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1973

Farm Business

Summary

By Type of Farming

for Northern Minnesota

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TABLE OF CONTENTS

	Page
Introduction	1
Capital managed and earnings	3
Land use and crop yields	10
Returns from livestock enterprises	12
Conclusion	16

INTRODUCTION

This report summarizes 1973 farm business records by type of farming for 551 northern Minnesota farmers. Farm records were supplied by area vocational-technical schools at Duluth and Thief River Falls. Fergus Falls, Stables, and Pine City are on the southern edge of the territory covered.

The purpose of this report is to present specific information concerning costs and returns from actual farming operations by types of farming. This information should be of use to farmers and individuals working with farmers in determining the most profitable types of farming and in providing information for farm planning.

Records were obtained from four types of farming for this report (table 1). Farms were classified according to the proportion of cash income received from the various livestock enterprises and from the sale of crops. The following classifications were used in this report:

700/7/74

1. Specialized farms - 80 percent or more of the cash income was from one enterprise or source.
2. Two enterprise farms - 90 percent of the income was from two enterprises, with a minimum of 20 percent from the smaller of the two.

Specialized dairy farms are further divided into five categories based on the average number of dairy cows maintained.

Table 1. Number of Farms by Type

Type	Number
Dairy, under 25 cows	79
Dairy, 25-34 cows	96
Dairy, 35-44 cows	45
Dairy, 45-54 cows	20
Dairy, 55 cows and over	22
Dairy and cash crops	85
Beef breeding herd and cash crops	62
Cash crops	<u>142</u>
Total	551

Records included are for only one year. Farm earnings in 1973 were significantly higher than in 1972.¹ Differences in climatic conditions as well as variations in general price levels are two important factors that cause farm income to vary widely from year to year and among types of farms. The increase in farm earnings in 1973 was due primarily to higher farm product prices.

1. For a comparison with 1972, see Nodland, Truman, Edgar Persons and Janet Otis, "1972 Farm Business Summary by Type of Farming for Northern Minnesota," University of Minnesota Department of Agricultural and Applied Economics Economic Report 73-2. August 1973.

CAPITAL MANAGED AND EARNINGS

The average value of capital used per farm for the various types of farming is shown in table 2. These data represent values as reported by farmers in their farm business records and deviate somewhat from current market values for assets with a long useful life, such as real estate. Real estate improvements are valued at cost and depreciated on the basis of estimated life. These book values tend to be below present market values because of changes in the price level. Also, land is valued at cost and has not been corrected for price inflation or for the increase in real value which has occurred since many of the farms were purchased. Thus, the value of land depends to a certain extent on date of purchase. Capital managed also includes the values of any assets furnished by landlords.

The data in table 3 show total and per acre investment in real estate based on "book values." Average per acre real estate values varied from \$74 per acre on the beef breeding herd-cash crop farms to \$153 per acre on large dairy farms. This compares with sales prices for 1973 as reported by Mandale and Raup¹ of \$146 per acre for northwestern Minnesota (including the Red River Valley) and \$115 for northeastern Minnesota.

Capital managed per farm varied widely between types of farming included in this study, in part because of differences in soils and climate. Ottertail and Todd counties, for example, have a rather large acreage in corn for grain. Only occasional fields of corn for grain can be found in the extreme northern counties.

Other factors contributing to the wide variation in capital managed are number of acres per farm, investment in livestock, and the buildings and equipment associated with each type of farm. Types of farming which can be classified as extensive require large amounts of capital. For example, where cash crops are

1. Mandale, Maurice and Philip M. Raup, "The Minnesota Real Estate Market in 1973." Economic Report ER74-1, Department of Agricultural and Applied Economics, University of Minnesota, January 1974.

Table 2. Summary of Inventories by Type of Farming, 1973

Item	Dairy, under 25 cows	Dairy, 25-34 cows	Dairy, 35-44 cows	Dairy, 45-54 cows	Dairy, 55 cows & over	Dairy, cash crops	Beef br., cash crops	Cash crops
1. No. of farms	79	96	45	20	22	85	62	142
2. Acres in farm	256	328	404	499	491	598	659	840
Average capital managed as of January 1, 1973								
3. Dairy cows	\$ 7047	\$ 11031	\$ 13373	\$ 17776	\$ 28176	\$ 10590	\$ 239	-
4. Other dairy cattle	3852	5867	8566	9872	15076	7051	52	2
5. Beef cattle	123	40	665	288	411	1129	17000	2250
6. Hogs	87	109	23	-	-	169	85	153
7. Sheep	45	20	-	-	-	143	265	119
8. Other lvstk.	10	9	3	-	-	-	1	-
9. Total lvstk.	\$ 11164	\$ 17076	\$ 22630	\$ 27936	\$ 43663	\$ 19082	\$ 17642	\$ 2524
10. Crops, seed, feed	\$ 2450	\$ 4316	\$ 7018	\$ 7346	\$ 12995	\$ 8517	\$ 8574	\$ 22383
11. Auto & truck (fm. sh.)	\$ 946	\$ 1303	\$ 1693	\$ 1390	\$ 2413	\$ 2097	\$ 1790	\$ 3673
12. Tractors & crop mach.	3927	7805	12138	12361	20883	13088	10114	20587
13. Livestock equip.	989	3137	3555	5153	11419	2663	278	234
14. Total equip.	\$ 5862	\$ 12245	\$ 17386	\$ 18904	\$ 34715	\$ 17848	\$ 12182	\$ 24494
15. Land	\$ 12644	\$ 20464	\$ 23594	\$ 30089	\$ 37516	\$ 50836	\$ 35475	\$104918
16. Buildings, fencing*	5803	9668	13209	19225	30762	12532	6463	8281
17. Total capital	\$ 37903	\$ 63769	\$ 83837	\$103500	\$159651	\$108815	\$ 80336	\$162600
18. Value of bldgs. per acre	\$ 23	\$ 29	\$ 33	\$ 38	\$ 63	\$ 21	\$ 10	\$ 10
19. Value of land per acre	49	62	58	60	76	85	54	125
20. Total value per acre	\$ 72	\$ 91	\$ 91	\$ 98	\$139	\$106	\$ 64	\$135
Average capital managed as of December 31, 1973								
21. Total capital	\$ 45620	\$ 73614	\$104691	\$125962	\$188006	\$138410	\$104051	\$219230

* Not including farm dwelling.

Table 3. Average Investment in Real Estate, by Type of Farming, 1973

Item	Dairy, under 25 cows	Dairy, 25-34 cows	Dairy, 35-44 cows	Dairy, 45-54 cows	Dairy, 55 cows & over	Dairy, cash crops	Beef br., cash crops	Cash crops
Land (beg. of yr.)	\$ 12644	\$ 20464	\$ 23594	\$ 30089	\$ 37516	\$ 50836	\$ 35475	\$104918
Farm buildings	5803	9668	13209	19225	30762	12532	6463	8281
Estimated invest. in dwelling	7000	7000	7000	7000	7000	7000	7000	7000
Total investment in real estate	\$ 25447	\$ 37132	\$ 43803	\$ 56314	\$ 75278	\$ 70368	\$ 48938	\$120199
Number of acres	256	328	404	499	491	598	659	840
Average investment per acre	\$ 99	\$113	\$108	\$113	\$153	\$118	\$ 74	\$143

the major enterprise, large amounts of capital are used. More intensive farms, such as those with dairy cattle, tend to have smaller capital investments, except for those farms with large numbers of dairy cows.

Earnings are presented on a cash basis in table 4. In order to make all farms comparable, receipts and expenses of landlords are included. "Labor and management earnings" (line 45) is the amount that would be left as a salary to the farm operator if he paid hired man's wages for the labor of other members of the family and six percent interest on all capital managed.

Increases in farm capital are reported as a receipt and decreases in farm capital are reported as an expense in table 4. Increases or decreases are the differences in the average farm capital between January 1, 1973 and December 31, 1973, as shown in table 2. This summarizes in one figure the net effect of the following changes:

1. Products produced but not sold during the year, so they are on the end of the year inventory.
2. Products that were produced during the previous year or years (on hand at the at the beginning of year) and sold this year.
3. Products bought but not fully used up during the year, such as fertilizer, depreciable assets, etc.
4. Products sold that were previously purchased, such as feeder pigs and feeder cattle.
5. Casualty losses.

Table 4. Summary of Earnings - Cash Statement, by Type of Farming, 1973

Item	Dairy, under 25 cows	Dairy, 25-34 cows	Dairy, 35-44 cows	Dairy, 45-54 cows	Dairy, 55 cows & over	Dairy, cash crops	Beef br., cash crops	Cash crops
RECEIPTS								
1. Dairy cattle	\$ 4197	\$ 5725	\$ 6465	\$ 7951	\$10655	\$ 6439	\$ 159	\$ 3
2. Dairy products	11891	20148	27659	38485	53524	20691	315	-
3. Beef cattle	107	59	590	378	445	1238	6862	1211
4. Hogs	189	183	41	20	-	445	308	531
5. Sheep	13	16	-	-	-	125	228	159
6. Other livestock	5	49	23	-	-	-	4	-
7. Wheat, other sm gr	477	621	839	1290	579	18349	16071	46423
8. Row crops	16	55	534	231	285	2515	428	13816
9. Other crops	140	198	302	306	414	548	1867	1259
10. Other cap assets	164	331	937	238	607	527	1556	1646
11. Work off farm	81	160	153	181	386	327	358	727
12. Misc. fm. income	448	871	1552	1239	2091	1796	2650	4180
13. Total fm. sales	\$17728	\$28416	\$39095	\$50319	\$68986	\$53000	\$30806	\$69955
14. Incr in cap.	7717	9847	20855	22462	28354	29596	23714	56630
15. Fam. liv. fr. fm.	568	696	905	954	1027	764	295	95
16. Total received	\$26013	\$38959	\$60855	\$73735	\$98367	\$83360	\$54815	\$126680
EXPENSES								
17. Dairy cattle	\$ 1859	\$ 1173	\$ 2845	\$ 3157	\$ 1776	\$ 1406	\$ 5	\$ 188
18. Beef cattle	217	-	9	-	-	477	1334	413
19. Hogs	63	38	16	27	-	68	102	56
20. Sheep	2	1	-	-	-	15	6	12
21. Other lvstk.	2	8	4	-	-	-	1	-
22. Misc. lvstk. exp.	659	1006	1657	2423	2845	1197	200	67
23. Feed	2703	4214	5162	8335	10063	2899	469	1055
24. Fertilizer	295	621	1431	1268	2316	2946	2681	8456
25. Other crop exp.	440	724	1295	1291	1780	4890	2750	9345
26. Custom work hired	680	1083	1733	2150	2562	1539	588	1320
27. Gas, oil, grease	852	1017	1282	1459	1956	2187	1557	2829
28. Rep. auto, truck, trac., crp mach.	983	1325	1796	2326	2556	3010	1996	3764
29. Rep. real estate	386	428	568	1060	538	585	597	576
30. Rep. lvstk equip.	131	208	286	378	479	297	78	16
31. Wages of hired lab.	422	635	1127	3125	3505	1750	971	3156
32. Elec. expense	306	404	552	617	897	486	202	219
33. Real est. taxes	250	401	568	653	1054	914	785	1737
34. Gen. farm exp.	415	583	945	879	1136	951	559	1024
35. Total cash exp.	\$10665	\$13869	\$21276	\$29148	\$33463	\$25617	\$14881	\$34233
36. New pow. & mach.	2424	4072	5686	6815	8073	9596	6780	15574
37. New lvstk. equip.	332	837	1738	2443	2671	1222	186	89
38. New buildings	1122	2582	7167	4059	6699	4617	3174	12852
39. Total purchases	\$14543	\$21360	\$35867	\$42465	\$50906	\$41052	\$25021	\$62748
40. Decr in fm cap.	-	-	-	-	-	-	-	-
41. Interest @ 6%	2505	4121	5655	6883	10429	7416	5531	11454
42. Unpd fam. labor**	706	801	672	1102	1054	1058	175	2412
43. Board, hired lab.	41	46	75	236	70	57	48	42
44. Total expenses	\$17795	\$26328	\$42269	\$50686	\$62459	\$49583	\$30775	\$76656
45. Labor & mgmt. earnings	\$ 8218	\$12631	\$18586	\$23049	\$35908	\$33777	\$24040	\$50024
46. Net cash income (line 13 - 39)	\$ 3185	\$ 7056	\$ 3228	\$ 7854	\$18080	\$11948	\$ 5785	\$ 7207

* Includes receipts from diverted acre payments.

** Includes a charge for partner's labor above one full time individual.

Approximately 50 percent of each dollar of sales is required to pay cash operating expenses (table 5). Purchased feeds were an important item on the dairy farms. Capital expenditures showed more variation. The amount of net cash income above all purchases was 8 to 26 percent. This is the amount available for living expenses, interest on money borrowed, debt retirement, and other savings.

Table 5. Purchases per \$100 of Total Sales, by Type of Farming, 1973*

Item	Dairy, under 25 cows	Dairy, 25-34 cows	Dairy, 35-44 cows	Dairy, 45-54 cows	Dairy, 55 cows & over	Dairy, cash crops	Beef br., cash crops	Cash crops
1. Dairy cattle	\$10.49	\$ 4.13	\$ 7.28	\$ 6.27	\$ 2.57	\$ 2.65	\$.02	\$.27
2. Beef cattle	1.22	-	.02	-	-	.90	4.33	.59
3. Other lvstk.	.38	.17	.05	.05	-	.16	.35	.10
4. Misc. lvstk exp.	3.72	3.54	4.24	4.82	4.12	2.26	.65	.10
5. Feed	15.25	14.83	13.22	16.56	14.59	5.47	1.52	1.51
6. Fertilizer	1.66	2.19	3.66	2.52	3.36	5.56	8.70	12.09
7. Other crop exp.	2.48	2.55	3.31	2.57	2.58	9.23	8.93	13.36
8. Custom work hired	3.84	3.81	4.43	4.27	3.71	2.90	1.91	1.89
9. Gas, oil, grease	4.80	3.58	3.28	2.90	2.84	4.13	5.05	4.04
10. Rep. auto, truck, tractor, crop machinery	5.54	4.66	4.59	4.62	3.70	5.68	6.48	5.38
11. Rep. real estate	2.18	1.51	1.45	2.11	.78	1.10	1.94	.82
12. Rep. lvstk equip.	.74	.73	.73	.75	.69	.56	.25	.02
13. Wages of hired labor	2.38	2.23	2.88	6.21	5.08	3.30	3.15	4.51
14. Electricity exp.	1.73	1.42	1.41	1.23	1.30	.92	.67	.31
15. Real est. taxes	1.41	1.41	1.45	1.30	1.53	1.72	2.55	2.48
16. Gen. farm exp.	<u>2.34</u>	<u>2.05</u>	<u>2.42</u>	<u>1.75</u>	<u>1.65</u>	<u>1.79</u>	<u>1.81</u>	<u>1.46</u>
17. Total operating expense	\$60.16	\$48.81	\$54.42	\$57.93	\$48.50	\$48.33	\$48.31	\$48.93
18. New power and machinery	13.67	14.33	14.54	13.54	11.70	18.10	22.01	22.26
19. New livestock equipment	1.87	2.94	4.45	4.85	3.87	2.31	.60	.13
20. New buildings	<u>6.33</u>	<u>9.09</u>	<u>18.33</u>	<u>8.07</u>	<u>9.71</u>	<u>8.71</u>	<u>10.30</u>	<u>18.37</u>
21. Total purchases	\$82.03	\$75.17	\$91.74	\$84.39	\$73.78	\$77.45	\$81.22	\$89.69

* Total purchases and sales are shown in table 4.

Table 6. Summary of Earnings - Enterprise Statement, by Type of Farming, 1973

Item	Dairy, under 25 cows	Dairy, 25-34 cows	Dairy, 35-44 cows	Dairy, 45-54 cows	Dairy, 55 cows & over	Dairy, cash crops	Beef br., cash crops	Cash crops
RECEIPTS AND NET INCREASES								
1. Milk cows	\$12377	\$20806	\$28758	\$39241	\$54894	\$21842	\$ 319	\$ -
2. Other dairy cattle	5435	8001	9244	12790	17042	8387	119	1
3. Beef breeding herd	66	-	329	-	322	477	10899	1186
4. Feeder cattle	-18	19	130	320	187	370	286	306
5. Hogs	187	200	42	37	-	395	422	520
6. Sheep - farm flock	65	26	-	-	-	184	231	153
7. Other livestock	-	43	27	-	-	-	9	-
8. Total produc. livestock	\$18112	\$29095	\$38530	\$52388	\$72445	\$31655	\$12285	\$ 2166
9. Feed fed	7584	12117	17814	23471	31318	13772	5019	1106
10. Value added by livestock	\$10528	\$16978	\$20716	\$28917	\$41127	\$17883	\$ 7266	\$ 1060
11. Crops, seed, feed	6839	9638	17444	21215	29737	40138	30760	83977
12. Misc. farm income	448	871	1552	1164	1694	1696	2637	4156
13. Total value added	\$17815	\$27487	\$39712	\$51296	\$72558	\$59717	\$40663	\$89193
EXPENSES AND NET DECREASES								
14. Truck & auto (farm share)	\$ 1029	\$ 1509	\$ 1812	\$ 2320	\$ 2697	\$ 2481	\$ 1478	\$ 3090
15. Electricity expense	306	404	552	617	897	486	202	219
16. Tractors & machinery	2047	3494	5260	6174	8380	7849	5347	14230
17. Livestock equipment	242	585	484	1022	2287	890	139	41
18. Buildings, fencing	836	1108	1974	2390	1697	753	1200	1622
19. Misc. lvstk. expense	659	1006	1657	2423	2845	1197	200	67
20. Labor**	1307	1645	2219	4886	5228	3004	1183	5685
21. Real estate taxes	250	401	568	653	1054	914	785	1737
22. General farm expense	416	583	945	879	1136	950	558	1024
23. Interest at 6 percent	2505	4121	5655	6883	10429	7416	5531	11454
24. Total expenses	\$ 9597	\$14856	\$21126	\$28247	\$36650	\$25940	\$16623	\$39169
25. Labor and management earnings	\$ 8218	\$12631	\$18586	\$23049	\$35908	\$33777	\$24040	\$50024

* Includes diverted acre payment.

** Includes wages paid and value of board to hired labor, unpaid family labor, a charge for partners above one full time individual, and the labor part of the payment for custom work hired.

The data in table 6 report earnings on an enterprise basis. On the enterprise basis, the value of livestock and livestock products produced includes the difference between sales and purchases of livestock, sale of products, value of livestock and products used in the home, changes in inventories, and an accounting of transfers between enterprises. The resulting figure represents value of livestock and livestock products added by the enterprise. Costs of operating each service enterprise (auto and trucks, tractors and crop machinery, etc.) are calculated in a similar manner. Credit is given to crops for feed raised on the farm and consumed by livestock. Thus, while earnings statements on an enterprise basis do not show purchases and sales, such a statement more truly shows value produced for the productive enterprises and the expenses for each of the service enterprises.¹

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 7). Even on the highly specialized dairy farms, approximately 35 to 40 percent of the income is from crops. The proportion of farm income from livestock, crops, and miscellaneous sources is based on receipts and net increases, as shown in table 6. Return over feed is the amount of income added by livestock and the return to crops represents the value of crops produced during the year.

Table 7. Proportion of Farm Income from Livestock, Crops, and Miscellaneous Sources by Type of Farming, 1973

Item	Dairy, under 25 cows	Dairy, 25-34 cows	Dairy, 35-44 cows	Dairy, 45-54 cows	Dairy, 55 cows & over	Dairy, cash crops	Beef br., cash crops	Cash crops
Livestock (return over feed)	59.1	61.7	52.2	56.4	56.7	29.9	17.9	1.2
Crops (net in- creases)	38.4	35.1	43.9	41.4	41.0	67.2	75.6	94.2
Miscellaneous income	<u>2.5</u>	<u>3.2</u>	<u>3.9</u>	<u>2.2</u>	<u>2.3</u>	<u>2.9</u>	<u>6.5</u>	<u>4.6</u>
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

1. For the method of calculation, see Nodland, Truman R., "Know Your Farm Business," University of Minnesota Agricultural Extension Pamphlet 138, Revised 1971.

Rate earned on capital managed is increasingly becoming a factor to consider, particularly when the contribution of capital managed to earnings is greater than the value of the operator's labor. Small dairy farms received a modest return to labor and 6.5 percent on capital. Large dairy farms, on the other hand, yielded a return to capital managed of 22 percent and \$8000 return to the farm operator for his labor. (See table 8.) Farms with cash crop enterprises reported even higher returns on capital managed. However, if current market prices are applied to real estate in lieu of "book" values, rate earned on capital would be considerably smaller. Also, crop prices in 1973 were unusually high relative to the previous year.

Table 8. Rate Earned on Capital Managed, by Type of Farming, 1973

Item	Dairy, under 25 cows	Dairy, 25-34 cows	Dairy, 35-44 cows	Dairy, 45-54 cows	Dairy, 55 cows & over	Dairy, cash crops	Beef br., cash crops	Cash crops
1. Labor earnings	\$ 8218	\$12631	\$18586	\$23049	\$35908	\$33777	\$24040	\$50024
2. Interest on cap. mgd.	<u>2505</u>	<u>4121</u>	<u>5655</u>	<u>6883</u>	<u>10429</u>	<u>7416</u>	<u>5531</u>	<u>11454</u>
3. Total (2+3)	\$10723	\$16752	\$24241	\$29932	\$46337	\$41193	\$29571	\$61478
4. Est. wage for operator	<u>8000</u>	<u>8000</u>	<u>8000</u>	<u>8000</u>	<u>8000</u>	<u>8000</u>	<u>8000</u>	<u>8000</u>
5. Return to capital (3-4)	\$ 2723	\$ 8752	\$16241	\$21932	\$38337	\$33193	\$21571	\$53478
6. Ave. capital managed	\$41762	\$68692	\$94264	\$114731	\$173828	\$123613	\$92194	\$190915
7. Rate earned on capital mgd.	6.5%	12.7%	17.2%	19.1%	22.0%	26.8%	23.4%	28.0%

LAND USE AND CROP YIELDS

Specialized dairy farms have a large proportion of land in pasture, hay, and silage crops (table 9.). Wheat, barley and oats are the predominant small grains. Some corn for grain and soybeans are raised on farms in the southern portion of the area. Sugar beets and sunflowers are important on cash crop farms. Farms which depend on cash crops as a source of income generally have a higher proportion of their land that is tillable than do farms with dairy as a major enterprise. Average crop yields are shown in table 10. Variations

in average yields were large and, in part, reflect differences in soils and climate. Large dairy farms tend to have higher average yields than the other groups.

Table 9. Distribution of Acres in Farm, by Type of Farming, 1973

Item	Dairy, under 25 cows	Dairy, 25-34 cows	Dairy, 35-44 cows	Dairy, 45-54 cows	Dairy, 55 cows & over	Dairy, cash crops	Beef br., cash crops	Cash crops
1. Barley	2.4	4.1	6.1	6.8	6.8	38.2	32.1	123.9
2. Oats	31.0	40.4	54.8	59.4	53.6	114.0	109.0	76.3
3. Wheat	3.6	4.7	6.6	10.2	9.7	107.5	95.5	281.6
4. Flax	1.3	.6	1.9	-	-	10.5	10.1	9.6
5. Other sm grains	.6	.6	.1	-	-	7.2	1.5	9.6
6. Total sm grains	38.9	50.4	69.5	76.4	70.1	277.4	248.2	501.0
7. Corn grain	8.3	16.5	44.4	35.3	64.6	26.2	3.9	8.1
8. Corn silage	9.7	17.2	28.0	33.4	53.4	23.4	6.8	1.0
9. Soybeans	-	.3	.4	.8	2.5	9.4	.2	16.0
10. Sunflowers*	-	.3	1.2	1.8	-	11.8	2.8	31.8
11. Sugar beets	-	-	-	-	-	-	-	33.2
12. Other cult.crops	.2	3.2	.1	4.0	-	2.4	.4	17.5
13. Total cult.crops	18.2	37.5	74.1	75.3	120.5	73.2	14.1	107.6
14. Alfalfa hay	19.0	30.5	37.3	45.1	77.2	41.4	27.0	7.6
15. Other leg. hay	30.9	44.3	54.3	66.7	55.1	42.9	67.4	14.5
16. Other hay	7.0	4.0	8.3	19.8	1.8	3.7	6.0	3.1
17. Grass seed	.2	.3	.3	-	-	1.4	35.5	16.8
18. Total til. land in hay	57.1	79.1	100.2	131.6	134.1	89.4	135.9	42.0
19. Legume pasture	2.8	4.2	2.7	7.2	-	9.9	26.2	3.1
20. Other till.past.	12.2	14.2	15.6	10.6	8.9	19.5	23.9	5.8
21. Total till. land in pasture	15.0	18.4	18.3	17.8	8.9	29.4	50.1	8.9
22. Till. land not cropped	7.2	8.4	8.8	9.9	8.1	29.0	36.0	90.6
23. Total tillable land	136.4	193.8	270.9	311.0	341.7	498.4	484.3	750.1
24. Non-till. past.	29.4	17.2	10.1	19.7	12.8	19.0	28.2	2.4
25. Other non-till.	89.8	117.4	123.3	168.4	136.9	81.1	146.8	87.3
26. Total acres in farm	255.6	328.4	404.3	499.1	491.4	598.5	659.3	839.8
27. Percent land tillable	53.4	59.0	67.0	62.3	69.5	83.3	73.4	89.3

* Includes sunflowers grown for seed.

Table 10. Crop Yields per Acre, by Type of Farming, 1973

Item	Dairy, under 25 cows	Dairy, 25-34 cows	Dairy, 35-44 cows	Dairy, 45-54 cows	Dairy, 55 cows & over	Dairy, cash crops	Beef br., cash crops	Cash crops
1. Barley, bu.	45.3	38.6	47.9	47.4	*	46.3	47.8	49.0
2. Oats grain, bu.	49.1	48.5	58.1	47.9	55.1	54.3	46.9	50.3
3. Wheat, bu.	36.1	22.4	32.8	31.3	47.8	37.0	36.0	40.8
4. Flax, bu.	*	*	*	-	-	13.3	10.9	-
5. Corn grain, bu.	66.3	63.8	68.8	73.3	76.7	68.7	59.8	73.2
6. Corn silage, T.	9.8	11.1	11.9	12.0	12.6	10.9	8.8	8.2
7. Soybeans, bu.	-	*	*	*	*	21.7	*	24.6
8. Sugar beets, T.	-	-	-	-	-	-	-	15.7
9. Alfalfa hay, T.	2.6	2.9	2.8	2.9	3.6	2.4	2.2	2.0
10. Other leg. hay, T	1.9	2.0	2.0	2.3	2.2	2.3	1.5	3.1

* Less than 5 cases.

RETURN FROM LIVESTOCK

Feed costs, returns and some related factors are shown for dairy cattle in tables 11 through 13. Home grown feeds have been charged to livestock at current market prices during the year. Purchased feeds were charged at cost. The number of head represents the average number on hand at the beginning of each month.

As shown in table 11, average return over feed per cow varied from \$351 for small herds to \$464 for large herds. The two large dairy herd categories had the highest production per cow and the highest price received per 100 pounds of milk sold. They also had relatively high total feed costs per cow. The larger herds had a price advantage, ranging from 16 to 38 cents more per hundred pounds than the smaller herds.

The return for \$100 of feed fed ranged from \$219 to \$239. Feed is the largest single item of cost for all classes of livestock and, in the case of dairy cattle, makes up about 50 percent of the total cost. Thus, on the average, a return of about \$200 for each \$100 of feed is necessary in order to break even, with average equipment, buildings, and labor. The same kind of analysis can be used with feed cost per 100 pounds of milk produced. The average producer will need to secure a price which is twice the cost of feed per unit of product produced in order to cover all costs, including modest amounts for labor.

Feed costs and returns from other dairy cattle are shown in table 12. These are mostly replacements for the milking herd. Return over feed cost per head and return for \$100 of feed are highest for small herds. The information in table 13 shows feed costs and returns from the entire dairy herd on a per cow basis. The information presented in this table is especially valuable for planning a dairy operation or for expanding an existing herd, since it includes replacement stock. A typical dairy herd averages about 1.3 head of young stock per cow.

Feed costs and returns from beef cows are shown in table 14. The average return over feed cost per cow of \$160 and return for \$100 of feed of \$245 received in 1973 is much higher than one normally expects from a beef cow operation. The return for \$100 of feed was approximately the same as that received from dairy cattle despite the fact that costs of shelter, equipment and labor are considerably greater for dairy cattle than for beef cow herds. The high relative profitability of beef cows in 1973 was largely a matter of favorable prices for beef cattle.

The average number of beef cattle per farm is small (43 cows and 35 head of other beef cattle). A total of 22 acres of silage, hay and pasture was used to provide roughages. This amounts to about 5 acres per cow, including young stock.

Table 11. Factors of Costs and Returns from Dairy Cows, by Type of Farming, 1973

Item	Dairy, under 25 cows	Dairy, 25-34 cows	Dairy, 35-44 cows	Dairy, 45-54 cows	Dairy, 55 cows & over	Dairy, cash crops
Number of cows	20	30	39	50	69	32
Pounds of milk per cow	10111	11072	11312	12231	12022	10815
Percent butterfat in milk	3.6	3.8	3.6	3.6	3.7	3.5
Pounds butterfat per cow	367	425	407	437	441	383
Price received per pound of butterfat	\$1.72	\$1.64	\$1.78	\$1.80	\$1.80	\$1.75
Price received per cwt. of milk	6.23	6.30	6.41	6.43	6.59	6.21
Value of produce per cow:						
Dairy product sales	\$606.58	\$678.38	\$709.21	\$771.24	\$777.97	\$652.71
Dairy produce used in home	9.39	7.74	7.64	5.47	5.16	7.85
Milk fed to livestock	14.90	12.86	8.56	9.84	12.98	11.70
Net increase in value of cows	.61	1.55	11.97	-.14	1.77	16.78
Total value produced	\$631.48	\$700.53	\$737.38	\$786.41	\$797.88	\$689.04
Feeds per cow, lbs.:						
Corn	918	1481	2237	2035	2859	1366
Small grain & complete dairy ration	3307	3208	2952	5448	2561	2929
Protein, salt, mineral	472	441	525	519	354	467
Total concentrates	4697	5130	5714	8002	5774	4762
Total hay	8015	7547	7367	7434	5475	7681
Total silage	6538	8516	12321	11666	17850	11106
Feed cost per cow:						
Concentrates	\$160.66	\$181.92	\$203.44	\$214.41	\$187.97	\$158.90
Roughages	110.92	116.36	129.33	129.91	145.73	127.48
Pasture	8.88	5.45	4.21	3.30	.64	8.08
Total feed cost	\$280.46	\$303.73	\$336.98	\$347.62	\$334.34	\$294.46
Return above feed cost per cow	\$351.02	\$396.80	\$400.40	\$438.79	\$463.54	\$394.58
Return for \$100 of feed	\$225	\$231	\$219	\$226	\$239	\$234
Feed cost per pound of butterfat	\$.76	\$.72	\$.83	\$.80	\$.76	\$.77
Feed cost per cwt. milk produced	2.77	2.74	2.98	2.84	2.78	2.72

Table 12. Feed Costs and Returns from Other Dairy Cattle, by Type of Farming, 1973

Item	Dairy, under 25 cows	Dairy, 25-34 cows	Dairy, 35-44 cows	Dairy, 45-54 cows	Dairy, 55 cows & over	Dairy, cash crops
Number of head	25	38	52	57	81	44
Net increase in value per head	\$223.17	\$212.07	\$179.69	\$223.99	\$209.88	\$190.07
Feed per head, lbs.:						
Concentrates	668	656	763	1156	988	954
Hay	2973	2856	3034	3445	2442	2710
Silage	1628	2312	3557	4632	5629	3195
Whole milk	183	150	100	130	126	129
Total feed cost per head	\$ 78.01	\$ 77.48	\$ 85.37	\$104.40	\$ 99.06	\$ 85.43
Return above feed cost per head	\$145.16	\$134.59	\$ 94.32	\$119.59	\$110.82	\$104.64
Returns for \$100 of feed	\$286	\$274	\$210	\$215	\$212	\$222

Table 13. Feed Costs and Returns from All Dairy Cattle, on a per Cow Basis, by Type of Farming, 1973

Item	Dairy, under 25 cows	Dairy, 25-34 cows	Dairy, 35-44 cows	Dairy, 45-54 cows	Dairy, 55 cows & over	Dairy, cash crops
Value of produce per cow:						
Dairy products	\$630.87	\$698.99	\$725.41	\$786.53	\$796.10	\$672.24
Net increase in value	<u>277.91</u>	<u>270.94</u>	<u>249.00</u>	<u>256.15</u>	<u>249.49</u>	<u>281.36</u>
Total value produced	\$908.78	\$969.93	\$974.41	\$1042.68	\$1045.59	\$953.60
Feed per cow, lbs.:						
Concentrates	5545	5976	6728	9340	6956	6118
Hay	11697	11153	11413	11376	8358	11466
Silage	8578	11522	16993	16966	24493	15569
Total feed cost per cow	\$377.25	\$402.43	\$450.02	\$467.05	\$451.23	\$414.09
Returns above feed cost per cow	\$531.53	\$567.50	\$524.39	\$575.63	\$594.36	\$539.51
Returns for \$100 of feed	\$240	\$241	\$217	\$223	\$232	\$230
Miscellaneous livestock expenses/cow	\$22.24	\$23.33	\$28.79	\$34.59	\$25.32	\$25.93
Veterinary expenses per cow	10.05	10.20	13.15	12.81	15.96	27.18

Table 14. Feed Costs and Returns from Beef Cows, 1973

Item	Average of 56 herds
Number of beef cows	43
Number of other beef cattle	35
Value produced per cow	\$271.08
Feed per cow, lbs.:	
Concentrates	492
Hay	7686
Silage	2032
Feed cost per cow:	
Concentrates	\$15.64
Roughages	80.52
Pasture	14.52
Total feed cost per cow	\$110.68
Return above feed cost per cow	\$160.40
Return for \$100 of feed	\$245
Net gain in weight produced, lbs.	23120
Pounds of beef produced per cow	541
Price received per 100 lbs. sold	\$47.15
Average weight per calf sold or transferred to feed lot	537
Percent death loss	3.6
Miscellaneous livestock expense per cow	\$7.70
Veterinary expense per cow	4.61

CONCLUSION

A summary of earnings, resources used, size of business, and expenses is presented in table 15. Small dairy farms showed the lowest earnings. They had \$10723 available to pay for the operator's labor and capital managed. Large dairy farms yielded a return large enough to provide \$8000 for labor performed by the operator and yield 22.0 percent return on the "book value" of capital managed. Farms with cash crop enterprises yielded even higher returns on capital managed.

Table 15. Some Characteristics of Various Types of Farms, Northern Minnesota, 1973

Item	Dairy, under 25 cows	Dairy, 25-34 cows	Dairy, 35-44 cows	Dairy, 45-54 cows	Dairy, 55 cows & over	Dairy, cash crops	Beef br., cash crops	Cash crops
Earnings								
1. Net cash income	\$ 3185	\$ 7056	\$ 3228	\$ 7854	\$18080	\$11948	\$ 5785	\$ 7207
2. Labor & mgmt. earnings	\$ 8218	\$12631	\$18586	\$23049	\$35908	\$33777	\$24040	\$50024
3. Rate earned on investment	6.5%	12.7%	17.2%	19.1%	22.0%	26.8%	23.4%	28.0%
Land								
4. Acres per farm	256	328	404	499	491	598	659	840
5. Tillable acres	136	194	271	311	342	498	484	750
6. % till. land in								
Small grain	29%	26%	26%	25%	21%	55%	51%	67%
Cult. crops	13%	19%	27%	24%	35%	15%	3%	14%
Hay & pasture	53%	50%	44%	48%	42%	24%	38%	7%
Not cropped	5%	5%	3%	3%	2%	6%	8%	12%
Labor								
7. No. of workers	1.4	1.5	1.6	2.2	2.5	1.7	1.3	1.7
8. Work units per worker	159	225	287	251	299	276	276	202
Capital								
9. Total capital managed	\$41762	\$68692	\$94264	\$114731	\$173828	\$123613	\$92194	\$190915
10. Capital managed per worker	\$29830	\$45795	\$58915	\$52150	\$69531	\$72565	\$70919	\$112303
Size of business								
11. Total work units	222	337	459	553	749	469	359	344
12. Net value added								
% by livestock	59%	62%	52%	57%	57%	30%	18%	1%
% by crops	38%	35%	44%	41%	41%	67%	76%	94%
% by miscel.	3%	3%	4%	2%	2%	3%	6%	5%
Expenses								
13. Total oper. exp.	\$10665	\$13869	\$21276	\$29148	\$33463	\$25617	\$14881	\$34233
14. Purch of capital items	\$ 3878	\$ 7491	\$14591	\$13317	\$17443	\$15435	\$10140	\$28515
15. Pow., mach., equip. & bldg. exp. per WU	\$20.09	\$21.06	\$21.96	\$22.64	\$21.30	\$26.56	\$23.30	\$55.81
16. Trac. & mach. exp. per crop acre	\$17.92	\$20.92	\$21.58	\$21.79	\$25.81	\$17.84	\$13.43	\$21.87
17. Total operat. exp. per \$100 of sales	\$60.16	\$48.81	\$54.42	\$57.93	\$48.50	\$48.33	\$48.31	\$48.93

Farms which have cash crops as a major enterprise generally use large amounts of capital and involve large acreages. This is an extensive enterprise and is best suited where labor is scarce compared to land and capital. Dairying tends to be located on relatively small farms where there is non-tillable land and where it is desirable, because of erosion and other factors, to include a considerable amount of hay and pasture in the rotation. Dairying is an intensive enterprise and is adapted to situations where labor is plentiful in comparison to land.

Dairy farms tend to have had less capital invested per worker than did the other types of farms included in this study. Most of the farm classifications had 1.3 to 2.5 workers. Small dairy farms had only 1.4 workers and large dairy farms had an average of 2.5 workers.

In terms of work units, large dairy farms had the largest business, with 749 productive man work units. Small dairy farms had relatively few work units in total and per worker. Work units are defined as the average accomplishment of a farm worker in a ten-hour day, working on crops and productive livestock at average efficiency, or ten hours off-the-farm work for pay.

It is important to bear in mind that the records included in this report are for only one year. Similar data for a different year would show variations in the data presented. Variations between years, in the main, are caused by differences in climatic conditions and general price levels--factors which the individual farmer cannot control. Furthermore, price levels do not rise or fall in unison. Some prices may rise while others are falling, or some may change faster than others. For these reasons, the relative earnings levels of the various types of farms may change from year to year.