

# COST *of* PRODUCING FLUID MILK *in* ALABAMA

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*An analysis of the cost of  
producing fluid milk on 90  
wholesale and 29 retail  
dairy farms in Alabama  
in 1945*

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AGRICULTURAL EXPERIMENT STATION  
*of the* ALABAMA POLYTECHNIC INSTITUTE

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# COST *of* PRODUCING FLUID MILK *in* ALABAMA

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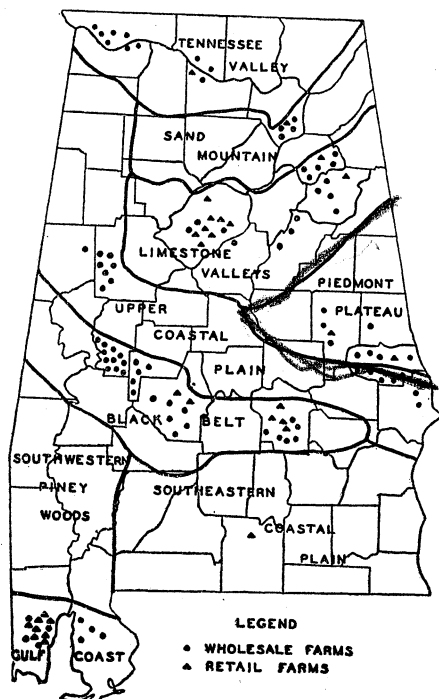
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**I**T IS ALWAYS advantageous for dairy farmers to analyze and know their production costs. Detailed cost statements indicate where savings can be made and the extent to which the dairy may be expanded or contracted to increase profit. The dairy farmer benefits from a cost analysis by studying the variations in various factors that go to make up production cost on different farms. It is these factors that tell the story of efficiency or inefficiency in organization and management of the farm. Some farmers produce fluid milk at a low cost per hundred-weight, while neighbors produce at an excessively high cost. This indicates the need for studying the conditions underlying business success in dairying.

The purposes of this study are to:

- (1) Analyze entire farm organization and operation of the dairy enterprise on wholesale and retail farms in Alabama.
- (2) Obtain and evaluate the more important cost items on these farms, showing variations in the items, and indicating the factors associated with such variations.
- (3) Analyze factors affecting efficiency.
- (4) Indicate relationship between the degree of dairy specialization and farm success.
- (5) Compare farms producing fluid milk at a profit with those producing at a loss, and indicate factors associated with profit.

Detailed records of the farm business were obtained from 119 farmers who were producing fluid milk throughout 1945. Of



the 119 records obtained, 90 were from farmers selling fluid milk at wholesale to plants, and 29 were from farmers retailing milk to homes and stores. The survey method of collecting information was used. Individual farms were selected at random from dairy farms located in seven of Alabama's major type-of-farming areas,<sup>1</sup> and in 23 Alabama counties (Figure 1). The Southwest Piney Woods and the Southeast Coastal Plain areas are not represented in this study.

FIGURE 1.—Distribution of farms studied by areas, Alabama, 1945.

## 1. COST of PRODUCING FLUID MILK on WHOLESALE FARMS

### FARM ORGANIZATION

Farm acreage on wholesale farms varied from an average of 93 acres per farm on Sand Mountain to 749 acres per farm in the Piedmont Area (Table 1). Land use varied considerably between type-of-farming areas. For example, 68 per cent of all farm land on the surveyed farms on Sand Mountain was cropland, while only 13 per cent was cropland in the Limestone Valley.

The average farm included in this study was much larger than the average of all farms in each respective area. All of the

<sup>1</sup> See Alvord, et al., "Factors Influencing Alabama Agriculture," Ala. Agr. Expt. Sta. Bul. No. 250, 1941. For a description of the several areas, see pages 65-72.

TABLE 1.— AVERAGE LAND USE FOR FARMS STUDIED, BY TYPE-OF-FARMING AREAS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Land use	Unit	Sand Mountain	Tennessee Valley	Limestone Valley <sup>1</sup>	Black Belt	Upper Coastal Plain		Piedmont	Gulf Coast
						A <sup>2</sup>	B <sup>2</sup>		
Cotton	<i>Acres</i>	--	35	6	16	15	9	13	--
Corn	<i>Acres</i>	1	42	26	27	49	16	44	40
Grain sorghum	<i>Acres</i>	4	6	6	3	--	5	7	--
Hay, all kinds	<i>Acres</i>	12	45	24	107	20	4	15	6
Kudzu	<i>Acres</i>	--	--	3	--	--	16	25	1
Grazing crops	<i>Acres</i>	38	35	21	11	2	99	49	37
Silage	<i>Acres</i>	1	16	4	8	--	8	8	10
Grain crops	<i>Acres</i>	26	71	6	37	10	--	6	6
Misc. crops	<i>Acres</i>	3	13	6	11	2	3	10	8
TOTAL CROP USE	<i>Acres</i>	85	263	102	220	98	160	177	108
Double cropped	<i>Acres</i>	22	22	20	34	9	37	15	16
TOTAL CROPPED	<i>Acres</i>	63	241	82	186	89	123	162	92
Idle cropland	<i>Acres</i>	11	--	58	8	26	26	116	20
Woods unpastured	<i>Acres</i>	4	109	139	31	214	25	162	--
Woods pastured	<i>Acres</i>	3	114	277	30	53	61	80	233
Open pasture	<i>Acres</i>	9	164	80	305	140	116	211	20
Land in corral	<i>Acres</i>	1	2	2	3	3	4	7	5
Farmstead, roads	<i>Acres</i>	2	6	6	8	5	6	10	3
Other land	<i>Acres</i>	--	6	2	11	--	--	1	--
TOTAL OPERATED	<i>Acres</i>	93	642	646	582	530	361	749	373
Farms studied	<i>Number</i>	4	10	16	28	8	8	8	8

<sup>1</sup> Limestone Valley includes parts of the Mineral area as handled here.

<sup>2</sup> The farms studied in the Upper Coastal Plain A were located in Pickens and Tuscaloosa counties; those in B were in the sandy areas of Lee and Russell. It was believed that the B group would give some indication of probable costs in the southeastern Coastal Plain.

TABLE 2.—LIVESTOCK NUMBERS PER FARM AND AVERAGE MILK PRODUCTION PER COW, BY TYPE-OF-FARMING AREAS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Kind	Unit	Sand Mountain	Tennessee Valley	Limestone Valley	Black Belt	Upper Coastal Plain		Piedmont	Gulf Coast
						A	B		
Workstock	No.	1	9	3	4	5	3	4	2
Dairy cows	No.	23	44	46	65	50	81	82	62
Dairy bulls	No.	1	2	1	2	2	2	3	3
Dairy replacement stock	No.	14	20	14	25	16	31	22	22
Beef cattle	No.	0	21	0	25	13	0	0	0
Hogs	No.	1	6	2	0	2	1	4	1
Chickens	No.	131	71	50	28 <sup>1</sup>	22	52	39	58
Milk production per cow	Lb.	5,971	5,255	5,038	4,157	4,037	5,130	4,873	5,169

<sup>1</sup> Average number of 28 chickens was obtained by omitting chicken numbers of one large poultry and dairy farm. The inclusion of this farm would have given an average of 269 chickens per farm.

TABLE 3.—AVERAGE INVESTMENT PER FARM BY TYPE-OF-FARMING AREAS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Investment	Sand Mountain	Tennessee Valley	Limestone Valley	Black Belt	Upper Coastal Plain		Piedmont	Gulf Coast	Average of all areas
					A	B			
	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>
Real estate	8,885	25,492	18,881	25,745	17,880	15,098	21,527	12,050	20,510
Livestock	3,985	9,514	6,942	10,347	7,747	9,968	11,095	7,688	8,932
Feed and supplies	906	3,430	836	2,099	1,301	839	1,299	1,672	1,677
Equipment	2,484	3,745	1,975	2,382	1,521	1,999	2,605	1,834	2,326
TOTAL	16,260	42,181	28,634	40,573	28,449	27,904	36,526	23,244	33,445

crops shown in Table 1 were not produced on all farms. For instance, only 36 farms produced cotton, 59 corn, 66 hay, 18 kudzu, and 20 grain sorghum. Only 47 grew a temporary grazing crop. Some of the hay acreage, particularly oats, was grazed as well as cut for hay. Most of the grain crops were grazed before being harvested for grain. Of the 90 wholesale dairy farmers, 26 produced silage, 33 a grain crop, and 14 a winter cover crop. Open pasture acreage per farm was very small on Sand Mountain and in the Gulf Coast Area. All open pasture was not improved, and in addition, it often was used by both dairy cattle and other livestock. Land in corral included that used for dairy lots and buildings.

Average production of fluid milk per cow on the 90 wholesale farms amounted to 4,700 pounds per year. Highest production per cow was found on Sand Mountain, where it averaged almost 6,000 pounds (Table 2). Lowest production per cow was in the Black Belt and Upper Coastal Plain "A" areas — about 4,000 pounds of milk per cow.

Average investment per farm varied from \$16,260 on Sand Mountain to \$42,181 in the Tennessee Valley (Table 3). Investment of the average wholesale farm amounted to \$33,445. Of this amount, 61 per cent was in real estate, 27 per cent in livestock, 5 per cent in feed and supplies, and 7 per cent in farm and dairy equipment.

#### COST FINDINGS ON WHOLESALF FARMS

The cost of producing a hundredweight of milk<sup>2</sup> varied from \$3.79 on Sand Mountain to \$6.23 in the Gulf Coast Area (Table 4). Feed costs, including pasture, constituted over half the gross cost of producing milk in all areas. Purchased feed accounted for more than half of the total feed cost except in the Tennessee Valley.

<sup>2</sup> The net cost of producing 100 pounds of milk is the total cost of keeping a cow for a year, less any credits, divided by her annual production. Credits were given for appreciation of cows, hides sold, feed sacks sold, manure sold or used, and calves dropped. Manure was credited at \$2 per ton and calves at \$2 per head. Where practical, all items of cost were charged to the dairy enterprise at their commercial farm value. Items purchased were entered at cost. In general, items that had no ready market were entered at cost of production to the farmer. Permanent pasture was charged at maintenance cost, temporary pasture at farm cost. Woods pasture and crop residue were charged at common rental rates in each area. Silage was valued at the farmer's estimated cost of production. Family and operator's labor were valued at what it would cost to replace with qualified hired labor.

TABLE 4.—AVERAGE COST OF PRODUCING AND PRICE RECEIVED FOR FLUID MILK, BY TYPE-OF-FARMING AREAS, 90 WHOLESALE FARMS IN ALABAMA, 1945<sup>1</sup>

Expense	Cost per hundredweight of herd-run milk								
	Sand Mountain	Tennessee Valley	Limestone Valley	Black Belt	Upper Coastal Plain		Piedmont	Gulf Coast	Average of all areas
					A	B			
	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.	Dol.
Purchased feed	1.15	0.98	2.57	1.40	2.03	3.10	2.58	2.84	2.10
Produced feed	0.57	1.11	0.32	0.86	0.68	0.13	0.42	0.60	0.60
All pasture	0.41	0.35	0.23	0.41	0.17	0.45	0.41	0.32	0.35
<b>TOTAL FEED AND PASTURE</b>	<b>2.13</b>	<b>2.44</b>	<b>3.12</b>	<b>2.67</b>	<b>2.88</b>	<b>3.68</b>	<b>3.41</b>	<b>3.76</b>	<b>3.05</b>
<b>TOTAL LABOR<sup>2</sup></b>	<b>0.69</b>	<b>0.78</b>	<b>1.28</b>	<b>1.05</b>	<b>1.18</b>	<b>0.96</b>	<b>1.00</b>	<b>1.26</b>	<b>1.06</b>
Hauling and vehicle	0.25	0.25	0.31	0.33	0.31	0.29	0.20	0.37	0.30
Misc. cash costs <sup>3</sup>	0.18	0.08	0.12	0.16	0.13	0.11	0.13	0.11	0.13
Herd charge	0.42	0.38	0.60	0.55	0.55	0.77	0.51	0.58	0.57
Building charges	0.16	0.09	0.12	0.18	0.16	0.12	0.12	0.11	0.14
Farm and dairy equipment	0.12	0.14	0.17	0.12	0.16	0.10	0.12	0.17	0.13
Other costs <sup>4</sup>	0.03	0.07	0.02	0.06	0.04	0.01	0.05	0.05	0.05
<b>TOTAL, "ALL OTHER COSTS"</b>	<b>1.16</b>	<b>1.01</b>	<b>1.34</b>	<b>1.40</b>	<b>1.35</b>	<b>1.40</b>	<b>1.13</b>	<b>1.39</b>	<b>1.32</b>
<b>TOTAL GROSS COST</b>	<b>3.98</b>	<b>4.23</b>	<b>5.74</b>	<b>5.12</b>	<b>5.41</b>	<b>6.04</b>	<b>5.54</b>	<b>6.41</b>	<b>5.43</b>
Credits	0.19	0.20	0.14	0.14	0.19	0.12	0.12	0.18	0.15
<b>NET COST</b>	<b>3.79</b>	<b>4.03</b>	<b>5.60</b>	<b>4.98</b>	<b>5.22</b>	<b>5.92</b>	<b>5.42</b>	<b>6.23</b>	<b>5.28</b>
Price received per cwt. of milk <sup>5</sup>	4.94	4.63	4.83	4.76	4.79	5.34	5.06	5.45	4.95

<sup>1</sup> For the average annual cost of keeping a cow for the year 1945 see Appendix Table 1.

<sup>2</sup> Total labor includes hired, family, operator and horse labor.

<sup>3</sup> Miscellaneous cash costs consist of dues, milk board fees, electric and telephone costs, washing soda, salt, ice, and similar items.

<sup>4</sup> Other costs consist of interest charges on feed and operating capital, corral charge, and bedding charge.

<sup>5</sup> Selling price plus butterfat adjustments and milk subsidy.



All factors that entered into total cost of producing milk are shown in Table 4. For the sake of simplicity in analyzing costs, these factors were placed in three groups, namely: (1) feed and pasture, (2) labor, and (3) all other costs. A weighted average of all 90 wholesale farms shows that 56 per cent of the total gross cost of producing fluid milk was for feed and pasture, 20 per cent for labor, and 24 per cent for all other costs (Appendix Table 2).

#### FACTORS AFFECTING COST OF MILK PRODUCTION

All such factors as the time of year when milk is produced, production per cow, size of herd, amount and kind of feed fed, percentage of feed purchased, and amount and value of labor affected cost of producing milk. Each of these factors were analyzed, and certain ways of reducing costs and increasing profits from dairying are suggested. There are some factors, however, over which the individual dairyman has little control. Nevertheless, he can increase his efficiency.

#### Season of Production

The cost of producing wholesale milk in each area varied by quarters of the year. In some areas this variation was small, while in others the change in cost from lowest to highest quarter was more than double. Some 60 per cent of the milk production on the surveyed farms in the Black Belt was produced in the summer months and at a relatively low cost (Table 5). The high winter cost of producing a small volume of milk increased the over-all yearly cost.

Variations in cost by quarters were due largely to changes in feeding practices, amount of pasture and temporary grazing available, and changes in production. The quarter with the lowest cost in each area was usually the one in which there was the highest percentage of the year's production. The highest cost quarter was usually the one with the lowest percentage of the year's production. Concentrates were fed throughout the year in all areas, but summer rations were lighter than winter rations. Hay and other roughage were fed mostly in the winter. There was little variation in total cost of labor and overhead expenses by quarters. The cost of these items per hundredweight of milk varied with production. With a constant labor cost, the cost per hundred pounds of milk was highest in seasons of lowest production.

TABLE 5.— COST OF PRODUCING MILK AND PERCENTAGE OF TOTAL PRODUCTION BY QUARTERS AND AVERAGE FOR THE YEAR, BY TYPE-OF-FARMING AREAS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Quarters of the year	Sand Mountain	Tennessee Valley	Limestone Valley	Black Belt	Upper Coastal Plain		Piedmont	Gulf Coast	Average of all areas
					A	B			
Cost per hundredweight:	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>
Jan., Feb., March	5.36	5.05	6.32	7.44	6.33	7.54	7.04	6.66	6.77
April, May, June	2.99	2.84	4.71	3.41	4.01	4.74	3.96	5.26	3.98
July, Aug., Sept.	2.98	3.53	5.16	3.58	4.39	4.75	4.52	5.65	4.30
Oct., Nov., Dec.	4.73	5.00	6.27	6.91	6.81	7.19	7.10	7.65	6.68
Av. for the year	3.79	4.03	5.60	4.98	5.22	5.92	5.42	6.23	5.28
Percentage of total production by quarters:	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
Jan., Feb., March	18	23	24	19	22	23	20	25	22
April, May, June	30	29	26	30	30	27	30	28	29
July, Aug., Sept.	31	24	25	30	27	28	28	26	27
Oct., Nov., Dec.	21	24	25	21	21	22	22	21	22

TABLE 6.— VARIATIONS IN WINTER AND SUMMER MILK PRODUCTION AS RELATED TO TOTAL PRODUCTION PER COW, 90 WHOLESALE FARMS IN ALABAMA, 1945

Range	Percentage of total production by seasons		Winter production per cow	Summer production per cow	Total production per cow	Number of farms
	Average winter	Average summer				
<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Number</i>
40 or less	37	63	1,603	2,692	4,295	29
41-45	43	57	2,015	2,708	4,723	36
46 or more	50	50	2,510	2,502	5,012	25
TOTAL OR AV.	44	56	2,062	2,638	4,700	90

Twenty-five of the 90 wholesale farms in 1945 produced 50 per cent of all milk in the winter months and 50 per cent in the summer months (Table 6). As the percentage of milk produced in winter increased, total production for the year increased. On the other hand, as summer production increased, total production decreased.

Winter production of milk is related to fall freshening of cows. A shift from 37 to 50 per cent winter production was associated with an increase of 717 pounds of milk per cow. Cows freshening in the fall normally have a "pickup" in milk production from spring pasture, which will usually result in a larger total production for the year.

Winter milk production required more effort on the part of the farmer and was more costly than summer milk. Market supplies of fluid milk were shortest in winter. The effects on yearly costs of variations in winter and summer production are indicated in Table 7.

TABLE 7.— VARIATIONS IN WINTER AND SUMMER PRODUCTION OF MILK AS RELATED TO COST OF PRODUCTION AND PRODUCTION PER COW, 90 WHOLESALE FARMS IN ALABAMA, 1945

Percentage of total milk production produced in 6 winter months		Winter cost per cwt. of milk	Summer cost per cwt. of milk	Average yearly cost per cwt. of milk	Average production per cow	Average number of cows per herd	Number of farms
Range	Average						
<i>Per cent</i>	<i>Per cent</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Pounds</i>	<i>Number</i>	<i>Number</i>
40 or less	37	7.17	3.60	4.93	4,295	49	29
41-45	43	7.07	4.05	5.34	4,723	61	36
46 or more	50	6.13	4.75	5.44	5,012	68	25
TOTAL OR AV.	44	6.73	4.14	5.28	4,700	59	90

Even production of fluid milk throughout the year is considered desirable on most milk markets. This practice requires that an appreciable percentage of the herd freshen in the fall, and that cows be better fed during the winter in order to maintain production. The cost of milk produced evenly throughout the year was usually greater than when cows freshened in the spring, in which case most of the milk was produced during the summer season.

The difference in price of winter- and summer-produced milk must be sufficient to cover the added winter expense. Under wartime conditions, farmers who produced fluid milk at the lowest cost per hundredweight gained the most. This was true

regardless of the season of production, because prices received for milk varied very little. However, if a surplus of summer milk develops in the future, winter producers may have a price advantage, even though winter production may be more costly. Summer milk produced in excess of the needs for fluid milk will probably be used as manufacturing milk and paid for as such. The price of milk for manufacture is usually considerably below that for retail consumption. Winter production in many cases determines the amount of milk that producers can sell as fluid milk in a surplus period. Winter producers may gain from having a smaller portion of their milk declared surplus. Their larger volume of milk over the year would provide more income. In addition, they would have possibilities of making greater reductions in costs than would summer producers through the use of winter grazing crops.

#### Size of Herd

Feed cost per hundredweight of milk produced increased as size of herd increased (Table 8). Labor and all other costs had a tendency to decrease as size of herd increased. However, total cost per hundredweight of milk increased as size of herd increased due to increased feed costs.

TABLE 8.— VARIATIONS IN COSTS PER HUNDREDWEIGHT OF MILK PRODUCED BY SIZE OF HERD, 90 WHOLESALE FARMS IN ALABAMA, 1945

Range in size of herd	Average size of herd	Cost per hundredweight				Number of farms	Operator's labor income
		Feed and pasture	All labor	All other	Total		
<i>Number</i>	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Number</i>	<i>Dollars</i>
15 or less	13	2.15	1.40	1.26	4.81	8	—356
16-30	23	2.41	1.25	1.28	4.94	10	656
31-45	37	2.86	1.12	1.18	5.16	25	112
46-60	55	2.99	1.12	1.19	5.30	17	—1,034
61 or more	104	3.22	1.00	1.13	5.35	30	—1,130
TOTAL OR AV.	59	3.05	1.06	1.17 <sup>1</sup>	5.28	90	—499

<sup>1</sup> The average of all other costs does not check with this item in Table 4 because all credits have been subtracted.

Large-size herds permitted more efficient use of labor, buildings, equipment, and supplies. Feed costs increased as size increased. This was due largely to the difficulty of providing adequate pasture and grazing crops for large herds and feeding both good and poor producing cows equal amounts of feed. Only 25 farmers out of 90 fed cows on the basis of production. These were scat-

tered throughout all size groups. Farmers with small herds, however, were able to give their cows more individual attention.

Most dairymen were of the opinion that a large herd had to be maintained in order to provide enough volume of milk to have a profitable dairy. Herds that ranged from 16 to 45 cows were the only size herds that on the average provided some return for the operator's labor and management. Herds within this size range could be handled largely with family labor. Also, the operator had time for growing crops and handling other livestock enterprises on the farm. In addition, operators were able to give better care to the dairy herd.

Dairymen with large herds may reduce costs by feeding on the basis of individual cow needs. This practice leads to a conversion of a greater portion of the hand-fed feeds into milk, and it tends to bring feed costs more nearly in line with those of small herds. In 1945, the gain in efficiency in the use of labor and all other cost items by the larger herds, was on the average more than offset by higher feed costs.

### Production per Cow

Average production of 14 low-producing herds amounted to only 3,100 pounds of milk per cow, while 8 high-producing herds averaged above 6,800 pounds (Table 9). Variation in total costs of the groups of herds amounted to almost a dollar per hundred-weight between the lowest and highest cost groups because of this difference in production.

TABLE 9.—COST OF PRODUCING MILK AS RELATED TO PRODUCTION PER COW, 90 WHOLESALE FARMS IN ALABAMA, 1945

Range in production	Average production per cow	Cost per hundredweight				Number of farms	Operator's labor income
		Feed & pasture	All labor	All other	Total		
<i>Pounds</i>	<i>Pounds</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>No.</i>	<i>Dollars</i>
3,500 or less	3,099	3.18	1.21	1.47	5.86	14	-1,057
3,501-4,500	4,146	2.87	1.11	1.26	5.24	26	-505
4,501-5,500	4,927	2.94	1.05	1.15	5.14	23	-1,182
5,501-6,500	5,939	3.38	0.98	1.01	5.37	19 <sup>1</sup>	414
(5,501-6,500)	(5,888)	(2.78)	(1.05)	(1.13)	(4.96)	(15)	(1,603)
6,501 or more	6,837	2.97	1.04	0.91	4.92	8	285
TOTAL OR AV.	4,700	3.05	1.06	1.17	5.28	90	-499

<sup>1</sup> The data based on the group of 19 farms contained 4 farms that averaged 130 cows per farm and were handled almost entirely on purchased feed; as a result, dairying as a whole can be expected to more nearly conform to figures related to the 15 farms.

Dairy cows use nearly half their feed to maintain body weight, repair worn tissues, and get energy for all vital processes. The remainder is used for milk production. Thus, maintenance cost of an average cow is about the same for feed and other costs regardless of the amount of milk produced. However, higher producing cows while eating more feed will usually produce milk at a lower feed and a lower total cost per hundredweight because production increases faster than costs. As shown in Table 9, the higher producing cows were associated with lower costs per hundredweight in practically all groups of expenses. However, an exception to this general rule may be brought about by forced feeding for high milk production. The only groups of farms that returned a positive operator's labor income were those groups that had high production per cow, and a lower than average cost per hundredweight of milk produced.

Feed costs of keeping a cow for a year, as well as total costs, average about the same in Alabama as in other areas of the United States. However, the surveyed wholesale dairymen are getting only 4,700 pounds of herd-run milk per cow, while dairymen in recognized dairy areas average 6,000 to 8,000 pounds of milk per cow. Alabama dairymen may overcome, in a large measure, this disadvantage by working toward three objectives: (1) establish year-round systems of grazing, such as those developed by the Alabama Agricultural Experiment Station; (2) feed according to requirements of individual cows; and (3) build up milk production by use of sires of high production breeding. The first two objectives can be attained in a relatively short time. The third, however, would require several years of selective breeding to attain marked results.

An increase in production per cow to an average of 6,000 pounds in all areas studied would have raised the average production per cow by 1,300 pounds and would have reduced costs by \$1.14 per hundredweight. This would have permitted milk to be produced at a profit in all areas studied in 1945.

### Feed and Pasture

Of the many items entering into the total cost of milk production, the most important group was feed and pasture. As total feed and pasture cost increased so did the net cost of producing a hundredweight of milk (Table 10).

TABLE 10.—AVERAGE FEED COST PER COW AND RELATED FACTORS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Range in feed and pasture cost per cow	Average per cow						Feed and pasture cost per cwt. of milk	Net cost per cwt. of milk (all items)	Number of farms
	Purchased feed	Produced feed	Pasture and grazing costs	Total feed and pasture	Total cost (all items)	Milk production			
<i>Dollars</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Lb.</i>	<i>Dol.</i>	<i>Dol.</i>	<i>No.</i>
Less than 100	40.77	34.05	12.18	87.00	186.89	3,897	2.23	4.80	16
101-125	61.97	29.49	18.61	110.07	202.72	4,189	2.63	4.84	31
126-150	91.31	30.97	12.15	134.43	234.79	4,468	3.01	5.26	15
151-175	107.54	38.09	16.81	162.44	285.08	5,135	3.16	5.55	11
176 and over	184.08	19.02	17.97	221.07	338.86	5,860	3.77	5.78	17
TOTAL OR AV.	98.44	28.26	16.81	143.51	247.96	4,700	3.05	5.28	90

TABLE 11.—COST PER POUND OF TOTAL DIGESTIBLE NUTRIENTS AND PROTEIN BY KINDS OF FEED IN ALABAMA, 1945

Kind	Price per 100 pounds	TDN in 100 pounds <sup>1</sup>	Digestible proteins in 100 pounds <sup>1</sup>	Cost of 1 pound TDN	Cost of 1 pound of protein
	<i>Dollars</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Cents</i>	<i>Cents</i>
Dairy feed	3.30	73.0	16.0	4.52	20.62
Cottonseed meal	2.80	73.6	33.9	3.80	8.26
Corn	2.50	82.5	7.1	3.03	35.21
Legume hay	1.75	53.0	11.9	3.30	14.71
Oats	3.00	71.5	9.4	4.20	31.91

<sup>1</sup> Source: Dairy feed computed from survey of feed tags, all other items from "Feeding Dairy Cattle," Alabama Extension Service Circular 157.

As total feed and pasture cost increased, average production per cow increased. However, production did not increase enough to result in a decreased feed cost per hundredweight of milk. This suggests that economical production of milk depends largely on two general factors in the use of feed and pasture: First, the efficiency of the cow — one with inherited ability to efficiently convert feed and pasture into milk; and second, the amount and type of feed, proper care in handling, and management. The cow should possess a capacity to make full and economical use of hand-fed feeds. Feeding a cow beyond her capacity, however, results in waste and a high cost of producing milk.

The average wholesale dairyman included in this study spent \$5,820 for feed in 1945 for his dairy cows. In addition, considerable feed was purchased for other livestock. The kinds of dairy feed purchased included grain, cottonseed meal, other concentrates, and grass and legume hay. Since most dairymen were purchasing large amounts of feed in 1945, the decision had to be made on what to buy. On the basis of average prices paid by all dairymen included in this study, Table 11 shows cost and indicates what the best buys were of the more commonly bought feed items.

Cottonseed meal, corn, and legume hay were among the best buys of feed in 1945. However, much of the dairyman's money was spent for feeds other than these. Most dairymen had to purchase some feed in order to furnish both the total amount required and to give sufficient proteins. Many dairymen attempted to feed a ration including at least three different kinds of grain (Table 12). In order to obtain a complete ration, many of them used a complete dairy feed. As a whole, dairymen fed more of this complete dairy feed than was needed or that 1945 milk prices justified. Only 16 per cent of all farms reported that they calculated the cost of the type ration being fed. The ration that is most economical at one time may not be best at another time. This makes it important to calculate costs of rations when there is a change in the prices of feeds or a change in the selling price of milk, and to change the ration if such price changes seem fairly permanent. The amounts of concentrates and roughage that were hand-fed the average cow in each type-of-farming area are shown in Table 12.

The amount of hand-fed feeds and their relationship to TDN (total digestible nutrients) and protein requirements are shown



TABLE 12.—AVERAGE AMOUNT OF FEEDS HAND-FED PER COW, BY TYPE-OF-FARMING AREAS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Kind	Sand Mountain	Tennessee Valley	Limestone Valley	Black Belt	Upper Coastal Plain		Piedmont	Gulf Coast	Average of all areas
	Pounds	Pounds	Pounds	Pounds	A	B	Pounds	Pounds	Pounds
<b>CONCENTRATES:</b>									
Dairy feed (-20% prot.) <sup>1</sup>	179	590	586	618	681	3,699	2,184	2,033	1,307
Dairy feed (+20% prot.) <sup>2</sup>	1	--	329	--	129	--	--	644	115
Cottonseed meal	1,154	664	649	577	983	58	511	600	568
Corn	780	900	1,320	480	1,320	120	360	1,380	725
Grain sorghum	--	53	32	32	--	--	61	--	26
Oats	64	320	384	288	96	--	32	64	197
Barley	144	48	--	--	--	--	--	--	7
Bran or shorts	4	--	255	170	--	9	--	44	99
Distillers' corn grains	--	--	33	5	--	11	--	175	8
Hominy feed	--	--	146	34	--	--	--	--	29
Beet pulp	--	--	243	--	--	--	--	--	45
<b>TOTAL</b>	<b>2,326</b>	<b>2,575</b>	<b>3,977</b>	<b>2,204</b>	<b>3,209</b>	<b>3,897</b>	<b>3,148</b>	<b>4,940</b>	<b>3,126</b>
<b>ROUGHAGE:</b>									
Cottonseed hulls	--	329	14	1	748	28	598	--	163
Legume hay	1,470	1,814	1,354	184	325	2,171	2,273	487	1,047
Grass hay	1,866	84	224	2,151	809	66	88	89	909
Corn tops	--	23	--	--	--	--	--	--	2
Corn fodder	--	--	--	12	--	--	6	--	1
Silage	161	3,012	756	1,372	--	880	855	2,101	1,239
<b>TOTAL</b>	<b>3,497</b>	<b>5,262</b>	<b>2,348</b>	<b>3,720</b>	<b>1,882</b>	<b>3,145</b>	<b>3,820</b>	<b>2,677</b>	<b>3,361</b>
<b>HAY EQUIVALENT OF ALL ROUGHAGE</b>	<b>3,390</b>	<b>3,254</b>	<b>1,844</b>	<b>2,805</b>	<b>1,882</b>	<b>2,558</b>	<b>3,250</b>	<b>1,276</b>	<b>2,565</b>

<sup>1</sup> -20 per cent = dairy feed of less than 20 per cent protein content.<sup>2</sup> +20 per cent = dairy feed of 20 per cent or more protein content.

in Table 13. As the percentage of hand-fed TDN requirements increased, feed cost per hundredweight of milk increased.

Much of the large amount of grain or other concentrates hand-fed in each area, as shown in Table 13, could have been reduced by feeding more roughage. There were large variations in the amount of concentrates hand-fed per hundredweight of milk between areas. However, areas that fed the largest amount of hay equivalent per cow fed the least concentrates.

All areas were hand-feeding as much or more total digestible protein than was needed. As hay feeding decreased and concentrate feeding increased, protein intake increased. The portion of the required TDN (total digestible nutrients) that was hand-fed varied from 75 to 100 per cent. The additional TDN needed came from pasture, grazing crops, and crop residue. These additional sources of TDN also furnished some protein. Sand Mountain, Tennessee Valley, and the Black Belt areas produced milk more cheaply in 1945 than any other area in the state. The concentrates fed per cow averaged considerably less in these three areas, but they fed more hay equivalent than the average of other areas. Also, more of the TDN requirements were supplied by grazing and the hand-fed ration was held lower in protein content.

Both protein and TDN are required to produce milk. However, to have economical production, a cow need not be fed any more of these items than needed for milk production and body maintenance. Although no attempt has been made in this study to measure the exact amount of feed value obtained from roughage and pasture, other studies<sup>3</sup> indicate that cheapest milk production comes from large amounts of pasture and hay with concentrate feeding held to a minimum. Most of the variation in total cost of producing a hundredweight of milk between different areas in Alabama was due to differences in feed costs. For instance, 61 per cent of the difference in the total gross cost of producing milk in the Tennessee Valley and the Gulf Coast Area was due to the difference in feed costs. Similarly, 70 per cent of the difference in total gross cost between Sand Mountain and the Gulf Coast Area was due to difference in feed cost. This is shown in Table 4. Both Sand Mountain and the Tennessee

<sup>3</sup> Experimental work at the Tennessee Valley Substation, the Black Belt Substation, the Gulf Coast Substation, and at the Main Station at Auburn, has shown that ample grazing and pasture, adequate quantities of good quality hay, and little or no grain are the key to low milk production costs.

TABLE 13.—AVERAGE AMOUNT OF FEEDS HAND-FED PER COW AND RELATED FACTORS, BY TYPE-OF-FARMING AREAS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Kind	Unit	Sand Mountain	Tennessee Valley	Limestone Valley	Black Belt	Upper Coastal Plain		Piedmont	Gulf Coast	Average of all areas
						A	B			
Total concentrates fed	Lb.	2,326	2,575	3,977	2,204	3,209	3,897	3,148	4,940	3,126
Hay equivalent fed	Lb.	3,390	3,254	1,844	2,805	1,882	2,558	3,250	1,276	2,565
<b>TOTAL HAND-FED FEED<sup>1</sup></b>	<b>Lb.</b>	<b>5,716</b>	<b>5,829</b>	<b>5,821</b>	<b>5,009</b>	<b>5,091</b>	<b>6,455</b>	<b>6,398</b>	<b>6,216</b>	<b>5,691</b>
Av. production per cow	Lb.	5,971	5,255	5,038	4,157	4,037	5,130	4,873	5,169	4,700
Amt. of concentrates hand-fed to produce 100 lb. milk	Lb.	39	49	79	53	79	76	65	96	67
Ratio of 1 lb. of concentrate to milk	Lb.	2.6	2.0	1.3	1.9	1.3	1.3	1.5	1.1	1.5
Total hand-fed feed cost per cwt. of milk	Dol.	1.72	2.09	2.89	2.26	2.71	3.23	3.00	3.44	2.70
<b>TOTAL NET COST PER CWT. OF MILK</b>	<b>Dol.</b>	<b>3.79</b>	<b>4.03</b>	<b>5.60</b>	<b>4.98</b>	<b>5.22</b>	<b>5.92</b>	<b>5.42</b>	<b>6.23</b>	<b>5.28</b>
TDN required <sup>2</sup>	Lb.	4,723	4,473	4,397	4,090	4,048	4,429	4,340	4,443	4,279
TDN hand-fed	Lb.	3,534	3,694	4,018	3,097	3,378	4,218	4,011	4,456	3,680
<b>PERCENTAGE OF REQUIREMENTS</b>	<b>Pct.</b>	<b>75</b>	<b>83</b>	<b>91</b>	<b>76</b>	<b>83</b>	<b>95</b>	<b>92</b>	<b>100</b>	<b>86</b>
Lb. of digestible protein required <sup>3</sup>	Lb.	527	490	478	433	426	483	470	485	461
Lb. protein hand-fed	Lb.	723	676	737	479	629	858	824	861	669
<b>PERCENTAGE OF REQUIREMENTS</b>	<b>Pct.</b>	<b>137</b>	<b>138</b>	<b>154</b>	<b>111</b>	<b>148</b>	<b>178</b>	<b>175</b>	<b>178</b>	<b>145</b>
Percentage of all feed purchased	Pct.	54	40	82	52	70	84	76	76	69

<sup>1</sup>This is the total amount of feed made available to the average cow; some, however, may have been wasted rather than consumed.

<sup>2</sup>Morrison, F. B., "Feeds and Feeding," 20th Edition, 1936. Appendix Table III indicates that the daily TDN requirement for maintenance of a 900 pound cow is 7.23 pounds with an added TDN requirement of 0.349 pounds for each pound of 4.5 per cent milk produced.

<sup>3</sup>*Ibid.* The protein requirements for maintenance of a 900 pound cow is 0.593 pounds with an added protein requirement of 0.052 pounds for each pound of 4.5 per cent milk produced.

Valley produced milk at a profit in 1945, whereas the Gulf Coast Area was not receiving enough for milk to cover total costs. By producing milk with a feed cost equal to that of the Tennessee Valley, the Gulf Coast Area could have made a profit of almost 60 cents per hundredweight on all milk sold in 1945.

The differences between areas in feed costs were largely due to the type of ration fed rather than the amounts of total feed fed. The maximum difference in hand-fed concentrates and roughage per day per cow between areas amounted to only 4 pounds (Table 14). The difference in production per cow per

TABLE 14.—AVERAGE MILK PRODUCTION PER COW PER DAY AS RELATED TO HAND-FED FEED, BY TYPE-OF-FARMING AREAS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Area	Average milk production per cow per day	Average amount of concentrate hand-fed per cow per day	Average amount of hay equivalent hand-fed per cow per day	Total lbs. of concentrates and hay equivalent hand-fed per cow per day	Pounds of hand-fed feed per pound of milk
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
Up'r Coastal Pl. A	11.1	8.8	5.2	14.0	1.26
Black Belt	11.4	6.0	7.7	13.7	1.20
Piedmont	13.4	8.6	8.9	17.5	1.31
Limestone Valley	13.8	10.9	5.1	16.0	1.16
Up'r Coastal Pl. B	14.1	10.7	7.0	17.7	1.26
Gulf Coast	14.2	13.5	3.5	17.0	1.20
Tennessee Valley	14.4	7.1	8.9	16.0	1.11
Sand Mountain	16.4	6.4	9.3	15.7	0.96
<b>AVERAGE</b>	<b>12.9</b>	<b>8.6</b>	<b>7.0</b>	<b>15.6</b>	<b>1.21</b>

TABLE 15.—NET COST OF KEEPING A COW AND OTHER RELATED FACTORS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Item	Unit	Range in net cost per cow				Av. of all farms
		\$200.99 and less	\$201.00-250.99	\$251.00-300.99	\$301.00 and above	
Average net cost per cow	<i>Dol.</i>	181.68	222.00	265.64	351.54	247.96
Tot. feed & past. cost per cow	<i>Dol.</i>	101.22	120.56	151.59	220.40	143.51
Tot. feed & past. cost per cwt. of milk	<i>Dol.</i>	2.63	2.66	3.08	3.78	3.05
Percentage of all feed bought	<i>Pct.</i>	55	57	72	83	69
Pur. feed cost per cwt. of milk	<i>Dol.</i>	1.44	1.52	2.22	3.12	2.10
Net cost per cwt. of milk	<i>Dol.</i>	4.72	4.90	5.39	6.02	5.28
Selling price per cwt. of milk	<i>Dol.</i>	4.75	4.80	4.95	5.26	4.95
Av. production per cow	<i>Lb.</i>	3,848	4,531	4,926	5,836	4,700
Size of herd, cows	<i>No.</i>	64	52	58	65	59
Number of farms	<i>No.</i>	25	27	20	18	90

day amounted to slightly over 5 pounds. There was no great difference in the amounts of concentrates and roughage fed per pound of milk produced between areas.

A study of the net cost of keeping a cow for the year 1945 shows that with low feed costs total costs are low. Conversely, with high feed costs, total costs are high (Table 15).

As indicated in Table 15, size of herd was not an important factor in the increase in net cost per cow. However, as production per cow increased, net cost per cow increased. By feeding a cow according to her ability to produce, net cost per hundredweight of milk, however, should decrease instead of increase. High concentrate and low roughage feeding were related to the groups with highest net cost per cow. There was a 52 per cent increase in production from the lowest to the highest cost group. At the same time, the total gross cost of keeping a cow for a year increased by 90 per cent. Seventy per cent of this increase in gross cost was in feed and pasture costs. As the net cost per cow ranged upward, the percentage of purchased feed in relation to all feed used increased.

The range in net cost per hundredweight of milk varied from \$4.06 to \$6.82 (Table 16). The range in net cost per hundredweight of milk from the lowest to the highest group amounted to \$2.76. Of this increase, 58 per cent was in feed and pasture costs, 20 per cent in labor, and 22 per cent in all other costs.

TABLE 16.—NET COST OF PRODUCING A HUNDREDWEIGHT OF MILK AND RELATED FACTORS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Item	Unit	Range in net cost per hundredweight				
		\$4.50 and less	\$4.51- 5.50	\$5.51 6.50	\$6.51 and above	Av. of all farms
Av. net cost per cwt.	<i>Dol.</i>	4.06	5.00	5.92	6.82	5.28
Tot. feed & past. cost per cow	<i>Dol.</i>	116.29	135.90	158.79	174.17	143.51
Tot. feed & past. cost per cwt. of milk	<i>Dol.</i>	2.29	2.94	3.44	3.88	3.05
Percentage of all feed bought	<i>Pct.</i>	52	68	76	71	69
Pur. feed cost per cwt. of milk	<i>Dol.</i>	1.20	1.99	2.61	2.73	2.10
Selling price per cwt. of milk	<i>Dol.</i>	4.68	4.95	5.09	5.11	4.95
Av. production per cow	<i>Lb.</i>	5,076	4,629	4,618	4,492	4,700
Size of herd, cows	<i>No.</i>	43	72	65	51	59
Percentage feed & past. cost was of total gross cost	<i>Pct.</i>	54	57	57	55	56
Number of farms	<i>No.</i>	25	27	27	11	90
Operator's labor income	<i>Dol.</i>	2,282	-132	-1,846	-4,416	-499

The group of 25 farms that produced milk the cheapest had the smallest size herds, the highest production per cow, and raised more of their feed at home. This was the only group with a positive operator's labor income. Since 67 per cent of the total receipts of the 90 wholesale farms was from the sale of milk, the cost of producing milk was one of the most important factors affecting labor income.

Tables 15 and 16 indicate that purchased feed increased the cost of producing milk. This is further emphasized in Table 17.

It has been shown that as production per cow increased, cost per hundredweight tended to decrease. As size of herd increased, cost per hundredweight increased. These two factors partially offset each other, Table 17. Thus, the 70 cents per hundredweight difference in net cost between the lowest and highest cost groups may be largely due to buying feed. Some farmers make profits from producing milk with all purchased feed. Most farmers, however, who produced all their roughage, pasture, and grazing crops, and held their concentrate feeding to a minimum, made considerably more profits than those who bought most of their feed. Those wholesale farmers who in 1945 purchased more than 60 per cent of their feed had a high average production cost and a negative operator's labor income. This was true in spite of the fact that they were able to get higher milk production per cow. High milk production at the expense

TABLE 17.—PERCENTAGES OF FEED PURCHASED AS RELATED TO COST OF PRODUCING MILK, 90 WHOLESALE FARMS IN ALABAMA, 1945

Item	Unit	Percentages of all feed purchased					Av. of all farms
		40 and less	41-60	61-80	81 and above		
Av. per cent of all feed pur.	<i>Pct.</i>	26	50	73	91	69	
Tot. feed and past. cost per cow	<i>Dol.</i>	109.54	121.39	147.20	177.27	143.51	
Tot. feed and past. cost per cwt. of milk	<i>Dol.</i>	2.59	2.67	3.16	3.45	3.05	
Purchased feed cost per cow	<i>Dol.</i>	28.68	60.24	106.74	161.46	98.44	
Pur. feed cost per cwt. of milk	<i>Dol.</i>	0.68	1.32	2.29	3.15	2.10	
Net cost per cwt. of milk	<i>Dol.</i>	4.94	4.93	5.33	5.63	5.28	
Selling price per cwt. of milk	<i>Dol.</i>	4.79	4.79	5.05	5.05	4.95	
Av. production per cow	<i>Lb.</i>	4,232	4,549	4,653	5,131	4,700	
Size of herd, cows	<i>No.</i>	47	52	63	75	59	
Number of farms	<i>No.</i>	20	25	23	22	90	
Operator's labor income	<i>Dol.</i>	594	752	- 669	- 2,739	- 499	

TABLE 18.—PERMANENT PASTURE MAINTENANCE COST PER ACRE PER YEAR BY TYPE-OF-FARMING AREAS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Item	Unit	Sand Mountain	Tennessee Valley	Limestone Valley	Black Belt	Upper Coastal Plain		Piedmont	Gulf Coast <sup>1</sup>	Average of all areas
						A	B			
Fence upkeep	<i>Dol.</i>	6.30	0.42	0.68	0.28	0.29	0.44	0.49	0.25	0.37
Seeds	<i>Dol.</i>	0.00	0.10	0.48	0.53	0.00	0.34	0.51	0.39	0.42
Mowing and bushing	<i>Dol.</i>	0.40	0.03	0.64	0.37	0.16	0.37	0.34	0.05	0.30
Manure <sup>2</sup>	<i>Dol.</i>	2.12	0.09	0.14	0.02	0.00	0.00	0.42	0.00	0.08
Fertilizer, lime, phosphate, slag, etc.	<i>Dol.</i>	2.33	0.81	0.14	1.35	0.86	1.81	0.84	0.22	1.01
Man labor	<i>Dol.</i>	0.26	0.30	0.78	0.44	0.39	0.40	0.53	0.25	0.43
Mule labor	<i>Dol.</i>	0.00	0.05	0.11	0.11	0.13	0.13	0.16	0.04	0.10
Equipment	<i>Dol.</i>	0.00	0.14	0.57	0.24	0.12	0.15	0.12	0.09	0.21
Interest on land	<i>Dol.</i>	5.46	1.97	2.15	1.83	1.61	0.78	1.28	0.87	1.64
Taxes	<i>Dol.</i>	0.47	0.12	0.15	0.42	0.19	0.46	0.14	0.23	0.30
<b>TOTAL COST</b>	<i>Dol.</i>	17.34	4.03	5.84	5.59	3.75	4.88	4.83	2.39	4.86
Receipts from pasture	<i>Dol.</i>	0.00	0.00	0.89	0.46	0.00	0.00	0.00	0.00	0.29
<b>NET COST OF OWNED PASTURE</b>	<i>Dol.</i>	17.34	4.03	4.95	5.13	3.75	4.88	4.83	2.39	4.57
Cost of hired pasture	<i>Dol.</i>	0.50	0.88	1.02	0.00	0.00	0.00	0.00	0.17	0.20
<b>TOTAL PASTURE COST</b>	<i>Dol.</i>	17.84	4.91	5.97	5.13	3.75	4.88	4.83	2.56	4.77
Acres studied	<i>Acres</i>	37.8	1976.5	1379.5	8555.5	1172.5	930.0	1685.0	2052.0	17,789

<sup>1</sup> Permanent pasture in most areas was only open pasture, which may or may not have been improved. However, due to method of handling by the farmer, the permanent pasture in the Gulf Coast Area was both open and woods pasture. Woods pasture was largely second growth timber on cut-over land in that area.

<sup>2</sup> A charge for manure was made only for that hauled out and applied to the pasture by the farmer.

of large amounts of purchased feed did not pay on these farms in 1945.

*Pasture and grazing crops.* Approximately 25 per cent of the TDN requirements per cow in some areas of Alabama in 1945 was supplied by pasture and grazing crops. However, only 14 per cent of the TDN requirements came from pasture and grazing crops as an average of all areas. The permanent pasture maintenance cost averaged \$4.77 per acre in 1945, (Table 18).

Much of the permanent and open pasture acreage on these farms was unimproved. The low cost of these unimproved pastures held the average cost low. Because many farmers had both improved and unimproved pastures under one fence, it was not possible to show maintenance costs of improved and unimproved pastures separately. Farmers estimated that it would take 2.6 acres of the type of permanent pasture they had to carry a cow through a normal grazing season, but actually used only 2.2 acres per cow. About 54 per cent of all farmers reported that they made no attempt to adjust the amount of concentrates fed to the amount and quality of hay fed. Most farmers, however, did adjust their hay feeding to pasture and grazing available. In some cases, hay feeding was cut out altogether in the spring and summer months.

The cost of growing temporary grazing crops varied from \$6.18 per acre for velvet beans to \$22.72 per acre for cowpeas (Appendix Table 3). Oats and oat mixtures were the most commonly grown grazing crops. Crimson clover ranked second in acreage and was grown at a net cost of \$18.21 per acre. Seventy-seven per cent of the acreage of all grazing crops was completely grazed, while 23 per cent was partly grazed and partly harvested.

Not all of the costs of pastures and grazing crops were chargeable to dairy cows alone. Pastures were shared by bulls, replacement stock, and other livestock on the farm. The distribution of grazing costs of wholesale dairies is shown in Table 19.

Dairy cows consumed 42 per cent of all permanent pasture and 25 per cent of all temporary pasture on wholesale farms. Grazing costs chargeable to dairy cows were used as a direct charge against the cost of producing milk. Of all pasture and grazing costs for all livestock, 64 per cent was for permanent pasture and 35 per cent was for temporary grazing. Considering the short period in which permanent pastures usually furnish



**TABLE 19.— PERCENTAGE DISTRIBUTION OF PASTURE AND GRAZING CROPS BY KINDS OF LIVESTOCK AND TYPE OF CROP, 90 WHOLESALF FARMS IN ALABAMA, 1945**

Livestock	Permanent pasture	Temporary pasture	Woods pasture	Crop residue	Total
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
Dairy cows	41.7	25.2	0.5	0.1	67.5
Dairy bulls	1.4	1.0	0.0	0.0	2.4
Dairy replacement stock	9.3	6.8	0.1	0.0	16.2
All other livestock	11.9	1.9	0.0	0.1	13.9
<b>TOTAL</b>	<b>64.3</b>	<b>34.9</b>	<b>0.6</b>	<b>0.2</b>	<b>100.0</b>

feed for a cow, it is not surprising that most of the TDN requirements of the cows was hand-fed.

Many dairymen in 1945 were not taking full advantage of the possibilities of their pasture land. Others who had developed pastures were not utilizing them as well as they might because of continuous heavy concentrate feeding.

A farmer who keeps a certain number of cows for the production of fluid milk has to meet his overhead expenses. While doing this, he should make certain that his cows have the proper feed to insure full use of their production capacity. This does not mean over-feeding, nor does it mean that nearly all the feed has to be in the form of a grain or concentrate. About half of the feed consumed by a cow is for body maintenance. After going to the expense of giving an animal the necessary amount of feed to keep it alive, it would be poor economy not to furnish the remaining feed needed for full milk production. Over-feeding, however, is a serious mistake from the standpoint of economy and efficiency. Cows of low productive capacity may be overfed, especially when they are in the herds of dairymen who think in terms of liberal feeding. Many dairymen believe it is only possible to feed economically when cows are fed as individuals, and not as a herd. Feeding as a herd is usually inefficient and costly because high-producing cows do not get enough while the low-producing cows usually get too much. Even under year-round grazing programs and adequate supplies of hay, cows should be given individual attention in order to adequately care for the high producers.

When feeds must be purchased, buying in bulk and when prices are low are obvious factors in economy. In feeding, care must be used to prevent waste. The use of properly designed feed racks makes for a saving of hay. If prices of certain kinds

of hay or mill feeds, become very high, substitution may be made of other less expensive feeds from which practically the same results may be obtained.

### Labor and Wages

Labor costs made up 20 per cent of the total gross cost of producing milk on wholesale farms. As labor costs per cow increased, net cost per cow and per hundredweight of milk increased (Table 20). Farms with a labor cost of 30 dollars or less per cow used 2.4 hours of man labor per hundredweight of milk. Farms that had an average labor cost of 76 dollars or more per cow used 4.3 hours of man labor per hundredweight of milk. As the number of hours of man labor required to produce a hundredweight of milk increased, the net cost per hundredweight increased.

Labor costs on wholesale farms varied from 69 cents per hundredweight of milk on Sand Mountain to \$1.28 per hundredweight in the Limestone Valley (Table 21). Man labor requirement per hundredweight of milk varied from about 2.2 hours in the Tennessee Valley to 3.5 hours in the Piedmont area. As an average for all areas, hired labor did most of the dairy work.

The cost of labor per cow and per hundredweight of milk varied by size and arrangement of buildings, production per cow, size of herd, use of milking machine, and age of operator. The average man labor required for all dairy enterprise operations was 149 hours per cow. No breakdown was made of the various jobs, such as milking, barn chores, utensil cleaning, or miscellaneous work.

More time per cow was spent in caring for high producers than for low producers (Table 22). The average amount of man labor per cow rose steadily from 131 hours for a group in which the cows averaged less than 3,500 pounds of milk per cow to 172 hours for farms with herds averaging over 6,500 pounds.

The wage rate varied from 28 cents per hour in the 3,500-pound-or-less group to 41 cents per hour in the 6,501-pound-or-more group. The changes in the hours of labor per cow and per hundredweight are not accompanied by parallel changes in the cost of that labor.

Although more man hours were spent in caring for high- than for low-producing cows, the differences between groups in labor expenditures were much less than proportional to the correspond-

TABLE 20.—LABOR COST PER COW AND RELATED ITEMS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Range in labor cost per cow	Total labor cost per cow	Total labor cost per cwt. of milk	Man labor per cow	Man labor per cwt. of milk	Total net cost per cow (all items)	Average production per cow	Net cost per cwt. of milk	Number of farms
<i>Dollars</i>	<i>Dol.</i>	<i>Dol.</i>	<i>Hours</i>	<i>Hours</i>	<i>Dol.</i>	<i>Pounds</i>	<i>Dol.</i>	<i>No.</i>
30 or less	27.02	0.66	97	2.4	188.66	4,082	4.62	10
31-45	39.69	0.89	131	2.9	225.01	4,462	5.04	30
46-60	49.96	1.03	138	2.9	246.22	4,841	5.09	17
61-75	67.87	1.32	199	3.9	299.38	5,140	5.83	19
76 or more	90.87	1.70	229	4.3	329.72	5,358	6.15	14
TOTAL OR AV.	49.90	1.06	149	3.2	247.96	4,700	5.28	90

TABLE 21.—LABOR REQUIREMENTS PER HUNDREDWEIGHT OF MILK BY TYPE-OF-FARMING AREAS, 90 WHOLESALE FARMS IN ALABAMA, 1945<sup>1</sup>

Kind	Unit	Sand Mountain	Tennessee Valley	Limestone Valley	Black Belt	Upper Coastal Plain		Piedmont	Gulf Coast	Average of all areas
						A	B			
Hired labor	<i>Hr.</i>	0.54	1.34	1.78	2.77	2.03	1.74	2.78	0.87	2.05
Family labor	<i>Hr.</i>	0.97	0.28	0.69	0.11	0.08	0.90	0.26	0.95	0.44
Operator's labor	<i>Hr.</i>	0.91	0.56	0.91	0.54	1.11	0.57	0.49	0.94	0.69
Total man hours	<i>Hr.</i>	2.42	2.18	3.38	3.42	3.22	3.21	3.53	2.76	3.18
Horse labor	<i>Hr.</i>	0.00	0.02	0.04	0.10	0.02	0.07	0.10	0.01	0.06
Total man and horse	<i>Hr.</i>	2.42	2.20	3.42	3.52	3.24	3.28	3.63	2.77	3.24
Total labor cost	<i>Dol.</i>	0.69	0.78	1.28	1.05	1.18	0.96	1.00	1.26	1.06

<sup>1</sup> Labor requirements per cow are shown in Appendix Table 4.

ing differences in production. Thus, a 121 per cent increase in average production per cow, between the lowest and highest producing groups, was accompanied by only a 31 per cent increase in hours of man labor required. There was a marked decline in the amount and cost of labor per hundredweight of milk as the rate of production increased. As between the lowest and highest producing groups of herds, the saving on labor amounted to 1.7 hours and the difference in labor cost to 16 cents per hundredweight of milk.

Another factor related to labor usage was number of cows in the herd. The amount of time spent per cow was particularly variable, and in some cases it was extremely high among small herds. As herds increased in size, the average number of hours per cow declined (Table 23). Herds of 15 or less cows required twice the labor per cow as the average. Herds of 16 to 30 cows required nearly 50 per cent more labor than the average amount of labor for all cows.

High labor efficiency seems to have been very difficult to attain on the small farms. Only 2 of the 18 herds with 30 cows

TABLE 22.—MILK PRODUCTION PER COW AS RELATED TO MAN LABOR USE AND EFFICIENCY, 90 WHOLESALE FARMS IN ALABAMA, 1945

Range in production	Average production per cow	Average size of herd	No. of farms	Annual labor expenditure per cow		Cost of labor per cwt. of milk	
				Hours	Value	Hours	Value
<i>Pounds</i>	<i>Pounds</i>	<i>No.</i>	<i>No.</i>	<i>Hr.</i>	<i>Dol.</i>	<i>Hr.</i>	<i>Dol.</i>
3,500 or less	3,099	51	14	131	36.95	4.2	1.19
3,501-4,500	4,146	67	26	142	45.09	3.4	1.09
4,501-5,500	4,927	71	23	157	50.98	3.2	1.03
5,501-6,500	5,939	55	19	158	57.40	2.7	0.97
6,501 or more	6,837	25	8	172	70.74	2.5	1.03
TOTAL OR AV.	4,700	59	90	149	49.20	3.2	1.05

TABLE 23.—SIZE OF HERD AS RELATED TO MAN LABOR USE AND EFFICIENCY, 90 WHOLESALE FARMS IN ALABAMA, 1945

Range in size of herd	Average size of herd	Average production per cow	No. of farms	Annual labor expenditure per cow		Cost of labor per cwt. of milk	
				Hours	Value	Hours	Value
<i>Number cows</i>	<i>No.</i>	<i>Pounds</i>	<i>No.</i>	<i>Hr.</i>	<i>Dol.</i>	<i>Hr.</i>	<i>Dol.</i>
15 or less	13	6,430	8	305	89.71	4.8	1.40
16-30	23	4,732	10	215	57.78	4.5	1.22
31-45	37	5,055	25	159	55.81	3.1	1.10
46-60	55	4,227	17	153	46.30	3.6	1.10
61 or more	104	4,678	30	135	46.17	2.9	0.99
TOTAL OR AV.	59	4,700	90	149	49.20	3.2	1.05

TABLE 24.— COMPARISON OF FARMS WITH AND WITHOUT MILKING MACHINES, 90 WHOLESALE FARMS IN ALABAMA, 1945

Item	Unit	With milking machines	Without milking machines	Total or average
Number of farms	No.	68	22	90
Percentage of farms	Pct.	76	24	100
Average size of herd	No.	65	41	59
Average production per cow	Lb.	4,807	4,178	4,700
Man labor per cow	Hr.	142	186	149
Cost of man labor per cow	Dol.	49.21	49.14	49.20
Man labor per cwt. of milk	Hr.	2.95	4.45	3.17
Cost of man labor per cwt.	Dol.	1.02	1.18	1.05
Cost of man labor per hour	Dol.	0.35	0.26	0.33
Cost of dairy equipment per cow	Dol.	6.04	3.26	5.57
Cost of dairy equipment per cwt.	Dol.	0.13	0.08	0.12
Man labor and dairy equipment cost per cwt. of milk	Dol.	1.15	1.26	1.17

or less required labor expenditures as low as the general average of 149 hours per cow. Moreover, only 4 of these small herds required labor expenditures as low as 200 hours per cow. In contrast, only 10 of the 72 herds with 31 or more cows required more than 200 hours, and 23 herds required 125 hours or less per cow.

With increase in herd size of 31 or more cows, there was an increase in the percentage of operators reporting use of milking machines. This accounts, in part, for the reduction of man labor per cow. Of the farms having 30 or less cows, only 44 per cent had milking machines. Of the remaining farms, which had 31 cows or more, 83 per cent used milking machines.

Milking machines were reported on three-fourths of the wholesale farms studied. It took 44 hours less labor per cow annually on farms where machines were used, than on those where they were not used (Table 24).

Farms with milking machines produced a hundredweight of milk with 2.95 hours of man labor. Farms without milking machines used 4.45 hours. Part of this saving was due to the larger size of machine-milked herds. Higher production per cow of machine-milked herds also tended to reduce the labor requirements per hundredweight of milk. Machine-milked herds, however, had the disadvantage of higher wage rates. These rates averaged 35 cents an hour for farms with milkers and only 26 cents an hour for farms without milkers.

Farms with milkers had a dairy equipment cost of 13 cents per hundredweight of milk; those without milkers had a cost of

8 cents per hundredweight. This difference of 5 cents per hundredweight largely represents the added cost of milking machines, including repairs and upkeep, depreciation, and interest. To approximate the net advantage obtained by use of milkers, it is necessary to compare the total labor and equipment cost of each group of farms. The machine-milked herds had an average cost of \$1.15 per hundredweight of milk for these two items, while the herds without machines had an average cost of \$1.26 per hundredweight.

Another factor related to labor input is the age of the farm operator. Operators 60 or more years of age kept slightly smaller herds than average, and used a little more labor per cow in the care of their herds (Table 25).

TABLE 25.—AGE OF FARM OPERATOR AS RELATED TO LABOR USE AND COST, 90 WHOLESALE FARMS IN ALABAMA, 1945

Item	Unit	Range in age of farm operators				Total or average
		Less than 40	40-49	50-59	60 or more	
Average age	<i>Yr.</i>	33	44	53	65	47
Years of dairy experience	<i>Yr.</i>	8	12	15	17	12
Average size of herd	<i>No.</i>	49	61	75	51	59
Average production per cow	<i>Lb.</i>	4,837	4,883	4,491	4,404	4,700
Percentage using milking machines	<i>Pct.</i>	68	85	78	62	76
Man labor per cow	<i>Hr.</i>	159	145	140	162	149
Value of man labor per cow	<i>Dol.</i>	52.75	50.80	41.70	52.84	49.20
Man labor per cwt. of milk	<i>Hr.</i>	3.30	3.00	3.10	3.70	3.20
Value of man labor per cwt. of milk	<i>Dol.</i>	1.09	1.04	0.93	1.20	1.05
Wage rate per hour	<i>Dol.</i>	0.33	0.35	0.30	0.32	0.33
Number of farms	<i>No.</i>	22	34	18	16	90

With the exception of the first age group, the percentage of herds milked by machine decreased as the operator's age increased. Differences in the average amounts of labor used in the several age groups were not large; time spent on the milking herd averaged 16 per cent higher per cow on farms operated by men over 60 years of age than on those in the 50-59 age group. The relative difference between the 40-49-year-age group and the 60-year-and-over group was somewhat greater in hours per hundredweight than in hours per cow because of the lower than average rate of production in herds operated by men of 60 years of age or over. The relatively smaller number of milking machines used by the first group was associated with a high

percentage of small herds. Many of these younger operators were relatively new in the dairy business and had not developed their herds in size to the point of needing a machine milker.

Efficiency in the use of labor can be gained by proper arrangement of buildings and corrals, such as proximity of the feeding barn or the milk house to the milking barn. Efficient use of labor-saving machinery is important. If machinery is not used to capacity and not operated efficiently, it is possible for the operation and overhead costs of such machinery to more than offset its apparent saving in manual labor. Properly planning the dairy work is another factor in the economical use of labor. This implies a carefully worked-out schedule and daily routine for both the operator and his labor. Greater efficiency in the use of labor may be brought about by increasing production and applying more labor to higher producing cows and less labor to those that do not justify such expenditures. Size of herd should be such that, along with other farm work, it fully utilizes the available labor supply.

#### All Other Costs

The total of "all other costs" ranged from \$1.01 per hundred-weight in the Tennessee Valley to \$1.40 in the Black Belt (Table 4). These costs constituted 24 per cent of the total gross cost of producing wholesale milk. They include expenses for land in corral; dairy's use of farm buildings and equipment; milk hauling; dairy's share of the truck, auto, tractor, and water system costs; expenses for veterinary service; sprays and disinfectants; salt, feed grinding, advertising, dues and fees; herd charges on cows; dairy's share of electric and telephone expenses; bedding costs, and other miscellaneous items.

These costs ranged from 20 per cent of the total gross cost in the Piedmont Area to 29 per cent on Sand Mountain (Appendix Table 2). Since other costs were made up of so many different items, many of which are not under the farmers control, it is not possible for the dairymen to make as effective savings here as is possible with feed and labor. However, the alert dairymen can make certain savings in this group of costs.

*Herd charges.* The largest single item in this group is herd charges. This item is made up of interest on the average investment in cows, depreciation and mortality, registry fees, taxes, veterinary and medical expenses, insurance, and breeding costs. The average investment in dairy cows amounted to \$104 per head.

Based on a 6 per cent interest rate, these farms had an interest charge of \$6.24 per cow. Depreciation was the largest single item of expense in herd charges (Table 26). This charge averaged \$858 per farm or \$11.38 per cow, for wholesale dairies.

The major part of the depreciation was accounted for by cull cows and death losses. Cows culled from the herd usually were sold at prices below good milk cow prices. The number of cows culled and sold in 1945 amounted to 23 per cent of the number of cows on hand at the first of the year. Wholesale farms had an average death loss per farm of almost 3 cows. Causes of cow deaths as reported by the farmers included neglect, old age, mastitis, milk fever and other causes. The cause of each death, and the percentage of total deaths due to each cause are shown in Appendix Table 5. The average death loss was 4.5 per cent. The 90 wholesale farms reported a total of 10 cow deaths due to mastitis in 1945. However, 82 per cent of these farms reported having had trouble with mastitis within the last year or two.

Cows culled from the milking herd and those lost by death were replaced with purchased cows and heifers grown on the farm. Wholesale farms purchased 61 per cent of their replacement cows and raised 39 per cent in 1945. The average cost of purchased cows in 1945 was \$128 per head. The estimated value of heifers raised and placed in the milking herd in 1945 was \$103 per head at time of freshening. The difference in value of cows

TABLE 26.—DEPRECIATION IN VALUE OF COWS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Item	Average per farm		
	Head per farm	Value per farm	Value per head
	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Cows January 1, 1945	59.4	6,121.04	103.05
Cows purchased	9.7	1,239.52	127.79
Heifers freshened	6.3	651.50	103.41
TOTAL OR AVERAGE	75.4	8,012.06	106.26
Cows sold	13.8	952.54	69.02
Cows died	2.7		
Cows used for food	0.0 <sup>1</sup>	1.20	108.00
Cows, December 31, 1945	58.9	6,199.93	105.26
TOTAL OR AVERAGE	75.4	7,153.67	94.88
Net depreciation		858.39	11.38

<sup>1</sup> Less than 0.1 head per farm.



TABLE 27.— SIZE OF HERD AS RELATED TO BULL COST, 90 WHOLESALE FARMS IN ALABAMA, 1945

Range in number of cows	No. of farms	Av. number of cows	Average number of bulls per herd	Ratio of 1 bull to cows	Annual net cost of keeping 1 bull, including hire <sup>3</sup>	Net bull cost per cow including hire	Percentage of all bulls in each group registered
<i>Number</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>No.</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Per cent</i>
15 or less	8	13	0.8	17 <sup>1</sup>	91.37	5.40	50
16-30	10	23	1.1	21 <sup>2</sup>	91.15	4.37	27
31-45	25	37	1.7	22	111.19	4.99	51
46-60	17	55	1.7	33	105.93	3.23	67
61-75	10	69	2.2	32	107.80	3.36	42
76-90	4	82	2.8	30	113.40	3.79	9
91-105	6	99	2.9	34	120.81	3.57	97
106 and over	10	152	4.0	38	128.53	3.38	65
TOTAL OR AV. 90		59	2.0	30	112.07	3.76	56

<sup>1</sup> Two farms in this group hired all bull service.

<sup>2</sup> One farm in this group hired all bull service.

<sup>3</sup> Net cost is gross cost minus credits.

bought and those raised may be largely accounted for by the difference in age (Table 26).

*Bull charges.* Breeding costs made up part of the herd charge. The cost of keeping bulls on the farm was calculated separately. Only the net cost of keeping the bulls was chargeable to the herd and to the cost of producing milk. On a per cow basis this varied from \$3.34 in the Tennessee Valley to \$5.42 in the Gulf Coast Area. This cost for wholesale farms by type-of-farming areas is given in Appendix Table 6. Size of herd was a major factor affecting bull cost per cow (Table 27).

#### DEGREE OF DAIRY SPECIALIZATION IN RELATION TO FARM SUCCESS

Cash sales on the average wholesale farm amounted to \$16,664. Of this, \$1,243 was from the sale of field and truck crops, \$11,479 was from the sale of milk, \$1,838 came from the sale of livestock and other livestock products, and \$2,104 was from the sale of miscellaneous farm products and milk subsidy. Labor returns reflect the profitableness and efficiency with which farms are managed. As an average, wholesale farms had a minus operator's labor income for 1945 (Table 28).

There was a claim against the average wholesale farm of \$2,411 for the labor of the farm family and interest on the farmer's investment. However, the farm had only \$1,912 with which to

TABLE 28.—SUMMARY OF FARM RECORDS AND SUCCESS MEASURES, 90 WHOLESALE FARMS IN ALABAMA, 1945

Factor	Average for 90 wholesale farms
	<i>Dollars</i>
Sale of farm products	16,664
Cash farm expenses	15,058
Farm cash available (sales less expenses)	1,606
Total gross returns (sales plus inventory increases)	17,928
Total gross expenses (cash expenses plus inventory decreases)	16,016
Return to operator, family, and capital (without family-used products)	1,912
Value of family labor and interest on capital	2,411
Return for operators' labor (1912 — 2411)	— 499
Value of family-used products per farm	495
Return for operators' labor, including family-used products	— 4

cover these claims. This meant that either the family labor or interest lacked \$499 of being paid in full. In addition, there were no returns for the operator's labor and management.

A close relationship existed in 1945 between farm success and the portion of all farm cash receipts obtained from milk. Those farms that depended upon the sale of milk for less than half of their receipts had higher returns than those farms that were more dependent upon milk sales (Table 29).

Data in Table 29 show that the price received for milk was not sufficient to cover the total cost of producing milk in any of the groups shown. However, despite the somewhat unfavorable returns from the dairy enterprise, the 12 farmers having 37 per cent of their farm receipts from the sale of milk would probably consider their farms successful if they studied their cash farm returns and other related factors. This was probably also true of the 11 farmers who derived only 57 per cent of their receipts from the sale of milk. To them, other enterprises combined with dairying were paying off better than dairying alone. Dairying as the major source of income did not pay off under 1945 economic conditions to the three groups of farmers who were deriving 66, 77, and 83 per cent of their total farm receipts from the sale of milk. In addition to placing emphasis on milk production, three additional factors apparently contributed to the poor financial showing of the farmers in the last three groups. First, the larger size of herd had a higher cost per hundredweight of

milk produced. Second, the more specialized farmers grew a smaller percentage of their feeds on their farms. This was true even though in 1945 they usually found it cheaper to produce

TABLE 29.—PERCENTAGE OF FARM CASH RECEIPTS FROM THE SALE OF MILK AS RELATED TO FARM SUCCESS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Factor	Unit	Percentage of farm cash receipts from the sale of milk					Total or av.
		50 & less	51-60	61-70	71-80	81 & over	
Percentage receipts from milk sales	<i>Pct.</i>	37	57	66	77	83	69
Sale of farm prod.	<i>Dol.</i>	18,400	12,269	11,351	19,155	18,249	16,664
Cash farm expenses	<i>Dol.</i>	15,328	9,591	9,434	17,967	17,872	15,058
Farm cash avail. (sales less exp.)	<i>Dol.</i>	3,072	2,678	1,917	1,188	377	1,606
Tot. gross returns (sales plus inventory increases)	<i>Dol.</i>	20,308	13,450	12,556	20,238	19,543	17,928
Tot. gross exp. (cash expenses plus inventory decreases)	<i>Dol.</i>	16,354	10,711	10,079	19,181	18,425	16,016
Return to operator, family, and capital (without family used products)	<i>Dol.</i>	3,954	2,739	2,477	1,057	1,118	1,912
Val. of family labor and interest on capital	<i>Dol.</i>	2,698	1,945	2,499	2,577	2,068	2,411
Return for operator's labor (3954 — 2698)	<i>Dol.</i>	1,256	794	—22	—1,520	—950	—499
Val. of family used products per farm	<i>Dol.</i>	621	482	600	430	446	495
Return for operator's labor, including family-used products	<i>Dol.</i>	1,877	1,276	578	—1,090	—504	—4
Rate of return on investment	<i>Pct.</i>	5	2	0	—3	—6	—1
Net cost per cwt. of milk	<i>Dol.</i>	4.79	5.31	5.17	5.35	5.35	5.28
Price received per cwt. of milk <sup>1</sup>	<i>Dol.</i>	4.72	4.82	4.79	5.02	5.00	4.95
Number of farms	<i>No.</i>	12	11	16	35	16	90
Av. size of herd	<i>No.</i>	38	42	43	74	70	59

<sup>1</sup> Selling price plus butterfat adjustment and milk subsidy.

than to buy feed. Third, these three groups of farmers had a larger amount of their total income consumed by cash costs than did the first two groups. Some further factors associated with success on the more diversified farms, are shown in Table 30.

TABLE 30.—FACTORS RELATED TO DIVERSIFICATION AND SUCCESS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Factor	Unit	Percentage of farm cash receipts from the sale of milk					
		50 & less	51-60	61-70	71-80	81 & over	Total or av.
Percentage of receipts from milk	<i>Pct.</i>	37	57	66	77	83	69
Acres of cotton per farm	<i>Acres</i>	40.8	8.0	22.8	7.3	0.4	13.4
Av. cotton yield per acre	<i>Lb.</i>	344	381	276	227	143	300
Acres of corn per farm	<i>Acres</i>	47.3	35.0	50.4	21.0	10.8	29.6
Av. corn yield per acre	<i>Bu.</i>	28	22	21	23	20	23
Acres of all hay per farm	<i>Acres</i>	65.4	72.7	48.2	52.0	27.1	51.2
Av. hay yield per acre	<i>Lb.</i>	2,317	2,296	2,534	2,134	1,995	2,247
Av. number of beef cattle per farm	<i>No.</i>	34	13	7	12	0	12
Av. no. of hens per farm	<i>No.</i>	96	28	69	33	38	48
Av. no. of hogs per farm	<i>No.</i>	1	1	3	1	1	2
Av. no. of dairy cows per farm	<i>No.</i>	38	42	43	74	70	59
Av. production per cow	<i>Lb.</i>	4,523	4,159	4,338	4,750	5,109	4,700
Percentage of feed & past. cost of total gross cost	<i>Pct.</i>	51	49	56	57	60	56
Percentage of labor cost of total gross cost	<i>Pct.</i>	22	23	20	18	20	20
Percentage of all other costs of total gross cost	<i>Pct.</i>	27	28	24	25	20	24
Percentage of total feed that was purchased	<i>Pct.</i>	43	47	50	72	82	69
Number of farms	<i>No.</i>	12	11	16	35	16	90

Those farmers who received only 37 per cent of their receipts from the sale of milk had a larger total production of cotton, corn, and hay than did the group with 83 per cent of the receipts derived from sale of milk. The first group purchased only 43 per cent of their feed, while the last group purchased 82 per cent. Home-raised feed, which was produced for less than market price, plus more cash crops for sale enabled the first group to show more total returns than the last group. Also, beef cattle and poultry added to the income and success of the first group of farms.

A one-year study does not provide sufficient information to say

that diversified farming is consistently better than specialized dairy farming. However, this information, together with other research, does indicate that highly specialized dairying with a large number of cows dependent upon purchased feed will tend to be a relatively high-cost undertaking. Unless the price of milk is held high to the consumer, such specialized dairymen may continue to find their returns small.

The final test of the success of the dairy enterprise is whether it makes the farm, as a whole, more profitable. It is possible to make the dairy enterprise alone return a profit at the expense of the rest of the farm business. At the same time, an unprofitable dairy can cancel any profits derived from other farm enterprises. Since 69 per cent of the total gross sales of wholesale farms was from the sale of milk, the cost of producing milk was one of the most important factors affecting farm income. To be profitable, dairy farms must produce milk at a total cost that does not exceed the selling price of milk.

#### COMPARISON OF PROFIT AND LOSS FARMS

Some farms produce milk at a profit; others produce at a loss. Even with profit being defined as that amount of the selling price remaining after *all* costs have been deducted, some 40 per cent of all wholesale dairies included in this study made such a pure profit in 1945 (Table 31).

TABLE 31.—NUMBER AND PERCENTAGE OF DAIRIES SHOWING A PROFIT BY TYPE-OF-FARMING AREAS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Area	Number of farms	Number showing a profit	Per cent showing a profit
	<i>Number</i>	<i>Number</i>	<i>Per cent</i>
Sand Mountain	4	4	100.0
Tennessee Valley	10	9	90.0
Limestone Valley	16	5	31.0
Black Belt	28	11	39.0
Upper Coastal Plain A	8	3	38.0
Upper Coastal Plain B	8	1	12.5
Piedmont	8	2	25.0
Gulf Coast	8	1	12.5
<b>TOTAL OR AVERAGE</b>	90	36	40.0

Of the 90 wholesale farms studied, 36 produced milk at a profit, while 54 produced at a loss (Table 32). Some profit farms, as well as some loss farms, were found in almost every area of the State. Thus, location as such was not the most important

factor. Neither was size of herd important. The profit group had an average size herd of 56 cows, while the loss group averaged 61 cows. On the other hand, average production per cow of the profit group was approximately 500 pounds more milk than that of the loss group.

TABLE 32.—COMPARISON OF FARMS PRODUCING MILK AT A PROFIT AND THOSE PRODUCING AT A LOSS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Item	Unit	Av. of farms producing milk at a profit	Av. of farms producing milk at a loss
<b>PER COW</b>			
Purchased feed	<i>Dol.</i>	81.23	109.02
Produced feed	<i>Dol.</i>	32.81	26.67
All pasture and grazing	<i>Dol.</i>	16.29	15.92
Total feed and pasture	<i>Dol.</i>	130.33	151.61
Total labor	<i>Dol.</i>	42.54	54.42
All other costs	<i>Dol.</i>	58.44	63.60
Total gross costs	<i>Dol.</i>	231.31	269.63
Credits	<i>Dol.</i>	7.66	6.72
Net cost	<i>Dol.</i>	223.65	262.91
Average production	<i>Lb.</i>	5,027	4,499
Man labor	<i>Hr.</i>	132	160
<b>PER HUNDREDWEIGHT OF MILK</b>			
Purchased feed	<i>Dol.</i>	1.62	2.42
Produced feed	<i>Dol.</i>	0.65	0.60
All pasture and grazing	<i>Dol.</i>	0.32	0.35
Total feed and pasture	<i>Dol.</i>	2.59	3.37
Total labor (man and horse)	<i>Dol.</i>	0.85	1.21
All other costs	<i>Dol.</i>	1.16	1.41
Total gross costs	<i>Dol.</i>	4.60	5.99
Credits	<i>Dol.</i>	0.15	0.15
Net cost	<i>Dol.</i>	4.45	5.84
Selling price per cwt. of milk	<i>Dol.</i>	4.90	4.99
Man labor	<i>Hr.</i>	2.62	3.56
<b>PERCENTAGES</b>			
Percentage of all feed bought	<i>Pct.</i>	62	72
Percentage of feed and pasture costs of total gross cost	<i>Pct.</i>	56	56
Percentage of labor costs of total gross cost	<i>Pct.</i>	19	20
Percentage of all other costs of total gross cost	<i>Pct.</i>	25	24
Number of farms	<i>No.</i>	36	54

The profit group produced a hundredweight of milk for \$1.39 less than the loss group. All principal costs were lower on the profit farms. Feed cost was 78 cents less, labor 36 cents less, and other items 25 cents less per hundredweight. Thus, of the total difference in cost per hundredweight of milk of the two groups, 56 per cent was accounted for by feed costs, 26 per cent by labor costs, and 18 per cent by other costs. The profit group purchased 62 per cent of all feed, while the loss group purchased 72 per cent. A breakdown of the kinds and amounts of feed fed by both the profit and the loss groups is shown in Table 33.

The profit group fed per cow 856 pounds less concentrates but fed 771 pounds more hay equivalent than did the loss group. There was almost no difference in the total amount of hand-fed feeds used by the two groups (Table 34). Thus, the switch to more roughage and pasture and less grain accounted for 56 per cent of the difference in the cost of producing a hundredweight of milk between the two groups.

The profit group hand-fed 80 per cent of the TDN required, while the loss group hand-fed 90 per cent. The loss group used

TABLE 33.— COMPARISON OF FEED, BY PROFIT AND LOSS GROUPS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Factor	Average per cow of	Average per cow of
	36 farms producing milk at a profit	54 farms producing milk at a loss
	<i>Pounds</i>	<i>Pounds</i>
<b>CONCENTRATES</b>		
Dairy feed (-20% protein)	1,043	1,469
Dairy feed (+20% protein)	115	115
Cottonseed meal	536	587
Corn	563	828
Grain sorghum	27	25
Oats	197	198
Barley	17	--
Bran or shorts	84	108
Distillers' corn grains	2	12
Hominy feed	11	40
Beet pulp	2	71
<b>TOTAL CONCENTRATES</b>	<b>2,597</b>	<b>3,453</b>
<b>ROUGHAGE</b>		
Cottonseed hulls	333	58
Legume hay	1,105	1,012
Grass hay	1,032	833
Corn tops	2	2
Corn fodder	--	1
Silage	1,620	1,005
<b>TOTAL ROUGHAGE</b>	<b>4,092</b>	<b>2,911</b>
<b>HAY EQUIVALENT OF ALL ROUGHAGE</b>	<b>3,012</b>	<b>2,241</b>

TABLE 34.—COMPARISON OF FEED AND RELATED FACTORS, BY PROFIT AND LOSS GROUPS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Factor	Unit	Average per cow of profit group	Average per cow of loss group
Total concentrates	<i>Lb.</i>	2,597	3,453
Total hay equivalent of all roughage	<i>Lb.</i>	3,012	2,241
<b>TOTAL HAND-FED<sup>1</sup></b>	<i>Lb.</i>	5,609	5,694
Amount of hand-fed concentrates to produce cwt. of milk	<i>Lb.</i>	52	77
Ratio of 1 lb. of concentrate to milk	<i>Lb.</i>	1.9	1.3
Hand-fed feed cost per cwt. of milk	<i>Dol.</i>	2.27	3.02
<b>NET COST PER CWT. OF MILK</b>	<i>Dol.</i>	4.45	5.84
TDN required	<i>Lb.</i>	4,393	4,209
TDN hand-fed	<i>Lb.</i>	3,504	3,773
<b>PER CENT OF REQUIREMENTS<sup>1</sup></b>	<i>Pct.</i>	80	90
Pounds of digestible protein required	<i>Lb.</i>	478	450
Pounds of digestible protein hand fed	<i>Lb.</i>	619	699
<b>PER CENT OF REQUIREMENTS<sup>1</sup></b>	<i>Pct.</i>	129	155

<sup>1</sup> See footnotes 1, 2, and 3, Table 13.

160 hours of man labor per cow, whereas the profit group used only 132 hours per cow. The loss group had a labor cost of \$53.58 per cow, while that of the profit group amounted to \$42.08<sup>4</sup>. Milking machines were used by 81 per cent of the profit group and by 72 per cent of the loss group. The loss group used 3.56 hours of man labor to produce a hundredweight of milk, while the profit group used only 2.62 hours. The loss group had a man labor cost of \$1.19 per hundred pounds of milk, while the profit group had a cost of only \$0.84 per hundredweight. The fact that 23 out of 72 farms with 31 or more cows used 125 hours or less of man labor per cow indicates that nearly all farms can reduce the time spent in caring for dairy cows.

“All other costs” for farms producing wholesale milk at a profit in 1945 amounted to \$1.16 per hundredweight. In contrast “all other costs” for farms producing milk at a loss totaled \$1.41 per hundredweight. This difference emphasizes that good management must be applied to all phases of milk production in order to put dairying on a profitable basis.

The profit group had cash sales of \$17,466 in 1945, whereas the loss group had cash sales of \$16,130. Sixty-three per cent of all receipts in the profit group was from the sale of milk, while

<sup>4</sup> The wage rate paid in the two groups was practically the same, amounting to 33 cents per hour for the loss group and 32 cents per hour for the profit group.



69 per cent of all receipts in the loss group came from milk sales (Table 35).

The average total investment of the profit group amounted to \$34,173, while that of the loss group amounted to \$32,960 (Table 36). The profit group had 61 per cent of the total investment in

**TABLE 35.— FARM RECEIPTS, INCLUDING VALUE OF FAMILY-USED PRODUCTS OF PROFIT AND LOSS FARMS, BY SOURCE, 90 WHOLESALE FARMS IN ALABAMA, 1945**

Kind	Average of 36 profit farms		Average of 54 loss farms	
	Dollars	Per cent	Dollars	Per cent
<i>Sales</i>				
Field and truck crops	1,779	10	886	5
Milk	11,458	63	11,493	69
Livestock products	136	1	263	2
Livestock sales	1,967	11	1,399	8
Miscellaneous <sup>1</sup>	2,126	12	2,089	13
<b>TOTAL SALES</b>	<b>(17,466)</b>	<b>(97)</b>	<b>(16,130)</b>	<b>(97)</b>
<i>Family used products</i>	609	3	419	3
<b>TOTAL</b>	<b>18,075</b>	<b>100</b>	<b>16,549</b>	<b>100</b>

<sup>1</sup> Includes milk subsidy, AAA payments, and other farm receipts.

**TABLE 36.— SUMMARY OF FARM RECORDS AND SUCCESS MEASURES, OF PROFIT AND LOSS FARMS, 90 WHOLESALE FARMS IN ALABAMA, 1945**

Factor	Average of 36 profit farms	Average of 54 loss farms
	Dollars	Dollars
Investment in real estate	20,710	20,376
Investment in livestock	8,671	9,106
Investment in feed and supplies	1,995	1,466
Investment in equipment	2,797	2,012
<b>TOTAL INVESTMENT</b>	<b>34,173</b>	<b>32,960</b>
Sales of farm products	17,466	16,130
Cash farm expenses	13,989	15,770
Farm cash available (sales less expenses)	3,477	360
Total gross return (sales plus inventory increases)	18,922	17,267
Total gross expenses (cash expenses plus inventory decreases)	15,003	16,694
Return to operator, family labor, and interest on capital (without family used products)	3,919	573
Value of family labor and interest on capital	2,445	2,389
Return for operator's labor (3919 - 2445)	1,474	-1,816
Value of family used products	609	419
Return for operator's labor, including family used products (1474 + 609)	2,083	-1,397
Value of labor performed by operator	1,591	1,896
<b>PROFIT</b>	<b>492</b>	<b>-3,293</b>

real estate, 25 per cent in livestock, 6 per cent in feed and supplies, and 8 per cent in equipment. The loss group had 62 per cent of the total investment in real estate, 28 per cent in livestock, 4 per cent in feed and supplies, and 6 per cent in equipment.

Sales of the profit group were \$1,336 more than on the loss group. Of this difference, 67 per cent came from larger sales of field and truck crops and the remainder was from the sale of livestock and from miscellaneous farm items. In addition to larger sales, the profit group held all farm cash expenses lower by \$1,781. The larger amount of cash available to the profit group was the result of both greater receipts and lower costs. The profit group had a return of \$2,083 for operator's labor, which exceeded the estimated value of that labor by \$492. This return of \$492, therefore, is pure profit or return to management.

The profit group of farms had an average of 20 acres of cotton per farm while the loss group had slightly less than 9 acres per farm. The average yield per acre was higher on the profit farms for all crops (Table 37).

In many respects there were few differences in these two groups of farms, yet one group had favorable returns, while the other had low returns. The larger cotton acreage along with a higher yield

TABLE 37.—FACTORS RELATED TO SUCCESS, PROFIT AND LOSS GROUPS OF FARMS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Item	Unit	Average of 36 profit farms	Average of 54 loss farms
Acres of cotton per farm	<i>Acres</i>	20.3	8.7
Average cotton yield per acre	<i>Lb.</i>	320	270
Acres of corn per farm	<i>Acres</i>	29.1	30.0
Average corn yield per acre	<i>Bu.</i>	27	21
Acres of all hay per farm	<i>Acres</i>	46.7	54.2
Average hay yield per acre	<i>Lb.</i>	2,807	1,926
Average number of beef cattle per farm	<i>No.</i>	10	13
Average number of hens per farm	<i>No.</i>	71	34 <sup>1</sup>
Average number of hogs per farm	<i>No.</i>	3	1
Average number of dairy cows per farm	<i>No.</i>	56	61
Average production per cow	<i>Lb.</i>	5,027	4,499
Net cost per hundredweight of milk	<i>Dol.</i>	4.45	5.84
Per cent of farms with milking machines	<i>Pct.</i>	81	72
Per cent of total milk produced in winter	<i>Pct.</i>	43	44
Percent of total milk produced in summer	<i>Pct.</i>	57	56

<sup>1</sup> Average number of 34 hens was obtained by omitting chicken numbers of one large poultry and dairy farm. The inclusion of this farm would have given an average of 167 hens per farm.

accounted for some of the difference in returns. The difference in the cost of producing milk between the two groups, however, accounts for most of the difference in returns.

These data show clearly why one group made a profit while the second group produced milk at a loss. Dairymen of the loss group can assure themselves of a shift to the profit side, and the profit group can increase their profits, through intensive efforts to reduce production costs per unit of product.

#### SUMMARY

The size of farm included in this study varied by areas from 93 acres on Sand Mountain to 749 acres in the Piedmont Area. Total investments averaged \$33,445 per farm. The average wholesale farm had 59 cows, with an average production per cow of 4,700 pounds.

The net cost of producing a hundredweight of wholesale milk varied by areas from \$3.79 on Sand Mountain to \$6.23 in the Gulf Coast Area. Feed and pasture costs were the chief expenses. Practically all the feed cost of the Gulf Coast Area was for purchased feed.

Variations in cost of producing wholesale milk by quarters of the year were due largely to differences in feeding practices, in amount of pasture and temporary grazing available, and in production. The quarter with the lowest cost was usually the one in which there was the highest production. Conversely, the highest cost quarter was usually the one with the lowest production. Twenty-five farms that averaged producing half of their milk in summer and half in winter had a total production of 5,012 pounds per cow. Twenty-nine farms that averaged producing 37 per cent of their milk in the winter months and 63 per cent in summer had a total production of only 4,295 pounds per cow. The cost of milk produced evenly throughout the year was greater than when cows freshened in the spring, with most of the milk being produced largely during the pasture season. The cost of milk produced evenly amounted to 51 cents per hundredweight more than when 63 per cent of the total yearly production was produced in the summer months.

Feed cost per hundredweight of milk produced increased as size of herd increased. Labor and all other costs had a tendency to decrease as size of herd increased. Total cost per hundredweight of milk increased as size of herd increased from 13 cows

to 104 cows by 54 cents per hundredweight due to increased feed costs.

Milk cost 94 cents more per hundredweight on wholesale farms with an average production of 3,099 pounds per cow than on those with an average production of 6,837 pounds per cow. High-production cows produced milk at a lower cost per hundredweight for feed, labor, and "all other costs."

Feed and pasture costs made up 56 per cent of the total gross cost of producing milk on wholesale farms. The variation in hand-fed feeds by areas was from 75 per cent to 100 per cent of TDN (total digestible nutrients) requirements. As the percentage of hand-fed TDN requirements increased, feed costs per hundredweight of milk increased. Areas that fed the largest amounts of hay equivalent fed the least concentrates, while areas feeding the smallest amount of hay equivalent fed the most concentrates.

Most of the variation in total cost of producing a hundredweight of milk between areas is accounted for by the difference in feed cost. This difference is largely due to the type of ration fed rather than to the amounts of total feed fed. As the percentage of all feed purchased increased, the net cost of producing milk increased. Those farms that bought less than half of their feed, produced milk at a cost of \$4.93 per hundredweight, while those farms that bought an average of 91 per cent of their feed, produced milk at a net cost of \$5.63 per hundredweight.

Labor costs made up 20 per cent of the total gross cost of producing milk on wholesale farms. The average amount of labor used per cow rose steadily from 131 hours on farms that averaged less than 3,500 pounds of milk per cow to 172 hours for farms with herds averaging over 6,500 pounds. However, there was a well-marked decline in the amount of labor per hundredweight of milk associated with increases in the average rate of production. An increase from 3,500 pounds of milk per cow to more than 6,500 pounds resulted in a saving of labor of 1.7 hours per hundredweight of milk. An average of 149 hours of man labor was required per cow for all dairy operations on the 90 surveyed farms producing wholesale milk in 1945.

Milking machines were reported on three-fourths of the wholesale farms. It took 44 hours less labor per cow annually on farms where machines were used than where they were not used.

"All other costs" ranged from 20 per cent of the total gross

cost in the Piedmont Area to 29 per cent on Sand Mountain. A weighted average of all 90 farms shows that "all other costs" amounted to 24 per cent of the total gross cost. Herd charge was the largest single cost item in "all other costs." Of the herd costs, depreciation was the largest item, averaging \$11.38 per cow. The death loss amounted to approximately 3 cows per farm. Wholesale farms purchased 61 per cent of their replacement cows and raised 39 per cent.

Bull costs varied by type-of-farming areas and size of herd. By areas, this variation ranged from \$3.19 per cow in the Upper Coastal Plain A Area to \$5.42 in the Gulf Coast Area. By size of herd, it ranged from \$5.40 per cow in herds of 13 cows to \$3.23 in herds of 55 cows, and averaged \$3.76 per cow on all wholesale farms.

As an average, the cash return for the operator's labor was *minus* \$499. However, when the \$495 worth of family-used products was considered, the operator's labor income amounted to a *minus* \$4. Twelve farms that depended upon the sale of milk for only 37 per cent of their farm receipts had an average return for operator's labor of \$1,256. Sixteen farms that depended upon the sale of milk for 83 per cent of their farm receipts had an average return for operator's labor of *minus* \$950. Farms depending upon milk sales for only 37 per cent of their income had a large acreage of cotton and feed crops, and in addition, had beef cattle and poultry to supplement the farm income. Farms with 83 per cent of their income from the sale of milk were highly specialized; the remaining 17 per cent of the income came from the sale of cull milk cows, calves, and other related dairy sources. These farms grew almost no crops for sale and little for feed purposes. Some 82 per cent of all their feed was purchased.

Of the 90 wholesale farms, 40 per cent produced milk at a profit. Some of these were located in every area of the state studied. The profit group had an average size herd of 56 cows, while the herd of the loss group averaged 61 cows. The profitable group had an average production per cow of approximately 500 pounds of milk more than the loss group.

The profit group produced a hundredweight of milk for \$1.39 less than the loss group. The importance of feed is shown by the fact that 78 cents, or 56 per cent of the \$1.39 difference, was saved in feed cost. The remainder of the reduced cost is accounted for by a saving of 26 per cent in labor and 18 per

cent in all other costs. The profit group bought only 62 per cent of all feed, while the loss group bought 72 per cent. Thus, a profit was made by having slightly better cows, by better handling of these cows, by close attention to feeding, by growing a larger amount of all feed, and by feeding more roughage and less concentrates.

The profit group fed 2,597 pounds of concentrates and 3,012 pounds of hay equivalent of all roughage. This amounted to a total of 5,609 pounds of hand-fed feed. The loss group fed 3,453 pounds of concentrates and 2,241 pounds of hay equivalent for a total of 5,694 pounds of hand-fed feed. The profit group fed 856 pounds less grain but 771 pounds more hay equivalent, with little difference in the total amount of feed fed. The profit group hand-fed 80 per cent of the TDN required, while the loss group hand-fed 90 per cent.

The loss group used 160 hours of labor per cow, while the profit group used an average of only 132 hours per cow. Eighty-one per cent of the profit group had milking machines and 72 per cent of the loss group had milkers. The loss group used 3.6 hours of man labor to produce a hundredweight of milk, while the profit group used only 2.6 hours.

The profit group had a cost of \$1.16 per hundredweight for the group of "all other costs," whereas the loss group had a cost of \$1.41 per hundredweight.

The average total investment of the profit group amounted to \$34,173 per farm, while that of the loss group amounted to \$32,960. The cash sales of the profit group amounted to \$17,466 and for the loss group \$16,130. The profit group paid out \$13,989 as cash expenses while the loss group paid out \$15,770. The return for the operator's labor amounted to \$1,474 per farm to the profit group; to the loss group it was a *minus* \$1,816. The profit group had a *pure* profit of \$492, which is a return to management.

## 2. COST of PRODUCING, PROCESSING, DISTRIBUTING FLUID MILK by RETAIL FARMS

The 29 retail farms studied were selling milk on 11 different markets. The three major retail markets were Birmingham, Mobile, and Montgomery. The eight remaining markets included Decatur, Albertville, Gadsden, Anniston, Selma, Andalusia, Ope-

lika, and Dadeville. Since nearness to market is ordinarily a very important factor in choosing a location for a retail dairy, these farms were analyzed on a market basis rather than by type-of-farming areas. The markets analyzed are Birmingham, Mobile, and Montgomery, while the farms included in the eight remaining markets are grouped together under the heading "other markets." Retail dairymen on the Mobile and Montgomery markets sold practically all of their milk to stores and cafes. Retail dairymen studied on the Birmingham market and the group of "other markets" sold milk to homes, stores, and cafes.

#### FARM DESCRIPTION AND ORGANIZATION

Retail farms as a whole grew fewer crops than wholesale farms. The extra labor required for processing and distributing milk on retail routes often made crop production difficult because of labor shortage in 1945. Total acreage in the farms averaged almost 300 for those selling on the Birmingham market and 500 for those retailing on the Montgomery market (Table 38). Crops grown by retail producers were almost entirely for feed purposes and were considerably short of being sufficient to feed the livestock on these farms.

TABLE 38.—AVERAGE LAND USE ON FARMS STUDIED BY MARKETS, 29 RETAIL FARMS IN ALABAMA, 1945<sup>1</sup>

Land use	Unit	Birmingham market	Mobile market	Montgomery market	Other markets
Corn	<i>Acres</i>	--	21	15	39
Grain sorghum	<i>Acres</i>	--	--	--	4
All hay	<i>Acres</i>	1	13	124	39
Grazing crops	<i>Acres</i>	8	63	--	23
Grain crops	<i>Acres</i>	7	--	--	44
Silage	<i>Acres</i>	6	25	5	4
Miscellaneous	<i>Acres</i>	--	5	24	11
<b>TOTAL CROP USE</b>	<i>Acres</i>	<b>22</b>	<b>127</b>	<b>168</b>	<b>164</b>
Double cropped	<i>Acres</i>	5	26	10	17
<b>TOTAL CROPPED</b>	<i>Acres</i>	<b>17</b>	<b>101</b>	<b>158</b>	<b>147</b>
Idle cropland	<i>Acres</i>	6	3	--	10
Woods unpastured	<i>Acres</i>	--	5	83	52
Woods pastured	<i>Acres</i>	145	142	2	53
Open pasture	<i>Acres</i>	120	50	246	175
Land in corral	<i>Acres</i>	7	6	3	4
Farmstead, roads, etc.	<i>Acres</i>	3	16	8	3
<b>TOTAL OPERATED</b>	<i>Acres</i>	<b>298</b>	<b>323</b>	<b>500</b>	<b>444</b>
Number of farms	<i>No.</i>	8	8	4	9

<sup>1</sup> Only 4 acres of cotton were produced by one retailer. This would have amounted to only one-tenth of an acre average for each of the 29 farms.

Retail producers selling on the Birmingham market had an average of 92 dairy cows per farm in 1945. Producer-distributors selling on the Montgomery market had an average of 109 cows per farm. Production per cow averaged 5,726 pounds of milk for the farms studied on the Birmingham market for 1945. Retail producers selling on the Montgomery market had an average production of 4,204 pounds of milk per cow (Table 39).

TABLE 39.—LIVESTOCK NUMBERS PER FARM AND PRODUCTION PER COW, BY MARKETS, 29 RETAIL FARMS IN ALABAMA, 1945

Kind	Unit	Birmingham market	Mobile market	Montgomery market	Other markets
Horses and mules	No.	2	3	4	2
Dairy cows	No.	92	74	109	65
Dairy bulls	No.	2	2	2	2
Dairy replacement stock	No.	34	28	21	32
Beef cattle	No.	—	—	—	—
Hogs	No.	1	—	4	1
Poultry	No.	27	41	34	29
Production per cow	Lb.	5,726	5,343	4,204	4,521

Horses and mules were used as farm workstock and for herding cattle on retail farms. Other than dairy cattle, all livestock on retail farms were largely for farm use.

Retail farms did not have commercial beef cattle or poultry as an additional source of income as did many of the wholesale producers in this study.

The total capital investment of the 29 retail farms averaged \$37,026. Producers on the Mobile market had an average investment of \$32,277, while those on the Montgomery market averaged \$45,914. Real estate was the largest single item in the investment (Table 40).

Some 58 per cent of the total investment of the average retail farm was in real estate, 29 per cent in livestock, 2 per cent in feed and supplies, and 11 per cent in equipment. Retail farms

TABLE 40.—AVERAGE FARM INVESTMENT BY MARKETS, 29 RETAIL FARMS IN ALABAMA, 1945

Kind of investment	Birmingham market	Mobile market	Montgomery market	Other markets	Average of all markets
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Real estate	18,043	16,285	28,871	25,319	21,310
Livestock	12,160	11,945	11,142	7,975	10,661
Feed and supplies	217	662	1,475	1,306	851
Equipment	5,161	3,385	4,426	3,982	4,204
<b>TOTAL</b>	<b>35,581</b>	<b>32,277</b>	<b>45,914</b>	<b>38,582</b>	<b>37,026</b>



had a higher total investment than wholesale farms. However, a smaller percentage of the total investment was in fixed assets.

COST STUDY OF RETAIL FARMS

Enterprise Basis

The net cost of producing, processing, and distributing a hundredweight of herd-run milk in 1945 varied from \$6.26 for the Montgomery market to \$8.65 for the Birmingham market (Table 41). This net cost per hundredweight averaged \$7.96 for all retail farms studied on an enterprise basis.

These calculations show the cost of producing, processing, and distributing a hundredweight of milk on the enterprise alone. All direct costs, such as feed, labor, and a share of the overhead

TABLE 41.— COST PER HUNDREDWEIGHT OF PRODUCING, PROCESSING AND DISTRIBUTING FLUID MILK, ENTERPRISE BASIS, 29 RETAIL FARMS IN ALABAMA, 1945<sup>1</sup>

Expense	Birmingham market	Mobile market	Montgomery market	Other markets	Average of all markets
	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>	<i>Dollars</i>
Purchased feed	3.69	3.12	2.23	2.65	3.08
Produced feed	0.07	0.57	0.68	0.93	0.49
All pasture	0.38	0.40	0.32	0.37	0.38
<b>TOTAL FEED AND PASTURE</b>	<b>4.14</b>	<b>4.09</b>	<b>3.23</b>	<b>3.95</b>	<b>3.95</b>
Hired labor	2.02	1.31	0.97	1.03	1.45
Family labor	0.25	0.56	0.07	0.12	0.28
Operator's labor	0.37	0.41	0.48	0.57	0.44
Horse labor	0.01	0.00	0.01	0.03	0.01
<b>TOTAL LABOR</b>	<b>2.65</b>	<b>2.28</b>	<b>1.53</b>	<b>1.75</b>	<b>2.18</b>
Hauling and vehicle	0.49	0.46	0.34	0.46	0.44
Miscellaneous <sup>2</sup>	0.30	0.26	0.26	0.32	0.29
Herd charge	0.45	0.58	0.40	0.50	0.49
Building charge	0.21	0.15	0.15	0.24	0.19
Farm & dairy equip. chg.	0.49	0.53	0.36	0.53	0.49
Other costs <sup>3</sup>	0.05	0.04	0.09	0.06	0.05
<b>TOTAL "ALL OTHER COSTS"</b>	<b>1.99</b>	<b>2.02</b>	<b>1.60</b>	<b>2.11</b>	<b>1.95</b>
<b>TOTAL GROSS CHARGE</b>	<b>8.78</b>	<b>8.39</b>	<b>6.36</b>	<b>7.81</b>	<b>8.08</b>
Credits	0.13	0.12	0.10	0.14	0.12
<b>NET COST PER CWT.</b>	<b>8.65</b>	<b>8.27</b>	<b>6.26</b>	<b>7.67</b>	<b>7.96</b>

<sup>1</sup> Cost of keeping a cow on retail farms in 1945 is shown in Appendix Table 7.

<sup>2</sup> Miscellaneous costs include dues and fees, electric and telephone bills, salt, ice, minerals, washing soda, and other such charges.

<sup>3</sup> Other costs include interest on feed, interest on operating capital, corral, and bedding charges.

items, were charged to each hundredweight of milk. The manure and calves were treated as credits against these costs.

### Farm Basis

In calculating milk costs on the farm basis, the entire farm expenses, cash and noncash, are charged to the dairy farm regardless of the type of expenditure. Income from all sources

TABLE 42.— COST OF PRODUCING, PROCESSING, AND DISTRIBUTING FLUID MILK ON A FARM BASIS, 29 RETAIL FARMS IN ALABAMA, 1945

Item	Total of 29 farms	Average per farm
	Dollars	Dollars
<b>CASH COSTS</b>		
Feed purchased	405,019	13,966
Crop labor hired	28,723	990
Dairy labor hired	175,780	6,061
Seeds, plants, etc.	8,800	303
Fertilizer, slag, lime, etc.	16,241	560
Veterinary, medicine, and other livestock expenses	7,237	250
Miscellaneous crop expense	1,737	60
Car, truck, tractor, and motor expense	67,157	2,316
Farm and dairy equipment expense	46,299	1,597
Building and fencing expense	9,010	311
Miscellaneous dairy expenses	37,560	1,295
Miscellaneous farm expenses, including taxes, insurance, etc.	28,699	990
Livestock purchased	60,565	2,088
<b>TOTAL</b>	<b>892,827</b>	<b>30,787</b>
<b>NONCASH EXPENSES</b>		
Depreciation	30,476	1,051
Interest charges	61,185	2,110
Value of unpaid family labor	38,092	1,314
Value of unpaid operator's labor and management	64,420	2,221
<b>TOTAL</b>	<b>194,173</b>	<b>6,696</b>
<b>TOTAL EXPENSE</b>	<b>1,087,000</b>	<b>37,483</b>
<b>FARM INCOME OTHER THAN DAIRY</b>		
Sale of field and truck crops	4,768	164
Sale of livestock products other than dairy products	16,528	570
Sale of livestock	36,264	1,250
Miscellaneous farm income other than milk subsidy	8,691	300
Increases in farm inventories	63,588	2,193
Value of products used in the home other than milk	7,616	263
<b>TOTAL FARM RECEIPTS OTHER THAN DAIRY</b>	<b>137,455</b>	<b>4,740</b>
<b>NET COST OF PRODUCING, PROCESSING AND DISTRIBUTING MILK</b>	<b>949,545</b>	<b>32,743</b>
<b>MILK PRODUCTION, pounds</b>	<b>11,835,784</b>	<b>408,130</b>
<b>NET COST PER HUNDREDWEIGHT</b>	<b>8.02</b>	<b>8.02</b>

other than milk, dairy products, and milk subsidy is credited to the dairy farm. This net expense, divided by the amount of milk produced, gives the net farm cost per hundredweight of milk. Since 82 per cent of the cash income of retail farms was from the direct sale of milk and an additional 11 per cent was from the sale of other dairy products and milk subsidy, or a total of 93 per cent from the dairy, it is reasonable to allot any profit or loss from any other source to the dairy.

On the farm cost basis, the average net cost of producing, processing, and distributing a hundredweight of milk was \$8.02, or 6 cents higher than the cost calculated on the enterprise basis (Table 42). While the difference was not significant, it was apparently due in part to an insufficient labor charge to the dairy on the enterprise basis.

#### FACTORS AFFECTING COST OF PRODUCING, PROCESSING, AND DISTRIBUTING FLUID MILK

Feed cost was the largest cost item in producing, processing, and distributing retail milk. As an average, 49 per cent of the total gross cost of producing and distributing a hundredweight of milk was for feed and pasture, 27 per cent for labor cost, and 24 per cent was for "all other costs" (Appendix Table 8).

#### Feed and Pasture

The average retail dairyman purchased \$3.08 worth of feed for each hundred pounds of milk produced in 1945. In addition, the average dairyman fed \$0.49 worth of farm produced feed and used \$0.38 worth of pasture for each hundred pounds of milk produced (Table 41). The total cost of hand-fed feed amounted to \$3.57 per hundredweight of milk, while the total feed and pasture cost amounted to \$3.95 per hundredweight. This cost of \$3.95 per hundredweight amounted to \$0.90 more than the average wholesale farm cost for feed and pasture. The major difference between wholesale and retail farms was in heavier feeding and an increase in the amount of purchased feed on retail farms. Two reasons largely account for the heavier feeding. First, the demand for milk was such that dairymen attempted to produce an even flow of milk during the year; this required heavier feeding. Second, the milk shortage throughout 1945 caused many dairymen to feed heavier in an attempt to produce more milk.

In 1945 the average producer-distributor selling on the Mobile market hand-fed 4,686 pounds of concentrates per cow, whereas the average retailer selling on the Montgomery market hand-fed only 2,564 pounds of concentrates. The average producer-distributor hand-fed 4,193 pounds of concentrates per cow in 1945 (Table 43). This amount is 1,067 more pounds per cow than that fed by wholesale dairymen. The amount of hay equivalent of all roughage hand-fed by retail producers exceeded that fed by wholesale producers by 482 pounds. This addition of 1,549 pounds of hand-fed feed largely accounts for the additional production of 348 pounds of milk that retailers received above that of wholesale producers.

TABLE 43.—AVERAGE AMOUNT OF HAND-FED FEEDS PER COW BY MARKETS, 29 RETAIL FARMS IN ALABAMA, 1945

Kind	Birmingham market	Mobile market	Montgomery market	Other markets	Average of all markets
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
<b>CONCENTRATES</b>					
Dairy feed (-20% prot.)	622	1,739	2,014	1,499	1,379
Dairy feed (+20% prot.)	942	950	--	--	536
Cottonseed meal	856	396	259	1,056	679
Corn	1,025	550	291	1,291	835
Oats	309	180	--	404	243
Barley	--	--	--	158	39
Bran or shorts	262	191	--	113	159
Distillers' corn grains	--	657	--	--	165
Hominy feed	172	--	--	--	54
Beet pulp	291	23	--	--	97
Wheat	5	--	--	21	7
<b>TOTAL</b>	<b>4,484</b>	<b>4,686</b>	<b>2,564</b>	<b>4,542</b>	<b>4,193</b>
<b>ROUGHAGE</b>					
Cottonseed hulls	143	--	--	125	76
Legume hay	3,355	1,184	638	1,641	1,880
Grass hay	390	--	2,590	386	700
Silage	390	3,060	643	654	1,174
<b>TOTAL</b>	<b>4,278</b>	<b>4,244</b>	<b>3,871</b>	<b>2,806</b>	<b>3,830</b>
<b>HAY EQUIVALENT OF ALL ROUGHAGE</b>					
	4,018	2,204	3,442	2,370	3,047

The amounts of hand-fed feeds and their relationship to TDN and protein requirements for retail dairies are given in Table 44. Retailers selling on the Montgomery market hand-fed 89 per cent of the total TDN requirements, while those on all remaining markets hand-fed more than 100 per cent of the yearly TDN requirements. Although pastures were used by retailers during the pasture seasons, heavy winter feeding accounts for the TDN

hand-fed in excess of requirements in 1945. Hand-fed protein also exceeded cow requirements in all areas. Purchased feed made up 69 per cent of all feed on the Montgomery market and 89 per cent on the Birmingham market. As an average for all retail farms, 78 per cent of all feed was purchased.

TABLE 44.—AVERAGE AMOUNT OF FEEDS HAND-FED PER COW AND RELATED FACTORS, BY MARKETS, 29 RETAIL FARMS IN ALABAMA, 1945

Kind	Unit	Birmingham market	Mobile market	Montgomery market	Other markets	Av. of all markets
Total concentrates fed	Lb.	4,484	4,686	2,564	4,542	4,193
Hay equivalent fed	Lb.	4,018	2,204	3,442	2,370	3,047
<b>TOTAL HAND-FED FEED<sup>1</sup></b>	Lb.	8,502	6,890	6,006	6,912	7,240
Av. production per cow	Lb.	5,726	5,343	4,204	4,521	5,048
Amt. con. hand-fed to produce 100 lb. milk	Lb.	78	88	61	100	83
Ratio 1 lb. concentrate to milk	Lb.	1.3	1.1	1.6	1.0	1.2
Total hand-fed feed cost per cwt. milk	Dol.	3.76	3.69	2.91	3.58	3.57
<b>TOTAL NET COST PER CWT. OF MILK</b>	Dol.	8.65	8.27	6.26	7.67	7.96
TDN required <sup>2</sup>	Lb.	4,637	4,504	4,106	4,217	4,401
TDN hand-fed	Lb.	5,491	4,746	3,662	4,684	4,767
<b>PERCENTAGE OF REQUIREMENTS</b>	Pct.	118	105	89	111	108
Pounds digestible protein required <sup>3</sup>	Lb.	514	494	435	452	479
Pounds protein hand-fed	Lb.	1,129	976	570	961	946
<b>PERCENTAGE OF REQUIREMENTS</b>	Pct.	220	198	131	213	197
<b>Percentage of all feed purchased</b>	Pct.	89	76	69	67	78

<sup>1</sup> This is the total amount of feed made available to the average cow; some, however, may have been wasted rather than consumed.

<sup>2</sup> Morrison, F. B., *Feeds and Feeding*, 20th Edition, 1936. Appendix Table 3 indicates that daily TDN requirement for maintenance of a 900-pound cow is 7.23 pounds with an added TDN requirement of 0.349 pounds for each pound of 4.5 per cent milk produced.

<sup>3</sup> *Ibid.* The protein requirement for maintenance of a 900-pound cow is 0.593 pounds with an added protein requirement of 0.052 pounds for each pound of 4.5 per cent milk produced.

There was little variation in the amount of total concentrates and hay equivalent of all roughage hand-fed per pound of milk between markets. The maximum difference in hand-fed concentrates and roughage per day per cow between markets amounted to almost 7 pounds (Table 45). The difference in

production per cow per day amounted to slightly over .4 pounds. The maximum difference in hand-fed feeds per pound of milk produced amounted to only two-tenths of a pound of feed.

*Permanent pastures.* Practically all of the retail dairy farms had permanent pastures. The maintenance cost of these pastures varied from \$3.99 per acre in the Mobile market area to \$9.45

TABLE 45.—AVERAGE MILK PRODUCTION PER COW PER DAY AS RELATED TO HAND-FED FEED, BY MARKETS, 29 RETAIL FARMS IN ALABAMA, 1945

Market	Av. milk production per cow per day	Av. amt. conc. hand-fed per cow per day	Av. amt. of hay equivalent hand-fed per cow per day	Tot. lb. conc. and hay equivalent hand-fed per cow per day	Pounds hand-fed feed per lb. of milk produced
	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>	<i>Pounds</i>
Birmingham	15.7	12.3	11.0	23.3	1.48
Mobile	14.6	12.8	6.0	18.8	1.29
Montgomery	11.5	7.0	9.4	16.4	1.43
Other	12.4	12.4	6.5	18.9	1.53
Av. of all markets	13.8	11.5	8.3	19.8	1.43

TABLE 46.—PERMANENT PASTURE MAINTENANCE COST PER ACRE BY MARKETS, 29 RETAIL FARMS IN ALABAMA, 1945

Item	Unit	Birmingham market	Mobile market	Montgomery market	Other markets	Av. of all markets
Fence upkeep	<i>Dol.</i>	0.66	0.41	0.22	0.51	0.48
Seeds	<i>Dol.</i>	0.79	0.38	0.47	0.10	0.45
Mowing and bushing	<i>Dol.</i>	0.20	0.10	0.39	0.33	0.24
Manure <sup>1</sup>	<i>Dol.</i>	0.50	0.04	0.36	0.14	0.27
Fertilizer, lime, slag, phosphate, etc.	<i>Dol.</i>	2.72	0.67	0.57	1.24	1.46
Man labor	<i>Dol.</i>	0.87	0.38	0.17	0.27	0.47
Mule labor	<i>Dol.</i>	0.29	0.06	0.10	0.06	0.14
Equipment	<i>Dol.</i>	0.47	0.16	0.33	0.20	0.30
Interest on land	<i>Dol.</i>	1.56	1.57	2.33	1.69	1.72
Taxes	<i>Dol.</i>	0.55	0.19	0.56	0.74	0.51
TOTAL COST	<i>Dol.</i>	8.61	3.96	5.50	5.28	6.04
Receipts from past.	<i>Dol.</i>	0.00	0.00	0.00	0.06	0.02
NET COST OF OWNED PASTURE	<i>Dol.</i>	8.61	3.96	5.50	5.22	6.02
Cost of hired past.	<i>Dol.</i>	0.84	0.03	0.00	0.03	0.28
TOTAL PASTURE COST	<i>Dol.</i>	9.45	3.99	5.50	5.25	6.30
Acres on farms studied	<i>Acr.</i>	1,918.0	1,537.0	983.0	1,572.0	6,010.0
Number of farms	<i>No.</i>	8	8	4	9	29

<sup>1</sup> A charge for manure was made only for that hauled out and applied to the pasture by the farmer.

in the Birmingham area. The average cost for maintenance of an acre of permanent pasture in 1945 amounted to \$6.30 (Table 46). All open pasture was considered permanent pasture, much of which was in native grasses. Both improved and unimproved pasture had to be considered because they were often found under one fence. Because retail farms are generally located near a market, they have high land values. This makes interest on land one of the highest cost items for pasture maintenance. Taxes were also found to be higher on retail dairy farms than on wholesale farms due to location.

Not all the costs of pasture and grazing crops were chargeable to dairy cows alone. Pastures were shared by bulls, replacement stock, and other livestock on the farm. The percentage basis on which this cost was distributed is given in Table 47.

TABLE 47.—PERCENTAGE DISTRIBUTION OF PASTURE AND GRAZING CROPS BY KIND OF LIVESTOCK AND TYPE OF CROP, 29 RETAIL FARMS IN ALABAMA, 1945

Livestock	Permanent pasture	Temporary pasture	Woods pasture	Crop residue	Total
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
Dairy cows	53.2	24.5	0.1	0.0	77.8
Dairy bulls	1.0	0.5	0.0	0.0	1.5
Dairy replacement stock	10.8	7.4	0.2	0.0	18.4
All other livestock	1.5	0.8	0.0	0.0	2.3
<b>TOTAL</b>	<b>66.5</b>	<b>33.2</b>	<b>0.3</b>	<b>0.0</b>	<b>100.0</b>

Permanent pastures made up 66.5 per cent of all pasture and grazing crop costs. Dairy cows consumed 53 per cent of all permanent pasture. Temporary pastures or grazing crops made up 33.2 per cent of all pasture and grazing crop costs, with dairy cows consuming 24.5 per cent of all temporary pastures. Many dairymen had not developed their pastures as well as they might have. Others did not make efficient use of their pastures because of the continuance of heavy concentrate feeding.

### Labor and Wages

Retail farms had higher labor costs per cow and per hundredweight of milk than did wholesale farms, since their labor was used for producing, processing, and distributing to stores and homes. The average retail dairy required 248 man hours of labor per cow or 4.9 hours per hundredweight of milk. The average wage rate amounted to \$0.44 per hour (Table 48).

TABLE 48.—MAN LABOR COSTS ON RETAIL DAIRIES, BY MARKETS, 29 RETAIL FARMS IN ALABAMA, 1945

Item	Unit	Birmingham market	Mobile market	Montgomery market	Other markets	Av. of all markets
Hours of man labor per cow	<i>Hr.</i>	295	250	203	219	248
Value of man labor per cow	<i>Dol.</i>	151.20	121.87	63.72	77.98	109.43
Hours of man labor per cwt. of milk	<i>Hr.</i>	5.1	4.7	4.8	4.8	4.9
Value of man labor per cwt. of milk	<i>Dol.</i>	2.64	2.28	1.52	1.72	2.17
Wage rate per hour	<i>Dol.</i>	0.52	0.49	0.32	0.36	0.44

The amount of man labor used per cow varied between markets because of size of herd, production per cow, and methods of distribution. Markets where all or most of the milk was sold to stores rather than homes required less labor per cow and per hundredweight of milk than did those markets where most of the milk was delivered to homes.

The retail farms studied used an average of 248 man hours per cow or 4.9 hours per hundredweight of milk produced as compared to 149 man hours per cow and 3.2 hours per hundredweight of milk for wholesale farms. This difference of almost 100 hours per cow or 1.7 hours per hundredweight of milk was used by retail farms for processing and distribution. No special study was made of the different methods of processing and distributing used by retailers. It is, therefore, impossible to illustrate means by which labor might be saved in these operations. Some of the obvious ways of reducing delivery costs are continuation of alternate-day delivery, cutting out call-backs, reduction of route mileage, maintaining higher delivery densities per mile of street, and using trucks of proper size and arrangement for efficient handling of milk. Retail dairymen have an interest in efficient distribution because of its importance in stimulating increased milk consumption and in maintaining satisfactory milk prices.

#### All Other Costs

The total of "all other costs" ranged from \$1.60 per hundredweight on the Montgomery market to \$2.11 on the group of other markets (Table 41). These costs constituted 25 per cent of the total gross cost of retail milk on the Montgomery market



and 27 per cent of the total gross cost on the group of other markets.

Hauling and vehicle expense, herd charge, and farm and dairy equipment charges were the three highest costs in the group of "all other costs." Hauling and vehicle expense was largely the cost for trucks.

*Herd charges.* Herd charges were made up of interest on the average investment in cows, depreciation and mortality, registry fees, taxes, veterinary and medical expenses, insurance, and breeding costs. The average investment in cows on retail farms amounted to \$105 per cow. Based on a 6 per cent interest rate, retail farms had an interest charge of \$6.30 per cow. Depreciation cost per cow was the largest single item of expense for herd charges. This charge averaged \$960 per farm or \$9.53 per head for the retail dairies (Table 49).

**TABLE 49.— DEPRECIATION IN VALUE OF COWS, 29 RETAIL FARMS IN ALABAMA, 1945**

Item	Head per farm	Value per farm	Value per head
	<i>Number</i>	<i>Dollars</i>	<i>Dollars</i>
Cows, Jan. 1, 1945	77.6	7,964.14	102.63
Cows purchased	14.6	1,997.59	136.82
Heifers freshened	8.5	901.90	106.11
<b>TOTAL OR AVERAGE</b>	<b>100.7</b>	<b>10,863.63</b>	<b>107.88</b>
Cows sold	13.6	841.28	61.86
Cows died	3.0		
Cows, Dec. 31, 1945	84.1	9,062.24	107.76
<b>TOTAL OR AVERAGE</b>	<b>100.7</b>	<b>9,903.52</b>	<b>98.35</b>
<b>NET DEPRECIATION</b>		<b>960.11</b>	<b>9.53</b>

The major part of the depreciation cost was accounted for by cull cows and death losses. Cows sold amounted to 18 per cent of the cows on hand the first of the year. The death loss averaged 3 cows per farm. Causes of cow deaths are shown in Appendix Table 5. Replacements for cows culled from the milking herd, those lost by death, and the increase in inventory numbers came from purchases and heifers raised on the farm. Retail farms purchased 63 per cent of their replacements and raised 37 per cent. Cows purchased cost an average of \$137 per head in 1945, while heifers raised were valued at \$106 per head. The difference in age largely accounts for the difference in value of purchased and raised cows.

*Bull charges.* Breeding costs made up part of the herd charge. The bull charges per cow varied from \$4.92 on the Birmingham market to \$1.57 on the Montgomery market. The average bull charge per cow on all retail farms was \$3.78 (Table 50). The average cost on all wholesale farms was \$3.76 per cow.

TABLE 50.—AVERAGE COST OF KEEPING A BULL, BY MARKETS, 29 RETAIL FARMS IN ALABAMA, 1945

Expense	Unit	Birmingham market	Mobile market	Montgomery market	Other markets	Av. of all markets
Concentrates	Dol.	51.89	73.46	21.22	34.25	49.17
Silage	Dol.	2.64	16.67	2.67	—	6.01
Hay	Dol.	67.78	30.73	24.67	40.65	43.96
Other roughage	Dol.	0.62	1.79	—	0.23	0.77
Pasture	Dol.	10.00	13.00	7.44	23.81	14.03
Depreciation	Dol.	10.26	—	5.56	9.06	6.32
Building use	Dol.	8.29	7.72	—	1.88	5.29
Interest	Dol.	13.74	12.42	5.00	9.16	10.93
Man labor	Dol.	52.32	31.85	8.00	12.88	29.94
Other costs <sup>1</sup>	Dol.	1.69	2.94	12.22	2.50	3.78
<b>TOTAL</b>	Dol.	219.23	190.58	86.78	134.42	170.20
Credits <sup>2</sup>	Dol.	32.72	32.28	10.89	28.31	28.32
Net cost per bull <sup>3</sup>	Dol.	186.51	158.30	75.89	106.11	141.88
Bull cost per cow	Dol.	4.92	4.83	1.57	2.92	3.78
Man labor	Hr.	110	75	31	42	71

<sup>1</sup> Other costs consist of charges for bedding, taxes, insurance, horse labor, machinery use, hired services, veterinary and medical supplies, salt, various supplies, registry and transfer fees, and other miscellaneous costs.

<sup>2</sup> Credits are made for appreciation, manure, service fees and service to heifers bred within the year but had not entered the milking herd at the end of the year.

<sup>3</sup> Net cost per bull is the net cost to the cows only, since credit is given for bred heifers.

### FARM SUCCESS ON RETAIL FARMS

Cash sales on the average retail farm amounted to \$33,728 (Table 51). Of this, \$164 came from the sale of field and truck crops, \$27,903 from the sale of milk, \$1,445 from the sale of other livestock products, including some dairy products, \$1,250 from livestock sales, and \$2,966 from miscellaneous farm sources including milk subsidy and AAA payments. Milk sales without subsidy or other dairy products accounted for 82 per cent of all sales. The return for operator's labor amounted to \$658 on the average retail farm without the addition of family-used products.

While the operator of the average retail farm did receive some pay for his labor, the return was only half enough to cover the

TABLE 51.— SUMMARY OF FARM RECORDS AND SUCCESS MEASURES, 29 RETAIL FARMS IN ALABAMA, 1945

Factor	Average of all farms
	<i>Dollars</i>
Sale of farm products	33,728
Cash farm expenses	30,787
Farm cash available (sales less expenses)	2,941
Total gross returns (sales plus inventory increases)	35,921
Total gross expenses (cash expenses plus inventory decreases)	31,839
Return to operator, family, and capital (without family-used products)	4,082
Value of family labor and interest on capital	3,424
Return for operator's labor (4082) — (3424)	658
Value of family-used products per farm	472
Return for operator's labor, including family-used products	1,130

TABLE 52.— NUMBER AND PERCENTAGE OF DAIRIES SHOWING A PROFIT, 29 RETAIL FARMS IN ALABAMA, 1945

Market	Number of farms	Number showing a profit	Per cent showing a profit
	<i>Number</i>	<i>Number</i>	<i>Per cent</i>
Birmingham	8	1	12.5
Mobile	8	4	50.0
Montgomery	4	3	75.0
Other	9	4	44.4
TOTAL OR AVERAGE	29	12	41.4

estimated value of this labor. There was no pure profit on the average retail farm. Only 41 per cent of all retail farms were able to show a pure profit in 1945 (Table 52).

Location was not the important factor determining profit, since some profitable farms were found in every market group. Factors affecting profitable operations on retail farms were, as in the case of wholesale farms, the amount and kind of ration fed, amount and use of pasture and grazing crops, percentage of all feed purchased, and the efficiency with which labor and "all other costs" were managed.

### SUMMARY

The 29 retail farms studied were selling milk on 11 different markets. The three major markets were Birmingham, Mobile, and Montgomery. Retail dairymen on the Mobile and Mont-

gomery markets sold practically all of their milk to stores and cafes. Retail dairymen on the Birmingham and the remaining markets sold milk to homes, stores, and cafes.

Retail dairymen on the Birmingham market had an average size farm of 298 acres. The total acreage operated by the average retail dairymen on the Montgomery market was 500. There was very little livestock on the retail farms studied other than dairy cattle. The average retail farm had 81 cows with an average production of 5,048 pounds of milk in 1945. The capital investment of the retail farms averaged \$37,026, with 58 per cent of this in real estate.

On an enterprise basis, the net cost of producing, processing, and distributing a hundredweight of milk varied from \$6.26 on the Montgomery market to \$8.65 on the Birmingham market, and averaged \$7.96 for all retail farms. On a farm cost basis, the average net cost of producing, processing, and distributing a hundredweight of milk was \$8.02, or 6 cents higher than the enterprise cost.

Feed and pasture costs amounted to 49 per cent of the total gross cost of producing, processing, and distributing milk on retail farms. The total feed and pasture cost amounted to \$3.95 per hundredweight of milk produced. Of the feed cost, \$3.08 was for purchased feed, \$0.49 was for home raised feed, and \$0.38 was for pasture and grazing crop expenses. Heavy concentrate feeding accounted for most of the feed cost. The average retail dairyman hand-fed 4,193 pounds of concentrate and 3,047 pounds of hay equivalent of all roughage per cow. This amounted to 8 per cent more than the yearly TDN requirements of the cow. The amount of protein hand-fed each cow also amounted to considerably more than requirements.

The average retail dairy required 248 man hours of labor per cow or 4.9 hours per hundredweight of milk. The average wage rate was \$0.44 per hour. Retail dairymen on the Montgomery market required only 203 man hours per cow in 1945. The less-than-average requirements on this market were due to lower-than-average production per cow and the fact that all milk was sold to stores and cafes rather than doorstep delivery. Labor costs amounted to 27 per cent of the total gross costs on all retail farms.

The group of "all other costs," including hauling and vehicle expense, miscellaneous costs, herd, building and equipment expenses, averaged \$1.95 per hundredweight of milk on all retail

farms. As an average, "all other costs" amounted to 24 per cent of the total gross cost of producing, processing, and distributing milk. Herd charges, the largest single item in the group of all other costs, averaged \$0.49 per hundredweight. Depreciation averaged \$9.53 per head. Cull cows and death losses largely accounted for depreciation. Death loss averaged 3 cows per farm. As an average, 63 per cent of all replacement cows were purchased and 37 per cent were raised.

Bull charges per cow varied from \$1.57 on the Montgomery market to \$4.92 on the Birmingham market. The average bull charge per cow on all retail farms amounted to \$3.78. The low cost on the Montgomery market was the result of allowing bulls to run with the herd all or most of the year.

Cash sales on the average retail farm amounted to \$33,728. Of this, \$27,903 came from the sale of milk. Cash expenses on the retail farms averaged \$30,787 per farm. The return for the operator's labor amounted to \$658 and \$1,130 when the value of family-used products was included. Of the 29 retail farms, 41 per cent produced milk at a profit in 1945. Factors leading to profitable retail farms were the amount and kind of ration fed, amount and use of pasture and grazing crops, percentage of all feed purchased and the efficiency with which labor and all other costs were handled.

## RECOMMENDATIONS

The farmer individually can do little about the general price level of milk. He can, however, increase his farming efficiency, and lower his cost of production. Since profits represent the difference between selling price and the cost of production, farmers should make intensive efforts to reduce production costs per unit of product wherever possible.

Reductions in production costs of a hundredweight of milk can best be achieved by the following:

- (1) Produce more and better roughage, pasture, and feed grains. In 1945 wholesale farms bought 69 per cent of all their feed and retail farms bought 78 per cent. Much of this feed could be grown on the farm.

- (2) Improve feeding practices, especially by feeding more high quality roughage and reducing grain or other concentrates to the amount needed to balance roughage and pasture. In the case of many cows, no concentrates will be required if sufficient

good pasture, temporary grazing crops, and roughage is available.

(3) Increase output per worker. The average wholesale farm used 149 man hours to care for a cow for a year, while the average retail farm used 248 man hours per cow in producing, processing, and distributing the milk from 1 cow. The man hours per cow can be reduced materially by proper supervision of the labor force, better arrangement of barns and milk houses, proper construction of hay racks, and correct handling of milking machines.

(4) Improve breeding practices and methods of selection of replacement cows. This can lead to higher production per cow and a larger percentage of all milk produced in winter months by breeding for fall freshening. Those farms with a larger acreage of pasture and cropland for growing roughage over and above the needs of the milking herd usually will find it profitable to raise their replacement heifers. Dairymen who follow this practice reduce the risk of introducing disease into their herds. Also, they can be certain of the production records of the animals in their herds.

(5) Use more effective sanitation and disease control measures. A reduction in mortality and percentage of cows culled from the herd each year would greatly reduce herd depreciation. Many cow deaths each year are due to improper supervision.

(6) Closer supervision on the part of management in production, buying, and selling. Cash sales of farm products on the average wholesale farm amounted to almost \$17,000 in 1945. Cash sales on the average retail farm amounted to almost \$34,000 in 1945. In either case, this is sufficient business to merit close supervision. The average wholesale farm in 1945 had cash farm expenses of \$15,000 and the average retail farm almost \$31,000. With this amount of purchasing each year, dairymen should give attention to the possibilities of buying at wholesale, buying at times when products can be purchased cheapest, and buying in large quantities.

#### ACKNOWLEDGMENT

The author acknowledges the assistance and cooperation in this study from the 119 farmers surveyed in 23 Alabama counties, the Alabama Extension Service, A.P.I., Production and Marketing Administration, State and County Health Departments, Alabama State Milk Control Board, and the Dairy Department of the Alabama Agricultural Experiment Station, A.P.I.

**APPENDIX**

APPENDIX TABLE 1.—AVERAGE ANNUAL COST OF KEEPING A COW, BY TYPE-OF-FARMING AREAS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Item	Unit	Sand Mountain	Tennessee Valley	Limestone Valley	Black Belt	Upper Coastal Plain		Piedmont	Gulf Coast	Average of all areas
						A	B			
Purchased feeds	Dol.	68.91	51.48	129.30	58.40	81.96	159.04	125.91	146.73	98.44
Produced feeds	Dol.	34.11	58.47	16.53	35.23	27.56	6.55	20.45	31.01	28.26
Perm. pasture	Dol.	3.92	12.63	8.41	14.77	5.65	5.38	9.77	8.14	10.42
Temp. pasture	Dol.	20.12	5.32	2.91	2.25	0.96	17.54	9.47	8.35	6.20
Woods pasture	Dol.	--	0.30	0.09	0.09	--	0.09	0.16	0	0.10
Crop residue	Dol.	--	--	0.02	--	--	--	0.08	--	0.01
Insurance on feed	Dol.	0.13	--	--	0.10	--	--	0.27	--	0.08
TOTAL FEED AND PASTURE COST	Dol.	127.19	128.20	157.26	110.84	116.13	188.60	166.11	194.23	143.51
Hired labor	Dol.	8.21	25.17	33.78	28.07	26.43	21.30	32.71	17.90	26.88
Family labor	Dol.	9.70	2.97	11.06	1.62	1.00	10.01	2.81	18.04	5.86
Operator's labor	Dol.	23.11	12.26	19.15	13.02	19.78	17.45	12.34	28.91	16.46
Horse labor	Dol.	--	0.41	0.53	0.97	0.26	0.65	1.15	0.15	0.70
TOTAL LABOR COST	Dol.	41.02	40.81	64.52	43.68	47.47	49.41	49.01	65.00	49.90
Hired hauling	Dol.	1.71	--	3.30	4.06	2.02	0.32	1.94	5.42	2.83
Car, truck, tractor, motor	Dol.	13.87	13.11	11.92	9.60	10.41	14.60	7.77	14.06	11.16
Miscellaneous exp.	Dol.	10.10	4.61	6.31	6.08	5.21	6.16	6.27	6.15	6.05
Interest on feed	Dol.	1.62	2.34	0.76	1.38	1.21	0.56	0.73	1.48	1.19
Interest on operator's capital	Dol.	--	--	--	1.28	0.60	0.08	1.19	0.74	0.71
Herd charge	Dol.	24.83	19.99	30.19	22.96	22.26	39.49	24.96	29.88	26.60
Building charge	Dol.	9.85	4.73	6.27	7.69	6.32	5.95	6.01	5.74	6.59
Corral charge	Dol.	0.17	0.27	0.20	0.12	0.11	0.07	0.14	0.15	0.14
Farm equip. charge	Dol.	1.12	1.43	0.83	0.74	0.26	0.34	0.45	0.41	0.67
Dairy equipment charge	Dol.	6.16	5.73	7.40	4.35	6.27	4.56	5.41	8.08	5.57
Bedding cost	Dol.	--	1.24	--	0.04	--	--	--	--	0.12
TOTAL ALL OTHER	Dol.	69.43	53.45	67.18	58.30	54.67	72.13	54.87	72.11	61.63
TOTAL GROSS CHARGE	Dol.	237.64	222.46	288.96	212.82	218.27	310.14	269.99	331.34	255.04
Credits	Dol.	11.22	10.74	6.97	5.96	7.39	6.25	5.92	9.52	7.08
NET COST PER COW	Dol.	226.42	211.72	281.99	206.86	210.88	303.89	264.07	321.82	247.96
Av. prod. per cow	Lb.	5,971	5,255	5,038	4,157	4,037	5,130	4,873	5,169	4,700
COST PER CWT. OF MILK	Dol.	3.79	4.03	5.60	4.98	5.22	5.92	5.42	6.23	5.28





APPENDIX TABLE 3.—TEMPORARY GRAZING CROP COST PER ACRE, BY KIND OF CROPS GROWN, 119 WHOLESALE AND RETAIL DAIRIES IN ALABAMA, 1945<sup>1</sup>

Item	Unit	Oats and mixtures	Crimson Clover and Mixtures	Cowpeas	Soybeans	Sudan Grass	Grain sorghum	Millet	Lespedeza	Velvet beans
Fence upkeep	<i>Dol.</i>	0.09	0.77	0.38	0.00	0.55	0.56	0.00	0.18	0.00
Seeds	<i>Dol.</i>	3.92	5.84	3.74	3.82	3.10	1.07	3.63	1.10	2.00
Manure	<i>Dol.</i>	1.20	2.08	1.26	3.27	1.64	0.78	0.00	1.00	0.00
Fertilizer	<i>Dol.</i>	3.85	2.93	4.47	0.00	5.07	2.27	9.90	0.68	0.00
Man labor	<i>Dol.</i>	2.81	2.83	5.07	5.00	2.32	3.62	4.67	1.82	2.16
Mule labor	<i>Dol.</i>	0.77	0.36	1.05	0.00	0.35	0.97	0.00	0.26	0.67
Equipment	<i>Dol.</i>	3.29	3.74	5.16	4.00	3.33	1.53	3.00	1.06	0.25
Harvesting	<i>Dol.</i>	0.25	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Interest on land	<i>Dol.</i>	1.36	2.71	1.33	0.91	1.63	1.69	0.66	0.85	0.90
Taxes	<i>Dol.</i>	0.21	0.21	0.26	0.20	0.13	0.15	0.16	0.12	0.20
Cost of rented land	<i>Dol.</i>	0.19	0.14	0.00	0.00	0.92	0.00	0.00	0.00	0.00
TOTAL COST	<i>Dol.</i>	17.94	21.70	22.72	17.20	19.04	12.69	22.02	7.07	6.18
Receipts from harvested crops	<i>Dol.</i>	2.89	3.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
NET COST OF GRAZING	<i>Dol.</i>	15.05	18.21	22.72	17.20	19.04	12.69	22.02	7.07	6.18
No. of acres studied	<i>Acres</i>	1,785	400	95	55	156	71	105	284	60
No. of acres grazed completely	<i>Acres</i>	1,261	245	95	55	156	71	105	284	60
No. of acres with some harvest	<i>Acres</i>	524	155	0	0	0	0	0	0	0

<sup>1</sup> No attempt was made to figure cost of production on crops which were not grazed. The production from such crops when fed was charged at farm value. In some cases, crops were grazed, before being harvested. For these crops, the charge for grazing was made on the basis of loss of yield. When a crop was grazed completely, or almost so, cost of production was used as the charge.

APPENDIX TABLE 4.—LABOR REQUIREMENTS PER COW FOR FLUID MILK PRODUCTION, BY TYPE-OF-FARMING AREAS, 90 WHOLESALE FARMS IN ALABAMA, 1945

Kind	Unit	Sand Mountain	Tennessee Valley	Limestone Valley	Black Belt	Upper Coastal Plain		Piedmont	Gulf Coast	Average of all areas
						A	B			
Mgr. or foreman	<i>Hr.</i>	--	--	--	0	--	--	8	--	1
Other hired labor	<i>Hr.</i>	32	70	90	115	82	89	128	45	95
Family labor	<i>Hr.</i>	58	15	34	4	3	46	12	49	21
Operator's labor	<i>Hr.</i>	54	30	46	23	45	30	24	49	32
TOTAL MAN HOURS	<i>Hr.</i>	144	115	170	142	130	165	172	143	149
Horse labor	<i>Hr.</i>	--	--	2	4	1	3	5	1	3
TOTAL MAN AND HORSE	<i>Hr.</i>	144	115	172	146	131	168	177	144	152
Av. prod. per cow	<i>Lb.</i>	5,971	5,255	5,038	4,157	4,037	5,130	4,873	5,169	4,700
HOURS PER CWT. OF MILK	<i>Hr.</i>	2.42	2.20	3.42	3.52	3.24	3.28	3.63	2.77	3.24

APPENDIX TABLE 5.— CAUSES OF COW DEATHS AS REPORTED BY FARMERS, 119 WHOLESALE AND RETAIL DAIRIES IN ALABAMA, 1945

Item	90	29	Total	Percentage of
	wholesale farms	retail farms	of 119 farms	total deaths due to each cause <sup>1</sup>
	<i>Number</i>	<i>Number</i>	<i>Number</i>	<i>Per cent</i>
Number of deaths	242	87	329	--
Average number of cows	5,321	2,345	7,666	--
<i>Cause of death</i>				
Neglect	12	9	21	6.4
Old age	8	12	20	6.1
Mastitis	10	7	17	5.2
Milk fever	25	13	38	11.6
Bloat	11	2	13	4.0
Calving	40	4	44	13.4
Pneumonia	10	2	12	3.6
Scours	1	0	1	0.3
Blood poisoning	19	2	21	6.4
Plant poisoning	7	2	9	2.7
"Hardware" poisoning <sup>2</sup>	14	7	21	6.4
Nitrate of soda	3	0	3	0.9
Shipping fever	1	0	1	0.3
Choked	1	0	1	0.3
Injury	12	3	15	4.6
Snake bite	1	0	1	0.3
Hoof rot	1	0	1	0.3
Drowned	12	0	12	3.6
Black leg	2	0	2	0.6
Lightning	1	0	1	0.3
Shot by hunters	1	0	1	0.3
Unknown	50	24	74	22.4

<sup>1</sup> The death loss on the wholesale farms averaged 4.5 per cent of the average number of cows, while that of the retail farms amounted to 3.7 per cent, and averaged 4.3 per cent on all farms.

<sup>2</sup> "Hardware" poisoning was the result of eating metals, nails, etc.

APPENDIX TABLE 6.— AVERAGE COST OF KEEPING A BULL, 90 WHOLESALE FARMS, BY TYPE-OF-FARMING AREAS IN ALABAMA, 1945

Expense	Unit	Sand Mountain	Tennessee Valley	Limestone Valley	Black Belt	Upper Coastal Plain		Piedmont	Gulf Coast	Average of all areas
						A	B			
Concentrates	<i>Dol.</i>	14.13	25.09	44.86	39.86	51.52	54.03	26.43	44.73	39.28
Silage	<i>Dol.</i>	—	9.53	2.39	5.12	—	3.43	1.46	7.75	4.39
Hay	<i>Dol.</i>	32.36	31.31	43.77	33.65	31.92	36.51	33.58	27.67	34.03
Other roughage	<i>Dol.</i>	0.73	0.20	0.43	0.41	1.98	0.33	—	—	0.39
Pasture	<i>Dol.</i>	37.82	21.71	13.00	20.13	6.75	27.54	18.21	9.71	18.04
Depreciation	<i>Dol.</i>	18.18	0.88	5.43	12.27	1.67	16.00	4.37	—	7.39
Building use	<i>Dol.</i>	1.45	1.94	6.13	2.53	3.88	5.77	3.83	2.56	3.49
Interest	<i>Dol.</i>	7.18	5.99	7.37	9.96	5.30	11.41	9.94	6.40	8.50
Man labor	<i>Dol.</i>	4.36	5.55	18.77	7.95	16.17	10.01	11.54	29.07	13.14
Other costs <sup>1</sup>	<i>Dol.</i>	0.92	3.52	2.52	3.38	4.58	2.92	1.55	1.88	2.79
TOTAL	<i>Dol.</i>	117.13	105.72	144.17	135.26	123.77	167.95	110.91	129.77	131.44
Credits <sup>2</sup>	<i>Dol.</i>	18.64	18.90	19.95	21.26	17.92	18.40	15.87	19.92	19.37
Net cost per bull <sup>3</sup>	<i>Dol.</i>	98.49	86.82	124.22	114.00	105.85	149.55	95.04	109.85	112.07
Bull cost per cow	<i>Dol.</i>	4.84	3.34	3.88	3.42	3.19	4.04	3.47	5.42	3.76
Av. no. of cows per farm	<i>No.</i>	28	44	46	65	50	81	82	62	59
Man labor	<i>Hr.</i>	9	22	48	33	46	42	47	74	42

<sup>1</sup> Other costs consist of charges for bedding, taxes, insurance, horse labor, machinery use, hired services, veterinary and medical supplies, salt, various supplies, registry and transfer fees, and other miscellaneous costs.

<sup>2</sup> Credits are made for appreciation, manure, service fees, and service to heifers bred within the year but had not entered the milking herd at the end of the year.

<sup>3</sup> Net cost per bull is the net cost to the cows only since credit is given for bred heifers.

APPENDIX TABLE 7.— AVERAGE ANNUAL COST OF KEEPING A COW, BY ITEMS AND MARKETS, 29 RETAIL FARMS IN ALABAMA, 1945

Item	Unit	Birmingham market	Mobile market	Montgomery market	Other markets	Av. of all markets
Purchased feed	<i>Dol.</i>	211.31	166.87	93.68	120.02	155.67
Produced feed	<i>Dol.</i>	4.38	30.32	28.68	41.58	24.63
Permanent pasture	<i>Dol.</i>	20.04	8.05	10.80	10.36	12.91
Temporary pasture	<i>Dol.</i>	1.45	13.52	2.73	6.33	5.93
Woods pasture	<i>Dol.</i>	0.16	--	--	0.04	0.06
Crop residue	<i>Dol.</i>	--	--	--	0.04	0.01
<b>TOTAL FEED AND PASTURE COSTS</b>	<i>Dol.</i>	<b>237.34</b>	<b>218.76</b>	<b>135.89</b>	<b>178.37</b>	<b>199.21</b>
Hired labor	<i>Dol.</i>	115.55	69.70	40.76	46.67	73.06
Family labor	<i>Dol.</i>	14.62	30.18	2.91	5.68	14.14
Operator's labor	<i>Dol.</i>	21.03	21.99	20.05	25.63	22.23
Horse labor	<i>Dol.</i>	0.76	0.10	0.55	1.03	0.62
<b>TOTAL LABOR COST</b>	<i>Dol.</i>	<b>151.96</b>	<b>121.97</b>	<b>64.27</b>	<b>79.01</b>	<b>110.05</b>
Hired hauling	<i>Dol.</i>	0.05	0.71	--	--	0.20
Car, truck, tractor, motor	<i>Dol.</i>	28.00	23.32	14.11	20.70	22.43
Miscellaneous exp.	<i>Dol.</i>	16.97	13.78	11.30	14.68	14.54
Interest on feed	<i>Dol.</i>	0.13	0.49	0.71	1.11	0.57
Interest on operator's capital	<i>Dol.</i>	2.07	1.35	2.77	1.24	1.81
Herd charge	<i>Dol.</i>	25.81	31.09	16.78	22.48	24.64
Building charge	<i>Dol.</i>	11.75	7.92	6.32	10.75	9.53
Corral charge	<i>Dol.</i>	0.56	0.22	0.06	0.23	0.30
Farm equip. charge	<i>Dol.</i>	0.63	0.35	0.68	1.08	0.68
Dairy equip. charge	<i>Dol.</i>	27.58	27.95	14.36	23.21	24.14
Bedding charge	<i>Dol.</i>	--	--	--	0.10	0.03
<b>TOTAL ALL OTHER</b>	<i>Dol.</i>	<b>113.55</b>	<b>107.18</b>	<b>67.09</b>	<b>95.58</b>	<b>98.87</b>
<b>TOTAL GROSS CHARGE</b>	<i>Dol.</i>	<b>502.85</b>	<b>447.91</b>	<b>267.25</b>	<b>352.96</b>	<b>408.13</b>
Credits	<i>Dol.</i>	7.45	6.19	4.18	6.03	6.18
<b>NET COST PER COW</b>	<i>Dol.</i>	<b>495.40</b>	<b>441.72</b>	<b>263.07</b>	<b>346.93</b>	<b>401.95</b>
Av. prod. per cow	<i>Lb.</i>	5,726	5,343	4,204	4,521	5,048
Cost per cwt. of milk	<i>Dol.</i>	8.65	8.27	6.26	7.67	7.96
Cost per quart	<i>Cents</i>	18.6	17.8	13.5	16.5	17.1
Number of farms	<i>No.</i>	8	8	4	9	29

**APPENDIX TABLE 8.— DISTRIBUTION OF TOTAL GROSS COST FOR PRODUCING, PROCESSING, AND DISTRIBUTING FLUID MILK, 29 RETAIL FARMS IN ALABAMA, 1945**

Expense	Birming- ham market	Mobile market	Montgom- ery market	Other markets	Average of all markets
	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>	<i>Per cent</i>
Purchased feed	42.02	37.19	35.06	33.93	38.14
Produced feed	0.80	6.79	10.69	11.91	6.04
All pasture	4.33	4.77	5.03	4.74	4.63
<b>TOTAL FEED AND PASTURE</b>	<b>47.15</b>	<b>48.75</b>	<b>50.78</b>	<b>50.58</b>	<b>48.81</b>
<b>TOTAL LABOR</b>	<b>30.18</b>	<b>27.18</b>	<b>24.06</b>	<b>22.41</b>	<b>26.97</b>
Hauling and vehicle	5.58	5.48	5.35	5.89	5.54
Miscellaneous	3.42	3.10	4.09	4.10	3.56
Herd charge	5.13	6.91	6.29	6.40	6.04
Building charge	2.39	1.79	2.36	3.07	2.34
Farm and dairy equipment	5.58	6.32	5.66	6.79	6.08
Other costs	0.57	0.47	1.41	0.76	0.66
<b>TOTAL ALL OTHER COSTS</b>	<b>22.67</b>	<b>24.07</b>	<b>25.16</b>	<b>27.01</b>	<b>24.22</b>
<b>TOTAL GROSS COST</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

