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DAIRY - CASH CROP FARMS IN SOUTHERN MINNESOTA

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Introduction

Approximately 40 percent of the 102,900 farms in Minnesota in 1970 maintained dairy cows.[1] Some were highly specialized with little in the way of income other than dairy products and cull dairy cattle. Others combined dairy cattle with one or more other enterprises, including cash crops.

This report summarizes 1970-1971 farm business records of farmers who organized their farm businesses around dairy cattle and cash crops. The major objectives of this study are (1) to provide dairy-cash crop farmers, educators, students, credit agency personnel, and others working with farmers with specific information which can be used as a basis for comparison, and (2) to account for some of the variations in earnings which occur among farmers. Individual farm records were secured from the Southeastern and Southwestern Minnesota Farm Management Associations and the vocational-technical schools in Winona, Austin, Mankato, Jackson, and Willmar.

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* The authors are indebted to Dorothy T. Spreck for making many of the calculations included in the tables appearing in this report.

1. Minnesota Agricultural Statistics, 1971, State-Federal Crop and Livestock Reporting Service, Minnesota Department of Agriculture, March 1971, page 93.

The data in table 1 show the number of farms in each size-of-business category for which averages were secured. Where the number of cases allows, each category is further divided into high and low earnings groups. Total work units are used as a measure of size of business, since they make it possible to combine dairy cattle and crops into one figure representing size of business.[1] Farms are classified as dairy-cash crop farms when 80 percent or more of the cash income comes from the two enterprises, with a minimum of 20 percent from the smallest of the two.

Table 1. Number of Farms Included in Study of Dairy-Cash Crop Farms in Southern Minnesota

Size of business	1970	1971	Average
Less than 275 work units	20	13	16
275-374 work units	34	45	40
375-474 work units	42	38	40
475-699 work units	40	40	40
700 work units and over	16	16	16
	152	152	152

Simple arithmetic averages are used throughout the publication. Calculations were made for each group or category each year and the results for each of the two years were averaged.

It is suggested that dairy-cash crop farmers copy facts concerning their business into the column headed "Your Farm," so some comparisons can be made with appropriate averages. Such comparisons will not tell a farmer what to do but they will provide ideas for further study.

1. For a discussion of work units, see C. L. Pherson and T. R. Nodland, "Work Unit Estimates for Measuring Size of Business," Department of Agricultural Economics, University of Minnesota, Report No. R68-4, September 1968.

Capital Managed

Average capital managed for the various size groups of dairy and cash crop farms is shown in table 2. Capital managed includes the value of capital supplied by landlords as well as the farm operators. These data represent values as reported by farmers in their farm business records and approximate current market prices, except for real estate. Land is valued at cost and real estate improvements are valued at cost less an annual depreciation based on length of life. No corrections have been made for the price inflation of the past several years.

Per acre values of land and farm buildings vary from an average of $230 to $280 per acre among the different size-of-business and earnings groups of farms. An additional $125 to $175 per acre would more nearly reflect current real estate prices. This, in turn, would increase total capital managed by approximately 25 percent.

Average total capital managed, as of January 1, varies from about $75,000 for small dairy and cash crop farms to $250,000 for large farms, using account book totals. There are relatively small differences between high and low earnings groups in the value of the various types of assets.

Table 2. Capital Managed on Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971

Item	Your farm	Less than 275 work units	275-374 work units		
			1/2 high in labor earnings	Average	1/2 low in labor earnings
1. Number of farms	_____	16	20	40	20
2. Acres per farm	_____	215	269	275	282
3. Cows per farm	_____	17	24	24	23
4. Number of work units	_____	233	334	329	324
		Average capital managed as of January 1			
5. Dairy cows	$_____	$ 4570	$ 6570	$ 6574	$ 6579
6. Other dairy cattle	_____	2435	3434	3475	3516
7. Other livestock	_____	696	841	1073	1305
8. Crops, seed, feed	_____	7736	9890	9404	8918
9. Auto & truck (fm.sh.)	_____	1178	1360	1375	1390
10. Tractors & crop mach.	_____	6528	8667	9279	9891
11. Livestock equipment	_____	818	2141	1795	1449
12. Farm buildings*	_____	8782	12525	13861	15197
13. Land	_____	40555	49280	53732	58183
14. Total capital managed	$_____	$73298	$94708	$100568	$106428
Per acre values:					
15. Buildings*	$_____	$ 41	$ 47	$ 50	$ 54
16. Land	_____	189	183	195	206
17. Land and buildings	$_____	$230	$230	$245	$260
		Average capital managed as of December 31			
18. Total capital managed	$_____	$76127	$99838	$104503	$109168

* Not including farm dwelling.

Earnings Statements

Receipts, expenses and labor earnings are shown in table 3. In order to make all farms comparable, receipts and expenses of landlords are included. "Labor earnings" is the amount remaining to one farm operator for his labor and management when he compensates other members of the family for any labor they performed and a charge of six percent interest on all capital managed is included as a part of the farm expenses.

Table 2. Capital Managed on Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971 (continued)

	375-474 work units			475-699 work units			700
	1/2 high in labor earnings	Average	1/2 low in labor earnings	1/2 high in labor earnings	Average	1/2 low in labor earnings	work units & over
1.	20	40	20	20	40	20	16
2.	330	330	330	411	426	441	647
3.	30	30	30	41	42	43	62
4.	413	416	418	542	552	562	863
	Average capital managed as of January 1						
5.	$ 8930	$ 8342	$ 7754	$11415	$11545	$11676	$16224
6.	3967	4525	5083	6355	6333	6310	12633
7.	1635	1620	1605	1268	1337	1406	1140
8.	12062	12105	12148	16626	15798	14970	24517
9.	1785	1829	1873	1948	2170	2393	2811
10.	13096	12776	12456	17132	17653	18173	26786
11.	3001	2758	2516	2797	3390	3984	6880
12.	23618	21710	19802	28808	29370	29933	47276
13.	68682	66564	64445	80440	80124	79807	109968
14.	$136776	$132229	$127682	$166789	$167720	$168652	$248235
Per acre values:							
15.	$ 72	$ 66	$ 60	$ 70	$ 69	$ 68	$ 73
16.	208	202	195	196	188	181	170
17.	$280	$268	$255	$266	$257	$249	$243
	Average capital managed as of December 31						
18.	$143835	$132568	$131302	175286	$174121	$172956	$262548

Labor earnings increase with each increase in size of business. Small farms yielded labor earnings of $4559. The next four size-of-business categories yielded average labor earnings of $5407, $7673, $9126, and $18,763, respectively. However, there are larger variations in earnings within each size-of-business category than there are between size categories. The one-half of the farmers with high earnings in each size group averaged $7500 to nearly $11,000 more than the low one-half in earnings. These great differences in earnings among farmers within the same size group suggest a farmer should check his efficiency of operation before he contemplates an increase in size of business.

Table 3. Cash Statement for Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971

Item	Your farm	Less than 275 work units	275-374 work units		
			1/2 high in labor earnings	Average	1/2 low in labor earnings
RECEIPTS					
1. Dairy cattle sold	$_____	$ 2335	$ 4178	$ 3702	$ 3226
2. Dairy products sold	_____	8489	13318	12368	11417
3. Other livestock sold	_____	1019	2055	2111	2168
4. Corn sold	_____	3152	4465	4618	4770
5. Other crops sold	_____	4814	6179	5800	5420
6. Other cap. assets sold	_____	221	416	343	271
7. Work off the farm	_____	118	462	321	180
8. Misc. farm income	_____	406	477	441	405
9. Total farm sales	$_____	$20554	$31550	$29704	$27857
10. Increase in farm cap.	_____	2829	5130	3935	2740
11. Fam. living from farm	_____	308	372	367	363
12. Total farm receipts	$_____	$23691	$37052	$34006	$30960
EXPENSES					
13. Dairy cattle bought	$_____	$ 848	$ 1096	$ 992	$ 888
14. Other livestock bought	_____	126	216	345	474
15. Miscel. lvstk. exp.	_____	742	895	861	828
16. Feed bought	_____	1460	2068	2039	2010
17. Fertilizer bought	_____	1090	1641	1858	2074
18. Other crop expenses	_____	1182	1590	1810	2029
19. Custom work hired	_____	918	1605	1433	1261
20. Gas, oil, grease bot	_____	882	990	1087	1184
21. Repairs--auto, truck, tractors, crop mach.	_____	1054	1264	1351	1439
22. Repairs--real estate	_____	206	383	412	441
23. Repairs--lvstk. equip.	_____	136	192	207	222
24. Wages of hired labor	_____	328	470	616	762
25. Electricity expense	_____	260	369	360	351
26. Taxes paid	_____	1090	1387	1426	1465
27. General farm expense	_____	400	538	525	511
28. Total cash expense	$_____	$10722	$14704	$15322	$15939
29. Power & mach. bought	_____	2200	3579	3857	4136
30. Lvstk. equip. bought	_____	371	839	781	724
31. Bldgs & R E improve.	_____	683	2521	1868	1214
32. Total farm purchases	$_____	$13976	$21643	$21828	$22013
33. Decrease in farm cap.	_____				
34. Interest @ 6%	_____	4482	5836	6152	6468
35. Unpaid family labor	_____	666	446	568	691
36. Board for hired labor	_____	8	41	51	60
37. Total farm expenses	$_____	$19132	$27966	$28599	$29232
38. Labor earnings	$_____	$ 4559	$ 9086	$ 5407	$ 1728

Table 3. Cash Statement for Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971 (continued)

	375-474 work units			475-699 work units			700
	1/2 high in labor earnings	Average	1/2 low in labor earnings	1/2 high in labor earnings	Average	1/2 low in labor earnings	work units & over
RECEIPTS							
1.	$ 3255	$ 3728	$ 4202	$ 5389	$ 5737	$ 6086	$10700
2.	18098	17294	16489	24500	23890	23280	38244
3.	3513	3070	2626	2796	2501	2206	2908
4.	7642	6994	6346	9327	8089	6852	13322
5.	8263	7483	6703	10372	9179	7986	13648
6.	850	586	322	481	470	459	1272
7.	533	540	547	1204	1050	896	1715
8.	1173	1099	1024	844	867	890	2343
9.	$43327	$40794	$38259	$54913	$51783	$48655	$84152
10.	7059	5339	3620	8497	6401	4304	14313
11.	516	457	399	400	477	553	632
12.	$50902	$46590	$42278	$63810	$58661	$53512	$99097
EXPENSES							
13.	$ 764	$ 1067	$ 1370	$ 1150	1524	$ 1898	$ 1452
14.	470	594	718	406	384	361	830
15.	1352	1347	1341	1614	1703	1792	2825
16.	2817	3112	3407	3500	3534	3568	6461
17.	2869	2789	2709	3320	3043	2766	4749
18.	3172	2912	2652	3674	3391	3108	4976
19.	1782	1802	1823	1798	1938	2078	2711
20.	1402	1372	1342	1795	1761	1728	2430
21.	1815	1768	1720	2236	2384	2532	3366
22.	472	466	460	676	688	700	998
23.	291	324	357	446	435	424	690
24.	1000	1039	1078	1514	1669	1823	4705
25.	450	441	432	547	555	563	957
26.	2000	2037	2075	2806	2707	2608	3546
27.	608	592	576	777	763	750	1027
28.	$21264	$21662	$22060	$26259	$26479	$26699	$41723
29.	4529	4618	4708	8264	7402	6540	10454
30.	760	807	854	625	1289	1952	1430
31.	3598	2545	1492	2267	2453	2640	8133
32.	$30151	$29632	$29114	$37415	$37623	$37831	$61740
33.							
34.	8419	8094	7770	10262	10255	10248	15323
35.	849	1114	1379	1451	1506	1561	3046
36.	59	77	94	113	151	189	225
37.	$39478	$38917	$38357	$49241	$49535	$49829	$80334
38.	$11424	$ 7673	$ 3921	$14569	$ 9126	$ 3683	$18763

Differences in cash expenses, total farm purchases, and total farm expenses are relatively small within each grouping by size of farm business, when compared to the large differences in receipts.

The data in table 4 show earnings on an enterprise basis. Instead of stressing purchases and sales, the enterprise statement shows value added by each productive enterprise and net expenses for each service enterprise, such

Table 4. Enterprise Statement for Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971

Item	Your farm	Less than 275 work units	275-374 work units		
			1/2 high in labor earnings	Average	1/2 low in labor earnings
RECEIPTS AND NET INCREASES					
1. Milk cows	$_____	$ 8696	$13622	$12509	$11395
2. Other dairy cattle	_____	3069	4554	4246	3938
3. Other livestock	_____	674	1804	1626	1448
4. Total prod. livestock	$_____	$12439	$19980	$18381	$16781
5. Feed fed	_____	6058	9364	9390	9415
6. Return over feed	$_____	$ 6381	$10616	$ 8991	$ 7366
7. Value added by crops*	_____	10964	15211	14123	13035
8. Income from labor off farm	_____	60	268	173	78
9. Misc. farm income	_____	406	477	441	405
10. Total value added	$_____	$17811	$26572	$23728	$20884
EXPENSES AND NET DECREASES					
11. Truck and auto	$_____	$ 1057	$ 1397	$ 1374	$ 1351
12. Electricity expense	_____	260	369	360	351
13. Tractors & crop mach.	_____	2819	3753	4038	4324
14. Livestock equipment	_____	338	665	620	574
15. Buildings, fencing	_____	762	1176	1260	1343
16. Miscel. lvstk. expense	_____	742	895	861	828
17. Labor**	_____	1302	1470	1705	1941
18. Taxes	_____	1090	1387	1426	1465
19. General farm expense	_____	400	538	525	511
20. Interest @ 6%	_____	4482	5836	6152	6468
21. Total expenses	$_____	$13252	$17486	$18321	$19156
22. Labor earnings	$_____	$ 4559	$ 9086	$ 5407	$ 1728

* See table 3 for value of cash sales of crops.

** Includes wages paid and value of board to hired labor, unpaid family labor, and a part of the payment for custom work hired.

as farm buildings or livestock equipment. Net increase in value produced by the livestock enterprises includes sales, value of products used in the home, changes in inventories, and accounts for transfers between enterprises. Purchases of livestock are subtracted so the data represents value of livestock and livestock products added by the enterprise.

In the calculation of value added by crops, credit is given to crops for

Table 4. Enterprise Statement for Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971 (continued)

	375-474 work units			475-699 work units			700
	1/2 high in labor earnings	Average	1/2 low in labor earnings	1/2 high in labor earnings	Average	1/2 low in labor earnings	work units & over
RECEIPTS AND NET INCREASES							
1.	$18248	$17020	$15792	$24351	$23610	$22870	$38341
2.	4956	5430	5904	6695	6418	6140	12329
3.	2560	2244	1929	2484	2052	1620	2360
4.	$25764	$24694	$23625	$33530	$32080	$30630	$53030
5.	12412	12571	12730	15166	15680	16195	24832
6.	$13352	$12123	$10895	$18364	$16400	$14435	$28198
7.	21907	19469	17030	26872	24603	22334	39997
8.	204	220	235	389	386	384	957
9.	1173	1098	1024	845	867	889	2343
10.	$36636	$32910	$29184	$46470	$42256	$38042	$71495
EXPENSES AND NET DECREASES							
11.	$ 1643	$ 1665	$ 1686	$ 1901	$ 1930	$ 1958	$ 2386
12.	450	441	432	547	555	563	957
13.	5351	5379	5407	6313	6996	7679	10644
14.	843	892	942	1041	1158	1275	2118
15.	2026	1953	1880	2920	3073	3226	5013
16.	1352	1347	1341	1614	1703	1792	2825
17.	2520	2837	3154	3720	3990	4260	8893
18.	2000	2037	2075	2806	2707	2608	3546
19.	608	592	576	777	763	750	1027
20.	8419	8094	7770	10262	10255	10248	15323
21.	$25212	$25237	$25263	$31901	$33130	$34359	$52732
22.	$11424	$ 7673	$ 3921	$14569	$ 9126	$ 3683	$18763

feed raised on the farm and consumed by livestock. The return to crops, as shown in table 4, becomes the net value of crops produced that year less the cost of seed, fertilizers, pesticides, and similar expenses.

Costs of operating each service enterprise (trucks and farm share of autos, tractors and crop machinery, etc.) are calculated in a similar manner. Expenses and net decreases include depreciation as well as repairs, gas, oil, etc. While earnings statements on an enterprise basis do not show purchases and sales, such statements more accurately reflect annual production for each productive enterprise and annual costs of each service enterprise than the cash statement shown in table 3.[1]

Table 5. Proportion of Value Added by Livestock, Crops, and Miscellaneous Sources for Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971

Source of income	Your farm	Less than 275 work units	275-374 work units		
			1/2 high in labor earnings	Average	1/2 low in labor earnings
1. Livestock	_____	35.8	40.0	37.9	35.3
2. Crops	_____	61.6	57.2	59.5	62.4
3. Miscellaneous sources	_____	2.6	2.8	2.6	2.3
4. Total	_____	100.0	100.0	100.0	100.0

The largest item of expense is the interest charge of six percent on total capital managed. Tractors and crop machinery represent the second largest item of expense; labor is in third place.

Crops are a major source of income on all farms, when credit is given to crops for feed raised on the farm and consumed by livestock (table 5.) Approxi-

1. For the method of calculation of net value produced and expenses on an enterprise basis, see Truman R. Nodland, "Know Your Farm Business," University of Minnesota Agricultural Extension Service Pamphlet 138, revised 1971.

mately 60 percent of the total value added on these farms came from the crop enterprise and about 35 to 40 percent came from dairy cattle. Off the farm work produced a small amount of income. The proportion of value added by crops, livestock and miscellaneous sources is developed from information in table 4.

The data in table 6 show return to capital managed and rate earned on capital managed. In this statement, capital and management are made the residual claimants for any income which remains after a charge has been deducted for all factors of production except the operator's labor and management.

A charge of $8000 was assumed as a wage for the operator. This is an arbitrary figure which is too high for operators of low earnings farms and

Table 5. Proportion of Value Added by Livestock, Crops, and Miscellaneous Sources for Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971 (continued)

	375-474 work units			475-699 work units			700
	1/2 high in labor earnings	Average	1/2 low in labor earnings	1/2 high in labor earnings	Average	1/2 low in labor earnings	work units & over
1.	36.4	36.8	37.3	39.5	38.8	37.9	39.4
2.	59.8	59.2	58.4	57.8	58.2	58.7	56.0
3.	3.8	4.0	4.3	2.7	3.0	3.4	4.6
4.	100.0	100.0	100.0	100.0	100.0	100.0	100.0

too low for the operators of high earnings farms. Thus, rate earned on capital managed tends to be an overstatement on the high earnings farms and an understatement on the low earnings farms.

The top managers received earnings on farm capital which is equal to or above current interest rates on borrowed capital. Less efficient operators earned 3.5 percent or less on capital managed. They would find payments on borrowed capital difficult to meet from these relatively low returns, if they were heavily in debt.

Table 6. Return on Investment for Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971

Item	Your farm	Less than 275 work units	275-374 work units		
			1/2 high in labor earnings	Average	1/2 low in labor earnings
1. Labor earnings	$_____	$ 4559	$ 9086	$ 5407	$ 1728
2. Interest on capital managed	_____	4482	5836	6152	6468
3. Total (1 + 2)	_____	9041	14922	11559	8196
4. Estimated value of operator's labor	_____	8000	8000	8000	8000
5. Return to capital managed (3 - 4)	_____	1041	6922	3559	196
6. Total capital managed	_____	74712	97273	102535	107798
7. Percent earned on capital managed	_____	1.4	7.1	3.5	.2

The Cropping Program

Data in tables 7 and 8 show average acreage and yields per acre for the various categories of farms included in this study. Since approximately 60 percent of the total value produced on these farms comes from crops, it is important for a good dairy farm manager to manage crop production as well as dairy cattle. Corn harvested for grain is the major crop on all farms. Soybeans are second in importance, followed by land in the feed grain program alfalfa hay, corn silage, and oats.

The larger farms reported relatively higher average yields. Likewise, the one-half of the farms high in labor earnings reported higher yields than the low earnings farms. High earnings farms reported as much as 17 bushels more corn and 8 bushels more soybeans per acre than low income farms.

Some crop production expenses are shown in table 9. Fertilizers and

Table 6. Return on Investment for Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971

	375-474 work units			475-699 work units			700 work units & over
	1/2 high in labor earnings	Average	1/2 low in labor earnings	1/2 high in labor earnings	Average	1/2 low in labor earnings	
1.	$11424	$ 7673	$ 3921	$14569	$ 9126	$ 3683	$18763
2.	8419	8094	7770	10262	10255	10248	15323
3.	19843	15767	11691	24831	19381	13931	34086
4.	8000	8000	8000	8000	8000	8000	8000
5.	11843	7767	3691	16831	11381	5931	26086
6.	140305	132398	129492	171038	170920	170804	255392
7.	8.4	5.9	2.8	9.8	6.7	3.5	10.2

other crop expenses per tillable acre were quite inconsistent in that there does not appear to be any relationship of these expenses to size of business or to the level of earnings. Tractor and machinery expenses and investment per crop acre increased with each increase in size of business. Economies of size are not evident from these data.

Table 7. Distribution of Acres on Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971

Item	Your farm	Less than 275 work units	275-374 work units		
			1/2 high in labor earnings	Average	1/2 low in labor earnings
1. Canning peas	_____	2.0	2.0	1.6	1.2
2. Wheat	_____	2.4	3.1	4.4	5.7
3. Oats for grain	_____	16.3	15.2	20.4	25.6
4. Other small grain	_____	1.4	.7	3.9	7.0
5. Total small grain	_____	22.1	21.0	30.3	39.5
6. Corn for grain	_____	58.1	79.2	80.7	82.2
7. Soybeans	_____	39.6	44.2	40.2	36.3
8. Sweet corn	_____	1.6	4.4	3.0	1.6
9. Corn silage	_____	5.3	12.2	12.2	12.2
10. Other cultivated crops	_____			.1	.2
11. Total cultivated crops	_____	104.6	140.0	136.2	132.5
12. Alfalfa hay	_____	25.2	27.3	30.1	32.8
13. Other hay	_____	.2	1.0	.9	.9
14. Total till. land in hay	_____	25.4	28.3	31.0	33.7
15. Alfalfa pasture	_____	1.3	3.3	4.0	4.6
16. Other till. pasture	_____	.9	.8	1.2	1.6
17. Total till. pasture	_____	2.2	4.1	5.2	6.2
18. Feed grain program	_____	19.1	35.4	29.1	22.8
19. Till. land not cropped	_____	.4	.6	.7	.8
20. Total tillable land	_____	173.8	229.4	232.5	235.5
21. Wild hay	_____	.6	1.2	1.1	1.0
22. Non-tillable pasture	_____	20.5	15.5	16.5	17.5
23. Timber	_____	2.2	4.0	5.2	6.4
24. Waste and roads	_____	12.0	9.7	11.6	13.6
25. Farmstead	_____	5.8	9.5	8.9	8.3
26. Total acres in farm	_____	214.9	269.3	275.8	282.3
27. Percent land tillable	_____	81	85	84	83

Table 7. Distribution of Acres on Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971 (continued)

	375-474 work units			475-699 work units			700
	1/2 high in labor earnings	Average	1/2 low in labor earnings	1/2 high in labor earnings	Average	1/2 low in labor earnings	work units & over
1.	.9	1.6	2.3	1.7	1.5	1.2	7.7
2.	2.8	2.2	1.6	3.6	3.1	2.7	4.0
3.	21.8	21.6	21.5	24.8	29.0	33.2	37.8
4.	.8	.6	.4	2.5	4.2	5.9	16.3
5.	26.3	26.0	25.8	32.6	37.8	43.0	65.8
6.	112.2	112.4	112.6	137.4	130.8	124.2	199.7
7.	59.5	57.3	55.0	70.6	66.3	62.0	87.9
8.	4.6	3.7	2.8	6.1	4.7	3.4	8.2
9.	12.1	12.3	12.4	17.1	18.7	20.3	30.7
10.			.2	.1	.4	.6	2.2
11.	188.4	185.7	183.0	231.3	220.9	210.5	328.7
12.	34.6	36.7	38.7	45.4	54.3	63.3	78.7
13.	1.0	1.1	1.2	.1	.9	1.6	2.5
14.	35.6	37.8	39.9	45.5	55.2	64.9	81.2
15.	1.3	3.8	6.2	7.4	6.3	5.2	4.7
16.	3.2	3.2	3.2	3.8	3.9	4.0	.7
17.	4.5	7.0	9.4	11.2	10.2	9.2	5.4
18.	35.4	31.0	26.7	37.9	39.0	40.1	67.5
19.	1.0	1.9	2.8	.8	.8	.8	.2
20.	291.2	289.4	287.6	359.3	363.9	368.5	548.8
21.	1.4	2.1	2.8	4.4	3.0	1.7	2.8
22.	10.8	12.0	13.2	20.4	22.4	24.4	44.3
23.	5.7	6.0	6.3	1.1	3.0	4.8	12.3
24.	10.7	10.4	10.0	15.2	23.0	30.8	23.3
25.	10.0	10.1	10.2	10.6	10.5	10.4	15.3
26.	329.8	330.0	330.1	411.0	425.8	440.6	646.8
27.	88	88	87	87	85	83	85

Table 8. Crop Yields per Acre for Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971

Item	Your farm	Less than 275 work units	275-374 work units		
			1/2 high in labor earnings	Average	1/2 low in labor earnings
1. Wheat, bushels	_____	31.2	25.6	25.6	25.6
2. Oats for grain, bushels	_____	56.5	63.3	60.0	56.8
3. Corn for grain, bushels	_____	85.0	89.4	87.7	86.0
4. Soybeans, bushels	_____	26.7	27.4	26.6	25.8
5. Corn silage, tons	_____	13.3	14.8	14.4	13.9
6. Alfalfa hay, tons	_____	3.7	4.0	3.7	3.4
7. Feed grain program, $	_____	66	60	62	65

Table 9. Crop Production Expenses on Dairy-Cash Crop Farms in Southern Minnesota 1970-1971

Item	Your farm	Less than 275 work units	275-374 work units		
			1/2 high in labor earnings	Average	1/2 low in labor earnings
1. Fertilizers bought per tillable acre	$_____	$ 6.26	$ 7.17	$ 8.01	$ 8.79
2. Other crop expenses per tillable acre	_____	6.79	6.94	7.80	8.60
3. Tractor and machinery expense per crop acre	_____	18.46	19.70	20.33	20.92
4. Tractor and machinery investment per crop acre	_____	42.75	45.50	46.72	47.85

Costs and Returns from Dairy Cattle

Feed costs, returns and related factors are shown for dairy cattle in tables 10, 11 and 12. Home grown feeds have been charged to dairy cattle at current market prices, while purchased feeds have been charged at cost. The number of cows and the number of head of young cattle represent the average number on hand at the beginning of each month.

Table 8. Crop Yields per Acre for Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971 (continued)

	375-474 work units			475-699 work units			700
	1/2 high in labor earnings	Average	1/2 low in labor earnings	1/2 high in labor earnings	Average	1/2 low in labor earnings	work units & over
1.	34.5	31.6	28.7	30.5	29.2	27.9	32.1
2.	64.9	63.2	61.4	65.0	63.4	61.8	65.4
3.	105.9	99.4	92.8	105.5	96.7	87.8	104.3
4.	31.0	28.9	26.8	33.4	29.5	25.5	30.5
5.	17.4	16.3	15.2	17.9	16.0	14.2	17.6
6.	4.5	4.2	3.8	4.2	4.1	4.0	4.0
7.	68	67	66	65	64	62	63

Table 9. Crop Production Expenses on Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971 (continued)

	375-474 work units			475-699 work units			700
	1/2 high in labor earnings	Average	1/2 low in labor earnings	1/2 high in labor earnings	Average	1/2 low in labor earnings	work units & over
1.	$ 9.86	$ 9.65	$ 9.41	$ 9.25	$ 8.36	$ 7.22	$ 8.65
2.	10.90	10.08	9.21	10.23	9.32	8.45	9.06
3.	21.26	21.38	21.50	20.12	22.07	23.26	22.24
4.	52.03	50.78	49.53	54.72	55.69	56.77	55.98

Average return over feed cost per cow varied from $281 for the two smallest size farms to $371 for the largest farms. The more successful managers averaged $80 to $90 more return over feed costs per cow than the less successful managers. This was accounted for by higher milk production per cow, resulting in higher milk receipts, and a generally smaller loss in the value of cows on the more profitable farms compared to the least profitable

Table 10. Feed Costs and Returns from Dairy Cows on Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971

Item	Your farm	Less than 275 work units	275-374 work units: 1/2 high in labor earnings	275-374 work units: Average	275-374 work units: 1/2 low in labor earnings
1. Number of cows	_____	17	24	24	23
2. Pounds of milk per cow	_____	10534	11706	11190	10675
3. Percent butterfat in milk	_____	3.6	3.6	3.6	3.5
4. Pounds of BF per cow	_____	385	419	396	374
5. Price recd. per lb. BF	_____	$1.30	$1.36	$1.34	$1.33
6. Price recd. per cwt. milk	_____	4.76	4.91	4.80	4.69
Value of produce per cow:					
7. Dairy product sales	$_____	$485.18	$558.62	$523.73	$488.84
8. Dairy produce used in home	_____	5.55	5.64	5.78	5.91
9. Milk fed to livestock	_____	5.86	6.12	5.76	5.40
10. Net increase in value of cows	_____	1.21	1.90	-4.89	-11.68
11. Total value produced	$_____	$497.80	$572.28	$530.38	$488.47
Feed cost per cow:					
12. Concentrates	$_____	$122.45	$135.41	$143.50	$151.58
13. Roughages	_____	81.26	103.35	98.59	93.83
14. Pasture	_____	12.28	7.23	7.03	6.83
15. Total feed cost	$_____	$215.99	$245.99	$249.12	$252.24
16. Return above feed cost per cow	$_____	$281.81	$326.29	$281.26	$236.23
17. Return for $100 of feed	$_____	$230	$233	$213	$193
Feeds per cow, lbs.:					
18. Corn		3495	4351	4607	4863
19. Small grain	_____	835	747	854	961
20. Commercial feeds	_____	550	580	586	592
21. Total concentrates	_____	4880	5678	6047	6416
22. Total hay	_____	6009	7084	6640	6196
23. Total silage	_____	7365	8918	9002	9086
24. Feed cost per lb. of BF	$_____	$ .58	$ .60	$ .64	$ .67
25. Feed cost per cwt. milk	_____	2.12	2.14	2.25	2.35

Table 10. Feed Costs and Returns from Dairy Cows on Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971 (continued)

	375-474 work units			475-699 work units			700
	1/2 high in labor earnings	Average	1/2 low in labor earnings	1/2 high in labor earnings	Average	1/2 low in labor earnings	work units & over
1.	30	30	30	41	42	43	62
2.	12532	11892	11253	12350	11792	11234	12235
3.	3.6	3.6	3.6	3.6	3.6	3.6	3.6
4.	445	426	406	442	420	398	442
5.	$1.37	$1.36	$1.36	$1.42	$1.42	$1.42	$1.44
6.	4.88	4.88	4.89	5.07	5.03	4.99	5.20
7.	$598.52	$568.80	$539.08	$618.26	$582.48	$546.69	$624.84
8.	4.58	4.30	4.02	3.82	3.80	3.79	3.64
9.	5.73	5.12	4.52	3.94	5.32	6.71	4.45
10.	-2.73	-16.50	-30.27	-10.79	-14.80	-18.82	-7.86
11.	$606.10	$561.72	$517.35	$615.23	$576.80	$538.37	$625.07
12.	$145.20	$148.56	$151.91	$136.81	$139.60	$142.38	$141.21
13.	110.63	103.62	96.62	99.85	102.15	104.45	110.83
14.	5.47	6.29	7.11	5.60	3.98	2.36	1.63
15.	$261.30	$258.47	$255.64	$242.26	$245.73	$249.19	$253.67
16.	$344.80	$303.25	$261.71	$372.97	$331.07	$289.18	$371.40
17.	$232	$217	$202	$254	$235	$216	$246
18.	4516	4599	4682	4441	4384	4328	4377
19.	685	708	731	714	716	718	708
20.	680	680	681	539	582	624	753
21.	5881	5987	6094	5694	5682	5670	5838
22.	7192	6907	6721	5988	6835	7682	7136
23.	10248	9477	8705	10746	9904	9062	10831
24.	$ .60	$ .62	$ .64	$ .55	$ .60	$ .64	$ .58
25.	2.12	2.22	2.32	1.96	2.10	2.24	2.08

Table 11. Feed Costs and Returns from Other Dairy Cattle on Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971

Item	Your farm	Less than 275 work units	275-374 work units: 1/2 high in labor earnings	275-374 work units: Average	275-374 work units: 1/2 low in labor earnings
1. Number of head	_____	21	30	30	30
2. Net increase in value per head	$_____	$152.65	$155.54	$148.39	$141.24
3. Total feed cost per head	_____	81.62	82.42	82.08	81.75
4. Return above feed cost per head	$_____	$ 71.03	$ 73.12	$ 66.31	$ 59.49
5. Return for $100 of feed	$_____	$187	$189	$181	$173
Feed per head, lbs.:					
6. Concentrates	_____	1606	1554	1591	1628
7. Hay	_____	2503	2558	2382	2206
8. Silage	_____	2002	2937	2884	2832
9. Whole milk	_____	146	112	100	88

Table 12. Feed Costs and Returns from All Dairy Cattle on Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971

Item	Your farm	Less than 275 work units	275-374 work units: 1/2 high in labor earnings	275-374 work units: Average	275-374 work units: 1/2 low in labor earnings
Value of produce per cow:					
1. Dairy products	$_____	$494.76	$569.86	$534.90	$499.93
2. Net increase	_____	182.89	197.69	179.83	161.97
3. Total value	$_____	$677.65	$767.55	$714.73	$661.90
4. Total feed cost per cow	$_____	$312.68	$355.42	$355.10	$354.77
5. Return above feed per cow	$_____	$364.97	$412.13	$359.63	$307.13
6. Return for $100 of feed	$_____	$217	$216	$201	$187
Feed per cow, lbs.:					
7. Concentrates	_____	6940	7851	8186	8520
8. Hay	_____	9075	10390	9761	9132
9. Silage	_____	9757	12746	12951	13156
10. Miscellaneous expenses per cow	$_____	$40.63	$36.75	$35.39	$34.03

Table 11. Feed Costs and Returns from Other Dairy Cattle on Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971 (continued)

	375-474 work unit			475-699 work units			700
	1/2 high in labor earnings	Average	1/2 low in labor earnings	1/2 high in labor earnings	Average	1/2 low in labor earnings	work units & over
1.	33	36	39	49	48	48	92
2.	$156.38	$155.79	$155.19	$150.82	$142.59	$134.37	$138.60
3.	84.65	86.40	88.14	84.52	87.41	90.30	87.35
4.	$ 71.73	$ 69.39	$ 67.05	$ 66.30	$ 55.18	$ 44.07	$ 51.25
5.	$183	$180	$176	$178	$163	$149	$159
6.	1520	1626	1732	1532	1470	1408	1447
7.	2528	2650	2772	2479	2937	3395	2899
8.	3474	3209	2944	3871	3474	3077	4221
9.	155	115	76	82	135	188	77

Table 12. Feed Costs and Returns from All Dairy Cattle on Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971 (continued)

	375-474 work units			475-699 work units			700
	1/2 high in labor earnings	Average	1/2 low in labor earnings	1/2 high in labor earnings	Average	1/2 low in labor earnings	work units & over
1.	$625.00	$588.79	$552.58	$625.31	$590.44	$555.58	$632.04
2.	170.23	173.35	176.47	165.42	146.85	128.27	195.16
3.	$795.22	$762.14	$729.05	$790.73	$737.29	$683.85	$827.20
4.	$365.28	$368.27	$371.26	$344.72	$346.32	$347.92	$379.26
5.	$429.94	$393.87	$357.79	$446.01	$390.97	$335.93	$447.94
6.	$218	$207	$196	$229	$213	$197	$218
7.	7869	8158	8447	7649	7501	7353	8028
8.	10368	10244	10120	8910	10215	11521	12795
9.	14296	13118	11941	16242	14317	12392	17145
10.	$45.51	$44.82	$44.13	$42.11	$41.76	$41.41	$44.95

operations. Variations in feed costs per cow were relatively small and they were not consistent. However, because of the differences in production per cow, feed costs per pound of butterfat produced and per hundredweight of milk produced were lowest on high earnings farms.

Data in table 12 shows costs and returns for the entire dairy herd on a per cow basis. High earnings farms gross about $800 per cow. Feed costs are less than half as large as gross returns. Since feed ordinarily represents half the cost involved in production, high earnings farmers included in this study were operating above the breakeven point.

Conclusion

Data in table 13 summarizes some of the characteristics of southern Minnesota dairy-cash crop farms. Variations in earnings within various size-of-business categories is greater than between size categories. Many of the average and below average earnings farms are not securing a rate earned on capital managed large enough to equal what farmers pay for borrowed capital, even when land values have been held to conservative levels. High earnings farms, on the other hand, received a rate earned on capital managed of 7.0 to 10.0 percent.

The following are some additional characteristics of the most profitable farms compared to the least profitable farms:

1. More capital managed per worker but not always more capital per farm.
2. Little difference in number of workers per farm.
3. More total value added per farm worker and in total.
4. Higher per acre yields of crops.
5. More pounds of milk per cow.
6. More returns per $100 of feed fed to dairy cattle.
7. Less power, machinery, equipment and building expense per work unit (per unit size of business).

Many of the above differences between high and low earnings farms are the result of differences in efficiency of production and in size of business. An increase in size of business does not guarantee an increase in earnings, since there are great differences in earnings among farmers with businesses of approximately the same size. Many farmers who do a good job of managing a medium size farming operation are likely to have larger earnings than managers of larger but poorly managed farms.

Table 13. Earnings, Resources Utilized, Size of Business, and Expenses for Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971

Item	Your farm	Less than 275 work units	275-374 work units		
			1/2 high in labor earnings	Average	1/2 low in labor earnings
Earnings					
1. Labor earnings	$_____	$ 4559	$ 9086	$ 5407	$ 1728
2. Rate earned on capital managed	_____	1.4	7.1	3.5	.2
Capital					
3. Total capital managed	$_____	$74712	$97273	$102535	$107798
4. Capital managed per worker	_____	62260	81061	78873	76999
5. Capital managed per work unit	_____	321	291	312	333
Labor					
6. Number of workers	_____	1.2	1.2	1.3	1.4
7. Work units per worker	_____	194	278	253	231
8. Total value added per worker	$_____	$14842	$22143	$18252	$14917
Land					
9. Total acres per farm	_____	215	269	276	282
10. Total tillable acres	_____	174	229	232	236
Percent tillable land in:					
11. - corn grain and silage	_____	36	40	40	40
12. - soybeans	_____	23	19	17	15
13. - hay and pasture	_____	16	14	16	17
14. Yield per acre - corn grain, bu.	_____	85.0	89.4	87.7	86.0
15. - soybeans, bu.	_____	26.7	27.4	26.6	25.8
16. - alfalfa hay, T.	_____	3.7	4.0	3.7	3.4
Size of business					
17. Total work units	_____	233	334	329	324
18. Total value added	$_____	$17811	$26572	$23728	$20884
Dairy					
19. Number of dairy cows	_____	17	24	24	23
20. Pounds of milk per cow	_____	10534	11706	11190	10675
21. Return for $100 feed to all dairy cattle	$_____	$217	$216	$201	$187
Expenses					
22. Pow., mach., equip. & bldg. expense per work unit	$_____	$22.47	$22.04	$23.26	$24.52
23. Tractor & machinery expense per crop acre	_____	18.46	19.70	20.33	20.92
24. Livestock equipment expense per cow	_____	19.88	27.71	25.83	24.96

Table 13. Earnings, Resources Utilized, Size of Business, and Expenses for Dairy-Cash Crop Farms in Southern Minnesota, 1970-1971 (continued)

	375-474 work units			475-699 work units			700 work units & over
	1/2 high in labor earnings	Average	1/2 low in labor earnings	1/2 high in labor earnings	Average	1/2 low in labor earnings	
Earnings							
1.	$11424	$ 7673	$ 3921	$14569	$ 9126	$ 3683	$18763
2.	8.4	5.9	2.8	9.8	6.7	3.5	10.2
Capital							
3.	$140305	$132398	$129492	$171038	$170920	$170804	$255392
4.	93537	88265	80932	95021	94956	89897	85131
5.	340	318	310	316	310	304	296
Labor							
6.	1.5	1.5	1.6	1.8	1.8	1.9	3.0
7.	275	277	261	301	307	296	288
8.	$24424	$21940	$18240	$25817	$23476	$20022	$23832
Land							
9.	330	330	330	411	426	441	647
10.	291	289	288	359	364	368	549
11.	43	43	43	43	41	39	42
12.	20	20	19	20	18	17	16
13.	14	16	17	16	18	20	16
14.	105.9	99.4	92.8	105.5	96.7	87.8	104.3
15.	31.0	28.9	26.8	33.4	29.5	25.5	30.5
16.	4.5	4.2	3.8	4.2	4.1	4.0	4.0
Size of business							
17.	413	416	418	542	552	562	863
18.	$36636	$32910	$29184	$46470	$42256	$38042	$71495
Dairy							
19.	30	30	30	41	42	43	62
20.	12532	11892	11253	12350	11792	11234	12235
21.	$218	$207	$196	$229	$213	$197	$218
Expenses							
22.	$24.97	$24.83	$24.75	$23.47	$24.84	$26.16	$24.47
23.	21.26	21.38	21.50	20.12	22.07	23.26	22.24
24.	28.10	29.73	31.40	25.39	27.57	29.65	34.16