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MADERA AND FRESNO COUNTY
DAIRY MANAGEMENT STUDY

1948



Study Conducted by
THE AGRICULTURAL EXTENSION SERVICE
UNIVERSITY OF CALIFORNIA COLLEGE OF AGRICULTURE
and
UNITED STATES DEPARTMENT OF AGRICULTURE
in Cooperation
with Local Dairymen and
Herd Improvement Associations

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AGRICULTURAL EXTENSION OFFICES
POST OFFICE BUILDING, MADERA
FEDERAL BUILDING, FRESNO,
CALIFORNIA

I N T R O D U C T I O N

This is the Second Annual Report of the Madera-Fresno Dairy Management Study. In order to preserve the confidential nature of the individual cooperator's figures and to provide better comparisons, the records from both counties have been summarized together in this report. The record year covers 12 months beginning March 1, 1948 and ending February 28, 1949.

Tables 1-5 present individual records in detail, while table 6 presents averages for the two main types of dairies for the last two years.

PURPOSE

The fundamental purpose of this study is to present information and data from a number of ranches producing a similiar product under similiar conditions so that these dairymen may compare the operation of their enterprises with that of their neighbors. Such comparisons should prove more valuable to the individual than the actual figures of the study. This study does not represent the average costs for the industry as a whole in either Madera or Fresno County because these costs vary from farm to farm and the study represents a relatively small percentage of the dairies in either county. Figures obtained, however, do make possible the development of dependable standards of inputs and costs for use as a guide in further computing or estimating costs.

DAIRY ENTERPRISE A PART OF THE TOTAL FARM BUSINESS

In order to understand the information in this report, it is necessary to think of the dairy enterprise as a separate part of the dairy farm business. The dairy enterprise records are carried as though the feeding and milking of cows were a separate business from feed production. Costs of growing feed do not appear as such, but the farm-grown feeds are charged to the dairy at a fair price delivered to the dairy. Hence, in addition to the profit or loss shown by the dairy enterprise, there may be profits or losses from the feed-producing enterprises on these same ranches. A study of the following tables should assist dairymen in evaluating various practices such as feeding of concentrates, use of pasture and silage, and production testing, and production of market milk or manufacturing milk. The reader should first acquaint himself with the following explanation of terms in order to properly understand the report.

EXPLANATION OF TERMS

Average number of cows is computed by dividing total cow months by 12. Cows in the herd, both dry and milking, on the first of each month are counted for that entire month. As soon as a heifer has her first calf she is counted as a cow.

An animal unit is a mature head equivalent in feed requirement, and its use enables comparison of herds having varying proportions of dairy stock other than cows. Cows and bulls are one animal unit each, calves under 3 months are considered 0.25 animal units; calves 3 months to a year, 0.40; heifers 1 to 2 years, 0.70; and heifers over 2 years are .75 animal units per head. The average animal units in the herd are the average for the year of all stock in the herd as computed on the above basis. The animal units per cow are used to show the proportion of stock other than cows.

Milk and milk fat income is the income from milk sold plus the value of milk used in the home.

Net stock income is the difference between stock sales plus closing stock inventory, and the stock purchases plus the opening inventory of dairy stock. If the latter sum is greater there is a net stock cost which is an expense rather than an income. Stock is inventoried at a uniform value per head for stock of the same age and quality at both the beginning and the end of the record year.

Total income is composed of the net stock income, income from manure and miscellaneous items, and the milk and milk fat income.

Feed costs are composed of the cost of purchased feeds and the value of farm produced feeds. The latter are charged to the dairy at farm value which is about what such feeds would bring at the time put up, or market value less marketing cost. Unused feeds remaining at the end of the year are inventoried at the same value at which originally charged to the dairy. Pasture is charged at the going rental value per acre or per head month where that can be estimated or, if that cannot be ascertained, at cost of growing the pasture, including land rent or interest on the value of the land plus taxes.

Total expense is composed of the following items: All expenditures for feed, labor, supplies, and miscellaneous items; the value of farm produced feeds; the value of labor provided by the operator and his family; depreciation on buildings and equipment; interest on the dairy enterprise investment at 5% and the net stock cost if any.

Management income is the difference between total income and total expense. If expense is larger, the loss is indicated by a minus sign (-). It is the amount by which income exceeds all costs of production except an allowance for management, and hence, is the residual available to reimburse management.

Labor income is the management income plus the value of the operator's and family labor. It is the amount the dairyman receives from his dairy enterprise for labor and management, and is sometimes called labor and management income.

Farm income is the labor income plus interest on investment. It is the total amount the dairyman receives from his enterprise for labor, management, and invested capital. From this total amount must come interest and principal payments on borrowed capital, since they are not obtained in these records it being assumed that interest on investment would cover interest on borrowed as well as the operator's own capital.

Total digestible nutrients (TDN) is that portion of the feed used which is digested and used by the animal for maintenance, growth, and production. The amount of TDN in the various feeds used in this study are as follows: Hay-50%, grain and concentrates-75%, silage and greens-17%, and pasture - 400 pounds per animal month.

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TABLE 1. Main Profit Factors in Individual Dairies

Serial Number	Size of Herd*	Per Cent Fat in Milk	Average Price		Wt. Milk Sold Per Cow	Lbs. Fat Sold Per Cow	Net Stock Income	Misc. Income	Milk Income	Total Income	Total Expense	Management Income	Farm Income
			Per cent Milk	Per lb. fat									
MARKET MILK DAIRIES													
1	Med.	4.9	6.48	1.32	87.2	427	49.61	6.50	561.86	617.97	427.73	190.24	248.78
2	Large	4.0	5.07	1.25	87.9	356	55.54	12.76	445.62	513.92	328.23	185.69	217.28
3	Med.	3.4	4.28	1.24	88.5	305	55.34	---	378.86	434.20	287.13	147.07	174.51
4	Med.	3.5	4.25	1.24	111.8	385	61.61	4.48	475.64	541.73	407.32	134.41	179.65
5	Med.	4.9	5.96	1.23	77.5	377	35.48	6.44	461.62	503.54	381.88	121.66	202.84
6	Large	3.7	4.74	1.28	109.8	406	34.29	8.69	520.13	563.11	466.33	96.78	104.22
7	Med.	5.1	6.38	1.25	86.8	445	139.48	6.56	553.52	699.56	619.23	80.33	123.34
8	Med.	4.3	5.39	1.24	59.9	259	51.18	2.33	322.46	375.97	306.24	69.73	175.89
9	Small	3.6	4.40	1.23	109.6	392	101.55	7.98	482.45	591.98	549.44	42.54	177.96
10	Small	3.7	4.77	1.34	171.0	377	-59.54	8.25	504.04	512.29	552.37	-40.08	89.94
11	Med.	4.3	5.12	1.20	72.3	309	18.50	7.70	369.99	396.19	438.44	-42.25	70.29
Av. Mkt.	Med.	4.1	5.15	1.26	91.9	375	53.52	7.30	473.17	534.05	421.50	112.55	171.49
MANUFACTURING MILK DAIRIES													
12	Med.	3.7	4.01	1.08	66.0	246	118.60	2.04	264.69	385.33	251.00	134.33	209.25
13	Med.	4.1	4.36	1.07	77.9	317	58.00	3.06	339.63	400.69	270.80	129.89	190.82
14	Small	3.6	3.65	1.02	92.8	331	95.31	1.38	338.40	435.09	356.19	78.90	163.29
15	Small	3.8	4.13	1.09	66.8	252	110.69	4.85	276.15	391.69	337.72	53.97	179.48
16	Small	4.2	4.34	1.04	73.0	305	31.33	1.30	317.03	349.66	308.55	41.11	126.29
17	Small	5.1	5.38	1.05	58.7	301	140.68	.96	315.69	457.33	476.21	-18.88	130.29
Av. Mfg.	Small	3.9	4.19	1.06	73.5	291	91.52	2.34	308.16	402.02	311.71	90.31	180.52

* Size of herd: Small-Under 25 cows, Medium-25 to 60 cows, large over 60 cows.

Individual dairies are listed in the above table in order of management income per acre under each particular type of dairy. Management income appears in the next to the last column above and is the difference between total income and total expense with the operator's own labor and interest on investment included in the expense. The main profit-determining factors are the quantity of the milk sold per cow, the price of milk, the total expense per cow, and the net stock income per cow. An inspection of the above table will show how these main factors varied from dairy to dairy with varying results in profit.

TABLE 2. Factors Influencing Milk Produced and Sold per Cow and Milk Cost

Serial No.	lbs. Of Milk		Per Cent of Fat Sold	% of Time Cows In Milk	Lbs. Conc. Per Cow	Conc. Feed BY Produc.	Lbs. TDN Cow Only*	Net Cost Lb. Milk Fat.	Dollars Per Cwt. Milk Sold				
	Lat Per Cow Sold	Cow Test Record							Total Cost	Inc. not Milk	Net Cost	Av. Price	Mgt. Income
1	427	468	91	86	3032	Yes	8390	87.0¢	\$4.93	.64	4.29	6.48	2.19
2	356	373	96	83	1344	Approx	7363	73.1	3.74	.78	2.96	5.07	2.11
3	305	365	83	78	123	No	6924	76.0	3.24	.62	2.62	4.28	1.66
4	385	425	91	86	1759	Yes	7250	83.6	3.64	.59	3.05	4.25	1.20
5	377	405	93	87	1718	Yes	7068	90.3	4.99	.54	4.39	5.96	1.57
6	406	Incomplete		81	2710	Yes	8294	104.3	4.25	.39	3.86	4.74	.88
7	445	502	89	85	4636	Yes	7914	106.4	7.13	1.68	5.45	6.38	.93
8	259	None	--	71	725	No.	6812	97.4	5.11	.89	4.22	5.39	1.17
9	392	402	98	87	2984	?	9404	112.2	5.01	1.00	4.01	4.40	.39
10	377	390	97	89	2425	Yes	9140	144.3	5.23	.08	5.15	4.77	-.38
11	309	326	95	88	2956	Yes	7531	133.2	6.06	.36	5.70	5.12	-.58
Av. Mkt.	375	---	---	83	2249	---	7728	96.2	4.60	.68	3.92	5.15	1.23
MANUFACTURING MILK DAIRIES													
12	246	---	---	86	0	No	5225	\$3.0¢	\$3.80	1.83	1.97	4.01	2.04
13	317	344	93	84	1026	Yes	5799	66.2	3.47	.78	2.69	4.36	1.67
14	331	352	94	88	1556	Yes	7560	78.4	3.84	1.04	2.80	3.65	.85
15	253	---	---	86	0	No	6768	88.0	5.05	1.73	3.32	4.13	.81
16	305	333	92	87	0	No	7034	90.4	4.23	.45	3.78	4.34	.56
17	301	352	85	61	4230	Yes	9287	111.3	8.12	2.42	5.70	5.38	-.32
Av. Mfg.	291	---	---	83	956	---	6501	74.9	4.24	1.28	2.96	4.19	1.23

High sales of butterfat per cow are, of course, dependent upon high production per cow. All but 4 of the dairies covered had complete annual production records. Sales are somewhat below the amount produced because of milk fed to calves and slight discrepancies in sampling and testing the milk.

There was a wide range in concentrate feeding and some rather good production without heavy concentrate feedings.

*Pounds of digestible nutrients per cow after deduction of standard amount for young stock and bulls--total shown in table 5. Higher production takes more nutrients but is profitable where obtained at moderate feed cost.

TABLE 3. Factors Influencing Net Stock Income per Cow

Serial No.	Per cent of av. no. of cows				Av. price per head sold		Head raised per cow	Animal units per cow	% of cows pure-bred	Stock incomes and costs, dollars per cow					
	Sold	Died	Add-ed	Incr. or Dec.	Cows	Young stock				Cows Sold	Other stock sold	Stock inven. incr.	Cows bought	Other stock bought	Net stock income
1	17.2	.0	25.8	8.6	141.08	62.76	.52	1.47	7	24.24	9.65	42.35	18.04	8.59	49.61
2	12.3	1.0	18.4	5.1	194.74	153.29	.40	1.48	47	23.87	19.64	30.54	5.36	13.15	55.54
3	9.9	.0	12.3	2.4	227.60	53.73	.76	1.34	0	22.42	50.29	-9.98	---	7.39	55.34
4	29.8	3.0	38.8	6.0	185.32	73.17	.36	1.62	6	55.32	64.94	-58.65	---	---	61.61
5	13.0	.0	57.3	44.3	155.07	14.29	1.33	1.35	0	20.19	16.00	88.28	88.99	---	35.48
6	13.2	2.3	24.0	8.5	193.29	209.57	.29	1.72	1	25.49	7.52	1.28	---	---	34.29
7	54.3	0	34.4	-19.9	260.59	1.84	.82	1.70	64	141.63	6.00	-2.72	---	5.43	139.48
8	16.4	4.7	37.5	16.4	185.55	66.03	.59	1.37	0	30.42	24.74	7.96	11.94	---	51.18
9	35.9	.0	26.9	-9.0	177.21	24.50	.63	1.64	9	63.57	6.59	31.39	---	---	101.55
10	74.1	.0	117.3	43.2	215.35	82.97	1.30	1.20	9	159.52	46.10	175.43	293.21	147.38	-59.54
11	25.8	3.4	37.4	10.2	173.32	45.54	.75	1.51	31	41.27	44.92	7.14	74.83	---	18.50
Av. Mfg.	21.7	1.4	31.1	8.0	204.13	48.95	.58	1.54	--	44.21	21.10	18.79	16.04	14.54	53.52
Manufacturing milk dairies															
12	17.0	.0	37.4	20.4	180.90	40.80	.92	1.66	0	30.77	29.16	60.88	---	2.21	118.60
13	76.2	.0	16.6	-59.6	181.33	20.27	.73	1.27	0	138.09	24.89	-94.77	6.62	3.59	58.00
14	10.7	.0	10.7	.0	150.00	69.10	1.07	1.61	0	26.74	54.13	27.81	---	13.37	95.31
15	14.9	.0	52.2	37.3	232.31	63.97	.97	1.50	0	34.67	52.51	24.25	---	.74	110.69
16	34.8	.0	87.0	52.2	165.32	16.55	1.39	1.54	0	57.50	12.96	65.22	---	104.35	31.33
17	0.0	.0	8.5	8.5	---	35.00	.93	1.36	100	---	2.97	154.66	---	16.95	140.68
Av. Mfg.	31.3	0.0	31.3	0.0	186.14	38.25	.95	1.49	--	58.27	30.51	20.42	1.74	15.94	91.52

Net stock income is the amount by which the value of stock raised and sold exceeds the cost of stock purchased. It is not a true profit figure but expresses the degree to which dairy stock is produced in the enterprise. Usually, however, the higher the net stock income, the higher tends to be the profit since it is usually profitable to grow and sell dairy stock in this area. No. 10 had a net stock cost with considerable buying and selling of cows during the year, paying \$365 per cow and selling as shown above for \$215. The head raised per cow means animals kept or sold and can be more than 1 head per average cow since heifers and cows may calve without being in the cow herd for a year. Where much less than 1 per average cow some of the calves were not raised or sold. Animal units per cow where above 1-4 indicates more than the usual proportion of stock other than cows and perhaps heifers not having the first calf till they are over 2½ years of age.

TABLE 4 Expense per cow

Serial No.	Hours labor per cow			Rate per hr. hired labor	Invest per cow	Costs, dollars per average cow						Total cost	Animal units per cow	Feed cost per animal unit
	Hired	Oper-ators	Total			Feed	Labor		Miscel-laneous	Deprec-iation	Int. on Invest			
1	44.3	35.4	79.7	.98	46 2.31	279.35	43.30	35.43	36.94	9.60	23.11	427.73	1.47	189.93
2	60.5	6.1	66.6	.89	509.22	216.89	54.14	6.13	17.79	7.82	25.46	328.23	1.48	146.34
3	53.9	8.9	62.8	.82	368.94	190.91	44.33	8.99	17.65	6.80	18.45	287.13	1.34	142.48
4	83.4	21.0	104.4	.75	485.04	266.19	62.38	20.99	27.90	5.61	24.25	407.32	1.62	164.53
5	36.4	50.2	86.6	1.40	618.83	214.56	50.95	50.24	20.62	14.57	30.94	381.88	1.35	158.44
6	64.8	18.0	82.8	.96	508.78	327.10	62.38	18.00	27.62	5.79	25.44	466.33	1.72	190.44
7	105.8	16.0	121.8	.92	534.05	428.86	96.60	16.31	44.88	8.88	26.70	619.23	1.70	252.65
8	.0	71.2	71.2	---	699.45	171.25	---	71.19	17.41	11.43	34.97	306.24	1.37	124.77
9	.9	92.5	93.4	.87	860.76	374.46	.78	92.38	22.32	16.46	43.04	549.44	1.64	228.16
10	.0	113.0	113.0	---	515.39	294.02	59.54	112.96	46.79	13.30	25.76	552.37	1.20	245.52
11	6.2	92.1	98.3	.79	408.64	293.59	4.93	92.11	20.52	6.86	20.43	438.44	1.51	194.40
Av. Mkt.	52.0	31.1	83.1	.93	525.89	279.23	48.29	32.87	26.19	8.62	26.30	421.50	1.54	181.76
Manufacturing Milk Dairies.														
12	0	54.3	54.3	---	413.44	160.42	---	54.25	9.37	6.29	20.67	251.00	1.66	96.85
13	0	60.9	60.9	---	219.94	183.00	---	60.93	12.60	3.27	11.00	270.80	1.27	144.29
14	0	72.1	72.1	---	385.07	228.29	---	72.09	26.00	10.56	19.25	356.19	1.61	141.83
15	2.3	107.2	109.5	.88	456.77	191.31	2.03	107.24	11.82	7.05	18.27	337.72	1.50	127.53
16	0	62.6	62.6	---	451.35	199.00	---	62.61	14.63	9.74	22.57	308.55	1.54	129.30
17	0	122.4	122.4	---	336.04	281.69	---	122.37	36.92	8.43	26.80	476.21	1.36	206.45
Av. Mfg.	.3	72.9	73.2	.88	379.43	197.29	.24	72.90	16.00	6.84	18.44	311.71	1.49	132.68

n- net stock cost in record No 10 is shown in hired labor column, there being no hired labor

Total expense per cow is a very important profit-determining factor. An inspection of the above table will show several dairies with high income and high production that are rather far down the profit scale because of high costs. Feed, which is the largest single cost, is shown in more detail in the following table. The high labor rate per hour in No. 5 where payment is on a percent of the milk check.

TABLE 5 Feeds Used and Feed Costs per Cow

Serial No.	Pounds per Cow		Av. Month Past. per c.	Total Lbs. TDN per cow	Feed Costs				Cost per cwt. TDN	Feed Costs per cow					
	Hay	Conc.			Silage & Greens	Hay per ton	Conc. per cwt.	Silage Greens per ton		Pasture per A. U. month	Hay	Concentrates	Silage Green feed	Pasture	Total
Market Milk Dairies															
1	7423	3032	7044	8.5	10646	25.70	3.49	8.00	5.89	2.62	95.45	105.72	28.18	50.00	279.35
2	10200	1344	5107	6.6	9667	23.05	3.59	8.00	4.71	2.26	117.28	48.28	20.43	30.90	216.89
3	8767	123	3448	8.6	8556	27.55	3.91	8.00	6.00	2.23	120.79	4.82	13.79	51.51	190.91
4	10390	1759	--	9.3	10225	26.75	4.08	----	5.94	2.61	138.96	71.74	-----	55.49	266.19
5	8307	1718	8229	4.6	8748	22.16	3.62	8.00	6.03	2.45	91.04	62.14	32.92	27.46	214.56
6	12561	2710	--	8.6	11750	25.90	4.16	----	6.00	2.78	162.86	112.75	---	51.49	327.10
7	9348	4636	22102	1.2	11274	25.93	4.39	9.00	4.00	3.81	121.17	203.54	99.46	4.69	428.86
8	6346	725	--	11.3	8218	23.50	4.30	----	5.78	2.08	74.55	31.19	---	65.50	171.24
9	14628	2984	--	7.3	12476	28.40	4.11	----	6.00	3.00	207.71	122.63	---	44.12	374.46
10	15380	2425	617	1.2	10053	27.08	3.18	4.63	5.85	2.94	208.29	77.08	1.43	7.22	294.02
11	8997	2956	--	7.9	9979	28.30	4.00	----	5.93	2.93	127.34	118.67	---	47.58	293.59
Av. Mkt.	10118	2249	2184	2425	10320	25.52	3.98	8.40	5.72	2.70	129.14	89.54	19.49	41.06	279.23
Manufacturing Milk dairies															
12	8707	--	--	10.1	8395	23.00	--	--	5.98	1.91	100.17	---	---	60.25	160.42
13	5866	1026	--	8.6	7143	29.60	4.35	--	6.00	2.56	87.02	44.62	---	51.36	183.00
14	8728	1556	--	12.4	10494	23.20	3.72	--	5.60	2.18	101.02	57.86	---	69.41	228.29
15	9776	--	--	10.7	9168	26.35	--	--	5.82	2.08	128.82	---	---	62.49	191.31
16	9957	--	--	11.5	9578	26.13	--	--	6.00	2.08	130.08	---	---	68.92	199.00
17	7711	4230	--	9.7	11015	19.52	3.50	--	6.00	2.55	75.47	148.05	---	58.17	281.69
Av. Mfg.	8112	956	--	10.2	8853	24.82	3.80	--	5.89	2.22	100.65	36.32	---	60.32	197.29

Feed quantities, feed prices, and costs are shown in the above table. The total pounds TDN per cow, as shown above, is the computed total digestible nutrients as figured from the feeds reported at the usual percentage for each type of feed. This figure includes the feed consumed by young stock and bulls as well as by the cows. The higher the proportion of feed obtained from lower-cost sources, such as pasture, the lower will be the cost per hundred pounds of TDN. Notice that cost per hundred pounds of TDN varied from a low of \$1.91 in dairy #12 to a high of \$3.81 in dairy #7. Dairy #7 fed a large quantity of high-priced concentrates thus increasing the total feed cost.

TABLE 6 Fresno and Madera Study Record Averages for two years.

	Market milk Dairies		Manufacturing Milk Dairies	
	1947	1948	1947	1948
Number of records	13	11	4	6
Average number of cows per dairy	57.3	51.3	28.3	19.2
Animal units per cow	1.5	1.5	1.3	1.5
Pounds of milk fat sold per cow	351	375	301	291
Average price per pound milk fat sold	\$ 1.16	\$ 1.26	\$.96	\$ 1.06
Net cost of production per pound	<u>.88</u>	<u>.96</u>	<u>.76</u>	<u>.75</u>
Management income per pound	\$.28	\$.30	\$.20	\$.31
Hours of labor per cow	84.7	83.1	70.5	73.2
Tons of hay per cow	4.6	5.1	3.9	4.1
Tons of concentrates per cow	1.1	1.1	.5	.5
Tons of silage, green feed, etc, per cow	1.2	2.2	.8	.0
Animal unit months of pasture per cow	6.8	7.2	8.3	10.2
Income per cow				
Net stock income	\$ 46.62	\$ 53.52	\$ 32.45	\$ 91.52
miscellaneous income	7.36	7.36	4.52	2.34
Income from milk sold	<u>406.65</u>	<u>473.17</u>	<u>288.21</u>	<u>308.16</u>
Total Income	460.63	534.05	325.18	402.02
Costs per cow				
Hay	\$112.60	129.14	\$ 82.75	\$ 100.65
Concentrates	87.15	89.54	44.60	36.32
Silage, green feed, etc.	10.21	19.49	3.40	--
Pasture	<u>29.02</u>	<u>41.06</u>	<u>37.67</u>	<u>60.32</u>
Total feed cost	238.98	279.23	168.42	197.29
Hired labor	46.10	48.29	.44	.24
Value of operator's and family labor	27.94	32.87	62.92	72.90
Miscellaneous expense	23.37	26.19	13.00	16.00
Depreciation of buildings and equipment	6.26	8.62	5.21	6.84
Interest on investment at 5 per cent	<u>21.59</u>	<u>26.30</u>	<u>16.57</u>	<u>18.44</u>
Total expense	364.24	421.50	266.56	311.71
Management income per cow	96.39	112.55	58.62	90.31
Farm income per cow	\$145.92	171.47	\$ 138.11	180.52

The above table presents averages for local records for the two years of the study. Records are not entirely on the same dairies in both years so differences from 1947 to 1948 are only partly due to changing price and cost conditions. Notice that prices were higher by 10 cents a pound of milk fat and that costs were up almost this much in the market milk dairies. Net stock incomes were higher in both groups for 1948 than for the previous year. The higher prices and efficiency resulted in better net incomes for both groups in 1948.