful there must of necessity be some organized effort to supply the community with more cows than are found in the average locality. The greater part of this work must be done before the creamery is ready for operation. The creamery promoter does not give this side of creamery organization work any consideration, but assumes that if the creamery is there, the cows will be obtained. The result generally is that the creamery fails before the cows to support it are obtained. It is a failure for want of raw material, and not because the creamery business would not be a success in this section of the country under proper conditions.

The prospective creamery stockholder will do well to have in mind the following points, should he ever be called on by a creamery promoter:

1. That the promoter has something to sell. He is not working just because he thinks the locality should have a creamery.
2. That if the people of the community decide they are in need of a creamery, the building can be erected and the equipment purchased for about thirty per cent less than the promoter will charge for it.
3. That the greater number of plants organized by promoters fail, and that a dead creamery is a hindrance to the development of the dairy industry of the community.

#### SELLING DAIRY PRODUCTS.

The fact that there are seventy active creameries in Texas gives abun-



dant evidence that the creamery industry is prosperous. Back of the growth in the creamery industry is a corresponding growth in dairying. Farmers are going into dairying and are finding it profitable. Access to creameries means better selling; better selling will bring a still higher percentage of profits. But in striving for these profits the farmer must keep two points in view. The point most commonly understood is a ready market which takes the farmers' goods at a good price; the other side of selling is the preparation of the goods for the market. A brief discussion, then, of the methods of selling dairy products will be of value.

The first question that presents itself to the prospective dairymen is: "How shall I market my product to the best advantage?"

There are several ways in which a dairyman can dispose of his product. He may sell it as whole milk, either retail or wholesale; he may sell it as sweet cream, either retail or wholesale; he may sell it as cream to the creamery; or, he may make it into butter. Let us compare briefly the relative advantages and disadvantages of these methods of marketing dairy products.

In the beginning it is well for the dairyman to understand that the form in which he should sell his product will depend, first, on the demand for the product; second, his location with reference to the particular market, and third, his equipment, or more broadly, his ability to supply a good quality of that particular product.

*The Whole Milk Retail Trade.*—The demand for whole milk is limited and is usually confined to a restricted area—principally around the larger cities. The demand for this product is variable and fluctuates with the supply. The demand is usually at its height during the late fall and winter months, decreasing during the spring and early summer months when the supply of "grass milk" is plentiful. This necessitates some provision for taking care of the surplus at a time when prices are unusually low. The price received for whole milk varies from 6 cents to 10 cents a quart retail, and from 16 to 25 cents a gallon wholesale.

From these prices it would appear, on the surface, that the selling of whole milk would be highly profitable. This is true when only the gross cash receipts are considered. We must remember, however, that the demand for whole milk is limited, and, as mentioned above, confined to sections around the larger cities where the price of land is high. This restricts the size of the farm and practically prohibits pasturage and the growing of feed crops, thus making the cost of the production of milk exceedingly high. Then, too, few dairymen consider the actual cost of delivering milk and look only at the receipts. Under average conditions it will cost from 2 to 3 cents per quart to deliver milk in bottles. This includes the cost from the cow to the consumer.

There are other objections to selling whole milk to the retail trade. Unusual hours are required and the work is objectionable to laborers. Collections are uncertain when dealing with so many customers. The sale of all the product as whole milk makes the raising of calves difficult. This tends to discourage herd improvement, the very basis of profitable dairying. The wholesaling of milk offers some advantages over retailing, but in the main the same objections apply.

*Selling Sweet Cream.*—Of late years, especially with the increased manufacture of ice cream, there has been created in this State a large demand for sweet cream—a demand that had previously been limited to supplying sweet cream for home consumption and confectionery purposes. Where a dairyman is so situated that he can cater to this particular trade there is no question but that it is one of the most profitable ways of selling his product. The price received for butterfat delivered in sweet cream is usually from 8c to 10c per pound higher than the price received for sour cream butterfat. This applies, however, only when special arrangement is made with the ice cream factory or creamery. In catering to this trade, however, the dairyman is forced to be more careful in the production, care, and delivery of his product, as the demand for such product will depend largely on its quality. It is well for every prospective dairyman to investigate the possibility of selling a part of his product at least as sweet cream.

*Selling Butterfat or Butter.*—We have just shown that the whole milk and the sweet cream trade is limited and confined to dairymen so situated that they can conveniently conform to the requirements of such a trade. The great mass of the dairy farmers of this State, must, therefore, look to other outlets for their products. In the more advanced dairy states there are four other avenues open to the dairy farmer; namely, farm butter making, the creamery, the cheese factory and the condensery. In Texas this is restricted to either the making of butter on the farm or the selling of the cream to the creamery. Therefore, it is appropriate that we make a comparison of these two methods.

In deciding whether to patronize the creamery or whether to make butter on the farm, the farmer should be guided by the returns expected from the two methods as well as by his obligation to the community. If all the farmers in a certain dairy community persisted in making butter at home, there would never be a creamery in that community. There would be an overproduction of farm butter, however, with about as many different grades as there are farmers. The community would never establish a reputation for the quality of its product and dairying would be at a standstill, or would probably retrograde. On the other hand, the creamery should make every effort to make it profitable to the farmer to patronize the creamery rather than make butter.

The properly managed creamery is a well organized selling and purchasing agency. It can make profitable sales contracts in distant cities. It can buy material such as cartons, salt, and other supplies at wholesale prices, thus cheapening the cost of manufacturing. By turning out a standard product from day to day the creamery establishes a reputation for its output and receives a good price. The making of good butter requires skilled labor and modern equipment. The creamery is able to provide these requirements, while the individual farmer is not.

Of course, there are a few dairymen who, by making a superior quality of product, thus building up a demand for their goods, receive more for their butter than the creamery can pay them for their fat. This, however, does not apply generally, as statistics would indicate that the average price received for farm or country butter is from 10c to 12c

below the average price received for butterfat when sold to creameries. Assuming that the "overrun" (a pound of butterfat will make a little less than a pound and a quarter of butter) will pay for the cost of making the butter on the farm, there is still a big difference in favor of selling the butterfat. There is no question but that thousands of dollars annually would be saved by Texas dairy farmers if more butter were made in the creameries and less on the farm.

Below is a statement of the return that might be expected under average conditions from 1000 pounds of whole milk testing  $4\frac{1}{2}$  per cent butterfat when sold as whole milk, sweet cream, butter and butterfat:

Whole milk—(Retail)—1000 lbs. equals 440 quarts (this allows 5 per cent loss for waste and shrinkage). 440 qts. at 6c (8c less 2c for delivery).....	\$26 40
Whole milk—(Wholesale)—1000 lbs. whole milk equals 118 gallons. 118 gallons at 20c gallon.....	\$23 60

Advantages: High gross returns.

Disadvantages: Demand limited and confined to restricted areas where land is usually high in price. Unusual hours and no skim milk for feeding calves.

Sweet cream—1000 lbs. $4\frac{1}{2}$ per cent milk, contains 45 lbs. of butterfat. 45 lbs. fat at 36c.....	\$16 20
840 lbs. skim milk, value 40c per hundred.....	3 36

Total . . . . . \$19 56

Advantages: Net returns fair and dependable. Skim milk for calves. Hours usual. Maximum amount of fertility retained on soil.

Disadvantages: Demand limited and confined to areas only where it is possible to deliver a sweet product. Extra care necessary in production and delivery of product. Use of ice necessary.

Farm butter.—1000 lbs. $4\frac{1}{2}$ per cent milk contains 45 lbs. butterfat. 45 lbs. of butterfat will make 53 lbs. of butter. 53 lbs. of butter at 17c (this allows for cost of making).....	\$ 9 01
950 lbs. skim and butter milk at 40c per hundred.....	3 80

Total . . . . . \$12 81

Advantages: Can be conducted in any section of the country even far from shipping points. Affords skimmilk and buttermilk for hogs, calves, etc. Retains maximum amount of fertility. Minimum amount of delivery required.

Disadvantages: Low receipts, maximum amount of labor.

Butter fat to creameries.—1000 lbs. $4\frac{1}{2}$ per cent milk contains 45 lbs. butterfat. 45 lbs. fat at 26c (average price paid by creameries for 1914).....	\$11 70
840 lbs. skimmilk at 40c per hundred.....	3 36

Total . . . . . \$15 06

Advantages: Can be conducted in most sections of the State. (See list and location of creameries. Page 15.) Affords skimmilk for hogs and calves with maximum amount of fertility retained on soil.

Disadvantages: More deliveries required than in making butter, direct returns low as compared with selling whole milk or sweet cream.

#### CARE OF MILK AND CREAM.

Assuming then that the farmer is so located as to make the selling of his cream to a creamery most advantageous, the following suggestions will be of great value to him in the care and delivery of his cream.

*Care in Milking.*—To produce the best quality of cream it is necessary to exercise certain precautions in caring for the cows and in milking them.

1. The barns should be kept clean and well ventilated, the yards free from manure and litter and drained so that no water will stand there even after the hardest of rains.

2. Before milking the cows should be brushed around the flanks and udder with a stiff brush; this should be followed with a damp cloth which will remove many of the dust particles and so dampen the others that they will stick to the cow during the process of milking.

3. The milker should keep his hands dry during the milking. Milking with damp hands is a filthy process, and is apt to cause the teats of the cow to chap and become a source of annoyance.

4. The milk should be removed from the barn or milking pen to a milk house as soon as possible after it is drawn.

5. The milk should be separated and the cream cooled as soon as possible after milking.

*The Care of the Cream.*—After the milk and cream have been separated great care should be exercised in handling it.

1. It should be immediately cooled. The cooling of cream can best be accomplished by placing the can containing it into good cold water, preferably ice water, where it can be stirred occasionally. A kitchen refrigerator should not be used for the cooling of cream, for the cream will absorb odors from the other food materials that are stored there.

In case ice is not available for use in keeping cream, a very effective and inexpensive method is to wrap a heavy cloth around the cream can and place it in a shady place where the air is circulating. Often a screened-in room is provided for this purpose. The cloth about the can is kept damp from a drip of water, the evaporation from the cloth reducing the temperature enough to keep cream or butter in very good condition in the warmest weather. This method has little value in damp weather for the evaporation from the cloth is so slow that there is very little cooling.

2. Never mix warm, fresh cream with that which has been cooled, for the fresh cream will warm up the whole lot and hasten its souring. If it is desirable that the cream be mixed, the fresh cream should be thoroughly cooled before the mixing takes place.

3. In case cream is allowed to stand for a time undisturbed, a sep-

aration takes place and a hard curd will be formed in the bottom of the can; after this curd becomes hard it is impossible to thoroughly remix it so there will be no lumps of curd in the cream. The presence of lumps makes it difficult to secure an accurate butterfat test. Lumpy cream may be avoided by thoroughly stirring it three or four times each day.

4. It is a common practice, but not a good one, to hang cans of cream in the cistern. There are generally odors in such places that are absorbed by the cream; besides, the cooling is not as efficient as can be obtained by other no more expensive methods.

5. When delivering cream to the factory a heavy blanket should be placed around the can to protect it from dust and dirt and to maintain a low temperature.

6. At all times the tinware used in the handling of milk should be kept clean and free from rust. Before any tinware is used for milk the seams should be flushed with solder. This will make it possible to keep them in good condition, which cannot be done if there are seams to catch and hold milk.

7. Cream should, under the best conditions, be delivered to the creamery every second day, and if the conditions for caring for it are not first class it should be delivered every day. The every-day delivery of cream can best be accomplished by a community delivery. By this method the neighbors rotate in the delivery, each neighbor taking the cream in as often as is necessary to make a proper delivery. This does not cause any one extra work, and has proved a very satisfactory arrangement where it has been tried.

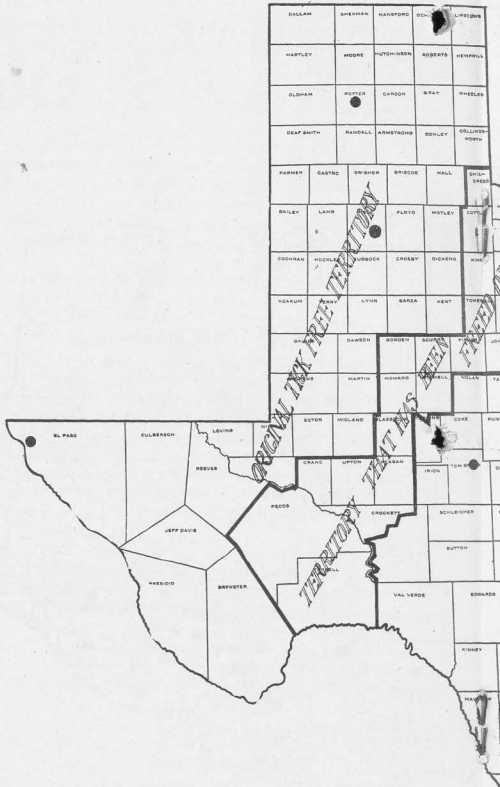
#### THE SEPARATOR.

In the foregoing discussion it has been assumed that the cream separator is used in separating the cream from the milk. Therefore, a discussion of the value of the separator and its care will be of importance.

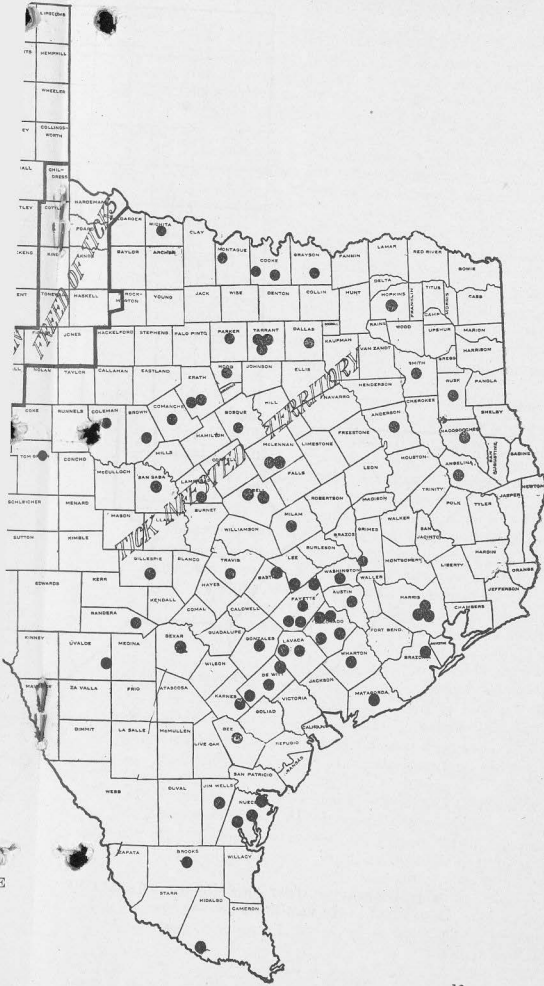
*Economy of the Separator.*—Bulletin No. 116 of the Purdue University shows that the butter lost in the skimmilk from a 6000-pound cow in one year's time is as follows, from the different methods of creaming:

Methods	Pounds lost in one year.
Water dilution.....	40.5
Shallow pan.....	26.2
Deep setting.....	10.1
Hand separator.....	1.2

As the average Texas cow produces only about one-half of the above amount of milk, these figures should be reduced 50 per cent to apply under Texas conditions. As the most common method of creaming in Texas is by the shallow pan when the separator is not used, we find that there is a saving of  $12\frac{1}{2}$  pounds of butter yearly for each cow when the hand separator is used as compared with the shallow pan. On four



A MAP SHOWING THE LOCATION OF THE ACTIVE CREAMERIES IN TEXAS.



cows there would be a saving of 50 pounds of butter, worth \$11.50 when valued at 23 cents a pound. This would pay interest, depreciation and repairs on a \$75.00 machine. In other words, when a farmer has only four cows the amount of butterfat saved by the use of a separator would warrant a \$75.00 investment in such a machine. A larger number of cows would make such an investment very profitable.

In addition to a saving of butterfat, the separator, when properly cared for, assures a better quality of cream and a cleaner and fresher skimmilk for feeding calves. Cream from the shallow pan system of creaming is nearly always sour at the time of its removal, and in addition has been subjected to unfavorable surroundings in most cases. It is usually of an undesirable quality and it is almost impossible to make it into good butter. Skimmilk obtained from the shallow pan system of creaming is usually highly acid. This acidity varies with the temperature and there is no uniformity as to the degree of sourness from day to day. Such milk as this has a tendency to produce scours or other digestive troubles when fed to calves. Good clean skimmilk, fresh from the cream separator, is the most valuable calf food that the dairyman has at his command.

*Cleaning the Separator.*—When the separator is cared for properly it aids materially in producing good clean cream. On the other hand, if it is neglected, and not cleaned properly and regularly, it may be responsible for a very undesirable and inferior product. Many dairymen have the idea that it is necessary to wash the cream separator only once a day or once every two or three days. They believe that a thorough “flushing” of the bowl with warm water after each separation is sufficient to clean the machine. This does not remove all of the milk or particularly the separator slime, and that which is left in the bowl undergoes decomposition. This produces a regular “hot-bed” of bacteria, and as the warm milk of the succeeding separations comes in contact with the bowl, it is contaminated with bacteria, resulting from the decomposition of the particles left in the bowl. After each separation the bowl should be flushed with luke warm or cold water. It should then be taken apart and every particle of the bowl that comes in contact with the milk should be thoroughly washed with hot water that contains some washing compound. A good stiff washing brush can be used to advantage for this purpose. Following this washing the parts should either be steamed or scalded, and then placed in the sun until again ready for use. The frame, and particularly the bowl frame, should be washed daily.

*Getting in Touch With the Creamery.*—If you wish to sell cream to a creamery, and wish to decide upon what creamery to sell to, you may consult the map on pages 12-13, showing the location of creameries and write to one or more of them about their prices, time of payment and their directions for shipping. As there are over 350 cream stations in addition to the creameries, an inquiry in your own town may give you a local source of information. In addition to the map the following is a list of active creameries of the State as far as the Extension Department has been able to determine.



## A LIST OF ACTIVE CREAMERIES IN TEXAS.

Creamery Company.	Manager	Location
Acme Creamery Co.....	C. T. Axlegard.....	Gainesville
Alamo Mfg. Co.....	Will Lathem.....	Brownwood
Alvin Houston Creamery.....	Geo. Conley.....	Houston
Alvin Creamery Co.....	J. E. Deland.....	Alvin
Alice Creamery Co.....	E. Augustine.....	Alice
Alta Vista Creamery Co.....	C. W. Berney.....	Ft. Worth
Amarillo Creamery Co.....	C. R. Ault.....	Amarillo
Bandera Creamery Co.,.....	C. H. Jones.....	Bandera
Bellville Promoting Co.....	A. J. Laas.....	Bellville
Bosque Valley Creamery.....	N. E. Lovelady.....	Clifton
Brenham Creamery Co.....	H. C. Hodde.....	Brenham
Cameron Creamery Co.....	F. P. Cziches.....	Cameron
Carmine Creamery Co.....	Julius Menke.....	Carmine
Comanche Creamery Co.....	M. A. Fenjer.....	Comanche
Creamery Dairy Co.....	Harry Barnett.....	Corpus Christi
Creamery Dairy Co.....	J. F. Kline.....	San Antonio
Creamery Dairy Co.....	J. F. Kline.....	Yoakum
Creamery Dairy Co.....	J. F. Kline.....	El Campo
Creamery Dairy Co.....	J. F. Kline.....	Beeville
Creamery Dairy Co.....	J. F. Kline.....	Yorktown
Cuero Creamery Co.....	D. C. Logue.....	Cuero
Dairy Products Co.....	G. W. Mullens.....	Kingsville
Deerfield Creamery Co.....	D. C. Darroch.....	Fredericksburg
Donnell Creamery Co.....	J. R. Donnell.....	Belton
Donnell Creamery Co.....	J. R. Donnell.....	Temple
Donnell Creamery Co.....	J. R. Donnell.....	Coleman
Eagle Lake Creamery Co.....		Eagle Lake
El Paso Creamery Co.....	Joe Dunne.....	El Paso
Empire Creamery Co.....	John Christianson.....	Dublin
Falfurrias Creamery.....		Falfurrias
Flatonia Creamery Co.....	R. Boe.....	Flatonia
Giddings Mfg. Co.....	E. J. Neitsch.....	Giddings
Gonzales Creamery Co.....	Geo. Minear.....	Gonzales
Granbury Creamery Co.....	T. C. DeLand.....	Granbury
Hallettsville Creamery Co.....	Wm. Peterson.....	Hallettsville
Henderson Creamery Co.....	C. C. Morris.....	Henderson
Holliday Creamery Co.....	D. J. Carithers.....	Wichita Falls
Henmason Ice Cream Co.....	W. P. Henmason.....	Lufkin
Jersey Farm Creamery.....	H. C. Sperry.....	Stoneburg
King's Sanitary Creamery.....	John King.....	Austin
Lampasas Creamery.....	L. H. Rutledge.....	Lampasas
LaGrange Creamery Co.....	A. Housen.....	LaGrange
Lyon Farm Creamery Co.....	R. Chresterferson.....	Sherman
Marigold Creamery.....	H. H. Cooper.....	Nacogdoches
McAllen Creamery Co.....	Paul Trawbridge.....	McAllen
M-B Creamery.....	A. P. McLendon.....	Waco
Navasota Creamery & Ice Cream Co.....		Navasota
New Ulm Creamery Co.....	J. J. Franke.....	New Ulm
Nissley Creamery Co.....	S. S. Lard.....	Ft. Worth
North Texas Creamery Co.....	C. O. Moser.....	Dallas
Paige Coop. Creamery Co.....	A. L. Fuchs, Jr.....	Paige

Palestine Creamery Co. ....	L. D. Lacey.....	Palestine
Peerless Creamery .....	D. M. Mebane.....	Weatherford
Plainview Creamery .....	J. N. Morrison.....	Plainview
Purity Creamery Co.....	Sheldon & Wertmon.....	Waco
Purity Creamery Co.....	J. O. Nanna.....	Corpus Christi
Rock Island Creamery Co.....	A. M. Taylor.....	Rock Island
Runge Creamery & Ice Mfg. Co.....	C. J. Steves.....	Runge
Sabinal Creamery.....	Conoley .....	Sabinal
San Angelo Creamery Co.....	R. S. Evans.....	San Angelo
San Saba Creamery Co.....	Paul George.....	San Saba
Schulenburg Creamery Co.....	W. D. Cowan.....	Schulenburg
Shaw Bros. Creamery Co.....	Albert Shaw.....	Fort Worth
Shiner Creamery & Ice Mfg. Co.....	J. F. Kasper.....	Shiner
Texas Creamery Co.....	A. J. Smith.....	Houston
Texas Star Creamery.....	E. C. Crawford.....	Houston
Tyler Creamery .....	Chas. B. Theiss.....	Tyler
Weimar Creamery Co.....	R. H. McCormick.....	Weimar

#### VARIATION OF BUTTERFAT PRICES AND WINTER DAIRYING.

The following table is compiled from data furnished by sixty-five creameries over the State and shows the average prices paid for butterfat by months for the last two years:

March .....	24.7c
April .....	22.2c
May .....	20.9c
June .....	21.0c
July .....	23.5c
August .....	25.5c
Average .....	22.9c
September .....	26.2c
October .....	26.9c
November .....	29.0c
December .....	28.2c
January .....	28.7c
February .....	25.6c
Average .....	27.4c

The above table shows that the creameries pay the highest price for butterfat during the months of September, October, November, December, January and February. The average for these months is 27.4c, as against 22.9c for the remaining six months of the year, or a difference of 4½c a pound. The farmer, therefore, who breeds his cows to calve in the fall will get better prices for the bulk of his product. Besides getting better prices, there are other advantages of having cows to calve in the fall. The Nebraska Station is authority for the statement that cows will produce 10 per cent more milk when they drop their calves in the fall as compared with cows that calve in the spring. Under Southern

conditions a larger increase than this might be expected, due to the favorable conditions for milk production during the fall and mild winter months that we have in this section of the country.

Calves dropped in the fall are raised to maturity cheaper than when they are dropped in the spring. When dropped in the fall they require less feed to mature them than when dropped in the spring, owing to the fact that there is always an abundance of pasturage for them when they have reached the age of five or six months at which time they are ready to be placed on the pasture. On the other hand, when dropped in the spring there is usually no pasture available when they have reached the age of five or six months.

Fall calves are always more thrifty than spring calves, as the annoyance from the flies and hot weather is much greater when the calves are born in the spring. Again, by having the heavy flow of milk come in the winter months the extra labor on the cattle will come at a time of the year when it will least interfere with other farm work. When we consider the fact that conditions are more favorable for the production of a clean product during the fall and winter as compared with the spring and summer, together with the advantages cited above, the dairyman who desires to make the most out of his business should practice "winter dairying," or breed his cows to calve during the months of August, September and October.

#### COMMUNITY ORGANIZATION IN DAIRYING.

So far in this bulletin the discussion has been upon such topics as are of interest to the farmer as an individual. There are several advantages in dairying, however, which can be developed only through community co-operation. These include the co-operative buying of bulls, the organization of cow-testing associations and the organizations of creameries when a new creamery is needed in a community.

*The Co-operative Buying of Bulls.*—The most effective way of bringing about an increase in the production of the dairy herds of this State is by the use of pure bred sires of high producing qualities and the rearing of their best heifer calves. That the average production of the herds over the State needs to be raised is shown by data from records which would indicate that the average yearly production of butterfat is between 100 and 125 pounds. A cow producing less than 150 pounds of butterfat in a year is unprofitable to her owner. We are only to combine these two statements in order to realize that the average Texas dairy cow, under present conditions, is an unprofitable animal.

True, this remarkably low yield cannot be attributed wholly to the cow. Improper feeding and management probably exerts as great an influence on this low production as does the inferiority of the cow. However, there is no doubt but that a large percentage of the dairy cows in the State are unprofitable because little attention has been given to their breeding and selection.

Since improvement can be brought about best through the use of

good bulls, it behooves every dairyman interested in the improvement of his condition to secure the service of such a bull.

This can be most economically and satisfactorily done through co-operative bull associations. A bull association is an organization consisting of the dairy farmers of a community that has as its object the purchase, use, and interchange of bulls. To a certain extent such an organization is restricted to communities where dairy farming predominates, yet three or four farmers could enter into an agreement to buy a bull, or bulls, co-operatively, and get the same advantages offered by a larger association.

Following are the advantages of a bull association:

1. It reduces cost of service, with the advantage of having the service of a bull after he has proved his value. Take the case of the dairyman with 20 cows covering a period of 8 years. This means 160 services which would cost him individually \$300 (assuming that he purchased a \$150 bull every two years and sold the bulls at one-half their purchase price), or \$1.87 per service. If this man were a member of a bull association with a membership owning 200 cows, assuming that the association purchased at the beginning 4 bulls at \$150 each, or \$600 his pro rata would be  $1/20$  of \$600, or \$30. This would entitle him to bull service for 8 years or 160 services or \$1.87 per service at only one-tenth of the cost when he purchases his bull individually.

2. It tends towards community breeding, with all the advantages of such breeding.

3. It stimulates a greater interest in dairying in that locality.

4. On account of its co-operative nature, the association can afford to pay better prices than individuals and thus secure better bulls. In addition, by the system of interchanging, the good bull is kept for his entire period of usefulness. Many a farmer has bought a registered bull of the best of stock, used him until his heifers have grown to the breeding age, and sold him only to find when the heifers have reached the age of mature producing cows that he had sold a really valuable bull. Quite often in the meantime the bull has been sold for beef. The inferior bull can be discarded when he has proved his inferiority.

The one great disadvantage of such an association is the danger of bringing in contagious abortion by the interchange of bulls. This, however, can be guarded against in the purchase of the bulls, and a strict supervision of their use.

*Cow-testing Associations.*—Every dairyman understands that there is a wide variation in the amount of milk and the quantity of butterfat produced annually by the different cows in his herd. He can reduce this to an exact basis by weighing the milk regularly and determining the percentage of butterfat with the Babcock tester. For a single farmer to do this would be rather expensive, but through the organization of a cow-testing association, he with a group of neighboring farmers will be able to employ a man capable of doing the work accurately and regularly.

The first one of these cow-testing associations was organized in Denmark in 1895. At that time the average Danish cow was producing 112

pounds of butterfat. Because of the work of these cow-testing associations this yield has been doubled in the past fifteen years. In 1911 there were 530 of these organizations in Denmark. In 1910 there were 200 such associations in Canada and, in 1911 there were 100 in the United States.

The plan of the cow-testing association is as follows: A group of twenty-six farmers owning 300 or more cows enter into an agreement with a young man who understands how to operate the Babeock Tester and who is accurate in figures. They pay him from \$1.00 to \$1.50 annually for the testing of each cow. This will yield him an income of from \$50 to \$100 a month. He spends one day each month with each herd. At each of these monthly visits he weighs the milk night and morning, takes a sample from each cow and determine the percentage of butterfat in the sample. He multiplies the number of pounds of milk by the percentage of fat. This gives him the daily production of the cow and he multiplies this result by thirty, which gives him the monthly production. He also weighs the feed. By thus weighing the milk produced and the feed consumed by each cow and testing for the percentage of butterfat, he is able to determine whether the cow is a good producer, a medium producer or one that is positively losing the farmer money. Having this information the farmer will know which cows to sell and which to keep and to raise the calves from.

It is usual for farmers of a community to have an association for a year, then allow it to drop for two or three years, and then organize again for a year. A better plan of course is to have the association continue from year to year. The Agricultural and Mechanical College will be glad to furnish articles of agreement for a cow-testing association and help to organize an association in any community wanting one.

*Suggestions for Organizing a Co-operative Creamery.*—First call a meeting of all the farmers in the locality and arrange to have a dairyman from the Agricultural and Mechanical College present to give information on creamery organization.

Determine the number of cows in the territory from which milk or cream is available for the proposed creamery. From 400 to 600 cows, depending on local conditions, are necessary for the successful operation of a creamery. In localities where the dairy industry is in its infancy and where there is no competition to be met, it is usually safe to start a creamery when the product of 400 cows is pledged, provided there are good prospects for an increase in the number from year to year. In places where the industry is developed and where creameries are already drawing milk or cream from the territory or where there is little or no prospect of an immediate increase in the number of cows available, pledges of 600 cows or more are usually necessary for a successful creamery. If whole milk is to be handled it is seldom feasible to cover a territory having a radius of more than 5 miles from the creamery. If cream is handled, an area having a radius of 10 miles from the creamery can usually be covered.

A committee should be appointed to ascertain how many cows there are and at the same time have the farmers express themselves as to how

many shares they will take at say \$25. This expression on the part of the farmer puts no legal obligation upon them to take the shares but you have a basis upon which to judge your future proceedings. If there is a sufficient amount promised, say one-half or two-thirds of the amount needed, you are safe in going to the expense of forming a legal organization. Write to the State Warehouse Commission at Austin, and ask for the blanks and information necessary to form a creamery company. When you have obtained the papers showing that you are a legal organization you are ready to issue stock to those who have signed their names to the organization agreement and to sell to others.

The strength of the organization depends on the number of farmers having shares, therefore, make it a point to sell to as many farmers as possible. The selling of shares is often a difficult task, but efforts spent along this line contribute greatly to the ultimate success of the creamery. In selling shares take either cash or a note from the purchaser, thus relieving the organization of the burden of paying interest. Use the notes as security to borrow a sum equal to the combined amount of the notes and have the sum bear no more interest than the notes.

Insert in your by-laws a regulation that gives each shareholder only one vote and not a vote for every share. Also have in your by-laws an article that makes the dividends payable on the amount of butterfat delivered to the creamery by the shareholder.

In selecting officers for the association it is of utmost importance that the stockholder elect the men best fitted for the respective places. Choose a president who will preside over the meetings in a fair and unbiased way. Select for a secretary and manager a man who has the confidence of all, one who does not become confused or excited over a little trouble. Select a treasurer and board of directors who will take an interest in the work and perform such duties as come before them.

Put the secretary and treasurer under a suitable bond. This is not a matter to be neglected and it should not be looked on as distracting those officers but as a measure that is used in the conduct of all good organizations where a considerable quantity of money is handled. Let good business judgment characterize all transactions, the election of officers, the contract for building, the placing of the machinery and the management of affairs after operations have commenced. Ask the Extension Department of the Agricultural and Mechanical College to send you an expert on creamery equipment and organization.

Through proper investigation the local conditions can easily be ascertained and the farmers who contemplate starting a cooperate creamery have as examples hundreds of successful plants to pattern after in building up a successful creamery. There are also hundreds of examples of badly started and poorly operated creameries that have failed and these serve to exemplify things that should be avoided in starting the new organization. It is the rule, with but very few exceptions, that the farmers who take the word of a professional creamery promoter instead of relying entirely on their own efforts or that of State dairy authorities spend from \$1000 to \$10,000 more than is necessary to start such a

creamery and this is only a small loss compared with the injury it does the dairy industry in that locality and the retarding influence it has on the industry in nearby localities. When such a promoted creamery fails it follows that the farmers who started it could have well afforded to have spent a little money to send a representative to other places for information, but the past has shown that this information is seldom sought.

#### IT COSTS TO FEED THE TICK.

The United States Department of Agriculture recently published, in Farmers' Bulletin No. 639, the results of experiments with the dairy cow to determine the effect of the cattle tick on milk production. In these experiments cows were divided into three groups. Group 1 was dipped every twenty-one days to keep them free from ticks; group 2 was sprayed at like intervals to keep the tickets down to a few, while group 3 was left to go heavily infested with ticks.

The results were as follows: Group 2 produced 18.6 per cent less milk than Group 1, and Group 3 produced 42.4 per cent less. The feed and other care of the cows were the same for all. During the test the cows heavily infested with ticks lost 9.3 pounds in weight and the tick-free cows gained 44.2 pounds.

It can be safely estimated the tick costs \$5.00 yearly in milk for each cow in the tick-infested district of Texas. There are about 800,000 milch cows in this district. At \$5.00 each would be \$4,000,000 annually, enough to build 200 dipping vats in every county in the tick district.

It costs more to feed the ticks than to kill them. Write the Agricultural & Mechanical College for information in regard to dipping vats and sprays.

#### AID BY BUSINESSMEN.

At this time there is a movement among the bankers and businessmen generally in aid of farmers who wish to purchase dairy cattle and hogs. In many communities the businessmen have organized to advance the money for such purchases. The plan is fully set forth in the attached letter from Mr. J. Hirsch, Chairman of the Texas Bankers Committee on Agriculture. It is inserted here for the general information of businessmen and farmers who may care to promote or take advantage of this movement.

Corpus Christi, Texas, January 25, 1915.

To the Members of the Texas Bankers' Association:

For three years the Agricultural Committee of the Texas Bankers' Association has endeavored to stimulate your interest in livestock farming. Texas bankers now have the best opportunity ever offered to do effective work along these lines.

The Fort Worth packers inform this committee that Texas paid out about \$52,000,000 last year for pork products. They are clamoring for more hogs. Help your farmers to place some good brood sows on their farms. Do it now. It has been stated by agents of the United States

Agricultural Department that 40 acres planted to feed, and three or four good hogs, three or four good cows and 100 chickens, together with one acre devoted to a home garden, ought to make \$1000 net a year for a good hard-working farmer.

In order to start the hog industry along right lines, get the advice of your local Government Demonstration Agent, or if you have none, the Agricultural College will be glad to render every possible assistance. Twenty or thirty acres, cut up into four or five small pastures and devoted to proper forage crops, should take care of three or four brood sows and their increase. In order to start a farmer along these lines, he needs your financial assistance, not only for purchase of brood sows, but also for proper hog fencing. The following plan is suggested for your consideration:

Call a meeting of local bankers and merchants. Assign a small committee, men well acquainted with the farmers, to select 25 or 50 or 100 farmers who you believe will properly care for three or four sows and a good boar. Pick out good men, who you believe to be honest, industrious and who will take proper care of the stock. Send committees to see them and urge them to put in the animals and fence their pastures for the proper care of same. If they are tenants, get the landlords to assist in this work by furnishing the wire for fencing, the tenant to do the work. Landlords are awakening to the fact that livestock farming will increase the value of their land, values which have been so terribly hurt by the present low price of cotton.

Lend them the money for these purposes, taking notes at one year's time. Charge them your usual rate of interest. This is not a philanthropic, but a purely sound business proposition. Let bankers agree to furnish the money up to a certain amount, on the security of the animals to be purchased, and in the case of tenants, with the endorsement of landlords. Over this amount, procure guarantees from your merchants on a certain amount of this hog paper. For example: Let us say that your community has two banks and that you can get 50 farmers interested, each of whom requires a credit of \$300, a total of \$15,000. We believe it would be fair for the banks to put up, say, \$5000; the balance of the \$10,000 to be guaranteed by the merchants. One merchant may endorse up to, say, \$1000 or \$1500, another \$750, another \$500, and so on. Each merchant will endorse only a given number of notes. The general store, the grocer, the hardware dealer, the lumber dealer, all are as much interested in this business as the banker, and should stand a share of the risk. They do not have to put up a cent of money. But they ought not expect the banks to furnish all the money for this enterprise and take all the risk. All notes to be secured by mortgages so the guarantors will be protected at any rate as far as the stock to be purchased covers the paper. There is little risk attached to these notes, provided you pick the right kind of farmers. This system will interest the entire business community.

This committee realizes that Texas bankers have no idle funds for investment at present, and would not be attracted by loans of this char-



acter purely from the investment standpoint. But we have arrived at a point when it is necessary to do something to put our farmers on an independent basis, and that can be done only by encouraging livestock farming, and you can not have livestock farming without livestock, nor livestock without money. It is up to the banks to furnish the money and it is up to the merchants, generally, to furnish a part of the credit and stand their share of the burden—they make as much profit as you do.

This plan is now in operation in several communities, the method varying, but we believe it to be entirely practical and fair for all concerned. It is to be pointed out that if you have enough paper of this kind, guaranteed by responsible merchants, you can safely invest some private funds in the paper. Your depositors who lend money will be glad to get paper of this kind.

Hog notes should be taken care of, repaid in full, probably in 15 months, at the outside. If your venture succeeds and farmers realize enough from sales of pigs to repay notes, we suggest further that you permit the use of the money for purchase of additional livestock, especially good dairy cows—these additional animals could then be put up as additional security, the original notes renewed with the same endorsers, and your paper ought then be perfectly good.

The chairman of this committee has inaugurated this plan in Nueces county. Corpus Christi merchants have already signed agreements to endorse \$10,000 of this class of paper. Merchants guarantees in neighboring towns, together with the amounts to be loaned by the banks, direct, and without the merchants guarantee, will run the total amount of cattle purchase paper up to approximately \$25,000.

This committee also discussed the details of this plan with the Fort Worth packers, who are in hearty accord and promise their active support. It is to be pointed out particularly that communities desiring to purchase brood sows may obtain the services of the Fort Worth Stockyards Company. The Stockyards Company and the packers are preparing a series of bulletins which will be sent out to Texas bankers from time to time.

We urge your active and immediate support. Please advise the chairman of this committee, and also write the Texas Bankers' Record, the official journal, what your community will do or is doing.

Yours very truly,

J. HIRSCH, Chairman.