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BULLETIN No. 85.

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RECORDS OF INDIVIDUAL COWS ON  
DAIRY FARMS.

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SUMMARY.

Eight herds are reported in this bulletin, containing 144 cows that have completed a year's work. The eight dairies had 176 cows at the beginning of the test, but 32 of them were sold before the end of the year.

Some of the herds returned their owners a good profit, others a small profit, and one herd was kept at a loss. Six herds out of the eight contained cows that did not pay for the feed they consumed.

In estimating the profit or loss on a cow it was counted that the calf paid for her keep while dry and the skim milk paid for labor.

The cow that yielded the most product gave 8,949 pounds of milk, and made 472 pounds of butter. The poorest cow produced 1,482 pounds of milk, 68 pounds of butter, and the average production for all the herds, except Gurler's (D), was 4,721 pounds of milk, 3.67 percent fat, 173 pounds of butter fat, and 202 pounds of butter.

It would not give the average production of the ordinary cows in Illinois if Gurler's herd were included, for he has been applying the scales and test for a number of years, hence his improved dairy. It should also be considered that the men who took up this work had been interested in improving their dairies, and undoubtedly have better cows than the average.

The most profitable cow gave a net profit of \$57.22 and the poorest cow was kept at an actual loss of \$17.83. The average net profit was \$9.96 per cow.

The above facts show clearly that the average production of the Illinois dairy cow can be doubled and the profit increased fourfold.

This can be done with little expense to the farmer. It will require better care and better feed for his stock, and the application of the scales and the Babcock test so that he can select and breed his animals more intelligently.

The results in this bulletin indicate that good care and good feed with judicious selection are the prime factors necessary for profitable milk and butter production.

For over a year the Department of Dairy Husbandry of the University of Illinois has been conducting field work among the dairymen of the state. A number of them were persuaded to weigh and sample each mess of milk a sufficient number of times during the year so that the performance of each cow could be estimated with a considerable degree of accuracy. It has been demonstrated by a number of our experiment stations that many cows are kept in the dairy at a very small profit and some at an actual loss. In order to determine the facts and to lead the dairymen to realize their full force and meaning a man was sent into the field to persuade a number of them to keep a record of every cow in their herds. While this bulletin gives no facts new to science, yet it presents a line of work on which we have but little data and it brings the farmers face to face with facts that exist upon their own farms. It shows them that some herds are kept at a good profit, some at a small profit, and others at an actual loss.

#### HOW THE FARM TEST WAS MADE.

The farmers who took up this work were required to weigh and sample the milk from each cow in the herd every seventh week for fourteen consecutive milkings. After each cow was milked the milk was poured into a weighing pail, weighed, and the weight recorded on a milk sheet directly under the cow's name. A small sample of milk was then taken with a sample dipper or a milk thief and put into the sample bottles. Corrosive sublimate tablets were used to preserve the samples of milk. Instructions were given to each man to shake the

composite samples each day so as to mix the fresh samples with the rest of the milk and keep the cream from becoming dry or hard on the sides of the bottle. The jars that were used for keeping the composite samples were one pint, tin top, covered bottles. When the period of weighing and sampling was completed the samples were tested either on the farm or at the creamery.

#### APPARATUS.

The things necessary for carrying on the work were: A spring scale for weighing the milk; a small dipper or milk thief for taking the samples; bottles for holding the composite samples; corrosive sublimate for preserving them; and milk sheets. All these were furnished by the Experiment Station. Each cow was given a name or number which was placed at the top of the milk sheet so that the weights of milk could be put directly under her name or number. Cut No. 1 shows all the necessary apparatus for carrying on the work, and Table I is a sample of a farmer's milk record.

TABLE I.—SAMPLE OF FARMER'S MILK RECORD FOR ONE WEEK, FROM JULY 30, P. M., TO AUGUST 6, A. M.

MILK—POUNDS.											
Number of the milking.	Spotty No. 1.	Black No. 1.	Black No. 2.	Bottle.	Milly.	Little Lamie.	Alice.	Belle.	Sleepy Eye.	Roaney.	Pet.
1	20.5	14.1	11.3	15.0	15.4	10.9	6.9	7.4	7.5	5.5	15.1
2	13.5	6.8	6.5	10.2	13.2	8.3	5.2	3.9	5.1	3.9	10.3
3	22.2	16.8	11.7	15.0	17.0	11.0	6.7	7.9	7.7	5.2	15.8
4	14.2	5.2	8.2	10.7	14.2	8.5	5.2	4.9	4.6	3.9	10.9
5	20.3	15.7	6.0	13.7	16.3	10.7	6.8	6.5	7.3	4.9	15.7
6	16.7	7.0	9.2	11.9	15.6	9.5	5.1	5.1	6.1	4.6	12.2
7	18.5	15.5	4.7	14.1	16.7	9.6	7.0	6.0	6.6	5.0	14.5
8	16.0	7.8	7.3	11.2	14.4	8.7	5.0	4.9	6.2	3.9	14.7
9	22.0	14.5	13.5	16.4	18.5	10.7	6.9	7.2	6.9	5.3	15.8
10	14.0	9.5	6.9	10.5	15.0	8.3	4.8	4.6	5.3	3.6	11.4
11	19.9	9.8	4.0	12.9	17.5	11.0	6.7	6.1	7.0	5.2	14.9
12	14.5	13.0	6.8	11.5	14.5	8.1	4.4	4.6	5.8	3.9	11.3
13	22.6	13.2	6.7	16.1	18.4	11.6	8.6	7.4	7.3	7.8	16.1
14	15.4	7.1	8.8	11.3	14.7	8.6	4.3	5.2	5.9	4.2	11.7
Total..	250.3	156.0	111.6	180.5	221.4	135.5	83.6	81.7	89.3	66.9	190.4
Fat, %	3.2	2.8	3.2	3.5	3.2	3.4	4.6	4.0	4.6	4.4	3.0
Fat, lb.	8.00	4.36	3.57	6.31	7.08	4.60	3.84	3.26	4.10	2.94	5.71

#### ARRANGING APPARATUS.

A considerable amount of time can be saved by arranging scales, sample bottles, and milk sheet in such a way that the weighing, recording the weight, and sampling the milk can be done with as few steps





CUT 1. SCALE FOR WEIGHING MILK. RECORD SHEET AND COMPOSITE SAMPLES.

and motions as possible. After the most desirable place in the barn has been chosen for weighing and sampling, the scales can be suspended from the ceiling so as to hang near the milk sheet which can be tacked to a board and hung on the wall, or fixed on an inclined shelf projecting from the wall. After the milk from each cow is weighed, a sample should be taken and placed in the jar bearing the cow's name or number. The sample bottles can be arranged on either side of the milk sheet, or if convenient, above it. If there are two or more milkers, the sample bottles can be arranged so that each milker will have his bottles together and arranged in the same order in which the cows are milked. This method saves time in finding the right sample bottle.

#### TIME CONSUMED IN WEIGHING AND SAMPLING.

The length of time required to weigh and sample the milk depends entirely upon the quickness of the man who is doing it. Some men will say that it takes but little time to weigh and sample each cow's milk, while others complain of the length of time necessary to do the work. It will take, on an average, about one minute to each cow, or two minutes a day. This indicates, for the seven weeks that it is done during the year,



about one hour and thirty-eight minutes for each cow tested. With this amount of time expended, the farmer can have a complete record of every cow in his herd. From this, with a knowledge of what he is feeding, he will know at the end of the year whether she has been a source of profit or loss to him; and furthermore, he will know from which cows to select heifers for his dairy. Considering the time that is consumed in doing this work, it seems strange that more dairymen do not have their herds tested. Many of them can weigh and sample each cow's milk every seventh week, and then have the buttermaker test the samples for them at the creamery. With the percent of fat and the weights of milk they can estimate for themselves the performance of every cow in their herds. The importance of doing this work will be shown further on in this bulletin.

#### CALCULATING THE AMOUNT OF MILK AND BUTTER FAT.

The milk was weighed and sampled during the fourth week of the seven-week periods. From the total amount of milk that each cow gave during this time, and the percent of fat, was calculated the amount of butter fat produced in the week. From these results were estimated the amount of milk and butter fat each cow produced during the three weeks before, and the three weeks following the test. The cow's yearly record was made up from these tests, and in this way the total amount of milk and butter fat that she produced during the entire year was determined. It may be objected to that this method did not secure results absolutely correct. On this it may be said that the chief object was to secure data from which cows could be compared with each other and that this object was fully attained even though the totals may have been either slightly too large or too small. Check methods show however, that the data are very close to the actual amounts produced. In many cases the dairymen also kept an approximate account of the grain and roughage that each cow consumed during the year. Where this was done the records are of exceptionally high value, for they clearly show the profit or loss of every cow kept in the dairy.

#### THE DIFFERENT METHODS THAT MAY BE USED IN WEIGHING AND SAMPLING.

There are several ways that records from each cow in the dairy can be obtained. The method used in obtaining the records given in this bulletin was as follows: The farmer, every seventh week, weighed and sampled each cow's milk for fourteen consecutive milkings. The amounts of milk yielded each day were added and from the percent of butter fat which the milk contained, was determined the amount of butter fat each cow produced during the week. From these results

were estimated the amount of milk and butter fat each cow produced the three weeks before and the three weeks following the test.

The Dairy Department of the Wisconsin Experiment Station had its patrons weigh and sample one day each week for the whole year. From the different weights and tests the amount of milk and butter fat that each cow produced in the entire year was estimated.

The testing of the milk each week is too much for the average farmer to do, but taking composite samples of milk of several milkings gives a very good average of the per cent of fat contained in the milk, and can be done by any one if he chooses. Fairly accurate results can be obtained by weighing and sampling the milk every thirteenth week and calculating the results the same way as when the weighing and sampling were done every seventh week. The method of weighing and sampling each cow's milk every seventh week for several consecutive milkings, or three and one-half days, gives very good results. The results can be multiplied by two which would equal the amount of milk and butter fat produced for one week, then estimated the same as if the weighing and sampling were done the entire week. The composite samples that are but three and one-half days old, are in better condition for testing than samples that are a week old. The farmers will take more pains with the work if it does not become tedious to them.

The accuracy of records obtained by weighing and sampling each cow's milk at regular times during the year is often doubted. As a check a comparison was made between the amount of milk and butter fat sold from two farms to a creamery and the amount of milk and butter fat as determined from weighing and sampling each cow's milk every seventh week for fourteen consecutive milkings during the year. In one case there was found a difference of 2.2 percent of butter fat, and .0015 percent in milk, making a difference of 4.67 pounds of butter fat and 8.09 pounds of milk per cow; in the other case a difference of .038 percent fat, and 1.98 percent in milk, or .27 pounds of butter fat and 120.3 pounds of milk per cow. From these results it is seen that by carefully weighing and sampling each cow's milk every seventh week during her period of lactation records can be secured which are substantially correct.

#### OBJECT OF THE WORK.

There is no better way of finding out the merits of a dairy animal when giving milk than to use the scales and the Babcock test. With the weights of milk produced, the percent of butter fat and the length of her milking season, together with the feed consumed, the value of a cow for the dairy can be determined. The object of getting dairymen to do this work is to determine which of the individual cows in their herds are the most profitable, so that the owners may cull out the poor

cows and keep the profitable ones; to show them the importance of better feeding and caring for their stock; and the importance of selecting better sires for their herds. A dairy animal should be selected for the amount of milk and butter fat which she yields during the year rather than on points of fancy or form. It is a reasonably safe rule in selecting dairy cows to go upon the results obtained from the scales and the Babcock test. If she is a good breeder, that also should be taken into consideration. If the performance of each cow in the herd is known, the heifers can be selected from the best cows and when these heifers become fresh the test should be applied to them and the inferior ones culled out. This can only be done when we have an intelligent understanding of each cow and her capability of producing milk and butter fat.

#### ELEMENTS OF DANGER IN THE USE OF SCALES AND BABCOCK TEST.

While the scales and Babcock test can be of great service in the selection of our dairy animals, they must, however, be used with judgment. Dairy cows have their "off years," and this must be considered when the herd is being culled. If we do not bear this fact in mind, we are apt to sell some of the best cows from our herds. The writer has in mind the cow Sweet Briar, of the Minnesota Experiment Station, that produced for ten years an average of 358.07 pounds of butter a year, while in 1898 she produced only 206.62 pounds of butter, but in 1899 she made 306.53 pounds, and in 1901 370.53 pounds. If the merits of Sweet Briar had been wholly based on the work she did in 1898 she would have been classed as a very ordinary cow, and perhaps sold. The great value of scales and Babcock test lies in their continued use in the dairy herd and not in one year's test. Good heifers usually come from the best dairy cows, but it sometimes happens that a promising heifer may do very poorly the first year. In such cases the heifer's individuality together with her breeding should be considered before she is sold. The testing of cows should, however, be carried on in every dairy if a systematic selection is to be made.

A good cow seldom has two "off years" in succession.

#### THE VARIATION IN FLOW AND PERCENT OF FAT IN MILK.

It has often been asked why it is necessary to weigh and sample each milking for a week. By weighing and testing each milking separately we usually find considerable variation in milk yield and fat content. The following tables show to what extent a cow will vary in quantity of milk and percent of fat from one milking to another. These tables are taken from records of cows that were tested for the Holstein-Friesian Advanced Registry.



TABLE 2.—SHOWING THE YIELD OF MILK AND PERCENT BUTTER FAT OF EACH MILKING FOR ONE WEEK.

ECHO BETTINA HERBERT'S RECORD.						
1902.		Milk, lb.	Fat, %	Fat, lb.	Total milk, lb.	Total fat, lb.
March 10,	Morning	12.3	4.60	.5658	31.4	1.2411
	Noon	9.0	3.80	.3420		
	Evening	10.1	3.30	.3333		
March 11,	Morning	14.2	3.10	.4402	35.2	1.0902
	Noon	10.0	3.20	.3200		
	Evening	11.0	3.00	.3300		
March 12,	Morning	15.6	3.70	.5772	38.5	1.4532
	Noon	11.0	4.20	.4620		
	Evening	10.9	3.80	.4142		
March 13,	Morning	17.6	3.30	.5808	41.8	1.4709
	Noon	12.2	4.05	.4941		
	Evening	12.0	3.30	.3960		
March 14,	Morning	16.5	3.10	.5115	40.4	1.35485
	Noon	12.2	3.70	.4514		
	Evening	11.7	3.35	.39195		
March 15,	Morning	18.0	3.50	.6300	42.9	1.6635
	Noon	12.6	4.20	.5292		
	Evening	12.3	4.10	.5043		
March 16,	Morning	17.2	3.50	.6020	43.0	1.6088
	Noon	13.0	4.20	.5460		
	Evening	12.8	3.60	.4608		

## MAID CLOVERDALE'S RECORD.

Sept. 23,	Morning	18.1	2.80	.506	45.3	1.322
	Noon	11.5	3.00	.345		
	Evening	15.7	3.00	.471		
Sept. 24,	Morning	18.4	4.20	.772	47.0	1.580
	Noon	13.0	3.10	.403		
	Evening	15.6	2.60	.405		
Sept. 25,	Morning	16.7	2.00	.334	46.5	1.250
	Noon	16.4	3.30	.541		
	Evening	13.4	2.80	.375		
Sept. 26,	Morning	17.3	2.60	.449	47.2	1.544
	Noon	18.0	4.50	.810		
	Evening	11.9	2.40	.285		
Sept. 27,	Morning	20.4	2.70	.550	50.1	1.395
	Noon	14.5	2.90	.420		
	Evening	15.2	2.80	.425		
Sept. 28,	Morning	18.5	3.80	.703	47.5	1.442
	Noon	14.5	2.80	.406		
	Evening	14.5	2.30	.333		
Sept. 29,	Morning	20.9	3.20	.668	51.1	1.488
	Noon	14.3	2.40	.343		
	Evening	15.9	3.00	.477		

The above table readily shows the importance of weighing and sampling the milk for more than one milking, if the average test of the

cow is to be obtained. Maid of Cloverdale, for example, tested on the morning of September 25, two percent, and at noon, September 26, 4.50 percent. Had either been taken as her actual test it would have been very misleading, for her average test for that particular week was 2.99 percent.

#### THE BASIS UPON WHICH THE PROFIT OR LOSS OF THE COW IS COMPUTED.

It is very difficult to express the true value of the dairy cow in dollars and cents. But since the profit or loss of most of the cows tested has been given, it is perhaps well to state the basis upon which the profit or loss was calculated. The value of the product that the cow yielded was based upon the amount of butter fat that she made, and the market price of butter fat at the time.

The value of the skim milk, the value of the calf, and the value of the manure produced by the cow were not credited to her, while on the other hand the cow was not debited with the amount of labor expended in her care nor the amount of feed she consumed when dry. The cow was simply credited with the amount of butter fat she produced, and charged for feed consumed when she was giving milk. The calf will usually pay for the cow's board when dry and the skim milk for the labor it takes to care for her. This method of calculation is, perhaps, a little unjust to some cows, for it is possible to have two cows yield the same amount of butter fat and one give a profit and the other a loss. If, for example, one milks ten months and the other but six months in the year to yield equal amounts of butter fat, which sometimes happens, one cow is charged with ten month's feed and the other with only six month's.

Red Bird in herd "B" and Duchess in herd "C" are examples of this kind. Red Bird milked ten months and charged \$1.28 cents for her board, and Duchess milked six months and gave a profit of \$9.16, and each yielded the same amount of butter fat.

The rations for the cows were not weighed each day. A number of dishes of meal was weighed in order to get the average amount of feed that the measure held and the number of dishes that each cow received a day was recorded. Cut and shredded corn stover and ensilage were estimated in the same manner. The hay was also weighed at different times.

#### REPORT OF HERD "A."

Herd "A" was composed of natives, grade Shorthorns, grade Jerseys, and grade Holsteins. The average weight of each cow was 1,000 pounds. The herd was not bred for dairy purposes. Moreover, they



CUT 2. COW NO. 6, HERD A, GAVE IN ONE YEAR 1,838 LB. MILK;  
AVERAGE TEST, 4.43%; 95 LB. BUTTER.

neither showed dairy form nor capabilities of giving large flows of milk, nor producing large amounts of butter fat. Nearly every cow showed some signs of disorder. They were not in a thrifty condition. A number of them aborted during the year, while others failed to get with calf and were sold. Some of them were disposed of so early in the test that their records are not calculated with the rest of the herd.

There were ten cows kept in this herd whose milk was not weighed or tested. It is unfortunate that the owner could not see the importance of weighing and testing each one of these cows, but the average amount of milk and butter fat that each of the untested cows produced for the year will be given, for a record of the amount of milk and butter fat that was sold from all the cows was kept.

The herd did not yield the amount of milk and butter fat that it should for the amount of grain consumed. While the owner did not keep an accurate enough account of the grain and roughage each cow ate to be reported upon, he fed a ration to his cows that was largely made up of corn and other foods rich in carbohydrates and containing a small per cent of protein. The cows received a small allowance of bran with the corn meal from October 1 to January 1. During the months of January and February, to the cows giving the largest flows of milk, was given the following:



## RATION 1.

Food stuffs.	Lb.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost.
Corn meal .....	10	8.91	.790	6.670	.430	10c
Silage .....	35	7.31	.315	3.955	.245	3.5c
Timothy hay .....	10	8.68	.280	4.34	.140	5c
Total nutrients .....		24.90	1.385	14.965	.815	18.5c

This ration was altogether too rich in carbohydrates and contained a very low per cent of protein. If this farmer had sold more of his corn and bought some mill feed he would, with less expense, have improved the ration. For example, a ton of corn meal would at this time have paid for more than a ton of grano-gluten. If a ration were made from five pounds of grano-gluten and three pounds of corn meal with the same amount and kind of roughage as contained in the above, the ration would be far better and cheaper. Such a ration would contain the following nutrients:

## RATION 2.

Food stuffs.	Lb.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost.
Grano-gluten .....	5	4.71	1.335	1.94	.620	4.5c
Corn meal .....	3	2.67	.237	2.001	.129	3c
Silage .....	35	7.31	.315	3.955	.245	3.5c
Timothy hay .....	10	8.68	.280	4.340	.140	5c
Total nutrients .....		23.38	2.167	12.236	1.134	16.0c

A number of the cows' udders became feverish and hard during the time that they were being fed so much corn. Four of them were giving milk from only three teats. It seems that excessive corn feeding must have had something to do with the general unsatisfactory condition of the herd, especially in the months of January and February, and perhaps the cause of four of them losing the use of one-quarter of their udders. The rye and corn meal were mixed equal parts by weight, and about eight pounds of the mixture, together with timothy hay and corn silage, was the ration they received until May 1, when ground oats was substituted in the place of rye. The cows were turned out to pasture about May 25, but were given a small allowance of silage to July 1. From this time on to the completion of the year's work they received nothing but grass. The ration which the cows received from March 1 to May 1 was somewhat better than the ration fed in January and February, but it could have been much improved with mill feed. The ration for fresh cows was about as follows:





CUT 3. COW NO. 10, HERD A, GAVE IN ONE YEAR 3,833 LB. MILK;  
AVERAGE TEST, 3.37%; 150 LB. BUTTER.

### RATION 3.

Food stuffs.	Lb.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost.
Rye .....	4	3.54	.396	2.704	.044	4.0c
Crushed corn and cob meal .....	4	3.40	.176	2.400	.116	4.0c
Silage .....	35	7.31	.315	3.955	.245	3.5c
Timothy hay .....	7	6.08	.196	3.038	.098	3.5c
Total nutrients.....		20.33	1.083	12.097	.503	15.0c

It will be noticed that this ration which contains but 1.083 pounds of protein costs nearly as much as Ration 2, which contains 2.167 pounds of protein. It readily shows that by exchanging some of the home-grown grain for mill stuff the ration could not only have been made better but actually cheaper. It can be said that the cows in this herd did a very ordinary year's work, but considering the individuality of each animal in the herd, the general condition of their health, together with unskillful feeding, it is not at all surprising that the results are no better.



CUT 4. COW NO. 15, HERD A, GAVE IN ONE YEAR 6,145 LB. MILK;  
AVERAGE TEST, 3.63%; 260 LB. BUTTER; NET PROFIT, \$18.40.

YEARLY RECORD OF BEST AND POOREST COW IN HERD "A," AND AVERAGE FOR  
ENTIRE HERD.

	Milk, lb.	Fat, %	Fat, lb.	Butter, lb.
Best cow, No. 15.....	6,145	3.63	223	260
Poorest cow, No. 37.....	1,482	3.97	58	68
Average record of cows tested.....	3,970	3.55	141	164
Average record of entire herd.....	3,361	3.55	119	139

It was found that the average cow must produce about 140 pounds of butter fat last year to pay for her board, since the average price for butter fat, when sold to the creameries, was twenty-two cents. Calculating the results upon that basis, the cows that were tested yielded a profit of twenty-three cents. To ascertain the amount of product yielded by each of the untested cows in the herd for the year, it was necessary to subtract the amount of milk and butter fat yielded by the eighteen cows that were tested from the total amount of milk and butter fat that was sold from this dairy. In this calculation a liberal amount of milk was estimated for house use and for feeding of calves.

Total amount of milk sold from Farm "A".....	97,720	lb.
" " " yielded by tested cows.....	76,060	"
" " " " the ten untested cows.....	21,660	"

The average amount of milk yielded by each untested cow . . .	2,166	lb.
“ total amount of butter fat sold from Farm “A” . . . . .	3,554	“
“ “ “ yielded by tested cows . . . . .	2,751	“
“ “ “ “ ten untested cows . . . . .	803	“
“ average amount of butter fat yielded by each cow untested . . . . .	80	“

Calculating for the whole herd, and estimating that it takes 140 pounds of butter fat to pay for a cow's board, there is a loss of \$4.54 a cow, or each cow should have produced 20.64 pounds more butter fat to have paid for her keep.

The best cow in this herd gave a profit of \$18.40, while the poorest was kept at an actual loss of \$17.83.

TABLE 3.—RECORD OF EACH COW IN HERD “A” FOR ONE YEAR.

GROUP 1.—COWS YIELDING LESS THAN 100 LB. OF BUTTER FAT.								
No. of cow.	Age, years.	Breed.	Date of calving.	Milk, lb.	Fat, per cent.	Fat, lb.	Lb. of butter.	Days in milk.
37	12	Grade Jersey . . . . .	11- 8-01	1482*	3.97	58	68	147
6	3	Native . . . . .	5-29-02	1838	4.43	81	95	210
25	8	Native . . . . .	2-13-02	2470	3.87	95	111	210
GROUP 2.—COWS YIELDING LESS THAN 140 LB. OF BUTTER FAT.								
1	4	Grade Shorthorn . . . . .	10-25-02	3176	3.45	109	128	196
31	10	Grade Shorthorn . . . . .	1-17-02	3535	3.18	112	131	245
8	3	Native . . . . .	9- 6-01	2740	4.16	114	133	259
10	4	Native . . . . .	3- 5-02	3833	3.37	129	150	245
34	10	Grade Shorthorn, Abr. . . . .	12- 5-01	4474	2.97	133	155	294
46	3	Native . . . . .	1- 8-02	3766	3.67	138	161	259
GROUP 3.—COWS YIELDING LESS THAN 175 LB. OF BUTTER FAT.								
33	10	Grade Holstein . . . . .	4- 9-02	3550	3.94	140	163	210
30	9	Native { Abr. . . . .	9-29-02	4306	3.55	153	178	299
		{ Clv. . . . .	12-18-01					
29		Native, Abr. . . . .	3-21-02	3916	4.00	156	183	210
4	3	Native . . . . .	4-13-02	3651	4.31	157	183	365
44	4	Native . . . . .	11-16-01	5082	3.15	160	186	294
GROUP 4.—COWS YIELDING LESS THAN 225 LB. OF BUTTER FAT.								
13	4	Grade Holstein . . . . .	2-25-02	4895	3.87	189	221	290
2	4	Grade Holstein . . . . .	10-30-01	6824	2.80	191	223	308
16	9	Grade Holstein . . . . .	1- 4-01	5776	3.33	192	224	308
15	9	Grade P. S. H. . . . .	11- 4-01	6145	3.63	223	260	294

\* The tenth's place in the “milk” column and the tenth's and hundredth's places in the “butter fat” and “butter” columns have been eliminated for the convenience of the reader. The average “percent fat,” the average production, and the profit or loss of the herd, however, were figured before the elimination. This method not only applies to herd “A,” but to all the herds tested.

## THE REPORT OF HERD "B."

This herd was composed largely of common native and grade Holstein cows. There were a number of fairly good dairy cows in the herd and a number of promising heifers. The cows weighed an average, about 1,050 pounds. The general health of the herd was good. A few of the cows aborted during the year and some of them had caked udders. A few of them were sold on this account. A number of them were disposed of so early in the test that their records are not calculated with the rest of the herd but are given separately. On the whole it can be said that the cows received good care and were fairly well fed throughout the year.

The cows were fed from October 1 to November 1, some ear corn and stalks and pasture. During the months of November and December, the cows received the following:

## RATION 4.

Food stuffs.	Lb.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost.
Bran .....	6	5.31	.774	2.406	.204	5.4c
Corn meal .....	6	5.35	.474	4.002	.258	6.0c
Millet hay .....	8	7.04	.256	3.880	.080	4.0c
Corn stover.....	10	5.95	.170	3.240	.070	2.0c
Total nutrients.....		23.65	1.674	13.528	.612	17.4c

This ration would have been considerably better if two pounds of oil meal or gluten meal had been substituted for three pounds of corn meal and would have cost no more.

During the months of January and February the fresh cows received seven pounds of bran, four pounds of corn meal, oat straw, and corn stover *ad libitum*.

In March and April they received a ration about as follows:

## RATION 5.

Food stuffs.	Lb.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost.
Bran .....	6	5.31	.774	2.406	.204	5.4c
Gluten feed .....	3	2.70	.699	1.521	.081	3.3c
Clover hay .....	5	4.23	.340	1.790	.085	2.5c
Corn stover .....	8	4.76	.136	2.592	.056	1.6c
Total nutrients .....		17.00	1.949	8.309	.426	12.8c
Oat straw, <i>ad libitum</i> .						



This is a balanced ration and contains enough nutrients for cows giving large flows of milk. If some succulent food, such as roots or silage, had been added, it would have been still better.

In May, the fresh cows or the ones giving the most milk, received the following:

RATION 6.

Food stuffs.	Lb.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost.
Shorts .....	7	6.17	.854	3.50	.266	6.3c
Gluten feed.....	3	2.70	.699	1.521	.081	3.3c
Clover hay .....	5	4.23	.340	1.790	.085	2.5c
Millet hay .....	8	7.04	.256	3.880	.080	4.0c
Total nutrients .....		20.14	2.149	10.691	.512	16.1c

This is another very good ration as it supplies enough nutriment for a cow producing 350 pounds of butter fat a year. Each cow in the herd during the rest of the year received two pounds of shorts a day, besides plenty of blue grass pasture.

YEARLY RECORD OF BEST AND POOREST COW IN HERD "B," AND AVERAGE FOR ENTIRE HERD.

	Milk, lb.	Fat, %	Fat, lb.	Butter, lb.
Best cow, Hartwell No. 2 .....	6,197	3.99	247	288
Poorest cow, Brindle No. 1 .....	3,731	2.88	107	125
Average record of entire herd .....	5,360	3.52	188	220

Spotty No. 1 charged to produce 100 pounds of milk, 40.7 cents and 12.6 cents for one pound of butter fat.

Red Bird charged to produce 100 pounds of milk, 70.9 cents, and 23.2 cents for one pound of butter fat.

The average cost of this herd to produce 100 pounds of milk was 57.0 cents and 16.1 cents to make one pound of butter fat.

Spotty No. 1 gave a profit of \$25.32 and Red Bird charged \$1.28 for her board.

The average profit of each cow was \$12.12.

The average price of grain and roughage from September 1, 1901, to September 1, 1902, was about as follows:

Bran .....	\$18.00 per ton.	Oil meal.....	\$28.00 per ton.
Shorts .....	18.00 "	Clover hay .....	10.00 "
Corn meal.....	20.00 "	Timothy hay ....	10.00 "
Corn cob meal ...	20.00 "	Millet hay .....	10.00 "
Grano-gluten ....	18.00 "	Corn stover.....	4.00 "
Gluten meal .....	28.00 "	Corn silage.....	2.00 "
Gluten feed .....	22.00 "	Pasture .....	\$1.00 per month.



CUT 5. SPOTTY NO. 1, HERD B, GAVE IN ONE YEAR 7,711 LB. MILK;  
AVERAGE TEST, 3.20%; 288 LB. BUTTER; NET PROFIT, \$25.32.



CUT 6. RED BIRD, HERD B, GAVE IN ONE YEAR 4,974 LB. MILK;  
AVERAGE TEST, 3.04%; 176 LB. BUTTER; NET LOSS, \$1.28.

The price of grain is based upon purchase price in the city market and the price of roughage is based upon the purchase price at the farm. When the cow is charged the above prices for farm products the farmer receives a profit on his land and the profit which the cow gives him is over and above what he could have received for his products if he had sold them upon the market, and moreover, the cows are often fed that which is not marketable. Take corn stover for example, what would it be worth if it was not for the live stock kept upon the farms?

The average prices of butter fat when sold to the creameries for the different months, were as follows:

September, 1901.....	19c	April, 1902.....	26c
October, 1901 .....	19c	May, 1902 .....	22c
November, 1901 .....	20c	June, 1902.....	21c
December, 1901 .....	22c	July, 1902 .....	20.5c
January, 1902.....	24c	August, 1902 .....	19c
February, 1902.....	28c	September, 1902 .....	20.5c
March, 1902 .....	28c	October, 1902 .....	23c

TABLE 4.—SHOWING PROFIT OR LOSS FOR EACH COW IN HERD "B" FOR ONE YEAR.

GROUP 1. KEPT AT A LOSS.

Name of cow.	Milk, lb.	Fat, %	Fat, lb.	Lb. butter.	Gross returns.	Cost of feed.	Profit or loss.
Red Bird.....	4,974	3.04	151	176	\$33.99	\$35.27	\$1.28
Belle .....	4,412	3.38	149	174	33.26	34.30	1.04
Brindle No. 1 .....	3,731	2.88	107	125	25.41	26.41	1.00

GROUP 2.—KEPT AT A SMALL PROFIT.

Alice .....	4,231	3.97	168	196	\$38.61	\$34.30	\$4.31
Little Lamie .....	3,956	3.05	120	140	27.32	21.95	5.37
Harry Cow.....	4,891	3.14	153	179	35.00	27.93	7.07
Sleepy Eye .....	4,190	4.20	176	205	40.53	31.67	8.86

GROUP 3.—KEPT AT A FAIR PROFIT.

Black No. 2 .....	5,474	3.53	193	225	\$44.28	\$32.91	\$11.37
Spotty No. 2 .....	6,720	3.34	224	262	50.85	38.51	12.34
Roaney.....	5,705	3.94	225	262	52.43	39.46	12.97
Dora .....	4,989	3.70	184	215	39.51	26.40	13.11
Black No. 1 .....	6,179	3.05	188	220	44.36	30.71	13.65

GROUP 4.—KEPT AT A GOOD PROFIT.

Hartwell No. 2 .....	6,197	3.99	247	288	\$55.47	\$30.49	\$24.98
Spotty No. 1 .....	7,711	3.20	247	288	56.73	31.41	25.32



TABLE 4—Continued.

## GROUP 5.—KEPT AT A VERY FAIR PROFIT.

Name of cow.	Milk, lb.	Fat, %	Fat, lb.	Lb. butter.	Gross returns.	Cost of feed.	Profit or loss.
Bottle .....	5,450	3.66	199	232	\$42.79	\$27.37	\$15.42
Beauty .....	6,402	3.82	245	285	53.62	36.79	16.83
Hartwell No. 1 .....	4,421	4.20	186	217	38.24	21.10	17.14
Brindle No. 2 .....	4,683	3.43	161	187	38.52	20.85	17.67
Clara .....	6,101	3.89	237	277	54.85	35.95	18.90
Pet .....	6,793	3.10	211	246	48.60	28.18	20.42

TABLE 5.—RECORD OF EACH COW IN HERD "B" FOR ONE YEAR.

## GROUP 1.—COWS YIELDING LESS THAN 160 LB. OF BUTTER FAT.

Name of cow.	Age, yr.	Breed.	Date of calving.	Milk, lb.	Fat, %	Fat, lb.	Lb. butter.	Days in milk.
Brindle, No. 1 ....	15	Native ...	2- 2-02	3,731	2.88	107	125	203
Little Lamie .....	8	" ...	3- 1-02	3,956	3.05	120	140	275
Belle .....	3	Gr. Holst.	11-10-01	4,412	3.38	149	174	290
Red Bird .....	6	"	9-30-01	4,974	3.04	151	176	300
Harry Cow.....	10	"	2- 3-02	4,891	3.14	153	179	240

## GROUP 2.—COWS YIELDING LESS THAN 200 LB. OF BUTTER FAT.

Brindle No. 2 .....	4	Native ...	.....	4,683	3.43	161	187	210
Alice .....	3	Gr.Holst.	11-13-01	4,231	3.97	168	196	287
Sleepy Eye. ....	5	Native ...	12-25-01	4,190	4.20	176	205	320
Dora .....	6	Gr. Holst.	3-21-02	4,989	3.70	184	215	310
Hartwell No. 1 ....	8	Native ...	5-27-02	4,421	4.20	186	217	270
Black No. 1 .....	8	Gr.Holst.	1-28-02	6,179	3.05	188	220	275
" 2 .....	4	"	2-21-02	5,474	3.52	193	225	340
Bottle .....	5	"	4-11-02	5,450	3.66	199	232	300

## GROUP 3.—COWS YIELDING LESS THAN 250 LB. OF BUTTER FAT.

Pet .....	5	Gr.Holst.	2-12-02	6,793	3.10	211	246	260
Spotty No. 2 .....	8	Native ...	9-24-01	6,720	3.34	224	262	300
Roaney.....	7	"	11- 7-01	5,705	3.94	225	262	305
Clara .....	5	Gr. Holst.	10- 1-01	6,101	3.89	237	277	300
Beauty .....	4	Native ...	10- 5-01	6,402	3.82	245	285	305
Spotty No. 1 .....	12	" ...	7-31-02	7,711	3.20	247	288	280
Hartwell No. 2 ....	12	"	2-21-02	6,197	3.99	247	288	267
			3- 1-02					

## REPORT OF HERD "C."

This herd was composed of natives, grade Shorthorns, grade Holsteins, one Red Poll and two grade Jerseys. The average weight of the cows was about 1,050 pounds and they were in good health during the whole year. There were no abortions or caked udders during the time the test was made. A number of the cows were sold early in the test because of their rapid falling off in milk flow when about three

months along in the period of lactation. This is a very common fault with a great many cows kept in the dairy, and it is not noticed by the owners so much as it should be. They remember the cow when she gave a full pail of milk. The herd received good care during the year and was kept in a warm barn during the winter where it received a fairly good ration. The fresh cows in October to November were fed daily about three pounds of bran, shock corn, and pasture. From November 15 to January 1, the ration consisted of the following feeds: Bran, five pounds; corn meal, three pounds; corn stover, *ad libitum*. If the farmer could have given his cows ten pounds of alfalfa or clover hay and less corn stover it would have been a considerably better ration.

In January and February a little better ration was fed. It was about as follows:

## RATION 7.

Food stuffs.	Lb.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost.
Bran .....	5	4.42	.645	2.005	.170	4.5c
Corn meal .....	5	4.45	.395	3.335	.215	5.0c
Gluten feed .....	1	.90	.233	.507	.027	1.1c
Timothy hay .....	5	4.34	.140	2.170	.070	2.5c
Corn stover .....	12	7.14	.204	3.888	.084	2.4c
Total nutrients.....		21.25	1.617	11.905	.566	15.5c



CUT 7. CRAZY, HERD C, GAVE IN ONE YEAR 6,945 LB. MILK; AVERAGE TEST, 4.23%; 343 LB. BUTTER; NET PROFIT, \$31.55.



CUT 8. DUCHESS, HERD C, GAVE IN ONE YEAR 4,229 LB. MILK;  
AVERAGE TEST, 3.59%; 177 LB. BUTTER; NET PROFIT, \$9.16!



CUT 9. JERSEY, HERD C, GAVE IN ONE YEAR 5,498 LB. MILK;  
AVERAGE TEST, 4.48%; 287 LB. BUTTER; NET PROFIT, \$34.77.



This ration would have been still better if the corn meal had been reduced two pounds and gluten feed increased to four pounds. During the months of March, April, and May, to the cows giving the largest flow of milk were given the following:

## RATION 8.

Food stuffs.	Lb.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost.
Bran .....	5	4.42	.645	2.005	.170	4.5c
Gluten feed .....	2	1.80	.466	1.014	.054	2.2c
Oil meal .....	1	.91	.293	.327	.078	1.4c
Timothy hay .....	15	13.02	.420	6.510	.210	7.5c
Total nutrients.....		20.15	1.824	9.856	.512	15.6c

The cows were turned out to pasture about May 20, and as soon as grass was plentiful they received no grain during the rest of the test. They, however, received some forage in connection with the pasture. Green peas and oats were fed in July, and in August green sorghum. It can be said that the herd was well cared for the whole year, and moreover, every cow was fed as near as possible according to the amount of milk and butter fat that she was yielding. It must be borne in mind that the rations given above were fed to cows that were producing the most milk and butter fat and not to the strippers.

## YEARLY RECORD OF BEST AND POOREST COW IN HERD "C," AND AVERAGE FOR ENTIRE HERD.

	Milk, lb.	Fat, %	Fat, lb.	Butter, lb.
Best cow, Crazy.....	6,945	4.23	294	343
Poorest cow, Harrison .....	2,721	3.96	108	126
Average yield of entire herd.....	4,942	3.90	192	224

Jersey produced butter fat the cheapest. She charged 29.7 cents to produce 100 pounds of milk, and 6.6 cents to make one pound of butter fat.

Harrison charged 97.7 cents to make 100 pounds of milk, and 24.6 cents to make one pound of butter fat.

The average cost of this herd to produce 100 pounds of milk was 55.5 cents, and 14.2 cents to produce one pound of butter fat.

Jersey gave a profit of \$34.77, and Harrison charged \$1.27 for her keeping.

The average profit for each cow in the herd was \$16.22.

TABLE 6.—SHOWING PROFIT OR LOSS FOR EACH COW IN HERD "C" FOR ONE YEAR.

GROUP 1.—KEPT AT A LOSS.							
Name of cow.	Milk, lb.	Fat, %	Fat, lb.	Lb. butter.	Gross returns	Cost of feed.	Profit or loss.
Harrison.....	2721	3.96	108	126	\$25.34	\$26.61	\$1.27
Ella.....	3,519	3.64	128	149	29.12	30.98	1.86
GROUP 2.—KEPT AT A SMALL PROFIT.							
White Face.....	3,865	3.56	137	160	\$31.69	\$31.30	\$ .39
Millie.....	4,118	3.83	157	184	36.68	28.29	8.39
Duchess.....	4,229	3.59	151	177	37.47	28.31	9.16
GROUP 3.—KEPT AT A FAIR PROFIT.							
Victoria.....	2,979	4.34	129	151	\$26.28	\$15.81	\$10.47
Little Brownie.....	5,121	3.75	192	224	45.18	32.60	12.58
Lady.....	5,015	3.94	197	230	42.71	27.72	14.99
GROUP 4.—KEPT AT A VERY FAIR PROFIT.							
Pet.....	5,590	3.43	191	223	\$45.15	\$25.66	\$19.49
Old Line Back.....	5,926	3.55	210	245	50.34	28.47	21.87
Queen.....	4,857	3.73	181	211	38.90	21.61	17.29
Black Hawk.....	6,500	3.99	259	303	58.52	34.88	23.64
Babe.....	5,186	4.68	242	283	54.78	33.60	21.18
GROUP 5.—KEPT AT A GOOD PROFIT.							
Stubbornness.....	5,924	3.50	207	242	\$45.19	\$20.39	\$24.80
Roaney.....	6,013	3.97	238	278	57.46	29.00	28.46
Crazy.....	6,945	4.23	294	343	66.77	35.22	31.55
Jersey.....	5,498	4.48	246	287	51.15	16.38	34.77

TABLE 7.—RECORD OF EACH COW IN HERD "C" FOR ONE YEAR.

GROUP 1.—COWS YIELDING LESS THAN 160 LB. OF BUTTER FAT.								
Name of cow.	Age, yrs.	Breed.	Date of calving.	Milk, lb.	Fat, %	Fat, lb.	Lb. of butter	Days in milk.
Harrison.....	2	Gr. Holst.	7- 6-01	2,721	3.96	108	126	246
Ella.....	2	"	9-25-01	3,519	3.64	128	149	295
Victoria.....	4	"	6- 5-02	2,979	4.34	129	151	214
White Face.....	2	"	9-15-01	3,865	3.56	137	160	290
Duchess.....	8	Native...	1- 2-02	4,229	3.59	151	177	197
GROUP 2.—COWS YIELDING LESS THAN 200 LB. OF BUTTER FAT.								
Millie.....	2	Gr. Holst.	10-20-01	4,118	3.83	157	184	330
Queen.....	4	Gr. S. H. .	3-28-02	4,857	3.73	181	211	260
Pet.....		Gr. Holst.	11-26-01	5,590	3.43	191	223	305
Little Brownie..	8	Native...	10- 3-01	5,121	3.75	192	224	245
Lady.....	9	Gr. S. H. .	3-28-02	5,015	3.94	197	230	303

TABLE 7—Continued.

## GROUP 3.—COWS YIELDING LESS THAN 300 LB. OF BUTTER FAT.

Name of cow.	Age, yrs.	Breed.	Date of calving.	Milk, lb.	Fat, %	Fat, lb.	Lb. of butter.	Days in milk.
Stubbornness . . .	9	Gr. Holst.	3-29-02	5,924	3.50	207	242	246
Old Line Back . . .	12	Native . . .	12-20-02	5,926	3.55	210	245	250
Roaney . . . . .		Gr. S. H. . .	1- 5-02	6,013	3.97	238	278	245
Jersey . . . . .	9	Gr. Jer. . .	1- 3-02	5,498	4.48	246	287	275
Babe . . . . .	6	"	10- 3-01	5,186	4.68	242	283	365
Black Hawk . . .	4	Gr. Holst.	9-26-01	6,500	3.99	259	303	335
Crazy . . . . .	10	Gr.RedP.	10- 4-01	6,945	4.23	294	343	335

## REPORT OF HERD "D."

The cows in this herd consisted of full blood Jerseys, grade Jerseys, full blood Holsteins, grade Holsteins, natives, and grade Shorthorns. There were sixty cows in the herd when the test began and forty-seven of them remained through the year. Thirteen of the cows were sold during the time the test was being made for they were found to be inferior and unprofitable animals. The herd contained a great many very fine dairy cows and they made some very good records. The cows were in a good condition during the whole year and were kept in a scrupulously clean and well-ventilated barn which was scrubbed once a day and white washed twice a year. The sanitary condition was nearly perfect. The cows were not only well cared for, but they received well balanced rations during the entire year. The results of this herd readily show the importance of taking good care of dairy cows and of feeding them well. Some of the rations that the herd received at different times during the year show clearly how well these cows were fed.

From September 1 to the middle of October, to the cows giving the largest flow of milk, the rations consisted of six pounds of grano-gluten and all the green corn that they would eat up clean. From October 15 to December 7, the ration to the best milkers was about as follows:

## RATION 9.

Food stuffs.	Lb.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost.
Grano-gluten . . . . .	5	4.71	1.335	1.940	.62	4.5c
Corn meal . . . . .	3	2.67	.237	2.001	.129	3.0c
Corn silage . . . . .	45	9.40	.405	5.085	.315	4.5c
Timothy hay . . . . .	5	4.34	.140	2.170	.070	2.5c
Total nutrients . . . . .		21.12	2.117	11.196	1.134	14.5c

The ration fed from December 7 to February 1 was as follows:

## RATION 10.

Food stuffs.	Lb.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost.
Shorts .....	3	2.65	.366	1.50	.114	2.7c
Corn meal .....	2	1.78	.158	1.334	.086	2.0c
Gluten meal .....	3	2.64	.963	1.236	.075	4.2c
Corn silage .....	45	9.40	.405	5.085	.315	4.5c
Hay .....	5	4.34	.140	2.170	.070	2.5c
Total nutrients.....		20.81	2.032	11.325	.660	15.9c

The cows seemed to do better when fed grano-gluten and corn meal than when they were fed shorts, corn meal, and gluten meal.

The ration from February 1 to March 15 was five pounds of grano-gluten, three pounds of corn meal, and fifty pounds of silage and timothy hay. From this time on until the cows were turned out to grass, they received about the following:

## RATION 11.

Food stuffs.	Lb.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost.
Grano-gluten .....	7	6.60	1.869	2.716	.868	6.3c
Corn meal .....	3	2.67	.237	2.001	.129	3.0c
Silage .....	60	12.54	.540	6.780	.420	6.0c
Total nutrients.....		21.81	2.646	11.497	1.417	15.3c

It will be noticed that this ration contains no hay, corn silage being the only roughage that the cows received. The cows did very well on this ration and when they were turned out to pasture, which was about June 1, they were in good condition. In June the cows received about four pounds of grano-gluten a day, besides a grass pasture.

In July and August they received nothing but pasture grass. The above rations apply more to the general feeding of the best milkers in the herd, the strippers and poor milkers getting according to the amount of milk they were producing.

It should be observed that the rations given to the cows during the year did not contain a large amount of grain, but each one contained a liberal amount of nutrients for cows that were giving a large flow of milk and yielding large amounts of butter fat. It will also be noticed that each ration contained over two pounds of protein. This can be accounted for when grano-gluten is compared with bran or oats, for it contains twice as much digestible protein. Therefore, it is not necessary to feed so many pounds of the grano-gluten as we would have to feed of bran or oats to get the same amount of digestible protein.



The above facts are mentioned so that the reader will not be misled when he compares the total amount of grain that each cow in this herd consumed with the total amount of grain consumed by each cow in some other herd. When the cows in this herd were not receiving grano-gluten they were receiving gluten meal which is a by-product of glucose refining companies. This feed is also very rich in protein. It contains about thirty-two per cent of digestible protein. These facts demonstrate very clearly that it often pays farmers to sell some of their oats or corn and buy some such by-products as gluten meal, gluten feed, grano-gluten, oil meal, or dried brewer's grains, etc.

YEARLY RECORD OF BEST AND POOREST COW IN HERD "D," AND AVERAGE FOR ENTIRE HERD.

	Milk, lb.	Fat, %	Fat, lb.	Butter, lb.
Best cow, No. 129 .....	8,949	4.52	404	472
Poorest cow, No. 324.....	3,364	4.06	136	159
Average record of entire herd .....	5,911	4.45	263	306

Cow No. 147 made butter fat the cheapest. She charged 7.5 cents to produce one pound of butter fat and 35.5 cents to produce 100 pounds of milk.



CUT 10. COW NO. 283, HERD D, GAVE IN ONE YEAR 10,151 LB. MILK; AVERAGE TEST, 3.68%; 436 LB. BUTTER; NET PROFIT, \$45.36.



CUT 11. COW NO. 317, HERD D, GAVE IN ONE YEAR 10,059 LB. MILK;  
AVERAGE TEST, 3.79%; 445 LB. BUTTER; NET PROFIT, \$48.94.



CUT 12. COW NO. 147, HERD D, GAVE IN ONE YEAR 7,890 LB. MILK;  
AVERAGE TEST, 4.70%; 432 LB. BUTTER; NET PROFIT, \$57.22.



CUT 13. COW NO. 199, HERD D, GAVE IN ONE YEAR 6,132 LB. MILK;  
AVERAGE TEST, 4.75%; 340 LB. BUTTER; NET PROFIT, \$31.54.



CUT 14. COW NO. 44, HERD D, GAVE IN ONE YEAR 3,399 LB. MILK;  
AVERAGE TEST, 4.58%; 181 LB. BUTTER; NET LOSS, 18 CENTS.





CUT 15. COW NO. 184, HERD D, WITH TWO QUARTERS OF HER UDDER GONE, GAVE IN ONE YEAR 7,997 LB. MILK; AVERAGE TEST, 4.77%; 445 LB. BUTTER; NET PROFIT, \$49.42.



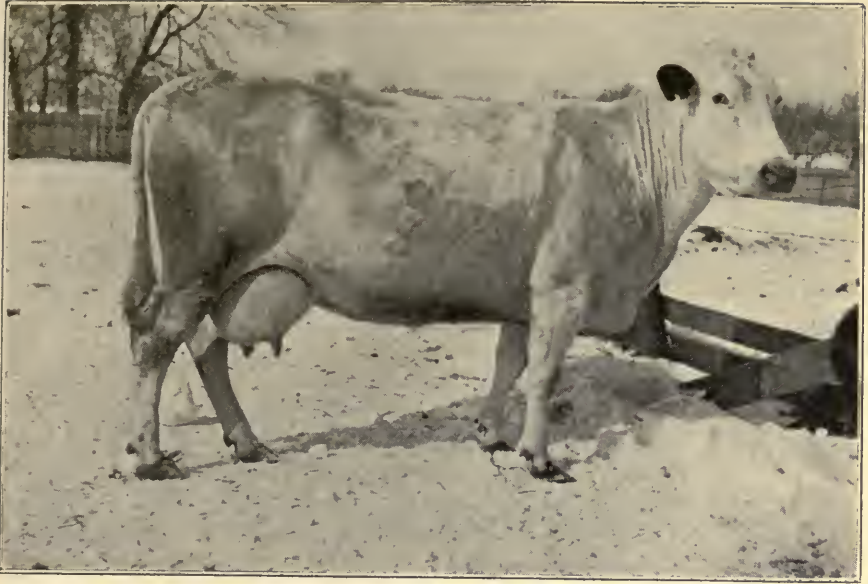
CUT 16. COW NO. 95, HERD D, GAVE IN ONE YEAR 7,615 LB. MILK; AVERAGE TEST, 4.85%; 430 LB. BUTTER; NET PROFIT, \$42.85.



CUT 17. COW NO. 337, HERD D, GAVE IN ONE YEAR 3,443 LB. MILK;  
AVERAGE TEST, 4.46%; 179 LB. BUTTER; NET PROFIT, \$2.52.



CUT 18. COW NO. 263, HERD D, GAVE IN ONE YEAR 4,887 LB. MILK;  
AVERAGE TEST, 4.04%; 230 LB. BUTTER; NET PROFIT, \$18.99.



CUT 19. COW No. 40, HERD D, GAVE IN ONE YEAR 6,575 LB. MILK;  
AVERAGE TEST, 3.23%; 248 LB. BUTTER; NET PROFIT, \$17.09.

Cow No. 44 charged the most to make butter fat. She charged 22.4 cents to make one pound of butter fat and \$1.03 to make 100 pounds of milk.

The average cost to produce one pound of butter fat was 12.3 cents and 54.9 cents to produce 100 pounds of milk.

Cow No. 147 gave a profit of \$57.22 and cow No. 44 charged 18 cents for her board.

The average profit of each cow in the herd was \$26.64. While the average profit is very good, it would, perhaps, have been better if the owner could have personally looked after his cows. The cows were cared for entirely by hired help.

TABLE 8.—SHOWING PROFIT OR LOSS FOR EACH COW IN HERD "D" FOR ONE YEAR.

GROUP 1.—KEPT AT A LOSS.

No. of cow.	Milk, lb.	Fat, %	Fat, lb.	Lb. of but- ter.	Gross returns.	Cost of feed.	Profit or loss.
44 .....	3,399	4.58	155	181	\$34.85	\$35.03	\$0.18



TABLE 8—Continued.

## GROUP 2.—KEPT AT A SMALL PROFIT.

No. of cow.	Milk, lb.	Fat, %	Fat, lb.	Lb. of butter.	Gross returns.	Cost of feed.	Profit or loss.
337 .....	3,443	4.46	153	179	\$35.29	\$32.77	\$2.52
324 .....	3,364	4.06	136	159	33.15	29.12	4.03
308 .....	4,617	3.83	177	206	40.17	33.80	6.37
323 .....	4,069	4.15	169	197	40.67	33.92	6.75

## GROUP 3.—KEPT AT A FAIR PROFIT.

22 .....	3,187	4.35	138	161	\$29.46	\$19.07	\$10.39
227 .....	4,389	4.40	193	225	40.47	29.22	11.25
272 .....	5,266	3.61	190	222	44.30	32.67	11.63
310 .....	3,777	4.99	188	220	41.86	30.00	11.86
264 .....	4,823	4.07	196	229	46.03	33.50	12.53
99 .....	4,700	4.72	222	259	46.76	32.16	14.60

## GROUP 4.—KEPT AT A VERY FAIR PROFIT.

138 .....	5,449	3.99	217	253	\$49.41	\$34.09	\$15.32
40 .....	6,575	3.23	212	248	45.83	28.74	17.09
240 .....	5,257	4.05	213	248	50.07	32.09	17.98
325 .....	5,446	4.30	234	273	52.73	33.94	18.79
263 .....	4,887	4.04	197	230	41.90	22.91	18.99
336 .....	4,796	5.00	239	279	54.11	34.88	19.23
20 .....	4,958	4.51	223	261	51.70	32.13	19.57
13 .....	4,462	5.26	235	274	55.03	33.88	21.15
180 .....	5,505	4.19	230	269	50.14	28.53	21.61
326 .....	5,285	4.79	253	295	57.64	34.07	23.57
335 .....	5,414	4.36	236	275	56.54	32.70	23.84

## GROUP 5.—KEPT AT A GOOD PROFIT.

161 .....	5,731	4.70	269	314	\$57.00	\$31.65	\$25.35
309 .....	7,979	3.75	299	349	67.06	41.59	25.47
112 .....	5,481	4.57	250	292	54.63	27.62	27.01
70 .....	6,732	4.34	292	341	63.83	35.95	27.88
190 .....	5,477	5.60	306	357	69.31	39.44	29.87
210 .....	5,201	5.07	263	307	61.90	32.03	29.87
114 .....	6,407	4.00	256	299	59.74	29.02	30.72
38 .....	7,199	4.36	313	366	69.15	37.61	31.54
199 .....	6,132	4.75	291	340	64.04	32.50	31.54
80 .....	5,551	5.14	285	332	65.86	33.94	31.92
87 .....	5,500	4.85	266	311	59.40	27.27	32.13

## GROUP 6.—KEPT AT A VERY GOOD PROFIT.

113 .....	5,577	4.99	278	324	\$58.01	\$24.80	\$33.21
109 .....	6,286	4.46	280	327	61.19	25.23	35.96
46 .....	6,549	4.62	302	353	71.29	35.07	36.22
247 .....	6,581	4.76	313	366	69.10	31.68	37.42
95 .....	7,615	4.85	369	430	79.30	36.45	42.85
249 .....	6,811	4.79	326	380	74.20	29.27	44.93



TABLE 8—Continued.

## GROUP 7.—KEPT AT AN EXCELLENT PROFIT.

No. of cow.	Milk, lb.	Fat, %	Fat, lb.	Lb. of butter.	Gross returns.	Cost of feed.	Profit or loss.
283 .....	10,151	3.68	374	436	\$87.13	\$41.77	\$45.36
129 .....	8,949	4.52	404	472	87.33	40.44	46.89
206 .....	7,130	4.71	336	392	78.30	31.27	47.03
202 .....	9,272	4.01	372	434	84.78	37.74	47.04
102 .....	6,501	5.46	355	414	82.20	34.88	47.32
317 .....	10,059	3.79	381	445	86.95	38.01	48.94
184 .....	7,997	4.77	382	445	83.77	34.35	49.42
147 .....	7,890	4.70	371	432	85.24	28.02	57.22

TABLE 9.—RECORD OF EACH COW IN HERD "D" FOR ONE YEAR.

## GROUP 1.—COWS PRODUCING LESS THAN 200 LB. OF BUTTER FAT.

No. of cow.	Age, yr.	Breed.	Date of calving.	Milk, lb.	Fat, %	Fat, lb.	Lb. of butter.	Days in milk.
324 .....			10-15-01	3,364	4.06	136	159	230
22 .....	10	Native ...	3- 7-02	3,187	4.35	138	161	225
337 .....	3	"	11- 1-01	3,443	4.46	153	179	304
44 .....	8	Gr. Jersey	3- 1-01	3,399	4.58	155	181	365
323 .....			10-29-01	4,069	4.15	169	197	245
308 .....			8-15-01	4,617	3.83	177	206	320
310 .....	4	Native ...	7-21-02	3,777	4.99	188	220	330
272 .....			8-11-02	4,389	3.61	190	222	350
227 .....	7	Gr. Holst.	5-28-02	5,266	4.40	193	225	274
264 .....	7	Native ...	10- 6-01	4,823	4.07	196	229	303
263 .....	7	Gr. Holst.	4-13-02	4,887	4.04	197	230	218

## GROUP 2.—COWS PRODUCING LESS THAN 225 LB. OF BUTTER FAT.

40 .....	9	Native ...	3-23-02	6,575	3.23	212	248	274
240 .....	5	Gr. Holst.	12- 1-01	5,257	4.05	213	248	323
138 .....	6	Gr. S. H..	8-24-01	5,449	3.99	217	253	275
99 .....	7	Native ...	5- 1-02	4,700	4.72	222	259	304
20 .....	5	Gr. S. H..	11-15-01	4,958	4.51	223	261	270

## GROUP 3.—COWS PRODUCING LESS THAN 275 LB. OF BUTTER FAT.

180 .....			3-16-02	5,505	4.19	230	269	267
325 .....	5	Native ...	4-13-02	5,446	4.30	234	273	300
13 .....	9	Jersey...	12- 1-01	4,462	5.26	235	274	302
335 .....	8	Native ...	10-27-02	5,414	4.36	236	275	305
336 .....			11- 1-01	4,796	5.00	239	279	340
112 .....	10	Gr. Jersey	3-23-02	5,481	4.57	250	292	262
326 .....	7	Native ...	10- 6-01	5,285	4.79	253	295	335
114 .....	10	"	1- 5-02	6,407	4.00	256	299	275
210 .....	10	"	12- 8-01	5,201	5.07	263	307	305
87 .....	9	"	2-23-02	5,500	4.85	266	311	253
161 .....	7	Gr. Jersey	4-13-02	5,731	4.70	269	314	300

TABLE 9—Continued.

## GROUP 4.—COWS PRODUCING LESS THAN 325 LB. OF BUTTER FAT.

No. of cow.	Age, yr.	Breed.	Date of calving.	Milk, lb.	Fat, %	Fat, lb.	Lb. of butter.	Days in milk.
113 .....	9	Native...	3-23-02	5,577	4.99	278	324	295
109 .....	9	" .....	3-23-02	6,286	4.46	280	327	260
80 .....			11-24-01	5,551	5.14	285	332	309
199 .....	8	Gr. Jersey	3-13-02	6,132	4.75	291	340	309
70 .....	11	Native...	6- 2-02	6,732	4.34	292	341	330
309 .....			7-21-01	7,979	3.75	299	349	365
46 .....	11	Native ...	11- 3-01	6,549	4.62	302	353	302
190 .....	11	Gr. Jersey	6-20-01	5,477	5.60	306	357	365
247 .....	10	Native ...	3-25-02	6,581	4.76	313	366	274
38 .....	10	Gr. Jersey	8- 4-02	7,199	4.36	313	366	265

## GROUP 5.—COWS PRODUCING LESS THAN 405 LB. OF BUTTER FAT.

249 .....	5	Native ...	1-19-02	6,811	4.79	326	380	211
206 .....	9	" .....	10-20-01	7,130	4.71	336	392	350
102 .....	7	Gr. Jersey	11-17-01	6,501	5.46	355	414	300
95 .....	6	Native ...	6-12-01	7,615	4.85	369	430	300
147 .....	8	" .....	12- 1-01	7,890	4.70	371	432	275
262 .....	8	" .....	10- 6-01	9,272	4.01	372	434	330
283 .....	8	Gr. Holst.	12- 1-01	10,151	3.68	374	436	316
317 .....	5	Holstein .	9-22-01	10,059	3.79	381	445	365
184 .....	10	Gr. Jersey	3- 9-02	7,997	4.77	382	445	335
129 .....	10	Gr. Holst.	11-15-02	8,949	4.52	404	472	325

## REPORT OF HERD "E."

This was a small dairy of seven cows, but each one proved herself to be a profitable animal. The herd consisted of grade Ayrshires, natives, and one grade Jersey; the average weight was 950 pounds. The cows were well fed and cared for during the test, and at the end of the year they were in good healthy condition. No caked udders, abortions, or other mishaps came to this herd during the year and no cows were sold, for every one in the herd gave the owner a good profit. Nearly all the cows came fresh the last of September and the first of October, and went dry in August. It was a winter dairy.

In October and November the cows received five pounds of bran, five pounds of corn meal, corn stover, and some pasture.

In December and to January 15 they received the following:



CUT 20. JENNIE, HERD E, GAVE IN ONE YEAR 4,449 LB. MILK;  
AVERAGE TEST, 5.01%; 260 LB. BUTTER; NET PROFIT, \$35.17.

RATION 12.

Food stuffs.	Lb.	Dry matter.	Protein.	Carbohydrates.	Fat.	Cost.
Grano-gluten .....	2.5	2.35	.667	.970	.305	2.2c
Bran .....	6.0	5.31	.774	2.406	.204	5.4c
Corn and cob meal .....	4.0	3.40	.176	2.400	.116	4.0c
Millet .....	5.0	4.40	.160	2.425	.050	2.5c
Stover.....	10.0	5.95	.170	3.240	.070	2.0c
Total nutrients .....		21.41	1.947	11.441	.745	16.1c

This is not only a balanced ration but it contains a variety of food stuffs and is palatable. Palatability should always be considered in making up a ration for a dairy cow.

From January 15 to March 1 the cows received the following ration: Six pounds of bran, three pounds of grano-gluten, five pounds of timothy hay, and all the corn stover they would eat up clean.

In March and to April the 10th, they received 2.5 pounds of bran, 2.5 pounds of grano-gluten, five pounds timothy hay, and corn stover *ad libitum*.

The first part of April the cows were turned out to rye pasture, and about the 15th of May were turned to blue-grass pasture. The herd was given no grain from April 10 to the completion of the year's work. It might be said that the rye pasture was plowed up and





CUT 21. PET HERD E, GAVE IN ONE YEAR 7,488 LB. MILK;  
AVERAGE TEST, 4.56%; 398 LB. BUTTER; NET PROFIT, \$48.07.

planted to corn—in other words, this farmer had a good pasture for a month by simply sowing his intended corn ground to rye in the fall. The cows liked the rye pasture so well that they cared nothing for grain when they were grazing in this field.

YEARLY RECORD OF BEST AND POOREST COW IN HERD "E," AND AVERAGE FOR ENTIRE HERD.

	Milk, lb.	Fat, %	Fat, lb.	Butter, lb.
Best cow, Brindle.....	7,828	4.41	345	403
Poorest cow, Star .....	5,398	3.89	210	245
Average record of entire herd .....	6,474	4.19	271	317

Brindle charged 39.1 cents to make 100 pounds of milk, and 8.8 cents to make one pound of butter fat.

Star charged 54.4 cents to make 100 pounds of milk, and 13.9 cents to make one pound of butter fat.

The average cost of production was 43.8 cents to make 100 pounds of milk, and 10.4 cents to make one pound of butter fat.

Brindle gave the largest profit, which was \$49.97, and Star the least, which was \$20.54.

The average profit for each cow in the dairy was \$35.80.

There were no unprofitable cows in this herd, for the owner has always given considerable attention to the selection of his dairy animals.



TABLE 10.—SHOWING PROFIT FOR EACH COW IN HERD "E" FOR ONE YEAR.

Name of cow.	Milk, lb.	Fat, %	Fat, lb.	Butter, lb.	Gross returns.	Cost of feed.	Net profit.
Star.....	5,398.4	3.89	210.42	245.49	\$49.91	\$29.37	\$20.54
Red Ellis.....	5,707.3	4.09	233.89	272.87	55.23	28.48	26.75
Line Back.....	6,552.9	4.08	267.50	312.08	65.54	30.66	34.88
Jennie.....	4,449.9	5.01	223.30	260.51	54.66	19.49	35.17
Blacky.....	7,896.7	3.55	280.44	327.18	65.94	30.69	35.25
Pet.....	7,488.9	4.56	341.95	398.94	77.44	29.37	48.07
Brindle.....	7,828.7	4.41	345.73	403.35	80.63	30.66	49.97

TABLE 11.—RECORD OF EACH COW IN HERD "E" FOR ONE YEAR.

Name of cow.	Age, yr.	Breed.	Date of calving.	Milk, lb.	Fat, %	Fat, lb.	Lb. of but-ter.	Days in milk.
Star.....	3.5	H. & J.....	10-15-02	5,398	3.89	210	245	320
Jennie.....	6	Jersey.....	1- 8-02	4,449	5.01	223	260	245
Red Ellis...	6	J. & S. H....	9-20-01	5,707	4.09	233	272	315
Line Back...	5	Native.....	9-20-01	6,552	4.08	267	312	275
Blacky.....	4	".....	9-15-01	7,896	3.55	280	327	280
Pet.....	8	Gr. Ayrshire.	9-25-01	7,488	4.56	341	398	330
Brindle.....	9	" ".....	9-28-01	7,828	4.41	345	403	327

## REPORT OF HERD "F."

There were fourteen full-blood Holstein cows in this herd that were tested; their average weight was about 1,050 pounds. A few of the cows that did not enter the test were disposed of before the end of the year for they had already proved themselves to be inferior and unprofitable animals. Less than half the dairy was matured cows. The herd was well cared for, but they did not receive a very large grain ration during the year, for the owner thought it would be more profitable to make less milk and butter fat than it would be to buy feed for his cows; the price of all kinds of grain being so very high last year.

The herd was kept in comfortable quarters, was in healthy condition during the test, and did a good year's work considering the grain that was given them.

The first period of the test the cows received a good ration which contained the following food stuffs:



CUT 22. CHECK, HERD F, GAVE IN ONE YEAR 6,812 LB. MILK;  
AVERAGE TEST, 3.16%; 251 LB. BUTTER; NET PROFIT, \$19.30.

RATION 13.

Food stuffs.	Lb.	Dry matter.	Pro-tein.	Carbohy- drates.	Fat.	Cost.
Bran .....	4	3.54	.516	1.604	.136	3.6c
Oats .....	4	3.56	.368	1.892	.168	4.4c
Clover hay .....	5	4.23	.340	1.790	.085	2.5c
Stover.....	10	5.95	.170	3.240	.070	2.0c
Silage.....	35	7.31	.315	3.955	.245	3.5c
Total nutrients.....		24.59	1.709	12.481	.704	16.0c

This is a very good ration for it contains a variety of feeds and enough nutrients for cows giving good flows of milk. The dry grains and dry roughage are mixed and in about the right proportion to the amount of corn silage. It is, perhaps, a little deficient in protein for heavy milking cows.

The second period of the test the cows received no grain. The ration consisted of thirty-five pounds of corn silage, five pounds clover hay, and all the corn stover they would eat. Each cow shrank considerably in milk flow, and the average percent of fat was less during this period. The cows received the following ration from the first of February until they were turned out to grass:



CUT 23. MAID, HERD F, GAVE IN ONE YEAR 5,979 LB. MILK;  
AVERAGE TEST, 3.34%; 233 LB. BUTTER; NET PROFIT, \$17.95.

RATION 14.

Food stuffs.	Lb.	Dry matter.	Pro- tein.	Carbohy- drates.	Fat.	Cost.
Grano-gluten .....	2	1.88	.534	.776	.248	1.8c
Silage .....	35	7.31	.315	3.955	.245	3.5c
Clover hay .....	5	4.23	.340	1.790	.085	2.5c
Corn stover .....	10	5.95	.170	3.240	.070	2.0c
Total nutrients .....		19.37	1.359	9.761	.648	9.8c
Oat straw, <i>ad libitum</i> .						

This is a better ration than the one that was fed during the second period of the test, and there was an increase in milk flow and an increase in percent of fat. The cows were turned out to pasture about June 19. The owner did not have enough pasturage to feed his herd entirely so the ration was supplemented with thirty pounds of corn silage a day. This ration was continued to the completion of the test. It is the belief of the owner that the cows would have given a larger profit if he had fed them more grain. While the above facts do not demonstrate that the herd would have been more profitable with better feeding, yet, judging by the individuality of each of the cows, better results might have been expected if more grain had been fed. The cows were certainly capable

of giving more milk and butter fat than the records show, if they had received a better ration.

YEARLY RECORD OF BEST AND POOREST COW IN HERD "F," AND AVERAGE FOR ENTIRE HERD.

	Milk, lb.	Fat, %	Fat, lb.	Butter, lb.
Best cow, Princess .....	7,817	3.35	262	305
Poorest cow, Mittie .....	3,461	3.19	110	128
Average record of entire herd .....	5,846	3.32	194	227

Princess, the best cow, charged 33.5 cents to produce 100 pounds of milk, and 10 cents to make one pound of butter fat; and Mittie charged 62.3 cents to produce 100 pounds of milk, and 19.5 cents to make one pound of butter fat.

The average cost of production was 42.9 cents to yield 100 pounds of milk, and 12.9 cents to make one pound of butter fat.

Princess gave a profit of \$32.63 and Mittie a profit of \$2.75.

The average profit for each cow in the dairy was \$18.58.

TABLE 12.—SHOWING PROFIT FOR EACH COW IN HERD "F" FOR ONE YEAR.

GROUP 1.—KEPT AT A PROFIT.							
Name of cow.	Milk, lb.	Fat, %	Fat, lb.	Lb. of butter.	Gross returns.	Cost of feed.	Net profit.
Mittie .....	3,461.8	3.19	110.54	128.96	\$24.33	\$21.58	\$2.75
Lady .....	4,386.4	3.39	149.05	173.89	34.41	22.66	11.75
Joe's Bride .....	5,136.7	3.00	154.32	180.04	32.31	20.47	11.84
Loma .....	5,677.1	3.14	178.44	208.18	40.96	27.85	13.11
Bell .....	5,050.2	3.61	182.56	212.98	38.89	23.94	14.95
Maid .....	5,979.1	3.34	200.12	233.47	44.22	26.27	17.95
GROUP 2.—KEPT AT A FAIR PROFIT.							
Mutual .....	5,586.5	3.25	181.82	212.12	\$41.07	\$22.11	\$18.96
Check .....	6,812.6	3.16	215.79	251.75	50.22	30.92	19.30
Maud .....	5,426.9	3.39	184.36	215.08	42.54	22.66	19.88
Zipsy .....	6,219.2	3.53	219.73	256.35	49.03	26.57	22.46
Echo .....	6,039.6	3.66	221.16	258.02	50.03	27.52	22.51
GROUP 3.—KEPT AT A GOOD PROFIT.							
Zur. ....	6,610.0	3.29	218.01	254.34	\$49.58	\$25.55	\$24.03
Alfrida. ....	7,641.5	3.22	246.10	287.11	55.55	27.52	28.03
Princess. ....	7,817.4	3.35	262.28	305.99	58.88	26.25	32.63



TABLE 13.—RECORD OF EACH COW IN HERD "F" FOR ONE YEAR.

GROUP 1.—COWS YIELDING LESS THAN 180 LB. OF BUTTER FAT.								
Name of cow.	Age, yr.	Breed.	Date of calving.	Milk, lb.	Fat, %	Fat, lb.	Lb. of butter.	Days in milk.
Mittie.....	3	Holstein .	7-17-02	3,461	3.19	110	128	260
Lady.....	4	"	12- 1-01	4,386	3.39	149	173	300
Joe's Bride.....	9	"	4- 5-02	5,136	3.00	154	180	275
Loma.....	12	"	2-13-02	5,677	3.14	178	208	235

GROUP 2.—COWS YIELDING LESS THAN 205 LB. OF BUTTER FAT.

Mutual.....	2	Holstein .	11-18-01	5,586	3.25	181	212	315
Belle.....	3	"	5-28-02	5,050	3.61	182	212	302
Maud.....	3	"	12- 1-01	5,426	3.39	184	215	300
Maid.....	3	"	10- 9-01	5,979	3.34	200	233	330

GROUP 3.—COWS YIELDING LESS THAN 275 LB. OF BUTTER FAT.

Check.....	15	Holstein .	1-23-02	6,812	3.16	215	251	252
Zur.....	2	"	1-31-01	6,610	3.29	218	254	305
Zipsy.....	3	"	10-13-01	6,219	3.53	219	256	335
Echo.....	4	"	10-11-01	6,039	3.66	221	258	334
Alfrida.....	7	"	10-14-01	7,641	3.22	246	287	336
Princess.....	4	"	8-26-01	7,817	3.35	262	305	330

## REPORT OF HERD "G."

There were only five cows in this herd at the beginning of the test and two of them were sold three months after the work began. The strange thing about the selling of these animals was that they were good cows, for they had averaged  $7\frac{1}{2}$  pounds of butter fat a week up to the time that they were disposed of. The herd was not well fed or cared for, but did a very fair year's work, notwithstanding. The cows were not kept in a comfortable barn, or one that was well cleaned. The dairy with this man was, so to speak, a sort of necessary evil.

The amount of grain and roughage that each cow consumed during the year was not kept, so there is no feed account reported.

TABLE 14.—RECORD OF EACH COW IN HERD "G" FOR ONE YEAR.

Name of cow.	Breed.	Milk, lb.	Fat, %	Fat, lb.	Lb. of butter.	Days in milk.
Jersey.....	Gr. Jersey.....	3,644	3.96	144	168	275
Mollie.....	Native.....	3,930	3.94	155	180	210
Lucy.....	".....	7,021	3.94	277	323	280

## REPORT OF HERD "H."

This herd consisted of eight native cows whose average weight was about 1,000 pounds. The cows were very ordinary animals and they did a very ordinary year's work. The most of them calved in March, and were dry by the first of November, the owner not trying to make milk in winter. The barn in which these cows were kept was very poor, being cold and poorly cared for. The stock was often exposed to cold, rain, and snowstorms, and the frozen snow and ice was often removed with brooms from the animals' backs.

In March and April the cows received a small amount of bran and corn meal and about one pound of oil meal a day, with clover hay and corn stover. By May 15 the cows were turned into a pasture which was not very good, the greater portion of it being woods. They received in connection with pasturage about two pounds of bran a day, but this was not enough grain when the kind of pasture is considered. The latter part of July the cows were changed to a good clover pasture.

TABLE 15.—SHOWING RECORD OF TWO COWS EVERY SEVENTH WEEK DURING THEIR PERIOD OF LACTATION.

FANNY.				
Week ending.	Milk, lb.	Fat, %	Fat, lb.	Butter, lb.
March 31.....	192.4	3.2	6.16	7.18
May 19 .....	142.4	4.3	6.12	7.14
July 7 .....	84.3	4.0	3.37	3.93
August 25 .....	7.0	6.9	.48	.56

LILY.				
Week ending.	Milk, lb.	Fat, %	Fat, lb.	Butter, lb.
May 19 .....	171	3.9	6.67	7.78
July 17 .....	99	3.5	3.47	4.04
August 25 .....	123.9	3.6	4.46	5.20
October 27 .....	75.2	4.1	3.08	3.59

These tables are good examples of the milk and butter fat yield of all the cows at different times during the test. They clearly show that the cows were not persistent milkers. The individuality of the cows, the poor care, and the poor feeding which they received, undoubtedly caused the rapid decline in milk and butter fat production from one period to the next and their short period of lactation.

The cows gave more milk and butter fat in the August test than they did in July. This was probably due to the fact that the cows were taken from a poor wood pasture the last of July and put into a good clover pasture.

## YEARLY RECORD OF BEST AND POOREST COW IN HERD "H," AND AVERAGE FOR ENTIRE HERD.

	Milk, lb.	Fat, %	Fat, lb.	Butter, lb.
Best cow, Jessie .....	5,420	4.08	221	258
Poorest cow, Fanny .....	2,398	3.92	94	109
Average record of entire herd .....	3,852	4.02	155	180

TABLE 16.—RECORD OF EACH COW IN HERD "H" FOR ONE YEAR.

Name of cow.	Age, yr.	Breed.	Date of calving.	Milk, lb.	Fat, %	Fat, lb.	Lb. of butter.	Days in milk.
Fanny.....	2	Native ...	3-20-02	2,398	3.92	94	109	195
Lucy.....	2	" .....	3-31-02	2,843	4.31	122	143	230
Bess.....	4	" .....	2-20-02	3,895	3.70	144	168	240
Lily.....	2	" .....	3-25-02	3,937	3.80	149	174	225
Liza.....	5	" .....	3-13-02	3,980	4.07	162	189	230
Reddie.....	6	" .....	1-21-02	3,848	4.23	163	190	235
Belle.....	7	" .....	3-23-02	4,498	4.07	183	213	215
Jessie.....	5	" .....	3-22-02	5,420	4.08	221	258	216

It is perhaps well to compare the performance of eight of the poorest cows as well as eight of the best cows kept in different herds, and also compare the average production and profit of each herd tested. This is done to show the great differences, even among the poorest and best cows, and also the difference in production and profit between herds of cows kept upon the farms of Illinois.

TABLE 17.—COMPARING THE PERFORMANCE OF THE POOREST COWS KEPT IN DIFFERENT HERDS.

Cow.	Herd.	Milk, lb.	Fat, %	Lb. of butter.	Net profit or loss.	Cost of 100 lb. of milk.	Cost of 1 lb. of fat.
No. 37 .....	"A"	1,482	3.97	68	\$-17.83	\$2.07	52.2c
Harrison.....	"C"	2,721	3.96	126	— 1.27	.97	24.6c
Red Bird.....	"B"	4,974	3.04	176	— 1.28	.70	23.2c
No. 44 .....	"D"	3,399	4.58	181	— .18	1.03	22.4c
Mittie.....	"F"	3,461	3.19	128	2.75	.62	19.5c
Star.....	"E"	5,398	3.89	245	20.54	.54	13.9c
Jersey.....	"G"	3,644	3.96	168			
Fanny.....	"H"	2,398	3.92	109			

\* This is estimated on the basis that it took 140 lb. of butter fat to pay for feed.

TABLE 18.—COMPARING THE PERFORMANCE OF THE BEST COWS KEPT IN DIFFERENT HERDS.

Cow.	Herd.	Milk, lb.	Fat, %	Lb. of butter.	Net profit.	Cost of 100 lb. of milk.	Cost of 1 lb. of fat.
Jersey .....	"C"	5,498	4.48	287	\$34.77	29.7c	6.6c
No. 147 .....	"D"	7,890	4.70	432	57.22	35.5c	7.5c
Brindle .....	"E"	7,828	4.41	403	49.97	39.1c	8.8c
Princess.....	"F"	7,817	3.35	305	32.63	33.5c	10.0c
Spotty No.1.....	"B"	7,711	3.20	288	25.32	40.7c	12.6c
No. 15.....	"A"	6,145	3.63	260	*18.40	50.1c	13.7c
Lucy .....	"G"	7,021	3.94	323			
Jessie .....	"H"	5,420	4.08	258			

\* This is estimated on the basis that it took 140 lb. of butter fat to pay for feed.

TABLE 19.—COMPARING THE AVERAGE PERFORMANCE OF ALL THE COWS IN EACH OF THE HERDS TESTED.

Herd.	Milk, lb.	Fat, %	Lb. of butter.	Net profit or loss.	Cost of 100 lb. of milk.	Cost of 1 lb. of fat.
"A" .....	3,361	3.55	139	\$-4.54	92.5c	25.8c
"B".....	5,360	3.52	220	12.12	57.0c	16.1c
"C" .....	4,942	3.90	224	16.22	55.5c	14.2c
"F" .....	5,846	3.32	227	18.58	42.9c	12.9c
"D".....	5,911	4.45	306	26.64	54.9c	12.3c
"E".....	6,474	4.19	317	35.80	43.8c	10.4c
"G".....	4,865	3.95	224			
"H" .....	3,852	4.02	180			

TABLE 20.—COMPARING THE RESULTS FROM THE SIX MOST PROFITABLE COWS IN HERD "D" WITH THE RESULTS FROM FIVE OTHER HERDS.

Herd.	No. of cows in herd.	Lb. milk.	Lb. butter.	Total profit.	Total loss.
"D" .....	6	50,669	2,644	\$296.97	.....
"A".....	28	94,126	3,899	.....	\$127.12
"B".....	20	107,217	4,409	242.41	.....
"C".....	17	84,014	3,823	275.90	.....
"E".....	7	45,322	2,220	250.63	.....
"F".....	14	81,845	3,178	260.15	.....

This table simply shows that a few good cows will yield a greater profit than large herds of unselected animals. It was found in herd "D," that fifteen of the best cows gave a profit of \$651.94 while the other thirty-two cows gave a profit of only \$600.24, or, the fifteen cows gave the owner \$51.70 more profit than the other thirty-two cows. It shows very clearly that it is far better to keep a few very good cows than large herds of our ordinary cows. The work is less and profit larger.















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