

DAIRY MANAGEMENT STUDY



TULARE COUNTY

AGRICULTURAL EXTENSION SERVICE

University of California - U.S. Department of Agriculture

Ross G. Thomas
Farm Advisor

B. B. Burlingame
Extension Economist

INTRODUCTION AND EXPLANATIONS

This is the third annual report of the current Tulare County Dairy Management Study. This study is being conducted by the Agricultural Extension Service in cooperation with local dairymen for the purpose of developing local management and cost information to help cooperating and other local dairymen in obtaining higher efficiency and profits. Averages in this report apply only to the records covered and for the period from March 1, 1950 to February 28, 1951. They are not represented as being average for the county. The dairies covered are probably above average in efficiency so would have lower than average production costs.

The Dairy Enterprise. These records apply only to the dairy enterprise which is usually only part of the total farm business, being associated in most cases with some other enterprises, such as the production of irrigated pasture, hay and sometimes silage, or even other commercial crops. Farm produced feed is charged to the dairy enterprise at local farm values along with purchased feed. The dairy enterprise consists of the production of milk and some raising of dairy cattle. Labor reported covers only the milking, feeding, and care of the entire dairy herd. Feed reported is for the entire herd, including bulls and young stock as well as the cows.

Animal Unit. An animal unit is one mature head of dairy stock or the equivalent in feed requirement. Animal units per head are as follows: Cows-1.00, bulls-1.00, calves under 3 months-.25, calves 3 mos. to one year-.40, heifers 1 to 2-.70, and heifers 2 to 3-.75. Animal units per cow vary from herd to herd with varying proportions of young stock, thus accounting for difference in quantities and costs of feed.

Total Digestible Nutrients. The nutrient content of all feeds may be estimated and combined to show the relative cost and efficiency of the net usable nutrients provided for production and growth. Total digestible nutrients (TDM) is the sum of all digestible organic nutrients--protein, fiber, nitrogen-free extract and fat. It is estimated as follows: Hay 50%, Concentrates 75%, Silage and Green Feed 8 to 18%, and Pasture 400 pounds per animal unit month. An animal unit month of pasture is the quantity used by one mature head of cattle or the equivalent in feed requirement getting all of the roughage from pasture for one month. It is equivalent to .4 of a ton of hay in feeding value.

Net Stock Income. The amount by which the sale of cows, calves, and other dairy stock exceeds cost of dairy stock bought, adjusted by an increase or decrease in inventory value of stock, is called "Net Stock Income." Over the years where replacements are largely raised in the dairy enterprise, this amounts to about 10% of the total income.

Management Income. This is the amount by which total income exceeds total cost of production as figured in these records.

Farm Income is management income plus the value of the operator's own labor and computed interest on investment. It is the total amount the dairyman makes from his dairy enterprise for his management, labor, and invested capital.

Investment. The investment per cow shown in this report is for the dairy enterprise only. It includes only the land in lots and corrals, dairy buildings, dairy equipment, and feed and stock on hand. Buildings and equipment are included at half of the original cost since over their useful life they decline in value by depreciation from cost to zero.

TABLE 1. MAIN PROFIT FACTORS IN INDIVIDUAL DAIRIES

Ser. No.	Size of herds*	Per cent fat in milk	Aver. price received for milk		Quantity sold per cow		Net stock income	Miscel. income	Milk income	Total income	Total expense	Management income	Farm income
			Per cwt.	Per lb. m. fat	Cwt. milk	Lbs. m. fat							
Market Milk Dairies													
35	M	3.5	3.67	1.04	127	448	475.75	-	467.12	942.87	674.31	268.56	327.84
16	M	3.6	3.52	.99	110	392	266.46	10.51	386.87	663.84	480.32	183.52	333.90
39	L	3.5	3.63	1.03	101	356	103.00	1.69	365.72	470.41	325.70	144.71	219.10
42	L	3.3	3.65	1.11	106	348	193.91	11.78	385.23	590.92	494.48	96.44	134.49
18	L	3.5	3.37	.97	108	377	46.68	4.59	365.36	416.63	331.43	85.20	110.22
37	M	4.9	4.75	.98	81	393	21.16	-	384.72	405.88	360.83	45.05	106.44
56	L	4.9	4.74	.98	61	299	43.22	3.37	291.28	337.87	356.92	-19.05	24.19
17	L	3.7	3.56	.96	77	285	(-18.46)	7.32	273.89	281.21	337.95	-56.74	-29.81
1950	87	3.7	3.76	1.01	93	344	103.57	5.65	347.51	456.73	394.91	61.82	108.98
1949	83	3.8	4.03	1.08	90	338	91.75	3.74	364.10	459.59	392.99	66.60	111.71
1948	79	3.6	4.50	1.26	96	344	98.62	5.55	431.20	535.37	444.55	90.82	141.78
Manufacturing Milk Dairies													
22	S	3.7	3.11	85.1	131	480	470.18	7.30	408.67	886.15	569.83	316.32	480.81
33	S	3.4	2.91	86.5	100	335	148.78	12.22	289.69	450.69	327.95	122.74	229.65
45	M	3.3	2.77	83.1	115	386	115.05	4.69	320.38	440.12	333.30	106.82	195.82
20**	M	5.0	4.95	93.3	51	268	186.36	-	250.32	436.68	363.18	73.50	142.88

* Size of herd: S - Under 30 cows, M - 30 to 60 cows, L - Over 60 cows.

** Herd number 20 produced both manufacturing and market milk.

The eight individual market milk dairies are listed above in order of management income per cow, which appears in the next to the last column. Averages for the three years of the study are inserted below these records. The manufacturing milk dairies are listed at the bottom of the table below the averages for the market milk dairies. No averages are shown for these dairies, since the number is small and the last dairy, No. 20, was market milk for part of the year.

The pounds of milkfat sold per cow times the average price per pound determines the milk income. This, plus net stock and miscellaneous income determines the total income. Total income minus total expense is the management income. Notice that all but two of the dairies in the study had a management income. Those two records show less than 300 pounds of fat sold per cow. Net stock incomes were unusually high in several of these dairies this year because of the high value of dairy stock and the attention paid to raising and selling superior breeding animals.

TABLE 2. PRODUCTION FACTORS AND MILK PRODUCTION COSTS

Ser. No.	lbs. milk fat per cow		% sales of C.T. record	% of time cows milking	Freshenings per cow	lbs. conc. per cow	Conc. fed by prod.	lbs. TDN cows only	Dollars per cwt. milk sold				
	Sold	DHIA record							Total cost	Inc. not milk	Net cost	Aver. price	Mgt. income
Market Milk Dairies													
35	448	504	89	83	1.01	5,843	Yes	11,555	5.30	3.74	1.56	3.67	2.11
16	392	435	90	90	1.12	5,075	Yes	7,673	4.37	2.52	1.85	3.52	1.67
39	356	380	94	85	1.31	2,903	Yes	6,388	3.23	1.04	2.19	3.63	1.44
42	348	374	93	82	.96	4,290	Yes	9,289	4.69	1.95	2.74	3.65	.91
18	377	389	97	86	.68	2,160	Approx.	7,925	3.05	.47	2.58	3.37	.79
37	393	416	94	81	.92	3,180	Yes	8,058	4.45	.26	4.19	4.75	.56
56	299	330	91	82	.93	2,700	Yes	6,181	5.81	.76	5.05	4.74	-.31
17	285	322	89	81	.63	986	Yes	8,340	4.38	.09	4.29	3.56	-.73
1950	344	374	92	83	.99	2,934		8,093	4.27	1.18	3.09	3.76	.67
1949	338	-	-	83	1.06	3,240		9,086	4.36	1.06	3.30	4.04	.74
1948	344	-	-	83	.89	2,298		7,653	4.64	1.09	3.55	4.50	.95
Manufacturing Milk Dairies													
22	480	539	89.1	82	.95	3,856	Yes	11,168	4.33	3.63	.70	3.11	2.41
33	335	360	93.1	89	1.12	1,667	Yes	7,277	3.29	1.61	1.68	2.91	1.23
45	386	378	102.0	88	1.12	2,351	Yes	7,820	2.88	1.03	1.85	2.77	.92
20	268	346	72.1	73	.88	919	Yes	7,019	7.18	3.68	3.50	4.95	1.45

High sale of milkfat per cow requires high production. However, sales are usually somewhat below the estimated annual production as computed by the cowtester. The figures are presented above for comparison in the first two columns. For the market milk dairies an average of 92 per cent of the cowtesting total was accounted for in sales and home use. High production per cow in addition to culling, breeding and feeding also depends on regular freshenings and a fairly high per cent of time the cows are milking.

The pounds of total digestible nutrients per cow for the cows only, as shown above, is computed from the total feed used reported, less feed probably used by the young stock reported. It would appear to be higher than necessary in some cases.

The net cost of production per cwt. of milk shows a wide variation resulting from large to small deductions from total cost resulting from high net stock income. Higher sales of milk per cow also result in lower costs per cwt. of milk.

TABLE 3. COST FACTORS AND COST PER COW

Ser. No.	Total hrs. labor per cow	Rate hr. hired labor	Invest-ment per cow	Feed	Cost in dollars per average cow						Feed cost per An. Unit	Irrigated	
					labor		Miscel.	Depreciation	Int. on Invest.	Total expense		Perm. Acres	Pasture A.U. Mo. Per A.
					Hired	Oper-ator							
Market Milk Dairies													
35	106	1.10	\$1186	\$387.32	116.38	-	94.91	16.42	59.28	674.31	219.43	1.0	6.0
16	109	1.00	846	280.37	.78	108.07	41.79	7.00	42.31	480.32	170.34	1.1	8.4
39	57	1.19	544	214.03	12.20	47.16	19.06	6.02	27.23	325.70	140.27	.1	15.1
42	99	1.09	761	279.18	108.17	-	52.18	16.90	38.05	494.48	188.84	.6	10.4
18	51	1.15	500	217.56	58.87	-	23.86	6.12	25.02	331.43	148.16	1.1	7.8
37	84	1.00	363	236.64	34.71	43.24	20.45	7.64	18.15	360.83	156.43	.3	23.9
56	75	.99	519	215.82	56.86	17.31	28.34	12.66	25.93	356.92	135.54	.6	10.2
17	63	.83	539	214.29	52.11	-	21.16	5.00	26.93	*337.95	131.51	1.1	-
1950	76	1.02	618	243.53	60.40	16.27	34.09	9.73	30.89	394.91	155.94	-	-
1949	73	.94	535	260.10	49.96	18.37	28.68	9.14	26.74	392.99	167.78	.7	10.0
1948	71	1.05	577	296.15	48.58	22.12	38.98	9.88	28.84	444.55	195.01	.6	-
Manufacturing Milk													
22	106	-	1176	324.84	-	105.69	66.56	13.94	58.80	569.83	192.21	1.2	10.1
33	82	-	498	183.59	-	81.99	32.11	5.34	24.92	327.95	105.56	.9	-
45	65	-	669	215.95	-	55.54	23.36	4.99	33.46	333.30	140.75	.7	-
20	71	1.00	704	230.03	37.14	34.20	17.37	9.26	35.18	363.18	144.23	.5	13.2

* Record number 17 includes a net stock cost of \$18.46 per cow in total expense.

Costs per cow are very important profit-determining factors and are furthermore subject to more managerial control on the part of the operator than the prices received for his products. Differences in size of herd and proportions of young stock raised can account for many of the differences shown above between the different herds. A careful consideration, however, of each item of cost should disclose occasional opportunities to reduce them. Feed cost, which last year was 61 per cent of the total cost, is the most important item and offers the greatest opportunity for extravagances or economy. Feed costs are shown in detail in table 4. It is possible to have lower labor inputs and costs in the larger, better managed herds. Miscellaneous, depreciation and interest costs are usually also lower per cow in the larger herds.

TABLE 4. FEEDS USED, FEED PRICES AND FEED COSTS PER COW IN DETAIL

Ser. No.	Quantity per cow			Past. A.U. No.	Feed prices in dollars					Silage, green feed			Total feed cost	Total lbs. TDN per cow	Cost cwt. TDN
	Tons		Si. Gr. F.		Hay per ton	Conc. per cwt.	Silage per ton	Pasture per A.U. Mo.	Concentrates	Pasture	green feed	Pasture			
	Hay	Conc.													
Market Milk Dairies															
35	8.4	2.9	-	6.1	20.26	3.09	-	6.00	170.26	180.51	-	36.55	387.32	15,227	2.54
16	3.3	2.5	-	9.1	24.58	2.83	-	6.00	82.26	143.48	-	54.63	280.37	10,793	2.60
39	3.7	1.5	1.7	6.7	20.06	3.28	62.12	6.00	74.78	95.23	3.65	40.37	214.03	8,932	2.40
42	6.1	2.1	-	5.7	17.99	3.02	-	7.00	109.50	129.66	-	40.02	279.16	11,585	2.41
18	3.6	1.1	4.1	8.8	20.00	3.12	6.38	6.00	71.43	67.33	26.02	52.78	217.56	10,181	2.14
37	4.4	1.6	3.8	6.1	17.24	3.07	7.00	6.00	75.68	97.60	26.82	36.54	236.64	10,519	2.25
56	3.4	1.3	3.3	6.3	23.59	2.85	8.00	5.93	79.40	76.91	22.16	37.35	215.82	9,013	2.39
17	3.7	.5	2.8	14.7	20.00	3.06	7.65	6.00	74.52	30.14	21.62	88.01	214.29	11,364	1.89
1950	4.4	1.5	2.2	8.5	19.88	3.04	87.13	6.13	88.32	89.11	14.06	52.04	243.53	10,781	2.26
1949	4.9	1.6	1.6	9.6	20.31	2.96	7.61	5.47	100.40	95.99	11.31	52.40	260.10	11,726	2.22
1948	4.3	1.1	3.8	7.1	27.90	3.52	8.91	6.54	134.47	80.89	34.15	46.63	296.15	10,151	2.92
Manufacturing Milk Dairies															
22	6.6	1.9	-	12.5	17.54	3.49	-	6.00	115.52	134.43	-	74.89	324.84	14,480	2.24
33	4.0	.8	-	14.0	13.73	2.68	-	6.00	54.59	44.70	-	84.30	183.59	10,825	1.70
45	4.8	1.2	10.4	2.1	19.22	2.43	5.07	6.00	93.07	57.13	53.22	12.53	215.95	10,384	2.08
20	6.4	.5	-	6.8	24.68	3.27	-	6.00	158.96	30.08	-	40.99	230.03	9,851	2.34

Since pasture is the cheapest source of nutrients, maximum use of this feed results in the lowest feed cost per cow and lowest feed cost per hundred pounds of total digestible nutrients (TDN). Herds Nos. 17, 22, and 33 show over 12 animal unit months of pasturage per cow as used by each cow and her proportion of young stock in the herd. The provision of about 12-14 animal unit months of pasturage per cow will be a profitable goal for local dairymen to attain. This amount of pasture need not result in reduced production per cow if the milking herd is adequately fed additional hay and concentrates. At the average prices shown above the cost of the nutrients in hay was \$2 per hundredweight, in concentrates \$4.05, in silage and green feed \$2.35, and in pasture \$1.53. The average shown in the last column for all feeds in the market milk dairies was \$2.26 but varied from a low of \$1.89 to a high of \$2.60. UC COOPERATIVE EXTENSION

TABLE 5. FACTORS INFLUENCING NET STOCK INCOME

Ser. No.	Per cent of average number of cows				Av. price per head sold		Animal units per cow	Head raised per cow	% cows pure-bred	From cows sold	Other stock sales	Stock inven. increase	Stock bought, Br. fees	Net stock income
	Sold	Died	Added	Incr. or -decr.	Cows	Young stock								
Market Milk Dairies														
35	12.9	12.9	21.5	-4.3	\$298	\$559	1.77	.88	100	38.53	335.93	101.29	-	475.75
16	34.1	3.1	18.6	-18.6	410	449	1.65	.62	100	139.93	177.00	-50.47	-	266.46
39	18.5	2.5	48.1	27.1	237	-	1.53	.41	3	43.87	-	141.11	81.98	103.00
42	22.0	4.5	24.2	-2.3	248	187	1.48	.49	100	54.46	168.07	-28.62	-	193.91
18	16.3	2.0	17.3	-1.0	290	26	1.47	.40	0	47.38	5.37	2.09	8.16	46.68
37	27.5	2.0	0	-29.5	147	47	1.51	.49	1	40.49	16.54	-26.52	9.35	21.16
56	81.7	3.8	36.5	-49.0	247	45	1.59	.68	53	201.99	35.32	-187.50	6.59	43.22
17	31.3	4.0	28.0	-7.3	230	-	1.63	.15	0	70.35	12.82	-99.00	2.63	-18.46
1950	32.0	4.0	26.5	-9.5	249	80	1.56	.45	-	79.62	72.59	-35.69	12.95	103.57
1949	17.7	1.0	32.3	13.6	168	41	1.55	.59	-	44.02	32.80	22.35	7.42	91.75
1948	32.0	1.7	34.4	0.7	212	83	1.52	.67	-	68.32	33.49	7.66	10.85	98.62
Manufacturing Milk Dairies														
22	7.3	0.0	21.9	14.6	300	359	1.69	.95	100	21.90	262.15	186.13	-	470.18
33	31.1	6.2	49.7	12.4	216	121	1.74	.87	5	67.08	30.15	51.55	-	148.78
45	41.1	0.0	41.1	0.0	234	53	1.54	1.07	0	96.27	27.68	-8.90	-	115.05
20	7.8	2.6	90.9	80.5	142	-	1.59	.81	100	11.04	-	376.62	201.30	186.36

Net stock income represents the gross income from raising and sale of dairy stock less the value of stock consumed in milk production. In ordinary grade dairy herds this usually amounts to from 10-20% of the total income. In this study, however, there is a higher proportion of purebred herds selling high-value breeding stock, which results in an unusually high net stock income. The computation of net stock income is shown in the last five columns of the above table.

It is interesting to note that in the market milk dairies all but one decreased in number of cows during the year and these dairies had an average decrease in stock inventory value per cow. Three of the manufacturing milk dairies showed an increase in number of cows during the year, while one remained the same. All of the herds show a rather high number of animal units per cow. Normally, where just enough heifers are raised to make the necessary replacements, around 1.4 animal units per cow would be usual. The number of head raised per cow is the number actually either raised or sold but does not include little calves that are given away.

TABLE 6. DAIRY ENTERPRISE RECORD AVERAGES 1948-50

	Market Milk Dairies				San Joaquin Valley		
	San Joaquin Val.		Tulare		Mfg. Milk		
	1948	1949	1950	1950	1948	1949	1950
No. of dairies	36	33	24	8	27	20	12
Av. no. cows per dairy	77.1	79.2	63.4	86.8	24.8	22.6	23.3
Animal units per cow	1.5	1.5	1.5	1.6	1.5	1.6	1.6
Lbs B.fat sold per cow	363	363	352	344	318	343	364
Av. price per lb. B.fat	1.26	1.09	1.00	1.01	1.04	.80	.83
Net cost per lb.	1.03	.92	.80	.83	.93	.77	.72
Management Inc. per lb.	.23	.17	.20	.18	.11	.03	.11
Hours of labor per cow	85.6	83.9	77.4	75.8	85.5	79.7	102
Tons of hay per cow	4.7	4.6	4.4	4.4	4.4	4.7	5.2
Tons of conc. per cow	1.2	1.5	1.4	1.5	.9	.9	1.1
Tons silage etc. per cow	2.7	2.0	3.7	2.2	1.6	1.6	3.0
A.U. Mo. pasture per cow	7.7	8.8	6.9	8.5	7.7	8.4	6.2
Net stock income per cow	\$ 71.18	\$65.10	\$90.65	\$103.57	\$65.51	\$77.59	\$104.24
Miscel. income	5.26	3.41	5.52	5.65	5.47	6.76	5.07
Income from milk sold	456.26	396.85	351.09	347.51	332.27	272.99	301.31
Total income per cow	532.70	465.36	447.26	456.73	403.25	357.34	410.62
Hay cost per cow	128.19	99.99	85.16	88.32	111.66	96.33	97.17
Concentrates	92.91	89.92	84.59	89.11	65.51	63.81	63.75
Silage green feed, etc.	22.75	12.48	21.17	14.06	9.49	8.61	20.53
Pasture	49.16	52.81	40.70	52.04	49.39	43.51	35.05
Total feed cost per cow	293.01	255.20	231.62	243.53	236.05	212.26	216.50
Hired labor	60.54	56.61	46.31	60.40	6.57	8.94	20.67
Operator's & family labor	24.35	24.74	28.92	16.27	75.81	73.55	76.44
Miscel. expense	33.43	32.38	31.33	34.09	20.70	20.17	26.51
Deprec., blg. & eqt.	11.22	10.42	10.03	9.73	6.40	8.66	5.69
Int. on investment	25.76	24.24	29.20	30.89	21.61	25.47	26.41
Total expense per cow	448.31	403.59	377.41	394.91	367.14	349.05	372.22
Management income	84.39	61.77	69.85	61.82	36.11	8.29	38.40
Farm income per cow	134.50	110.75	127.97	108.98	133.53	106.58	141.25

In the above table we present averages of all market milk and manufacturing milk dairy records obtained in San Joaquin Valley counties over the last three years. The Tulare market milk record average is shown separately, although it is included in the 24 San Joaquin records for 1950. Although no average was made of the 1950 Tulare County manufacturing milk records, they are included in the 12 records shown above.

Notice that pounds of butterfat sold per cow is good but not showing much improvement for the market milk dairies over the three-year period. The manufacturing milk dairies show a much higher average sale in 1950 but the number of records is considerably below the number in the previous years.

The above table shows higher management income per cow in market milk dairies. Since the manufacturing milk dairies, however, are much smaller, with most of the labor performed by the operator, the farm income per cow is not much different from that in the market milk group. Fewer cows, however, would provide a much lower total net farm income than in the larger market milk dairies.