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COMPARISON AND IMPROVEMENT OF
DAIRY HERDS IN TENNESSEE

BY

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Data gathered under a co-operative agreement with the Dairy Division of
the Bureau of Animal Industry, U. S. Department of Agriculture

KNOXVILLE, TENNESSEE

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Bulletins of this Station will be sent, upon application, free of charge, to any farmer in the State.

COMPARISON AND IMPROVEMENT OF DAIRY HERDS IN TENNESSEE

INTRODUCTION

The mere fact that Tennessee furnishes every opportunity for high-class dairying should be a sufficient inducement for the farmer to improve this business by raising more and better cows, thus increasing the annual output of dairy products. Tennessee imports from Northern creameries about 2,500,000 pounds of butter every year, worth approximately \$750,000.00. Notwithstanding the fact that the Tennessee farmer can produce butter and milk for about half what it costs the Northern farmer, he allows his Northern neighbor to take about three quarters of a million dollars out of this State every year.

The question is a simple one. Too many Tennessee farmers are trying to grow cotton, corn, and small grains without sufficient live stock to consume these crops and their by-products. They have not a sufficient number of dairy cows to supply the home demand, and until they realize the importance of the dairy herd in building up the land, etc., the conditions mentioned above will continue to exist. Every farmer in the State should have a few good cows and make some butter for the market. The heifer calves from these cows should be raised and put on the market as dairy cows, for the demand is good and the market is looking for dairy cows all the time.

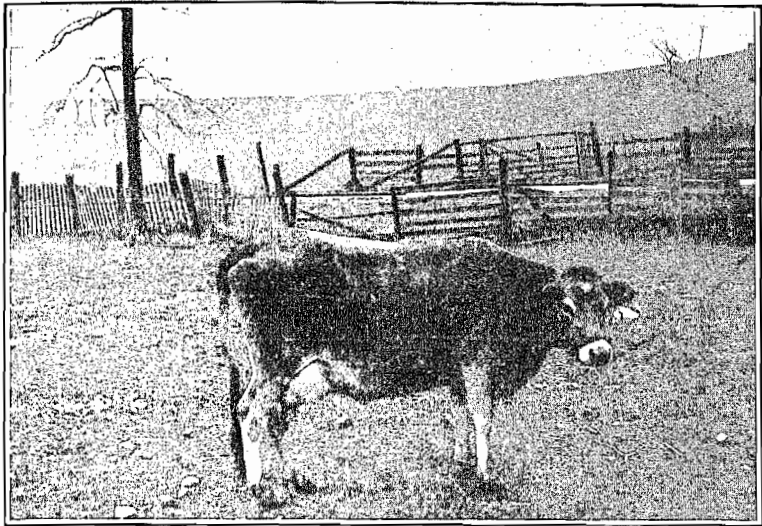
The dairy farmer in Tennessee can feed his cow much more cheaply than can the farmer of a Northern State. As soon as he learns to grow all the feed for his cow, he can amply feed her at a cost of \$30 per year. But a question of as much importance as anything else to the dairyman is that of the building up of his herd by means of *herd records*.

Some herds make a great deal more profit than others, and people often wonder what the reason is; they think the prosperous herd is favored in some way by natural conditions. But this is not necessarily true; the difference is due as a rule almost entirely to the individuality of the cows and the way they are fed, which is brought out by means of the herd record. If the record of a cow's milk and butter production, and of the amount and cost of the feed eaten, is kept for one year the owner can readily see where his profit or loss is coming from. It is a fact that no business can be run successfully without bookkeeping.

During the past two years the Tennessee Experiment Station and the Dairy Division of the Bureau of Animal Industry of the United States Department of Agriculture, in co-operation, have sent a man over the State

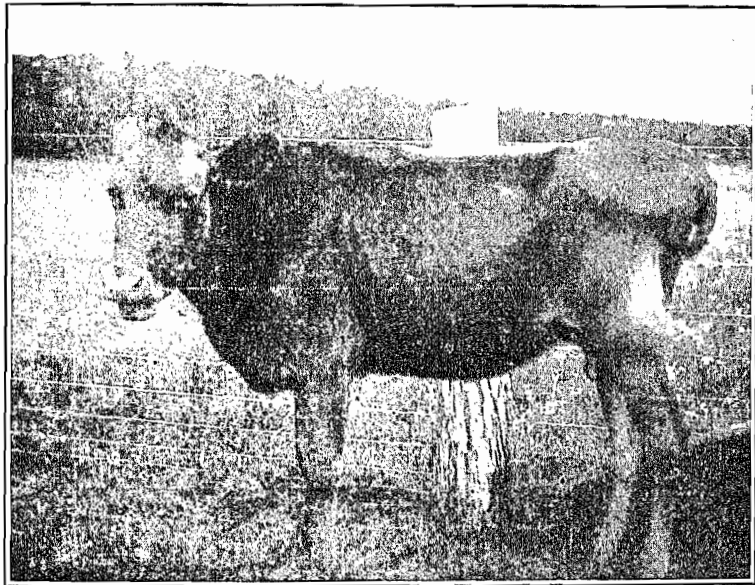
to assist dairy farmers in the growing and preparation of dairy rations, the breeding and selection of milch cows, the testing of milk, and the keeping of monthly and yearly records, as well as in adopting such sanitary methods in the keeping of their cows and the handling of their dairy products as will command the very best prices for milk and butter. This representative made regular visits to the dairy farms, and by the use of scales, Babcock test, and record blanks the cows not paying a good profit were indicated to the owners.

Owing to the importance of good silage as a food in the economical production of milk and butter, plans of various types of silo and personal advice with reference to bills for material and erection were given to all persons desiring information. Meetings for the discussion of dairy topics have been held in all sections of the State, the Tennessee Dairy Association has been organized, and two annual sessions have been held in the city of Nashville.



A DESIRABLE TYPE OF DAIRY COW

Record: 7606 lbs. milk, 394.04 lbs. butter fat; cost of feed \$38.33



AN UNDESIRABLE TYPE OF DAIRY COW

Record for 6½ months, while fresh: 1592 lbs. milk, 69.6 lbs. butter fat

TABLE I—*What the dairymen would gain by having their herds called to the standard of the best herd*

Records of herds as they are						What they would be if up to standard				
No. of herd	No. of cows in herd	Pounds of milk produced	Pounds of butter fat produced	Value of butter fat at 30c per lb.	No. of herd	No. of cows in herd	Pounds of milk produced	Pounds of butter fat produced	Value of butter fat at 30c per lb.	Gain by being up to standard
1	20	119,487	6,150.3	\$1,845.09	1	20	119,487	6,150.3	\$1,845.09	Standard herd
2	32	163,172	8,655.8	2,596.74	2	32	191,172	9,839.8	2,951.94	\$355.20
3	29	107,895	5,625.8	1,687.74	3	29	173,261	8,917.3	2,675.19	987.45
4	37	156,642	6,581.1	1,974.33	4	37	221,029	11,380.0	3,414.00	1,439.67
5	14	56,344	2,711.6	813.48	5	14	83,644	4,300.6	1,290.18	476.70
6	15	63,229	3,081.6	924.48	6	15	89,614	4,613.1	1,383.93	459.45
7	10	43,407	1,953.2	585.96	7	10	59,740	3,075.2	922.56	336.60
8	43	191,269	8,561.4	2,568.42	8	43	256,887	13,222.6	3,966.78	1,398.36
9	15	69,857	3,376.0	1,012.80	9	15	89,612	4,612.0	1,383.60	370.80
10	36	145,515	7,262.0	2,178.60	10	36	215,067	11,070.8	3,321.24	1,142.64
11	12	46,981	2,287.4	686.22	11	12	71,679	3,690.2	1,107.06	420.84
12	35	168,252	8,404.4	2,521.32	12	35	209,097	10,763.4	3,229.02	707.70

Table I shows what could be gained by the dairy farmer by keeping records and culling his herd to the standard of the best herd that has been tested in this State. Herd No. 1 is taken as a standard. It shows an average production of 5974 pounds of milk and 307.5 pounds of butter fat per cow per year. This is a herd of 20 cows, and figuring butter fat to be worth 30 cents per pound, it produces an income of \$1845, or an average of \$92.25 per cow. Compare with that, Herd No. 4, which is the poorest herd of the 12. It shows an average production of 4233 pounds of milk and 177.8 pounds of butter fat per cow. This is a herd of 37 cows, and makes a gross income of \$1974.33, or \$53.36 per cow. If these cows had all averaged as high as Herd No. 1 the owner would have made \$1439.67 more during the year than he did make.

Herd No. 2, which is the second best herd, would have made over \$25 per month more if it had averaged up to the best herd. And thus the table shows what each of the herds lost by not being up to the standard. In order to get these herds up to a standard the owners culled unmercifully and bought in more and better cows.

TABLE II—*Number of cows culled as a result of one year's records*

No. of herd	No. of cows in herd	No. of cows culled	No. of cows remaining	Per cent of cows culled
1	20	6	14	30.0
2	32	0	32	00.0
3	29	6	23	20.6
4	37	8	29	21.6
5	14	5	9	35.7
6	15	6	9	40.0
7	10	4	6	40.0
8	43	30	13	69.7
9	15	8	7	53.3
10	36	15	21	41.6
11	12	3	9	25.0
12	35	22	13	62.8

The first year's records showed that a great many cows were not paying, and some of the dairymen sold almost their entire herds, while others were slow to dispose of their inferior animals. So far only one man has refused to sell any of his cows, and most of the dairymen have expressed the desire to cull their herds still further as soon as they can find other cows to take the places of those sold. The getting of better cows is a problem in many sections, and it can be solved only by the raising of more good heifers from pure-bred bulls.

Out of 298 cows there have been 113 cows sold, which is over 37 per cent of the whole number. This leaves 111 more to be sold as soon as their places can be filled by better cows.

DOES IT PAY TO KEEP RECORDS?

One man who had 12 cows to begin with and sold three or four of them after keeping records for a year, said that he could now sell his best cows for more money than he could have gotten for the whole herd before it was tested.

Another man priced his herd at \$40 around before it was tested, and since keeping records for a year he has refused \$100 around for his entire herd. In this case the places of the culls were filled by heifers from the best cows in the herd.

TABLE III—*Comparison of individual cows in the 12 herds*

No. of cows	Average milk production	Average production butter fat	Average cost of feed	Average cost per pound butter fat	Value of butter fat at 30c per pound	Profit on butter fat	Loss on butter fat
	Lbs.	Lbs.		Cents			
Best cow	8,087	410.94	\$36.96	8.99	\$123.28	\$86.32	
Poorest cow	1,680	65.30	24.14	36.80	19.59		\$4.55
10 best cow	7,478	378.20	46.72	12.30	113.46	66.74	
10 poorest cows..	2,369	105.97	27.20	25.66	31.79	4.59	

Total number of cows, 298.

No. cows making over 400 lbs. fat, 1.

No. cows making over 350 lbs. fat, 11.

No. cows making over 300 lbs. fat, 23.

No. cows making over 250 lbs. fat, 74.

As is shown by Table III, the best cow in the 12 herds, comprising 298 cows, produced 8087 pounds of milk and 410.94 pounds of butter fat. It cost \$36.96 to feed this cow, which makes the butter fat cost a little less than 9 cents per pound, so that the cow makes a profit on butter fat alone of \$86.32 during the year. Compare with this the record of the poorest cow. She produced only 1680 pounds of milk and 65.30 pounds of butter fat, at a cost of 36.8 cents per pound, or a total of \$24.14, which results in the loss of \$4.55 for the year.

The best 10 cows out of the 298 produced an average of 7478 pounds of milk and 378.2 pounds of butter fat, at an average cost of \$46.72; while the poorest 10 cows averaged 2369 pounds of milk and 105.97 pounds of butter fat, at a cost of \$27.20 per year. The butter fat produced by the best 10 cows cost only 12.3 cents per pound, while that produced by the poorest 10 cows cost 25.6 cents per pound—over twice as much.

Out of the 298 cows only one made over 400 pounds of butter fat; 11 made over 350 pounds of butter fat; 23 made over 300 pounds of butter fat; and a total of 74 cows produced over 250 pounds, which is the stand-

and set by the Tennessee Dairy Association. This means that 224 cows out of the 298 are not worth keeping, or, in other words, that over 75 per cent of the cows tested are culls and should be sold for beef.

TABLE IV—*Comparison of records of the 12 herds*

No. of herd	No. of cows in herd	Average yearly production of milk	Average fat test	Average production of fat	Average cost of feed per cow	Cost of feed per pound of butter fat	Cost of feed per 100 pounds of milk
		Lbs.	P. ct.	Lbs.		Cents	Cents
1	20	5,974	5.14	307.5	\$34.21	11.1	.570
2	32	5,099	5.30	270.5	46.89	17.3	.919
3	29	3,720	5.21	194.1	21.51	11.0	.578
4	37	4,233	4.20	177.8	35.76	20.1	.844
5	14	4,024	4.82	194.0	26.51	13.7	.658
6	15	4,215	4.87	205.4	29.13	14.1	.691
7	10	4,340	4.50	195.3	27.95	14.3	.644
8	43	4,448	4.47	199.1	31.22	15.6	.701
9	15	4,657	4.83	225.1	30.37	13.5	.652
10	36	4,042	4.99	201.7	26.87	13.3	.664
11	12	3,915	4.86	190.6	24.68	12.9	.630
12	35	4,807	4.99	240.1	21.94	9.1	.456

COMPARISON OF HERDS

While but two herds out of the 12 show an average production of over 250 pounds of butter fat, there are several that contained cows producing more than that. Herd No. 4 has only one cow that makes the required standard; Herd No. 7 has not a single cow making the standard; while Herd No. 8 shows only 4 cows out of 43 that make as much as 250 pounds of fat, and 25 of these fall below 200 pounds of fat. This man started with 55 cows, but 12 of them were so poor that he sold them before the year's record was finished.

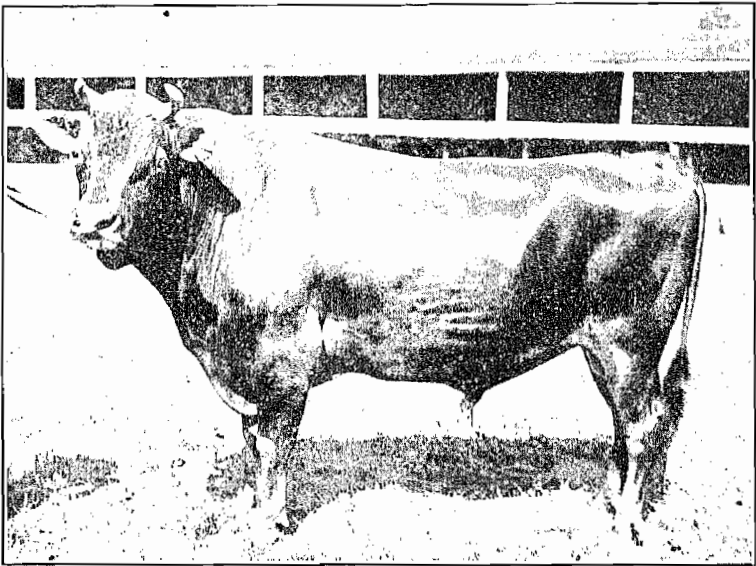
The best herd, which is Herd No. 1, had only 2 cows that fell below the standard, and 11 of them produced over 300 pounds of butter fat.

The question has been raised as to where more cows are to be obtained when all the culls are sold. Under the present conditions in Tennessee that question can be answered in only one way—raise them. Every dairyman should have a good pure-bred bull and save the heifer calves from the good cows.

Table V shows the average production of 100 cows out of herds that have been headed by pure-bred bulls, and also the record of 100 cows out of herds headed by grade or "scrub" sires.

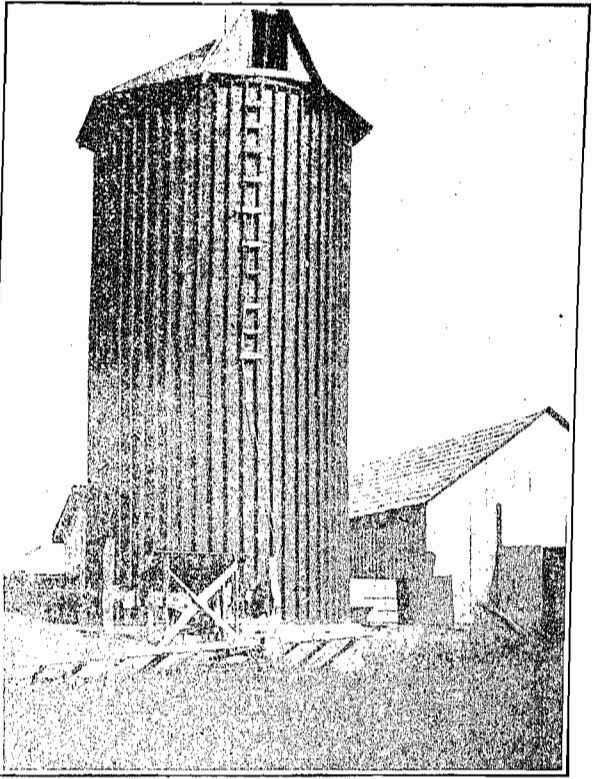
TABLE V—*Comparison of pure-bred sire and grade sire*

100 cows headed by pure-bred bull			100 cows headed by grade bull			
Pounds of milk produced	Pounds of fat produced	Value of butter fat at 30c per pound	Pounds of milk produced	Pounds of fat produced	Value of butter fat at 30c per pound	Difference in favor of pure-bred sire
455,400	22,428	\$6,728.40	427,180	19,973	\$5,991.90	\$736.50



BROOKHILL FOX—AN IDEAL TYPE OF DAIRY BULL

The 100 cows from the herds headed by pure-bred sires produced 28,220 pounds more milk and 2455 pounds more butter fat and made \$736.50 more than did the 100 cows headed by the grade sires, which shows very plainly what a good bull will do for a herd in a few years' time. \$736.50 would buy several fairly good bulls. The importance of a good sire in a dairy herd can not be emphasized too much. He is undoubtedly half the herd, as he is the sire of every calf in the herd, while each cow is the dam of only one.



AN IDEAL SILO OF THE MODIFIED WISCONSIN TYPE

Built according to Government plans on the farm of L. D. Mullins, Mullins, Tenn.

THE FEEDING QUESTION

This is a vital question with the Tennessee dairyman, as with any other, not because his cows are not amply fed, but because a more economical ration is usually needed. The silo is pretty well established in Tennessee, but there are many dairymen yet who do not believe in it, and continue to feed cotton-seed hulls and other expensive feeds to their cows. There is no roughness that is as economical and convenient as silage. Eight tons of this valuable food can be stored in the same space that is required to store one ton of hay. It transplants summer conditions into the winter and increases the milk flow while the prices are good. No dairyman can make a complete success unless he has a silo.

TABLE VI.—*Advantage in feeding silage to dairy cows*

Herd fed silage				Herd fed no silage				
No. of cows	Pounds of milk produced	Pounds of butter fat produced	Cost of feed	No. of cows	Pounds of milk produced	Pounds of butter fat produced	Cost of feed	Difference per year in favor of silage
35	168,252	8,101.4	\$768.31	32	163,172	8,055.8	\$1,500.49	\$732.18 Per cow \$20.91

Table VI shows the records of two herds located in the same section and with about equal advantages.

The total production of the two herds was about equal, but there was a great difference in the cost of the feed. The silage-fed herd contained 35 cows and was fed at a total cost of \$768.31. The herd that got no silage was composed of 32 cows and was fed at a cost of \$1500.49, a difference in favor of silage of \$732.18, or \$20.91 for each cow per year. Figuring butter fat at 30 cents per pound, the profit made by the silage-fed herd was \$1753, while that made by the other herd was \$1096.25, a difference in favor of silage of \$656.75, an amount sufficient to build a silo large enough to feed a hundred cows for six months.

CONCLUSIONS

1. Tennessee needs more and better cows to supply the local demand for milk and butter.
2. There is a vast difference in cows kept and fed under similar conditions. One cow made a profit of \$86.32, while another lost \$4.55.
3. Over 50 per cent of the cows in Tennessee fail to come up to the standard of 250 pounds of butter fat per year.
4. The dairymen of the State are losing thousands of dollars by not keeping records of their herds and culling to the above standard.
5. Cows can be fed on silage with other home-grown feed for about half what they are fed for without silage.
6. The pure-bred bull will pay for himself every year by heading a herd of 35 cows.
7. The best and about the only way to have a good herd of high-producing cows is to raise them.