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1953 REPORT
VOCATIONAL AGRICULTURE
FARM MANAGMENT SERVICE
SOUTHERN MINNESOTA

UNIVERSITY OF MINNESOTA
Institute of Agriculture
and
Vocational Division
MINNESOTA DEPARTMENT OF EDUCATION
Cooperating

Report No. 216
Department of Agricultural Economics
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Fig. 1. Type of Farming Areas in Minnesota and Location of Schools Submitting Farm Records for this Report

1953 REPORT OF THE FARM MANAGEMENT SERVICE FOR VOCATIONAL AGRICULTURE, SOUTHERN MINNESOTA

T. R. Nodland, G. A. Pond and Kermit Kleene

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INTRODUCTION

The Departments of Agricultural Economics and Agricultural Education and the Agricultural Extension Service of the University of Minnesota are cooperating with the Vocational Division, Minnesota Department of Education in maintaining a farm management service. The service was initiated during 1952 and is available to farmers who are enrolled in adult or young farmer classes in the public schools.

The purpose of the project as far as the schools are concerned is (1) to give assistance to the instructors in the mechanics of keeping farm records and (2) to aid in the analysis of the farm business through the use of records as a basis for vocational guidance. The enrollment is on a voluntary basis insofar as the number of schools participating and the number of farmers enrolled in the service.

The analysis of the records and the preparation of the reports are handled by the Department of Agricultural Economics under the direction of G. A. Pond and T. R. Nodland. The Department of Agricultural Education was represented by M. J. Peterson and the Agricultural Extension Service by S. B. Cleland and E. Hartmans. The State Department of Education was represented by G. R. Cochran, State Supervisor of Agricultural Education. At the end of the year, R. B. Zoller, D. S. Moore and Ralph Smith of the Department of Agricultural Economics aided in closing and summarizing the records.

Each farmer pays an annual fee which covers a portion of the cost. The Farmers Union Grain Terminal Association contributed $10.00 per record analyzed. Through a grant of funds from the Hill Family Foundation, Lauren Granger was employed by the Department of Agricultural Education as a coordinator for the project. The balance of the costs were defrayed by the University of Minnesota.

This report deals with farmers enrolled in 28 schools in southern Minnesota. The map on the inside front cover of this report shows the location of the schools. The following tabulation shows by schools the number of 1953 farm records submitted:

Southeastern Minnesota			
Austin	11	New Richland	3
Caledonia	2	Preston	1
Cold Spring	2	Rushford	1
Dassel	1	St. Peter	2
Forest Lake	3	Stewart	2
Glencoe	1	Waconia	1
Lake City	5	Watertown	1
New Ulm	9	Zumbrota	1
		Total	46

Southwestern Minnesota	
Alexandria	22
Brewster	1
Herman	6
Ivanhoe	4
Lake Benton	2
Madison	7
Morris	12
Mountain Lake	2
Redwood Falls	3
Worthington	1
Total	60

The subsequent pages in this report show the data for 97 farms. Nine farms were omitted from all the averages in the tables because the records were not sufficiently complete for a full analysis.

The records kept included farm inventories, cash receipts and expenses, feed consumed by the various classes of livestock, family living secured from the farm, household and personal expenses and receipts and the operators liabilities and assets other than farm capital. All types of tenure arrangements are represented ranging from full owners to partnerships in which the operator furnishes little or no capital.

FARM INVENTORIES

The capital investment per farm varied from $10558 to 100,829. The average investment for all farms included in this report and for the one-fifth high and the one-fifth low in operator's labor earnings is shown in Table 1.

Landlords or partners supplied some capital in 62 out of the 97 cases included in this report. The landlord's investment has been included in Table 1 in order to show the total amount used per farm.

FARM EARNINGS

Operator's earnings is a measure of the relative financial success of a farmer as compared with other farmers and represents the returns above all farm expenses and a charge for the use of farm capital. For purposes of comparison, the earnings are presented on a full-owner basis.

There are two methods of computing operator's earnings. Table 2 shows the earnings statement on a cash basis and Table 3 shows the earnings on an enterprise or accrual basis. The principal difference in the two statements is in the method of handling the net increase or decrease in the value of farm capital. In the cash statement the net increase or decrease in farm capital is entered as one item. In the enterprise statement the net change in the inventory has been included in each enterprise in order to compute "total returns and net increases", or "total expenses and net decreases" by enterprises.

Table 1. Summary of Farm Inventories, 1953*

Items	Your farm Jan. 1	Your farm Dec. 31	Average of 97 farms Jan. 1	Average of 97 farms Dec. 31
Size of farm (acres)			228	
Size of business (work units)**			323	
Dairy and dual purpose cows			$ 2124	$ 2139
Other dairy & dual purpose cattle			992	877
Beef cattle (Incl. feeders)			1189	1178
Hogs			970	1271
Sheep (including feeders)			124	91
Poultry (including turkeys)			190	213
Productive livestock (total)			5589	5769
Horses			27	28
Crop, seed and feed			3426	3912
Power mach. (farm share)			2517	2593
Crop and general machinery			2887	3129
Livestock equipment			504	522
Machinery & equipment (total)			5908	6244
Miscellaneous			-	-
Buildings, fences, etc.			5852	5927
Land			12782	12782
Total farm capital			33584	34662

Items	31 most profitable farms Jan. 1	31 most profitable farms Dec. 31	31 least profitable Jan. 1	31 least profitable Dec. 31
Size of farm (acres)	290		232	
Size of business (work units)**	355		326	
Dairy and dual purpose cows	$ 1576	$ 1639	$ 2285	$ 2070
Other dairy & dual purpose cattle	818	779	1114	996
Beef cattle (incl. feeders)	1828	2034	1965	1879
Hogs	1880	2475	676	913
Sheep (including feeders)	188	126	65	73
Poultry (including turkeys)	242	291	162	139
Productive livestock (total)	6532	7344	6267	6070
Horses	25	33	10	11
Crop, seed, and feed	4497	5916	4057	3694
Power Mach. (farm share)	3682	3777	2772	2715
Crop & general machinery	4155	4324	3108	3458
Livestock equipment	640	640	465	479
Machinery & equipment (total)	8477	8741	6345	6652
Miscellaneous	-	-	-	-
Buildings, fences, etc.	7532	7530	6052	6006
Land	16057	16057	16097	16097
Total farm capital	43120	45621	38828	38530

* For the purpose of comparison, all the data shown in this report with the exception of tables 6 and 7 are presented on a full-owner basis. The assets, expenses and receipts of the landlord were included in the records from rented farms.

** See page 13 for an explanation of "work units".

Table 2. Summary of Farm Earnings (Cash Statement), 1953

Items	Your farm	Average of 97 farms	19 most profitable farms	19 least profitable farms
FARM RECEIPTS				
Dairy and dual-purpose cows	_____	$ 368	$ 309	$ 467
Dairy products	_____	2367	1670	2100
Other dairy and dual-purpose cattle	_____	440	799	318
Beef cattle (including feeders)	_____	798	1429	879
Hogs	_____	3439	6097	2061
Sheep and wool (including feeders)	_____	103	127	39
Poultry (including turkeys)	_____	153	212	108
Eggs	_____	976	1318	690
Horses	_____	8	5	-
Corn	_____	960	1965	953
Small grain	_____	904	1737	774
Other crops	_____	604	637	755
Machinery and equipment sold	_____	202	287	199
Agricultural adjustment payments	_____	51	76	64
Income from work off the farm	_____	233	274	510
Miscellaneous	_____	51	51	32
(1) Total farm sales	_____	11657	16993	9949
(2) Increase in farm capital	_____	1078	2501	-
(3) Family living from the farm	_____	288	302	220
(4) Total farm receipts (1)+(2)+(3)	_____	13023	19796	10169
FARM EXPENSES				
Dairy and dual-purpose cows bought	_____	$ 151	$ 97	$ 190
Other dairy & dual-pur. cattle bought	_____	175	530	168
Beef cattle bought (incl. feeders)	_____	345	738	444
Hogs bought	_____	158	160	90
Sheep bought (incl. feeders)	_____	6	1	1
Poultry bought (incl. turkeys)	_____	112	135	66
Horses bought	_____	10	12	5
Misc. Livestock expense	_____	195	240	180
Misc. crop expenses	_____	622	1078	651
Feed bought	_____	1455	2070	947
Custom work hired	_____	397	326	369
Mech. power mach. (farm share)(new)	_____	572	792	489
Mech. power mach. (farm share)(upkp.)	_____	269	325	293
Mech. power (F. share)(gas, oil, etc.)	_____	860	989	1043
Crop and general machinery (new)	_____	819	925	1045
Crop and general machinery (upkeep)	_____	234	349	246
Livestock equipment (new)	_____	120	87	161
Livestock equipment (upkeep)	_____	80	140	68
Buildings and fencing (new)	_____	438	400	317
Buildings and fencing (upkeep)	_____	156	188	196
Hired labor	_____	252	386	348
Taxes	_____	457	607	469
General farm and insurance	_____	141	194	146
(5) Total farm purchases	_____	8024	10769	7932
(6) Decrease in farm capital	_____	-	-	298
(7) Interest on farm capital	_____	1706	2219	1934
(8) Unpaid family labor	_____	400	217	600
(9) Board furnished hired labor	_____	58	92	43
(10) Total farm exp. (sum of (5)to(8))	_____	10188	13297	10807
(11) Operator's earnings (4)-(10)		2835	6499	-638

Table 3. Summary of Farm Earnings (Enterprise Statement) 1953*

Items	Your farm	Average of 97 farms	19 most profitable farms	19 least profitable farms
RETURNS AND NET INCREASES				
Dairy and dual-purpose cows	_____	$2373	$ 1704	$1865
Other dairy & dual-pur. cattle	_____	682	674	529
Beef breeding herd	_____	63	174	33
Feeder cattle	_____	353	774	324
Hogs	_____	3654	6587	2249
Sheep-farm flock	_____	65	66	44
Sheep-feeders	_____	-	-	-
Turkeys	_____	15	-	8
Chickens	_____	1084	1504	739
All productive livestock	_____	8289	11483	5791
Crops, seed, and feed	_____	769	2559	472
Agricultural conservation payments	_____	51	75	64
Income from labor off the farm	_____	106	89	281
Miscellaneous	_____	47	42	23
(1) Total returns & net increases	_____	9262	14248	6631
EXPENSES AND NET DECREASES				
Horses	_____	$ 17	$ 16	$ 19
Tractor	_____	783	922	845
Truck	_____	196	253	286
Auto (farm share)	_____	324	383	342
Elec. & gas engine exp.(F. share)	_____	128	146	153
Hired power	_____	193	156	189
Total power	_____	1641	1876	1834
Crop and general machinery	_____	782	1036	870
Livestock equipment	_____	175	224	198
Buildings, fencing, and tiling	_____	515	581	552
Misc. productive livestock exp.	_____	195	240	180
Labor	_____	815	773	1086
Real estate taxes	_____	365	496	369
Personal property tax	_____	92	111	100
Insurance	_____	68	91	57
General farm	_____	73	103	89
Interest on farm capital	_____	1706	2218	1934
(2) Total expenses & net decreases	_____	6427	7749	7269
(3) Operator's earnings (1)-(2)	_____	2835	6499	-638

* Cash receipts and expenses are adjusted for changes in inventory for each enterprise and for each item of expense in order to show total receipts and net increases, and total expenses and net decreases. The operator's earnings are the same as those on page 4.

FAMILY LIVING FROM THE FARM

The family living from the farm is the estimated value of the farm produce used in the house and shelter furnished the farmer and his family by the farm. It is a part of the income of the farm and a part of the expenses of operating the household even though cash transactions are not involved. The omission of the farm produce used in the home results in an incomplete record of both farm income and personal expense.

The value of the family living as shown in Table 4 amounts to 2.2 per cent of the total farm receipts on these farms. The values assigned are a conservative market price on the farm. If these products had been purchased, the amount paid out would have been considerably higher.

Table 4. Family Living from the Farm, 1953

Items	Your farm	Average 97 farms	Your farm	Average 97 farms
Adult equiv. - family	_____	2.8		
- others	_____	.2		
Whole milk	_____	978 qts.	_____	$66.70
Skim milk	_____	41 qts.	_____	.69
Cream	_____	37 pts.	_____	7.31
Beef	_____	426 lbs.	_____	67.54
Hogs	_____	245 lbs.	_____	49.61
Lamb and mutton	_____	2 lbs.	_____	.43
Poultry	_____	86 lbs.	_____	19.48
Eggs	_____	103 doz.	_____	39.15
Potatoes	_____	5 bu.	_____	5.43
Vegetables & fruit			_____	24.98
Farm fuel			_____	7.29
Total			_____	288.61

HOUSEHOLD AND PERSONAL EXPENSES AND RECEIPTS

Household and personal accounts are important if the family is to manage its financial affairs wisely. The household and personal expenses and receipts are presented in Table 5. These farmers spent an average of $186 per month for family living in addition to the food, fuel and housing furnished by the farm. Most of the personal receipts were in the form of veterans' compensation payments.

Table 5. Household and Personal Expenses for Those Farms Which Kept Complete Accounts of These Expenses, 1953

Items	Your farm	Average of 51 farms	10 most profitable farms	10 least profitable farms
Number of persons - family	_____	3.8	4.2	3.8
Number of adult equiv. - family	_____	2.6	2.7	2.8
other*	_____	.2	.4	.1
Food and meals bought	_____	$ 615	$614	$ 568
Operating and supplies	_____	193	284	109
Clothing and clothing materials	_____	210	247	237
Personal care, personal spending	_____	86	86	66
Furnishings and equipment	_____	176	186	160
Education, recreation and development	_____	147	47	379
Medical care and health insurance	_____	194	247	196
Church, welfare	_____	91	120	103
Personal share of auto expense	_____	103	109	131
Household share of electric expense	_____	49	51	70
H.H. & pers. share of new auto, new dwelling	_____	149	353	88
House upkeep	_____	4	8	3
Gifts and special events	_____	62	69	55
Misc. taxes	_____	3	1	13
Total cash living expenses	_____	2082	2422	2178
State and Federal income taxes	_____	37	25	50
Insurance	_____	113	156	128
Total household and personal cash expense	_____	2232	2603	2356
Food furnished by the farm	_____	$ 276	$376	238
Fuel furnished by the farm	_____	12	1	19
Total cash expenses and perquisites	_____	2520	2980	2613
Purchase of stocks, bonds, and other invest.	_____	40	119	15
Receipts:				
Income from investments	_____	$ 255	$1213	$ 57
Miscellaneous income	_____	457	303	455
Return to capital and family labor	_____	2865	4389	592

* Hired help or others boarded.

NET WORTH

A net worth statement includes a listing of all the assets and liabilities as of a given date. The difference between the farmer's total assets and his liabilities is his net worth. A net worth statement for owners, cash and crop shared renters and livestock share partnerships is presented in Table 6. Both the farm and personal assets and liabilities are included.

The difference between the operator's net worth at the beginning and at the end of the year shows the gain in net worth. It represents the financial progress that has been made during the year.

Table 6. Net Worth Statement for Those Farmers Who Kept a Complete Record of All Assets and Liabilities, 1953 (Operator's Share)

Items	Your farm Jan. 1	Your farm Dec. 31	23 owners Jan. 1	23 owners Dec. 31
Total acres in farm	———		219	
Owned	———		219	
Rented	———		--	
Total farm capital	———	———	$28432	$ 28890
Accounts receivable	———	———	44	22
Stocks and bonds	———	———	417	424
Life insurance	———	———	395	438
Outside real estate	———	———	8	704
Other outside investments	———	———	134	151
Total outside investments	———	———	954	1716
Dwelling	———	———	3173	3057
Cash on hand and in bank	———	———	317	363
Other household & personal assets	———	———	1761	1791
Total cash, household & personal assets	———	———	5251	5211
TOTAL ASSETS	———	———	34681	35839
Federal Land Bank Mortgage	———	———	629	609
Other mortg. on land operated	———	———	6447	6179
Mortgages on other real estate	———	———	--	674
Production Credit Association	———	———	392	526
Crop loans	———	———	--	--
Other chattel mortgages	———	———	1948	1237
Notes payable	———	———	506	497
Accounts payable	———	———	163	197
TOTAL LIABILITIES	———	———	10085	9919
Farmer's net worth	———	———	24596	25920
Gain in net worth		———		+1324

Items	10 part owners* Jan. 1	10 part owners* Dec. 31	32 renters** Jan. 1	32 renters** Dec. 31
Total acres in farm	279		233	
Owned	108		-	
Rented	171		233	
Total farm capital	$29176	$32652	$12195	$12971
Accounts receivable	921	865	8	6
Stocks and bonds	118	209	708	713
Life insurance	262	354	196	235
Other outside investments	137	173	422	62
Total outside investments	517	736	1327	1010
Dwelling	3597	3632	-	-
Cash on hand and in bank	785	598	238	800
Other household and personal assets	2521	2644	1967	2161
Total cash, household and pers. assets	7003	6874	2205	2961
TOTAL ASSETS	37617	41127	15734	16948
Federal Land Bank Mortgage	416	400	-	-
Other mortgages on land operated	4710	4495	-	-
Mortgages on other real estate	-	-	-	-
Production Credit Association	330	310	63	13
Crop loans	355	1696	167	282
Other chattel mortgages	334	228	1471	1399
Notes payable	2603	2559	1773	1585
Accounts payable	245	38	445	418
TOTAL LIABILITIES	8993	9726	3919	3697
Farmer's net worth	28624	31401	11816	13251
Gain in net worth		+2777		+1435

* 3 rented for cash and 7 cash and crop share.

** 8 rented for cash, 14 cash and crop share, 2 crop share and 9 livestock share.

Table 7. Summary of Farm Earnings by Tenure, 1953 (Operator's Share)

Items	Your farm	23 owners	10 part owners	32 renters
FARM RECEIPTS				
Dairy and dual-purpose cows		$ 431	$ 130	$ 326
Dairy products		2164	554	2065
Other dairy and dual-purpose cattle		262	209	336
Beef cattle (including feeders)		1573	576	253
Hogs		2671	4100	3128
Sheep and wool (including feeders)		76	17	80
Poultry (including turkeys)		155	154	137
Eggs		994	1088	829
Horses		4	-	10
Corn		537	680	416
Small grain		974	1015	279
Other crops		291	996	478
Machinery and equipment sold		145	173	149
Agricultural adjustment payments		56	149	23
Income from work off the farm		367	332	137
Miscellaneous		29	120	23
(1) Total farm sales		10729	10293	8669
(2) Increase in farm capital		458	3476	776
(3) Family living from the farm		272	215	278
(4) Total farm receipts (1)+(2)+(3)		11459	13984	9723
FARM EXPENSES				
Dairy and dual-purpose cows bought		$ 140	$ 17	$ 148
Other dairy & dual-purpose cattle bought		42	2	50
Beef cattle bought (incl. feeders)		480	670	65
Hogs bought		153	119	94
Sheep bought (including feeders)		-	-	3
Poultry bought (including turkeys)		96	121	118
Horses bought		8	-	19
Miscellaneous livestock expenses		179	155	187
Miscellaneous crop expenses		595	1021	426
Feed bought		1442	1687	1160
Custom work hired		386	258	356
Mech. power mach. (farm share)(new)		535	495	295
Mech. power mach. (farm share)(upkp.)		268	241	263
Mech. power (f. share)(gas, oil, etc.)		879	927	711
Crop and general mach. (new)		982	731	826
Crop and general mach. (upkeep)		236	335	185
Livestock equipment (new)		101	58	153
Livestock equipment (upkeep)		67	82	80
Land, buildings and fencing (new)		709	849	25
Buildings and fencing (upkeep)		174	139	77
Hired labor		293	259	204
Taxes (real estate & personal property)		426	278	73
General farm and insurance		158	163	86
Cash rent		-	564	388
Interest paid		412	332	119
(5) Total farm purchases		8761	9503	6111
(6) Decrease in farm capital		-	-	-
(7) Interest on farm capital		1021	1214	510
(8) Unpaid family labor		399	238	220
(9) Board furnished hired labor		44	47	80
(10) Total farm exp. (sum of (5) to (8))		10225	11002	6921
(11) Operator's earnings (4)-(10)		1234	2982	2802
(12) Ret. to cap. & fam. Lab. (7)+(8)+(11)		2654	4434	3532

RETURNS TO CAPITAL AND FAMILY LABOR

The return to capital and family labor represents the amount available to the operator for living expenses, payment on indebtedness, and savings. The landlord's expenses and receipts are not included.

The average return to capital and family labor for 23 owners, 10 part owners, and 32 renters is shown in Table 7. The statement includes only theoperator's share of the earnings of the partnership. The earnings as shown in Table 7 are on an actual basis as compared to the full-owner basis in Tables 2 and 3.

MANAGEMENT FACTORS AND THEIR RELATION TO EARNINGS

Every study of farm earnings shows a wide variation in earnings among farmers in a given year (figure 2). The average operator's earnings of those farmers ranking in the upper 20 per cent of the range according to earnings was $6498 and of those in the lower 20 per cent was -$637. This is a range of $7135 between the average earnings of these two groups. Some of the causes for these differences in earnings, such as weather, may be beyond the control of the individual farmer. Other factors are within his control. The more important management factors af-

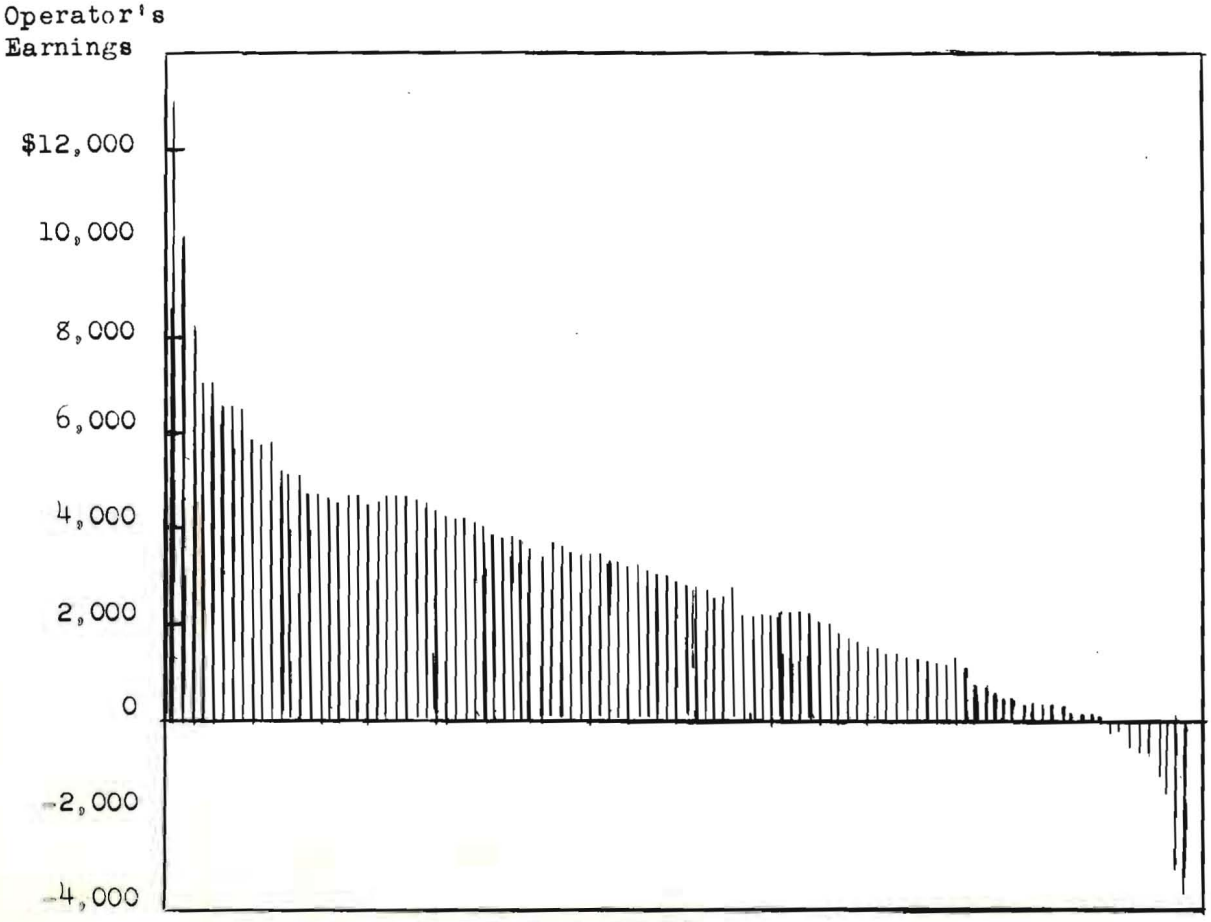

Fig. 2. Range in operator's earnings.
Each line represents the earnings of one farmer.

fecting earnings and their relationships with earnings are presented in the following tables. These factors vary from year to year in their relative influence on earnings. 1/

Crop Yields. The measure of crop yields used is the crop yield index. It is a comparison of the yield per acre of all crops on a given farm with the average yields for all farms included in the study. High crop yields make their maximum contribution to earnings if they are the result of good crop selection, the use of adapted varieties, skill and timeliness in performing the operations.

Table 8. Relation of Crop Yields to Farm Earnings

Index of crop yields		No. of	Average operator's
Range	Average	farms	earnings
Below 85	74	24	$1493
85 - 109	97	43	3142
110 and above	125	30	3468

Choice of Crops. Over a period of years certain crops have a definite advantage over others. The crops are classified on page 16 as A, B, C or D crops on the basis of their average net returns per acre. The relation of choice of crops to earnings is shown in Table 9.

Table 9. Relation of Choice of Crops to Farm Earnings

Percent of tillable land in high return crops		No. of	Average operator's
Range	Average	farms	earnings
Below 45.0	35.5	24	$2451
45.0 - 68.4	54.8	65	2883
68.5 and above	75.3	8	3596

Return from livestock. This is a measure of feeding efficiency. The majority of these farmers maintain some cattle, hogs and poultry. Most of the crops raised and some additional purchased feed are fed to livestock. Since feed is the major item of cash in livestock production, an increase in feeding efficiency results in a higher earnings.

Table 10. Relation of Returns from Productive Livestock to Farm Earnings

Index of returns for $100 feed consumed by productive livestock*		No. of	Average operator's
Range	Average	farms	earnings
Below 80	61	16	$ 507
80 - 119	99	64	1271
120 and above	140	17	4308

*The index is weighted by the number of animal units of each class of livestock.

Amount of Livestock. This factor measures the importance of livestock in the farm business. It is the amount of livestock units per 100 acres in the farm other than land in timber, roads, waste and farmstead. Livestock are important in that they add to the size of business. They provide employment throughout the year and aid in maintaining or building up the fertility of the land.

1/ See Pond, G. A. "Why Farm Earnings Vary". Minn. Agri. Expt. Sta. Bul. 386, June, 1945.

Size of Business. Productive man work units are a measure of size of business. The relationship of size of business to farm earnings is shown in Table 11. Average farm earnings tend to increase with an increase in size of business if size is accompanied by good management. For farmers operating their farms at a loss, the larger the volume of business, the larger will be the loss. Normally a large business has an advantage over a small business because they utilize more efficiently and to better advantage available labor, power, machinery, equipment and buildings.

Table 11. Relation of Size of Business to Farm Earnings

Work units Range	Average	No. of farms	Average operator's earnings
Below 255	219	27	$1883
255 - 414	334	56	3113
415 and above	478	14	3560

Work accomplished per worker. The work accomplished per worker is determined by dividing the total man work units by the number of workers on the farm during the year. An increase in the productive work accomplished per worker reduces the labor charge per unit of business. Planning of the farm work and economical use of labor-saving machinery help to increase the output of work per worker.

Table 12. Relation of Work Accomplished Per Worker to Farm Earnings.

Work units per worker Range	Average	No. of farms	Average operator's earnings
Below 190	164	23	$1747
190 - 264	225	52	2779
265 and above	292	22	4104

Control Over Expenses. The depreciation and cash cost of upkeep for power, machinery, equipment and buildings per unit of work is used as a measure of the efficiency of their use on a farm. Some farmers lack power, machinery and buildings for satisfactory operation. In case of others, an excessive investment in those items may constitute an important factor limiting earnings.

Table 13. Relation of Expenses to Farm Earnings

Expenses per work unit Range	Average	No. of farms	Average operator's earnings
$13.75 and above	$15.11	13	$2154
$ 6.35 - $13.74	9.51	73	2993
Below $6.35	5.23	11	2998

CUMULATIVE EFFECT OF EXCELLING IN A NUMBER OF MANAGEMENT FACTORS

The relation of several management factors to operator's earnings has been shown in the preceding section. Because of the large number of interrelationships between those factors the exact relationship between one factor and earnings can not be determined. The combined or cumulative influence of the seven management factors on earnings is shown in Figure 3. Insofar as these factors are within the farmer's control, he may be well paid for his efforts to improve his efficiency as measured by them.

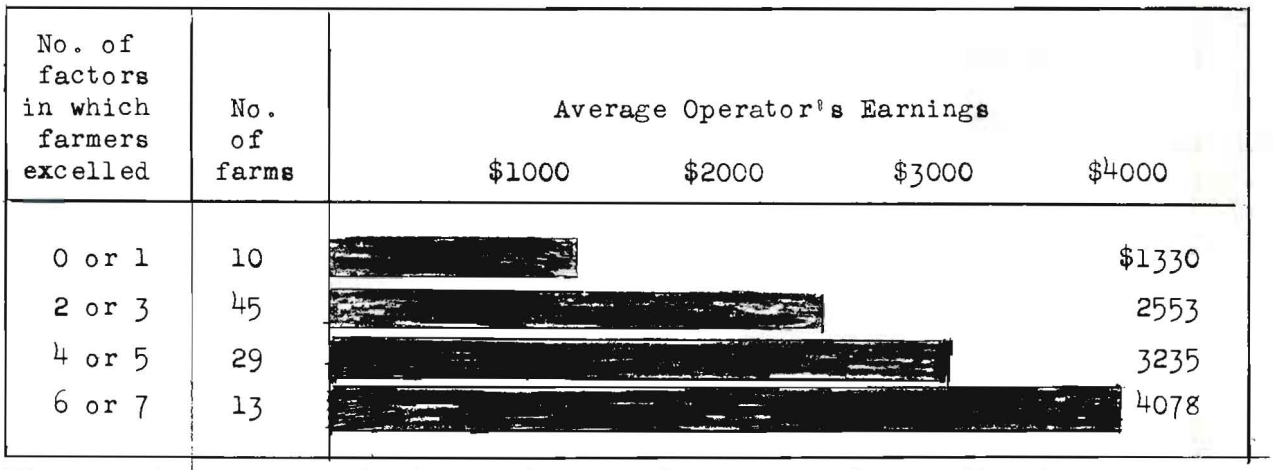

Fig. 3. Average operator's earnings on farms grouped according to number of management factors in which the farmer was above average.

The array in Figure 3 suggests that it may be well worth while for each cooperator to study carefully his ranking on pages 14 and 15, and learn his standing in respect to each of the seven factors as indicators of elements of strength and weakness in his farm business.

EXPLANATION OF "WORK UNITS"

The total "work units" for any one farm is a measure of the size of that farm business. A work unit as used in this report is the average accomplishment of a farm worker, in a ten hour day, working on crops and productive livestock at average efficiency or ten hours of work off the farm for pay. The number of work units for each class of livestock and each acre of crop are presented in Table 14.

Table 14. Number of Work Units for Each Class of Livestock and Each Acre of Crop

Item	No. of work units	Item	No. of work units
Dairy and dual-purpose cows	10.0 per cow	Small grain	.5 per acre
Other dairy & du. pur. cattle	3.5 per an. unit*	Sugar beets	1.5 per acre
Beef breeding herd	3.5 per an. unit*	Sweet corn	.7 per acre
Feeder cattle	.25 per 100 lbs.	Corn husked	.7 per acre
Sheep - farm flock	1.5 per an. unit*	Corn, hogged	.4 per acre
Sheep - feeders	.3 per 100 lbs.	Corn, shredded	1.5 per acre
Hogs	.2 per 100 lbs.	Corn, silage	1.0 per acre
Turkeys	.5 per 100 lbs.	Corn, fodder	1.0 per acre
Hens	20.0 per 100 hens	Alfalfa hay	.6 per acre
Canning peas	.5 per acre	Soybean hay	.8 per acre
Soybeans for grain	.5 per acre	Other hay crops	.4 per acre

* Animal unit represents one dairy cow or bull, two other dairy cattle, 1 1/4 beef cows or bull, 1 feeder steer or heifer, 3 1/3 other beef cattle, 7 sheep, 14 lambs, 2 1/2 hogs, 5 pigs, 50 hens or 1,100 pounds of turkeys produced.

Table 15. Measures of Farm Organization and Management Efficiency, 1953

Measures used in chart on page 15	Your farm	Average of 97 farms	19 most profitable farms	19 least profitable farms
Operator's earnings	$_____	$2835	$6499	$-638
(1) Crop yields*	_____	100	107	95
(2) Per cent tillable land in high ret. crops**	_____	51.7	50.5	54.6
(3) Ret. for $100 feed to prod. livestock***	_____	100	116	76
(4) Prod. livestock units per 100 acres****	_____	22.0	21.7	18.8
(5) Size of business - work units	_____	323	355	326
(6) Work units per worker	_____	231	254	204
(7) Pow., mach., equip., & bldg. exp. per work unit	$_____	$ 9.77	$10.64	$10.85
Items related to some of the above measures:				
(3) Index of return for $100 feed from:				
Dairy cattle (see pages 20 & 21)	_____	100	95	69
Beef cattle - breeding herd (see p. 22)	_____	100	97	16
Beef cattle - feeders (see page 22)	_____	100	100	80
Hogs (see page 19)	_____	100	109	80
Sheep - farm flock (see page 23)	_____	100	76	69
Turkeys	_____	100	--	87
Chickens (see page 24)	_____	100	103	102
(4) Number of animal units	_____	39.3	48.6	34.6
(5) Work units on crops	_____	95	126	96
Work units on productive livestock	_____	213	216	190
Other work units	_____	15	13	40
(6) Number of family workers	_____	1.2	1.1	1.4
Number of hired workers	_____	.2	.3	.2
Total number of workers	_____	1.4	1.4	1.6
(7) Power expense per work unit	_____	$5.21	$5.41	$5.78
Crop machinery expense per work unit	_____	2.39	2.91	2.65
Livestock equip. expense per work unit	_____	.55	.65	.65
Bldgs. & fencing exp. per work unit	_____	1.62	1.67	1.77

* Given as a percentage of the average.

** Crops are marked in table 16 as (A), (B), (C), and (D). All of acres in (A) crops, one half of acres in (B) crops, and one fourth of acres in (C) crops are used in calculating per cent of tillable land in high return crops.

*** An index weighted by the animal units of livestock.

**** Acres in timber not pastured, roads, waste and farmstead were not included.

Thermometer Chart

Using your figures from page 14, locate your standing with respect to the various measures of farm organization and management efficiency. The averages for the 97 farms included in this summary are located between the dotted lines across the center of this page.

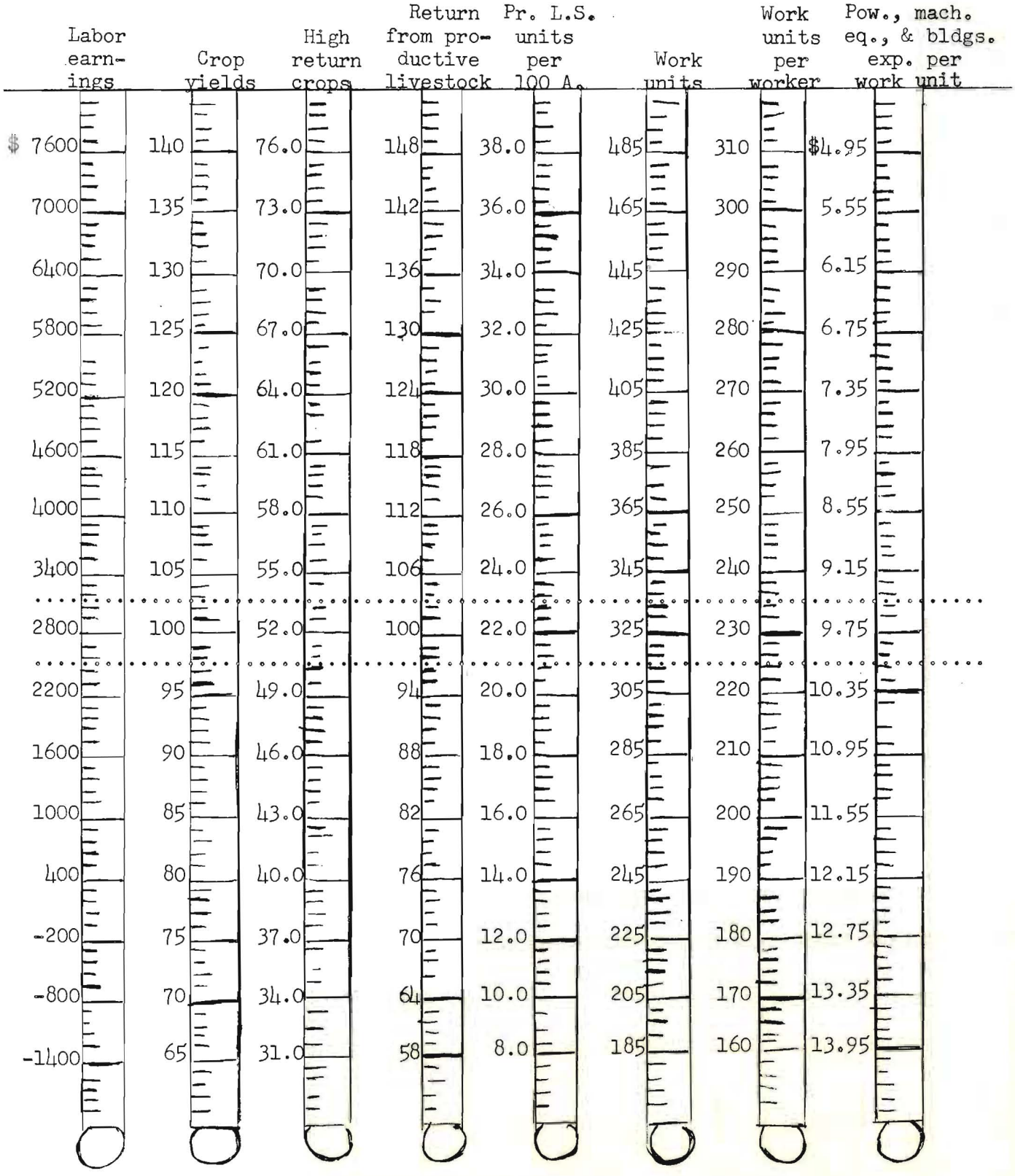

Table 16. Distribution of Acres in Farm, 1953

Crop	Crop ratings for* S. E. Minn.	S. W. Minn.	Your farm	Average of farms in S. E. Minn.	S. W. Minn.
Canning peas	A	A	_____	1.0	-
Flax	C	C	_____	1.0	21.5
Barley	D	D	_____	.7	18.1
Oats & oat mixtures	D	D	_____	32.5	43.0
Wheat	D	D	_____	1.5	5.2
Rye, millet	D	D	_____	-	2.1
Total small grain and peas			_____	36.7	89.9
Seed corn, potatoes, truck crops	A	A	_____	-	-
Corn grain	A	A	_____	41.1	52.8
Corn or sorghum silage	B	B	_____	5.5	5.9
Sweet corn	B	B	_____	2.1	-
Soybeans for grain	C	B	_____	12.6	7.9
Corn or sorghum fodder	D	D	_____	-	.1
Total cultivated crops			_____	61.3	66.7
Alfalfa hay	A	A	_____	18.6	23.5
Other legumes & mixtures	**	C	_____	5.8	2.6
Timothy & brome hay & seed	D	D	_____	2.3	1.1
Total tillable land in hay			_____	26.7	27.2
Alfalfa pasture	A	A	_____	4.9	2.8
Other legumes & mixtures	C	C	_____	6.8	4.0
Sudan and/or rape	C	C	_____	-	-
Other tillable pasture	D	D	_____	2.8	1.5
Total tillable land in pasture			_____	14.5	8.3
Tillable land not cropped	D	D	_____	2.4	.2
Total tillable land			_____	141.6	192.3
Wild hay			_____	4.3	3.5
Non-tillable pasture			_____	26.0	27.8
Timber (not pastured)			_____	9.6	2.1
Roads and waste			_____	10.9	19.0
Farmstead			_____	5.6	7.8
Total acres in farm			_____	198.0	252.5
Per cent land tillable			_____	71.5	76.2
Per cent tillable land in high return crops				55.8	48.7

* A, B, C, and D refer to ranking used in calculating per cent of tillable land in high return crops. See page 11.

** Clover was rated as a B crop and other legumes and mixtures as a C crop.

Table 17. Crop Yields Per Acre, 1953

Crop	Your farm	Average of farms growing each crop in S. E. Minn.	Average of farms growing each crop in S. W. Minn.
Canning peas, dollars	_____	$11.76	-
Flax, bu.	_____	-	9.8
Barley, bu.	_____	-	24.4
Oats, bu.	_____	34.0	35.3
Wheat, bu.	_____	22.2	10.1
Corn grain, bu.	_____	55.3	46.0
Corn silage, tons	_____	9.4	8.4
Sweet corn, tons	_____	2.5	-
Soybeans, bu.	_____	20.3	20.2
Alfalfa hay, tons	_____	2.9	2.7
Red clover hay, tons	_____	2.1	-
Other legumes & mixtures, tons	_____	1.7	1.6
Timothy or brome hay, tons	_____	1.8	2.0
Wild hay, tons	_____	.4	1.0

POWER AND MACHINERY EXPENSES

Power and machinery expense per crop acre is an indication of the economy with which capital is invested in these items. The crop acres per farm ranged from 27 to 489 with an average of 161 (Table 18). The expenses are high on the farms with a small acreage. In some cases, low expenses for labor might be offset by high power and equipment costs. The farmer is interested in operating at the lowest cost for power, machinery and labor combined.

Table 18. Power and Machinery Expenses Per Crop Acre, 1953

Items	Your farm	Average of 97 farms	19 most profitable farms	19 least profitable farms
Crop acres per farm	_____	161	219	163
Tractor and horse exp. per crop acre	_____	$5.35	$4.60	$5.94
Crop & gen. mach. exp. per crop acre	_____	5.13	4.93	5.57

AMOUNT OF LIVESTOCK

A large proportion of the farmers maintained some dairy or dual purpose cattle and hogs (Table 19). Seventy per cent of the farmers kept poultry.

Table 19. Amount of Livestock, 1953

	Your farm	Average of 97 farms	19 most profitable farms	19 least profitable farms
Number of milk cows	_____	11.3	7.8	10.7
Number of other dairy cattle	_____	13.0	10.8	12.8
Number of beef cattle (incl. feeders)	_____	7.2	13.5	10.1
Number of sheep*	_____	6.0	7.5	3.7
Number of hens	_____	164	201	117
Litters of pigs raised	_____	10	17	6
Pounds of hogs produced		15787	28289	9663

*Two lambs under six months of age considered as one head.

TOTAL FEED COSTS AND RETURNS FROM YOUR LIVESTOCK ENTERPRISES

The total "return over feed costs" for each class of livestock is shown in Table 20. This differs from the "return over feed" shown in the enterprise statement in that it is the total for each class of livestock instead of a return "per head" "per unit" or "per 100 pounds". These data indicate the relative importance of different classes of livestock as a source of income and as a market for feed. The total return is the same as the returns and net increases shown on page 5. The value of milk consumed by calves is included in the total returns from dairy or dual purpose cows and in the total feed cost for other dairy or other dual purpose cattle. The value of milk consumed by calves is not included in either the total returns or the feed cost of "all dairy" or "all dual purpose" cattle. The return over feed is not a net return, but rather the amount available from the gross income, after paying the feed bill, to cover the outlay for hired labor, power, equipment, taxes, insurance, interest and veterinary bills and to provide a return for the use of family labor and capital.

Table 20. Total Feed Costs and Returns From Your Livestock Enterprises, 1953

	Dairy or dual purpose cattle			Beef breeding herd
	Cows	Other	All	
Total returns				
Total feed cost				
Total return over feed				

	Feeder cattle	Hogs	Farm flock of sheep	Chickens
Total returns				
Total feed cost				
Total return over feed				

Feed is the largest single item of cost for all classes of livestock. However, the proportion of the total cost represented by feed varies considerably between classes of livestock. Feed makes up approximately 45 per cent of the total costs of maintaining dairy cattle and poultry, 50 per cent in the case of a farm flock of sheep, and 75 to 90 per cent for hogs, feeder cattle and feeder lambs. Consequently, it is necessary to secure a relatively higher return over feed from dairy cattle and poultry than from the other livestock enterprises in order to be able to cover all the costs other than feed.

HOGS

The return over feed cost per 100 pounds of hogs produced varied from $15.34 for those farmers ranking in the upper one-fifth in feeding efficiency to a return of $1.37 for those in the lowest one-fifth. Some of the important factors that affected return over feed were:

1. Quantity of feed required to produce 100 pounds of hogs.
2. Price received.
3. Number of pigs born per litter.
4. Number of pigs weaned per litter.

Table 21. Feed Costs and Returns from Hogs, 1953

Items	Your farm	Average of 81 farms	16 farms highest in returns above feed	16 farms lowest in returns above feed
Feed per cwt. hogs produced, lbs.:				
Corn	_____	344	223	539
Small grain	_____	116	92	230
Commercial feeds	_____	38	30	44
Total concentrates	_____	498	345	813
Skim milk and buttermilk	_____	91	112	109
Feed cost per cwt. hogs produced:				
Concentrates	$_____	$12.76	$8.74	$20.42
Skim milk and buttermilk	_____	.32	.38	.39
Pasture	_____	.11	.09	.12
TOTAL FEED COSTS	$_____	13.19	9.21	20.93
Net increase in val. per cwt. hogs prod.	_____	$23.12	$24.55	$22.30
RETURNS ABOVE FEED COST PER CWT. HOGS PRODUCED	$_____	$ 9.93	$15.34	$ 1.37
RETURNS FOR $100 OF FEED	$_____	196	$ 281	$ 114
Price received per cwt. hogs sold	$_____	$21.44	$21.93	$21.24
No. of spring litters raised	_____	8.0	6.0	4.6
No. of fall litters raised	_____	4.1	2.6	2.3
Total no. of litters raised	_____	12.1	8.6	6.9
No. of pigs born per litter	_____	8.6	9.1	7.8
No. of pigs weaned per litter	_____	6.7	7.0	5.5
Pounds of hogs produced	_____	18823	13069	9698

DAIRY AND DUAL PURPOSE CATTLE

The quantity of feed consumed, value of feeds and returns from dairy cattle are presented in Tables 22, 23, and 24. The statements include eight herds which were classified as dual purpose cattle.

The return over feed cost per cow varied from $-121.27 to $188.17 among the 79 herds covered by this study. Some of the important factors that affected the return over feed were:

1. Rate of production (pounds butterfat per cow)
2. Price received for butterfat
3. Feeding efficiency
4. Quality of ration
5. Economy of ration (Feed cost per pound butterfat)

Table 22. Factors of Cost and Returns from Dairy and Dual Purpose Cows,* 1953

Items	Your farm	Average of 79 farms	16 farms highest in butterfat per cow	16 farms lowest in butterfat per cow
Pounds of butterfat per cow		255	328	179
Price rec. per lb. B. F. sold (cents)		85.2	85.9	81.7
As cream (cents)		72.5	75.7	68.4
Other (cents)		91.5	92.0	90.5
Feeds per cow, lbs:				
Corn		1119	957	956
Small grain		927	1334	493
Commercial feeds		222	228	137
Legume hay		5129	5401	4752
Other hay		416	338	547
Fodder and stover		64	-	-
Total concentrates		2268	2519	1586
Total dry roughage		5609	5739	5299
Silage		5905	7007	4504
Feed cost per cow:				
Concentrates		$57.39	$63.88	$40.21
Roughages		62.57	68.97	55.66
Pasture		12.21	11.55	13.17
TOTAL FEED COSTS		132.17	144.40	109.04
Value of produce per cow:				
B. F. sales		$201.75	$261.83	133.14
Dairy produce used in house		7.60	6.63	7.79
Milk to livestock		15.07	20.23	13.33
Net increases in value of cows		-22.62	-22.99	-27.99
TOTAL VALUE PRODUCED		201.80	265.70	126.27
RETURNS ABOVE FEED COST PER COW		69.63	121.30	17.23
RETURNS FOR $100 OF FEED		$154	$188	$119
Feed cost per lb. B.F. (cents)		51.8	44.0	60.9
Number of cows**		13.7	15.5	12.1

* Eight herds were classified as dual purpose cattle.

** All dairy cows which have at some time in the past freshened are included in the dairy herd, and affect the average number of cows used in computing this table. There is some variation in the number of months of dry period per cow; however, this variation is small for the majority of farms.

Table 23. Feed costs and Returns from Other Dairy and Dual Purpose Cattle, 1953

Items	Your farm	Average of 78 farms*	16 farms highest in butterfat per cow	16 farms lowest in butterfat per cow*
Feeds per head, lbs.:				
Concentrates	_____	507	367	550
Hay and fodder	_____	2091	2131	2230
Silage	_____	1685	1782	1965
Skim milk	_____	390	484	235
Whole milk	_____	318	450	239
Feed cost per head:				
Concentrates	$_____	$13.56	$9.95	$13.86
Roughages	_____	21.35	22.22	23.02
Milk	_____	10.22	13.40	7.65
Pasture	_____	4.35	4.67	4.75
TOTAL FEED COSTS PER HEAD	_____	49.48	50.24	49.28
Net inc. in value of other cattle	_____	56.17	59.64	45.12
RETURNS ABOVE FEED COST PER HEAD	_____	6.69	9.40	-4.16
RETURNS FOR $100 OF FEED	$_____	$127	$124	$94
Number of head of other cattle	_____	15.4	17.2	15.0

* One farmer having both a milking herd and a beef herd, used a beef bull, and included all the young stock in the beef herd.

Table 24. Feed Costs and Returns from All Dairy and Dual Purpose Cattle, 1953

Items	Your farm	Average of 79 farms	16 farms highest in butterfat per cow	16 farms lowest in butterfat per cow
Feeds per animal unit, lbs.:				
Concentrates	_____	1798	1582	1375
Hay and fodder	_____	4990	5078	4776
Silage	_____	4934	5700	4217
TOTAL FEED COSTS PER ANIMAL UNIT	$_____	$111.30	$117.09	$96.85
Value of produce per animal unit:				
Dairy products	_____	$137.14	$173.90	$88.07
Net increase in val. of dairy cattle	_____	23.40	27.83	15.37
TOTAL VALUE PRODUCED	_____	160.54	201.73	103.44
RETURNS ABOVE FEED PER ANIMAL UNIT	$_____	49.24	84.64	6.59
RETURNS PER $100 OF FEED	$_____	$146	$176	$111
Animal units of cattle	_____	21.4	24.3	19.8

Table 25. Feed Costs and Returns from Beef Cattle, 1953

Items	Your farm	Average of all farms
Beef breeding herd: No. of farms:		10
Feeds per animal unit, lbs.:		
Concentrates	_____	411
Legume	_____	4598
Other hay	_____	307
Fodder and stover	_____	257
Silage	_____	4163
Feed cost per animal unit:		
Concentrates	$_____	$10.40
Roughages	_____	47.35
Milk*	_____	.83
Pasture	_____	16.55
TOTAL FEED COSTS	_____	75.13
Value of produce per animal unit:		
Dairy products	$_____	$ .21
Net increase in value of animals	_____	48.02
TOTAL VALUE PRODUCED	_____	48.23
RETURNS ABOVE FEED COST PER ANIMAL UNITS	$_____	-26.90
RETURNS FOR $100 OF FEED	$_____	$71
Number of cows and herd bulls	_____	15.3
Number of animal units in the herd	_____	16.8
Lbs. beef produced		8986
Feeding Cattle: No. of farms		20
Feeds per cwt. beef produced, lbs.:		
Corn	_____	497
Small grain	_____	37
Commercial feeds	_____	44
Legume hay	_____	475
Other hay	_____	64
Total concentrates	_____	578
Total hay and fodder	_____	539
Silage	_____	711
Feed cost per cwt. beef produced:		
Concentrates	$_____	$14.81
Roughages	_____	6.53
Pasture	_____	1.07
TOTAL FEED COSTS	_____	22.41
Net increase in value of feeders	_____	18.43
RETURNS ABOVE FEED COST PER CWT. BEEF PROD.	_____	-3.98
RETURNS FOR $100 OF FEED	$_____	$96
Price paid per cwt. beef bot	$_____	$15.85
Price recd. for feeder cattle sold	_____	18.94
Number of animal units	_____	19.0
Pounds of beef produced	_____	9600

* From the dairy herd

Table 26. Feed Costs and Returns from a Farm Flock of Sheep, 1953

Items	Your farm	Average of 15 farms
Feeds per head,* lbs.		
Concentrates	_____	89
Legume hay	_____	373
Other hay	_____	61
Silage	_____	149
Feed cost per head:		
Concentrates	$_____	$2.08
Roughages	_____	3.80
Pasture	_____	2.01
TOTAL FEED COSTS	$_____	7.89
Value of produce per head:		
Wool	$_____	$3.66
Net increase in value of sheep	_____	7.49
TOTAL VALUE PRODUCED	$_____	11.15
RETURNS ABOVE FEED COST PER HEAD	$_____	$3.26
RETURNS FOR $100 OF FEED	$_____	$161
Price per cwt. of lambs sold	$_____	$18.69
Price per lb. wool sold (cts.)	_____	50.3
Pounds of wool per sheep sheared	_____	9.5
Number of ewes kept for lambing	_____	28
Per cent lamb crop**	_____	94
Per cent death loss**	_____	8.2
Pounds of sheep produced	_____	1634
No. of head of sheep*	_____	37.4

* Two lambs under six months of age considered as one head.
** Lambs which die during month of birth are not included.

CHICKENS

Five out of the 68 farmers raising chickens failed to receive a return large enough to cover the cost of feed. The average return over feed from the 68 flocks included in this report was $2.16 per hen (Table 27).

Some of the important factors that affected the return over feed were:

1. Quantity of feed required per hen
2. Price received per dozen eggs sold
3. Eggs laid per hen
4. Per cent of hens that are pullets
5. Percentage death loss of hens

Table 27. Feed Costs and Returns from Chickens, 1953*

Items	Your farm	Average of 68 farms	14 farms highest in return above feed	14 farms lowest in return above feed
Feed per hen, lbs.:				
Grain	_____	95	90	106
Commercial feeds	_____	45	44	48
Total concentrates	_____	140	134	154
Skim milk and buttermilk	_____	3	8	2
TOTAL FEED COST PER HEN	$_____	$4.41	$4.02	$4.81
Value of produce per hen:				
Eggs sold and used in house	$_____	$6.14	$7.64	$4.67
Net increase in value of chickens	_____	.43	.93	.30
TOTAL VALUE PRODUCED	$_____	6.57	8.57	4.97
RETURNS ABOVE FEED COST PER HEN	$_____	$2.16	$4.55	$ .16
RETURNS FOR $100 OF FEED	$_____	$157	$217	$104
Price rec'd per doz. eggs sold (cts.)	_____	41.3	41.9	40.8
Eggs laid per hen	_____	179	220	139
Ave. no. of hens on farm during year	_____	226	251	215
Per cent of hens that are pullets	_____	86	88	83
Per cent death loss of hens	_____	15	10	18
Number of chicks started:				
Pullets	_____	219	377	285
Straight run	_____	88	39	-
Cockerels	_____	20	8	23
Lbs. chickens produced	_____	986	1493	876

* Includes feeds and returns from laying flock and rearing flock.

Table 28. Feed Costs and Returns From Chicks, 1953

Items	Your farm	Average of 8 flocks
Feed per 100 chicks raised, lbs.:		
Grain	_____	1124
Commercial feeds	_____	1080
Total concentrates	_____	2204
Skim milk	_____	291
Total feed cost per 100 chicks raised	_____	$80.41
Net increase in val. per 100 chicks	_____	90.48
Return over feed cost per 100 chicks	_____	10.07
Return for $100 of feed	_____	$129
Number of chicks bought:		
Pullets	_____	321
Straight run	_____	13
Cockerels	_____	100
Price paid per 100 chicks bought:		
Pullets	_____	$47.26
Straight run	_____	-
Cockerels	_____	-
Per cent death loss	_____	12.4
Number chicks raised	_____	380
Pounds of poultry produced	_____	1447

Table 29. Feed Cost and Returns from Laying Hens, 1953

Items	Your farm	Average of 10 flocks
Feed per hen, lbs.:		
Grain	_____	83
Commercial feeds	_____	32
Total concentrates	_____	115
Skim milk	_____	3
Total feed cost per hen	_____	$3.28
Value of produce per hen:		
Eggs sold and used in home	_____	$5.86
Less depreciation and death loss	_____	-.71
Total value produced	_____	5.15
Return above feed cost per hen	_____	$1.87
Return for $100 of feed	_____	$161
Eggs laid per hen	_____	172
Price rec'd per doz. eggs sold (cents)	_____	41.2
Ave. no. hens on farm during year	_____	220
No. of hens on hand beginning of year	_____	223
% death loss	_____	9
% of hens that are pullets	_____	88