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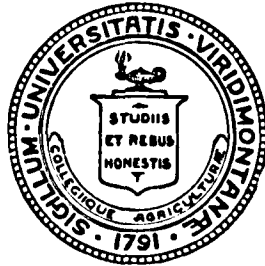
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THE COST OF PRODUCING MARKET MILK/  
IN 1916-17 ON 212 VERMONT FARMS

by G. F. E. STORY and W. J. TUBBS



THE VERMONT AGRICULTURAL EXTENSION SERVICE

THOS. BRADLEE, Director

AND UNITED STATES DEPARTMENT OF AGRICULTURE,  
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## THE COST OF PRODUCING MARKET MILK IN 1916-17 ON 212 VERMONT FARMS

By G. F. E. STORY AND W. J. TUBBS

### SUMMARY

1. Records were taken on 212 farms representing 4,650 cows distributed throughout Vermont.

2. The average cost of making milk during the year May 1, 1916-April 30, 1917 on these farms was \$136.11 per cow, the net cost \$111.86; the average production was 2,478 quarts or 5,328 pounds per cow; and the average cost per quart at the farm 4.51 cents and per 100 pounds \$2.23.

3. It is the judgment of the writers, formed after careful study of these data and of the present trend of prices for feed, roughage, labor, etc., that at the present writing, Oct. 1, 1917, the average cost of making milk on the farms under survey last spring, if one allows as should be allowed a reasonable return for the farmer's labors, approximates \$165 per cow, the net cost about \$147 per cow, and the average cost per quart and per 100 pounds at the farm in the vicinity of 5.9 cents and \$2.75 respectively.

4. Farmers who fed silage made milk at nine percent less cost than did those who fed an all-dry ration; and those who bought their grain at the time when its price was relatively low saved money as compared with those who bought piecemeal.

5. The use of scrub bulls is costing the farmers of Vermont thousands of dollars annually. A good pure bred sire should be available to every Vermont dairy farm.

6. An excellent means of reducing grain requirements is to grow soy beans in the silage corn and to increase clover and alfalfa areas.

7. The amount of man labor per cow is excessive on many farms. This is due to small herds, frequent feedings and to ill-planned barns. A litter carrier pays for itself in a year at present labor prices.

## INTRODUCTION

The Committee on Agriculture of the Boston Chamber of Commerce, cooperating with the Agricultural Colleges in the several New England States caused a survey to be made in the months of May and June, 1917, of the cost of milk production during the preceding year. While the initiative was taken by the Committee the entire expense of the Vermont survey was borne by the University through its Agricultural Extension Service, the cooperation being mainly one of good will. This is said in no sense in a captious spirit, but simply by way of explanation.

No argument is needed to prove that in a critical time like the present, with advancing prices and changing values, with sharp differences of opinions as to actual production costs, with none too much valid data at hand as to such costs, it is eminently desirable that the actual expense involved in the production of a quart of milk under present day conditions on a Vermont dairy farm shall be determined.

Nelson made such a survey in a small way in 1911-12. The results have just been issued in condensed form as one among many articles in Bulletin 202, pages 25-39 (1917). The recent distribution of this article, dealing with the situation as it existed five years ago when it cost infinitely less to produce milk than it does today, makes it particularly necessary to issue this statement bringing the matter more nearly up to date; otherwise misunderstanding is likely to arise. It is believed that the present bulletin sets forth with a fair degree of accuracy the facts as to the cost of producing milk in Vermont during the twelve months preceding May 1, 1917.

Definite knowledge as to the legitimate charges which enter into the cost of production, handling and marketing is an absolute essential to success and permanency in business. Some of these may be overlooked for a time, as, for example, depreciation. The operator may shut his eyes to them, but the day of judgment awaits him. Many a seemingly sound enterprise has been wrecked because of failure to take all the expense items into account. Accurate systems of cost accounting in business enterprises are now required by law in several States, in order to protect the interests of investors. Of course, in the restricted sense, the individual dairyman does not have to protect any one but himself, yet in his own interests he ought to know what it costs him to do business. Dairymen find it hard to keep accurate cost accounts owing to the complex nature of their business and to the many and diverse lines of work in which they engage. This makes it

all the more necessary that a survey be made as a basis from which the individual can make an estimate in his own case.

The rapidly rising costs of labor, feed, livestock, etc., have forced New England dairymen to demand higher prices for market milk than consumers are willing to pay unless the cost of producing milk is clearly understood. Definite production cost data must be shown in justification of price demands. These figures are not easily secured because few farmers keep accounts with their different farm enterprises and costs are constantly changing. However, acting on the initiative of the Committee on Agriculture of the Boston Chamber of Commerce, the Agricultural Extension Service of the College of Agriculture of the University of Vermont sent men into the field in May and June last, who, as a result of personal consultation with and questioning of 212 representative practical farmers, secured first hand and reasonably accurate data as to the cost of milk production in Vermont from May 1, 1916 to April 30, 1917.

The working crews were composed of University instructors and seniors and juniors in the College of Agriculture, all of whom had received instruction in the principles of farm management.

- (a) W. J. Tubbs, Farm Management Demonstrator (in charge), F. R. Churchill, '17, E. M. Root, '17, R. A. Briggs, '18.
- (b) R. T. Burdick, Professor of Agronomy (in charge), H. A. D. Leggett, Instructor in Poultry Husbandry, F. B. Jenks, Professor of Agricultural Education, A. C. Lewis, '17.
- (c) G. F. E. Story, Professor of Animal and Dairy Husbandry, (in charge), H. V. Adams, '18, J. A. Hitchcock, '18.

No attempt was made to "hand pick" these 212 farmers. They were meant to represent as nearly as possible the average of good dairymen. The advice of the county agents was sought in their choice. As a whole they probably were a little better than the average, yet not sufficiently so to cast doubt on the validity of the results, which represent what careful, moderately well informed and thoughtful breeders and feeders are accomplishing. The number of cows in these 212 herds was 4,650.

The following table indicates the distribution of cooperators who were located in 12 of the 14 counties of the State:

County	Number of records
Addison, 4 towns.....	21
Bennington, 5 " .....	14
Caledonia, 6 " .....	20
Chittenden, 5 " .....	18

Franklin,	4 towns.....	22
Lamoille,	4 " .....	20
Orange,	5 " .....	15
Orleans,	6 " .....	15
Rutland,	4 " .....	17
Washington,	6 " .....	17
Windham,	7 " .....	19
Windsor,	6 " .....	14
Total.....		212

About one-third of the 212 dairymen were shippers of market cream. It is not easy to find market milk shippers in some sections of Vermont. However, these men are potential milk shippers and no sound reason can be advanced against the inclusion of the data thus secured which has been calculated and expressed on a whole milk basis.

#### DEBITS

An important step in cost accounting is the establishment of an accurate inventory at the beginning and at the end of each year. The inventories used in this study were so arranged as to show the total *cow cost* for the year.

The following items have been considered in determining the cost of milk production, all being reduced to the unit basis of the single cow: (1) Cow, (2) sire, (3) food, (4) labor, (5) plant (buildings), (6) equipment, (7) bedding, (8) miscellaneous charges, (9) allowance for managerial ability, business risks, etc.

#### 1. cow

In arriving at the average figure to apply to the average cow, interest at 6 percent was figured on the average valuation of the herd, sales being balanced against purchases. Heifers were not considered to be a part of the herd unless they had freshened.

Owing to the sharp increase in the value of dairy stock during the past year, an *appreciation* occurred instead of a depreciation. This amounted to \$7.28 per head, equivalent to 10.3 percent gain. While this abnormal result is apparent in the survey for the current year, it will not hold true over a period of years. The only reasonable course to pursue in figuring future costs is to charge a normal annual depreciation on the present value of the herd. After careful study it was decided that 12 percent represented a fair depreciation charge to be used

in computing future costs and consequently an item reading "depreciation on cows, 12 percent on \$77.41 = \$9.29" appears in the estimates on page 17. Where a cattle owner sells his cows as soon as they reach their maximum values and replaces them with heifers at a lower price, 12 percent is perhaps an excessive figure, but under average herd conditions and in normal times it is not far from correct. For the purposes of this survey, the 4,650 cows were valued at grade prices, whether registered or not, for the reason that it did not seem fair to charge the heavy investment of a breeding establishment against the production of milk. It may be remarked, however, that many of the pure-bred cows paid a high return on their actual values.

## 2. SIRE

Many items, such, for example, as interest on investment, depreciation, feed, labor, bedding, etc., enter into the cost of maintaining a herd sire. From the total expense should be subtracted the service fees received from outside sources in order to arrive at the net cost to the herd of sire maintenance. The cost per cow was found to be \$1.94. This is a very low figure for registered sires. It would not be possible, except in large herds, were it not for the common practice of using young grade bulls and, later, selling them for beef, the gain in weight often covering the cost of feed and depreciation. There is little to recommend and much to condemn in this practice.

A prepotent pure-bred bull from producing ancestry will add easily ten dollars' value to the appearance and productivity of his daughters. If the bull cost \$500 and no more than five heifers are retained in the herd yearly, the investment has paid 10 percent interest. Many splendid young sires as well as some proven animals can be obtained at reasonable prices. There is no excuse nowadays for the use of an inferior sire.

When dairymen realize more clearly than at present the value of uniform stock, and when animal diseases are better controlled than they are today, closer cooperation may be looked for among cattle men along the line of the establishment of local breeders' organizations. Many cattle owners now feel that a dollar is the limit for a service fee, and even at that low figure often are so heedless that they bring diseased cows for service. It is safe to say that it costs many owners five dollars per cow for service, especially in small herds.

## 3. FOOD

The average cost of the hay fed at the barn was \$11.94 per ton, and, since most of it was mixed hay, this figure may be held to represent a fair farm value. The average cow consumed 3,500 pounds, costing \$20.93. Silage was figured at \$4.39 a ton, which would be a low estimate for the immediate future, owing to the increased labor costs of the present season. An average of 5,440 pounds, costing \$11.93, were fed per cow. Green soiling crops were valued at \$4 per ton and represent an outlay of only 80 cents in the total feed cost per cow. A small amount of dry forage was fed in some cases equivalent to 51 cents per cow.

Grain to the extent of 1,240 pounds, costing \$25.48 per cow, was fed. The average price of grain was reported as \$41.12 per ton. Grain charges during the past year were extremely dissimilar on the various farms studied in this survey, owing to the fact that some of the dairymen were forced to purchase more or less of their grain on the high winter market, having bought insufficient supplies during the fall.

The pasturage costs totaled \$6.95 per head. This figure was secured by combining interest charges and taxes on the land used, with the fencing and other expenses.

The average total food cost was \$66.60 per cow, with which should be included as a proper item the interest charges on the feed inventory, which in the present instance amounted to \$0.86.

Several factors entering into the food cost caused wide variations in individual cases. Among the more important are:

(a) *Value of land used for pasturage.* In Addison county, smooth meadow land worth from \$75 to \$100 an acre often is used as pasture and its cost is naturally very high. In other sections pasture valuations are low for the reason that there is little or nothing growing which the cattle will eat and the areas are nearly worthless from a pasture standpoint. It is to be expected that intensive feeding under either of these conditions ought to yield a greater profit than does straight pasturage.

(b) *The silo influences feed costs.* Approximately four-fifths of the farmers whose records were studied owned silos and one-fifth did not. It cost a half cent more per quart to produce milk when hay was used as the sole roughage than it did when both hay and silage were fed. Every Vermont farm carrying eight or more cows should have a silo. If one is milking less than eight cows and is not likely to in-



crease the numbers of the herd, probably it will be more profitable to raise mangels or half-sugar beets as a succulent feed than to construct a silo. Few people, other than the breeders who are doing official record work, realize the value of beets as a milk producer. It is safe to say that not one cow in ten making a large advanced registry record does it unless beets form an important part of the roughage ration.

(c) *Soiling crops are not commonly grown* in Vermont, since summer silage is usually cheaper and more satisfactory.

(d) *The scarcity of commercial feeds* during the past winter should teach Vermont dairymen the desirability of raising their feed at home whenever practicable, of growing soiling crops and of feeding silage the year around. Many of them raise little or no grain at home for cattle feeding and grow only a poor grade of roughage. Much effort was put forth this year throughout the State by the Agricultural Extension Service and especially through the county agents to secure the growing of an increased acreage of clover, alfalfa, soy beans and small grains. Farmers who adopted these suggestions and are planning to a greater extent than hitherto to feed their cattle on their home-grown resources, should be able to satisfy their needs at less cost and with equal or greater effectiveness than their neighbors who resort to the feed store. Furthermore, the railroads, now overburdened with the task of moving war freight, will be relieved of hauling much Western and Southern grain. This in itself is a patriotic duty.

Lest the reader misunderstand, it should be said that the purchase of grain for dairy cattle feeding is proper in normal times provided reasonable prices are charged, if it is used not in lieu of but as a supplement to home-grown material. Under such circumstances the practice is economically defensible, provided a new dollar can be seen clearly on its way to replace the old one laid out in grain purchase. The writers always and consistently have advocated the well-advised purchase of grain for dairy cattle and expect to continue such advocacy when the times are not out of joint. However, in view of the extremely abnormal conditions now obtaining and the high prices of all kinds of grain in comparison to the value of the product, they stress more than ever the necessity of reliance upon home resources and emphasize the imperative need that the farmer who purchases grain for his dairy cattle make wise choices. The poultrymen have been most persistent buyers of feed, but present conditions are forcing them upon a self-supporting basis. Surely Vermont dairymen will not allow

themselves to be outdone by their poultry keeping friends in the economical feeding of their stock.

Never was it more essential that dairymen study the markets in order to get what their herds really require; never was it more necessary that they have a clear understanding as to feeding values. Cattle now are being fed more and more on the several by-product feeds, some of which are well worth while and some of which are well worth leaving alone. Many farmers give little thought to the actual food value of the materials they buy. This seems to be especially true in these days of high prices when the cost per ton governs the selection of feeds. The Vermont law requires that a clear statement of the ingredients used in the make-up of a compound feeding stuff shall appear on the bag as well as a statement of its contents of protein, fat and fiber. Any farmer who reads the ingredients' statement can form a fairly shrewd notion as to the nature of the goods. For example, a brand of feeding stuffs largely sold in Vermont bears upon each bag the following statement: "Corn distillers' grains, cottonseed meal, linseed meal, hominy meal, gluten feed, cornstarch by-products with corn bran, barley feed, malt sprouts, brewers' grains and pure wheat bran." Any well informed dairyman can see that all these ingredients are high-grade and standard materials, well adapted to milk making. Another feed offered for sale in the State declares on each bag that it contains: "Ground oats, corn feed meal, wheat middlings, oat middlings, oat hulls, clipped oat by-products, ground grain screenings, 0.75% salt." Comment is unnecessary. Surely the second statement compares but poorly with the first. It is hardly to be expected that a man with his eyes open, a man knowing anything whatsoever about economical stock feeding, would buy the latter goods for his dairy cattle except at a relatively low figure. The Experiment Station's annual feeding stuffs bulletin clearly sets forth the manufacturers' statements as to ingredients and the protein, fat and fiber contents of each feed sold in the State. It is free for the asking. Its careful study ought to prove profitable to feed buyers. Dairymen who are in doubt as to what to feed should counsel with their county agents.

#### 4. LABOR

It has been assumed sometimes that the monetary value of the calf and the manure might be considered equivalent to the outlay made for the labor involved in caring for the herd. Such an assumption surely is not valid under present conditions, and obviously a study of the labor charges on these 212 farms was an imperative necessity.

*Man labor.* Careful estimates were secured of the time actually spent in milking, caring for the herd, hauling the feed, etc. The price per hour stated in each case by the individual farmer was that which was ruling in his locality. The average was 21.9 cents per hour and this sum was applied in the calculation of all labor charges whether performed by hired men or by members of the family. The present conditions of the labor market are such that 25 cents certainly is a conservative figure for use in computing future labor costs. It took 158 hours to care for a cow during a year, which, at 21.9 cents per hour, amounted to \$34.53.

Wide differences were noted in the labor costs on various farms. Some of the reasons for these divergences were:

(a) *Inconvenient barns.* Many of the barns were old, out of repair and ill adapted to the purpose of making milk; yet it would not be found a difficult task to rearrange many of them at comparatively slight outlay, so that much labor would be saved. Oftentimes the expense of such changes would have been thoroughly justified as an investment. Especially is it often worth while to install a litter carrier which generally will pay for itself within a year.

(b) *Small herds.* There are many duties or chores which take almost as long a time to accomplish in a small herd as in a large one. This, of course, handicaps the small farmer.

(c) *Excessive care.* Every good farmer likes to see his cattle look well, but there is a limit beyond which it is not profitable to spend labor on cows. This limit seems to be not far from 175 hours per year.

(d) *Long hauls.* Those farmers are disadvantaged whose barns are located at a distance from the feed store or are too small for their business, necessitating the hauling of hay from stacks or from outlying barns.

*Horse labor.* This was figured at 14.1 cents per hour. It is not a large item for the reason that only eight hours of horse labor were required for the average cow, costing \$1.09. It seems safe to assume that future costs should be based on an 18-cents per hour charge, owing to the present advanced cost of maintaining a team. The milk haulage charge is not considered in this connection, being discussed under production. This fact accounts for the small amount of horse labor charged against the individual cow.

The total labor cost was found to be \$35.62 per cow.

### 5. PLANT

A depreciation charge varying in most cases from two to four percent was charged against that portion of the buildings used or maintained for the purposes of the milking herd. Interest, insurance and repairs were also computed in order to determine the total building or housing costs properly chargeable against the herd. The cost of this item was \$7.50 per cow.

### 6. EQUIPMENT

This item included such articles as pails, strainers, forks, milking machine, if used, but not the separator. The cost of this item was \$1.12 per cow. In this connection it may not be amiss to remark that dairymen should see to it when establishing a herd that the cost of buildings and equipment is kept at as low a point as may be consistent with the maintenance of the cows in a comfortable and healthful condition. In some instances observed in the present survey the use of relatively expensive buildings and equipment more than doubled the charges necessarily debited against the cows for housing and equipment.

Where a milking machine was not used the equipment cost was in the neighborhood of 50 cents per cow.

### 7. BEDDING

The bedding was charged at the price which was paid for it, if purchased, whereas whenever it was home-grown a fair price was assessed. It cost on the average \$1.69 annually to bed a cow. Straw cost much more than did either shavings or sawdust.

### 8. MISCELLANEOUS CHARGES

A number of small items are grouped under this head for convenience sake, all of which are legitimate costs although, owing to local conditions, all do not pertain to every farm. They include:

- (a) Insurance on cows, based on the rate paid in each instance, usually 0.4 percent on two-thirds of the value of the herd.
- (b) Veterinarian's fees, medicines, disinfectants, etc.
- (c) Feed grinding.
- (d) Ice (in many cases a cold spring was available which made the use of ice unnecessary).
- (e) Cow testing association dues and fees. This item seems as legitimate a cost as the bookkeeping expense of a business house, and indicates that the farmer is desirous of maintaining an efficient herd.

The cost was \$1.25 per cow annually. Not all the farmers represented in this survey were members.

(f) Salt, stockfoods, etc.

(g) Taxes on cows, based on the local tax rate and figured on two-thirds value of the herd.

(h) Water and light, if purchased, at meter rates.

These items amounted to \$3.97 per cow and do not include milk hauling for the reason that a barn cost and not the cost of the product delivered at the railroad station was sought in this survey.

#### 9. MANAGERIAL ABILITY, BUSINESS RISKS, ETC.

The farmer who successfully conducts a dairy enterprise is justly entitled to something more than the regular wage of 21.9 cents per hour. Otherwise the "boss" stands on a level with the "hired man." He who directs and oversees is on a par with him who is told what to do. He is entitled to a fair profit on his business, to an income above bare cost charges in view of business risks such as temporary loss of market due to strikes, etc., to a sum which shall cover all sorts of minor incidental charges, such, for example, as telephone, postage and stationery and sundry small supplies. The farm management experts of the Federal Department of Agriculture have very thoroughly studied this phase of the matter and state that 10 percent of the total costs of conducting the business is a reasonable charge. The total in this survey was found to be \$123.74 and consequently \$12.37 is allowed as a proper charge under this item.

*The total average expense per cow on the 212 farms in this survey may be stated at \$136.11.*

#### CREDITS

The following items have been deemed proper credits, all being reduced to the unit-basis of the single cow: (1) Increase in stock value, (2) manure, (3) calf, (4) hides and feed bags, (5) production.

##### 1. INCREASE IN STOCK VALUE

The increase in value of the stock during year 1916-17 amounted to \$7.28 per cow or 10.3 percent of the individual value. This, of course, is an abnormal outcome. Under normal conditions this appreciation charge would be replaced by a depreciation charge of approximately 12 percent as noted above.

## 2. MANURE

It was assumed in this study that the average cow would void at the rate of a ton per month for the time she was in the barn. Each farmer was asked to name the price he considered a ton of manure to be worth. On this basis \$12.96 was the credit given for the manure per cow per year. This figure corresponds closely with that determined as a result of careful estimates made by experts in other States.

## 3. CALF

The value of the calf was figured on a grade basis when the calf was three days old and averaged \$3.52. The actual value of a calf at present veal prices is at least \$5.00 and this figure has been used in estimating future credits.

## 4. HIDES AND BAGS

Hides from cows lost to the milking herd, and cow feed bags averaged \$0.49 per cow.

These four credit items totaled \$24.25, leaving a net cost of \$111.86 to be defrayed by the returns received from the sale of milk.

## 5. PRODUCTION

As a result of the careful study of cow test association records when these were available as well as of the returns from milk and cream sales, giving due weight to conservative estimates as to household and other uses in each of the 212 herds, it was determined that the 4,650 cows produced on the average 2,478 quarts or 5,328 pounds of milk, including that used in the home, furnished to the hired help, and fed to the calves. The cost per quart on this basis at the farm was 4.51 cents. The cost of hauling milk to the shipping station varied from 10 to 25 cents per one hundred pounds. In case the farmer delivered his own milk, an allowance for man and horse labor at regular rates was charged. The haulage cost per quart averaged 0.273 cents, or a trifle less than one-third of a cent per quart.

A tabular summary of the previous discussion follows:

THE COST OF PRODUCING MARKET MILK

15

SUMMARY OF COST OF MILK PRODUCTION, MAY 1, 1916-APRIL 30, 1917 ON 212 VERMONT FARMS LOCATED IN 12 COUNTIES

4,650 COWS. 5,328 LBS. (2,478 QTS.) MILK PER COW

AVERAGE COST PER COW

		FOOD COST	
Grain	1,240 lbs. at \$41.12.....		\$25.48
Silage	5,440 lbs. at 4.39.....		11.93
Other succulents	400 lbs. at 4.00.....		0.80
Hay	3,500 lbs. at 11.94.....		20.93
Other dry forage	.....		0.51
Pasturage	.....		6.95
Total food cost .....			\$66.60

LABOR COST

Man labor	158 hours at \$0.219.....	\$34.53
Horse labor	8 hours at 0.141 .....	1.09
Total labor cost .....		\$35.62

OVERHEAD COSTS

Interest on animal inventory .....	\$ 4.44
Bedding .....	1.69
Use of buildings .....	7.50
Use of equipment .....	1.12
Bull service .....	1.94
Interest on feed inventory .....	0.86
Miscellaneous costs .....	3.97
Total overhead costs .....	\$ 21.52
Managerial ability, business risks .....	12.37
Total costs .....	\$136.11

AVERAGE RETURNS PER COW

Increased value of cows .....	\$ 7.28
Manure .....	12.96
Calves .....	3.52
Hides and feed bags .....	0.49
Total returns for items other than milk .....	\$24.25
Net cost of milk (\$136.11 — \$24.25) .....	\$111.86

Total production .....	2,478 qts. 5,328 lbs.
Cost per quart at farm .....	\$ 0.0451
Cost per 100 lbs. at farm .....	2.10
Hauling charge to station per quart .....	0.00273
Hauling charge to station per 100 lbs. ....	0.127
Cost per quart at station .....	0.0478
Cost per 100 lbs. at station .....	2.23

There seems reason to believe that the average milk yields obtained in this survey and cited above is nearly, if not quite, a full thousand pounds higher than that which would accurately represent the average production of the cows of the State as a whole. However, they represent what 212 practical farmers owning everyday farmers' herds are

making. They do not represent the results secured by fancy farmers owning high priced stock. They do not represent an impracticable ideal but an everyday practicality throughout Vermont. It does not seem too much to expect that dairymen who hope to continue in and succeed in the market milk business should so breed and feed their cattle as to develop herds capable of even greater production than this. It does not seem too much to say that dairymen who do not strive to increase the production of their cows, in so far as conditions admit of their doing so, should enter upon other lines of endeavor. Of course competition eventually will force them out of the milk business.

It is well known that the amount of milk a cow makes determines in a controlling degree its cost per quart. The following table drives home this idea.

Group	Number of farms in group	Number of cows in group	Average production	Cost per quart at farm.
Under 1800 quarts	28	689	1644 qts. 3535 lbs.	5.78 cts.
1801-2100	26	582	1957 qts. 4208 lbs.	5.00 cts.
2101-2400	49	1061	2247 qts. 4831 lbs.	4.80 cts.
2401-2700	36	734	2521 qts. 5420 lbs.	4.27 cts.
2701-3100	42	914	2862 qts. 6153 lbs.	4.36 cts.
Over 3100	31	670	3582 qts. 7701 lbs.	3.77 cts.
Average	212	4650	2478 qts. 5328 lbs.	4.51 cts.

Some dairymen have argued in shortsighted fashion that the sales price of milk should be set so high that all market milk makers, good, bad and indifferent, large and small, should make a profit. They seem to forget that consumers have rights, that sales prices in other lines of business are not determined by the capabilities of the inefficient but of the efficient operators who are able to make a profitable output at a less cost. Neither on the other hand should the lower production costs of the more highly organized and efficient dairies become the basis of price determination, since such conditions cannot universally obtain. Neither extreme affords a safe basis for the computation of cost charges. The material contained in this report represents an effort to secure data which may serve as a fair basis for milk bargaining.

If one is to attempt to estimate the costs of making market milk in the immediate future, it seems especially important that valid quantity figures be secured at the outset. In other words, it is more important to know that  $1\frac{3}{4}$  tons of hay were fed a cow during the year than to know that hay worth \$20.93 was fed. Ruling prices may be applied with safety and with a fair assurance as to their accuracy.



The cost of making milk for any given period then may be readily determined. In order to facilitate such a computation, the following table has been prepared, using the data secured during the survey now under discussion. The prices used for grain, roughage, labor, etc., are not those arrived at in the survey which, it will be remembered, covered the year from May 1, 1916 to April 30, 1917. To employ these figures in this year of rapid changes during the fall and winter of 1917 would be farcical. They have been modified according to the carefully formed judgment of the writers after a study of the survey data and conference with several of their associates.

OUTLINE FOR COMPUTING COST OF MILK PRODUCTION

PROBABLE COST OCTOBER 1, 1917		COST AT SOME FUTURE DATE	
<i>Food cost</i>		<i>Price per Ton Value</i>	
Grain, 1,240 lbs. @ \$50.....	\$31.00	0.62 @.....	.....
Silage, 5,440 lbs. @ \$5.....	13.60	2.72 @.....	.....
Other succulents (green oats, etc.), 400 lbs. ....	0.90	.... @.....	.....
Hay, 3,500 lbs. @ \$13.....	22.75	1.75 @.....	.....
Other dry forage (corn fodder, straw, etc.) .....	0.55	....	.....
Pasture .....	7.30	....	.....
<b>Total food cost.....</b>	<b>\$ 76.10</b>		
<i>Labor cost</i>		<i>Hrs.</i>	<i>Price Value</i>
Man labor, 158 hours @ 25c.....	\$39.50	158 @.....	.....
Horse labor, 8 hours @ 18c.....	1.44	8 @.....	.....
<b>Total labor cost.....</b>	<b>\$ 40.94</b>		
<i>Overhead costs</i>			
Depreciation on cows 12% on \$77.41	\$ 9.29	12% on .....	.....
Interest on cows 6% on \$77.41 .....	4.64	6% on .....	.....
Bedding .....	1.86	.....	.....
Use of buildings .....	8.25	.....	.....
Use of equipment .....	1.29	.....	.....
Bull service .....	2.13	.....	.....
Interest on feed inventory .....	1.03	.....	.....
Miscellaneous costs .....	4.57	.....	.....
<b>Total overhead costs.....</b>	<b>\$ 33.06</b>		
Managerial ability and business risks .....	15.01		
<b>Total cost .....</b>	<b>\$165.11</b>		
RETURNS OTHER THAN MILK			
Increased value of herd .....	\$.....	.....	.....
Manure .....	12.96	.....	.....
Calf .....	5.00	.....	.....
Hides and feed bags .....	.49	.....	.....
<b>Total cost .....</b>	<b>\$ 18.45</b>		
<b>Net cost of milk .....</b>	<b>\$146.66</b>		
Milk production (qts.) .....	2.478		
Cost per quart at farm .....	\$0.0592		
Cost per 100 pounds at farm .....	\$2.75		

## HOW TO USE THE TABLE

To make this table apply to local conditions, the right hand spaces may be filled in with such figures as individual judgment and experience dictate.

"Side line dairymen" will do well to make a close study of production costs, for then they will come to realize that the selling price of milk does not alone represent profit and that if they are to succeed in the business they must meet all legitimate expenses.

A reasonable profit on the enterprise should be allowed the dairyman. It is entirely fair to assume that any farmer who is capable of operating a complex dairy business could secure a commission of 10 percent on almost any business of equal size in which he embarked. Unless this is forthcoming from the farm, he is likely to turn to other fields, in which event a less efficient man takes his place and costs increase to a higher level than that occupied by cost and profit together under efficient management. Obviously from the standpoint of the milk-consuming public, it is desirable that the dairy business be made sufficiently attractive to hold the intelligent operator.

It should be clearly understood that this study was made in Vermont, that it deals with conditions as they exist in Vermont, and that the results are neither necessarily or probably applicable elsewhere. For example, it costs more to make milk in Southern New England than it does here. All that is claimed for the outcome is that it portrays with reasonable accuracy the average cost of making market milk on 212 Vermont dairy farms scattered all over the State during the year ending April 30, 1917, and that the estimate as to probable costs on these farms at the present writing, October 1, 1917, was determined by carefully considering the existing situation on the feed, labor and other markets in the light of the results secured in the spring study.

The following pages contain a series of forms for reporting cost of milk production data, being those adopted for uniform usage throughout the New England States in the 1917 spring study and supplied by the Agricultural Committee of the Boston Chamber of Commerce. It is hoped that every recipient of this bulletin who is a market milk maker or, indeed, carries on any sort of dairying operations and who possesses accurate data as to the actual cost of producing milk on his own farm will fill out these forms and mail them (signed) to the Extension Service, Burlington, Vermont. If a considerable number of Vermont dairymen will do this from year to year a sufficiently large mass of data can be thus accumulated to enable the University to furnish reliable information relative to the cost of making milk.

BLANK FOR STUDYING COST OF MILK PRODUCTION

Record for year ending.....19....County.....  
 Name..... P. O.....  
 Acres farmed..... Miles to shipping station.....

Cow cost—Inventories, Sales and Purchases

Number Value Total			Number Value Total		
Cows on hand			Cows on hand		
beginning of year	.... \$....	\$....	end of year..	.... \$....	\$....
Cows purchased...	....	....	Cows sold.....	....	....
Calves that became					
cows**	....	....	Cows died.....	....	....
Total	.... \$....	\$....	Total	.... \$....	\$....

Increased value \$..... Decreased value \$.....

Average inventory of cows, No..... Value, \$..... Interest @ 6%, \$.....

\*\*Give value of heifers at time of freshening.

Feed cost—Grain used by cows. (Do not include grain fed bulls or young cattle)

Purchased grain	Tons	Year Value per ton	Total
Barley or (wheat) mixed feed.....	.....	\$.....	\$.....
Crack corn or Soybean meal .....	.....	.....	.....
Distillers' dried grains .....	.....	.....	.....
Other feed .....	.....	.....	.....
Proprietary feeds (give brand name)..	.....	.....	.....
.....	.....	.....	.....
Total grain purchased for cows....	.....	\$.....	\$.....
Home-grown grain			
.....	.....	\$.....	\$.....
.....	.....	.....	.....
.....	.....	.....	.....
Total grain fed cows.....	.....	\$.....	\$.....

## Silage and other succulent food used by cows

	Tons		
Corn silage .....	.....	\$.....	\$.....
Soiling crop (name it) .....	.....	.....	.....
Roots .....	.....	.....	.....
		<u>.....</u>	<u>.....</u>
Total succulent food used by cows. ....	.....	\$.....	\$.....

## Dry forage used by cows

	Tons		
Mixed hay .....	.....	\$.....	\$.....
..... hay (name it).....	.....	.....	.....
.....	.....	.....	.....
Corn stover .....	.....	.....	.....
..... straw (name it).....	.....	.....	.....
		<u>.....</u>	<u>.....</u>
Total dry forage used by cows.....	.....	\$.....	\$.....

Average investment in feed and supplies used by cows, \$.....

Interest at 6%, \$.....

## PASTURE COST—Pasture used by stock

Acres .....	Value per acre \$.....	Total value \$.....
Interest and taxes at ....%	.....	\$.....
Annual fence costs .....	.....	.....
Paid for pasture .....	.....	.....
Other pasture cost .....	.....	.....
		<u>.....</u>
Total .....	.....	\$.....
Received for pasture .....	.....	\$.....
Difference = Cost .....	.....	\$.....
Proportion of cost charged to cows .....	.....	\$.....

BEDDING COSTS—Bedding used by cows

Amount	Value	Year	Total
Straw ..... Tons	\$.....	\$.....	
Shavings ..... Bales	.....	.....	
Sawdust ..... Loads	.....	.....	
.....	.....	.....	
<u>.....</u>	<u>.....</u>	<u>.....</u>	
Total .....	\$.....	\$.....	

LABOR COSTS—Labor on cows

Human labor charged @ ...c per hour. Horse labor charged @ ...c per hour

Human labor	Pasture season			Winter period			Total	
	Hours per day	Days	Total hours	Hours per day	Days	Total hours	Hours	Cost
	Milking .....	.....	.....	.....	.....	.....	.....	.....
Other chores† .....	.....	.....	.....	.....	.....	.....	.....	.....
Hauling milk.....	.....	.....	.....	.....	.....	.....	.....	.....
Hauling feed and bedding .....	.....	.....	.....	.....	.....	.....	.....	.....
<u>.....</u>	<u>.....</u>	<u>.....</u>	<u>.....</u>	<u>.....</u>	<u>.....</u>	<u>.....</u>	<u>.....</u>	<u>.....</u>
Total human labor .....	.....	.....	.....	.....	.....	.....	.....	\$....
Horse labor								
Hauling milk .....	.....	.....	.....	.....	.....	.....	.....	\$....
Hauling feed and bedding .....	.....	.....	.....	.....	.....	.....	.....	.....
Other labor .....	.....	.....	.....	.....	.....	.....	.....	.....
<u>.....</u>	<u>.....</u>	<u>.....</u>	<u>.....</u>	<u>.....</u>	<u>.....</u>	<u>.....</u>	<u>.....</u>	<u>.....</u>
Total horse labor .....	.....	.....	.....	.....	.....	.....	.....	\$....

\*As an aid in making estimates the following probable costs are given: Man labor 25c per hour; horse labor 12c per hour; cost of growing and storing silage corn 1.00 per ton.

†Feeding, care of barns, cows, products and utensils, etc.

BUILDING COSTS—Buildings used by cattle			EQUIPMENT COSTS—Equipment used by cows		
Value of buildings	Beginning of year	End of year	Inventory	Beginning of year	End of year
Cattle barns.....	\$.....	\$.....	Cans and other dairy utensils....	\$.....	\$.....
Milk house.....	.....	.....	Milk wagon.....	.....	.....
Ice house.....	.....	.....	Barn tools and equipment .....	.....	.....
Total .....	\$.....	\$.....	Total .....	\$.....	\$.....
Average value.....	\$.....		Average value.....	\$.....	
Interest and taxes @ ....%	\$.....		Interest .....	\$.....	
Insurance .....	.....		Equipment purchased .....	.....	
Yearly cost of building repairs* .....	.....		Repairs .....	.....	
Decreased value .....	.....	.....	Decreased value.....	.....	.....
Total .....	\$.....		Total .....	\$.....	
Increased value .....	\$.....		Increased value .....	\$.....	
Difference = Cost .....	\$.....		Difference = Cost .....	\$.....	
Proportion charged to cows. \$.....					

\*Materials purchased, materials used from farm, all labor employed, etc.

BULL SERVICE COST

Estimate the net cost of keeping herd bulls. Include under costs, feed, bedding, pasture, labor, use of buildings, interest, depreciation, etc. Deduct value of manure, receipts from service, appreciation, and any other returns..... \$.....

THE COST OF PRODUCING MARKET MILK

MISCELLANEOUS COSTS FOR COWS—(List all costs ~~not~~ previously given)

0210310  
MUE

insurance for cows .....	\$.....
medicines and disinfectants .....	.....
veternarian's fees .....	.....
feed grinding .....	.....
ce, ..... tons .....	.....
low test association dues, etc. ....	.....
aid for milk hauling .....	.....
alt and stock foods .....	.....
association fees and dues .....	.....
axes on cows .....	.....
water .....	.....
artificial light .....	.....
.....	.....
.....	.....
.....	.....
<b>Total .....</b>	<b>\$.....</b>

RETURNS OTHER THAN MILK

ow increase (page ....) .....	\$.....
anure, ..... tons @ \$.....	.....
ow hides .....	.....
alves, No. .... @ .....	.....
ow feed bags, ..... @ .....	.....
<b>Total .....</b>	<b>\$.....</b>

**2003-03**

DISPOSAL OF MILK

		Year	
Milk used in house.....	.....qts.* @	.....	\$.....
Milk furnished to hired help.	.....	.....	.....
Milk fed to stock .....	.....	.....	.....
Wholesale milk sold .....	.....	.....	.....
<b>Total milk produced</b> .....	<b>.....qts. @</b>	<b>.....</b>	<b>\$.....</b>

\*To change to pounds, multiply quarts by 2.15. To change pounds to quarts, divide pounds by 2.15.

SUMMARY

Costs	From page	Cost Amount	..... cows Year total Value
Cow decrease .....	.....	.....	\$.....
Interest on investment in cows.....	.....	.....	.....
Grains .....	.....	.....	.....
Succulent feed .....	.....	.....	.....
Dry forage .....	.....	.....	.....
Interest on investment in food and supplies .....	.....	.....	.....
Pasture .....	.....	.....	.....
Bedding .....	.....	.....	.....
Human labor .....	.....	.....	.....
Horse labor .....	.....	.....	.....
Use of buildings .....	.....	.....	.....
Use of equipment .....	.....	.....	.....
Bull service .....	.....	.....	.....
Miscellaneous costs .....	.....	.....	.....
<b>Total costs</b> .....	.....	.....	<b>\$.....</b>
Returns except milk .....	.....	.....	\$.....
Difference = Cost of milk.....	.....	.....	\$.....
Total milk receipts .....	.....	.....qts.	\$.....
Cost per quart.....	.....	.....	\$.....
Hauling cost per 100 lbs. ....	per qt. ....	.....	.....