SUMMARY REPORT
of the
SOUTHWESTERN MINNESOTA FARM MANAGEMENT SERVICE
1940-1942

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University of Minnesota
Department of Agriculture
and
United States Department of Agriculture
Bureau of Agricultural Economics
and the
County Extension Services of
Brown, Cottonwood, Faribault, Jackson, Lincoln, Lyon,
Martin, Murray, Nobles, Redwood, and Watonwan Counties
Cooperating

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Cooperator: _____

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Summary Report of the Southwest Minnesota Farm Management Service for the Years 1940, 1941, and 1942

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INTRODUCTION

The Division of Agricultural Economics and the Division of Agricultural Extension of the University of Minnesota, the Bureau of Agricultural Economics of the United States Department of Agriculture and the county extension services of several southwestern Minnesota counties are cooperating with the Southwest Minnesota Farm Management Association in maintaining a farm management service. This Association was organized in the fall of 1939 by farmers in that part of the state for the purpose of studying the farm business thru farm records. Each farmer pays an annual fee which covers a part of the cost. The balance of the cost is defrayed by the University of Minnesota.

The data included in this report were secured from the records of those farmers who cooperated in the Service continuously during the three year period, 1940 to 1942. The 92 farms included in this report were located in the following counties: Brown, Cottonwood, Faribault, Jackson, Lincoln, Lyon, Martin, Murray, Nobles, Redwood and Watonwan.

The cooperators were assisted and supervised by Mr. Ross Huntsinger, who was field agent during the period covered by this study. The records included inventories, cash receipts and expenses, a report of feed consumed by the various classes of livestock and a record of the family living secured from the farm.

The data in this report are presented very largely in terms of 3 year averages in contrast with the annual reports containing information for a single year. These three year average figures are somewhat more stable than the annual figures since to a considerable extent the effect of minor uncontrollable factors that may cause considerable variation in net returns or in efficiency of production for an individual year are reduced or eliminated. The data in this report should serve as a more stable basis for farm planning than that shown in annual reports.

Because the farmers included in this study are, in general, above the average in managerial ability and operate larger and more productive farms, they have returns materially higher than the average for this section of the state. There were, nevertheless, wide variations in the methods and practices followed by these men. It is reasonable to assume that similar variations occur among all farmers in the area. To the extent that this is true, this report should be of value to all farmers and to others interested in agriculture in that it illustrates how farm records may be used as a basis for making an analysis of a farm business and for improving the management of a farm.

Description of the Area

The soils range from dark brown to heavy black loam. The major part of the area is undulating to gently rolling land interspersed with almost level tracts. In the western part of the area the surface ranges from undulating to sharply rolling. Nearly all of the land is tillable and well drained.

The farms in this area have a wide diversity of enterprises. All classes of livestock are important although livestock kept for meat production tends to predominate. The sale of crops constitutes an important source of income. The principal feed crops grown are corn, oats, barley, and hay. In addition wheat, sweet corn, canning peas, and flax are grown to a limited extent as cash crops.

Description of the Cropping Seasons

In general, weather conditions during the three years 1940 to 1942 were very favorable for crop production. Unfavorable weather conditions in the early spring of 1940 delayed the seeding of small grain; however, the growing conditions in May and June were favorable. Corn was injured to some extent by dry weather in the latter part of July. However, conditions in September and October were very favorable for late crops and pasture.

In 1941 a considerable acreage of small grains were not seeded until early May. This was offset by favorable growing conditions during May and June. Beginning about July first, a series of hail storms devastated portions of the area. Hot, dry weather during July and August damaged small grains and pasture but was favorable for corn. In 1942 cool wet weather in May retarded the growth of vegetation, and the planting of corn and other late crops was delayed. Small grains and grasses did well in July. Heavy rains in the summer delayed haying, harvesting and threshing, and caused some damage to grain in shocks and to hay. Heavy rains, heavy snows and freezing temperatures in late September damaged late maturing corn and soybeans.

Table 1. Monthly and Annual Departure from Normal Precipitation

	Worthington			Fairmont			New Ulm			Redwood Falls		
	1940	1941	1942	1940	1941	1942	1940	1941	1942	1940	1941	1942
	Inches											
Jan.	-0.63	-0.02	-0.44	-0.57	+0.06	+0.75	-0.41	-0.36	-0.93	-0.60	-0.01	-0.73
Feb.	+0.05	+0.01	-0.36	-0.27	-0.24	+0.75	+0.50	+0.41	-0.71	-0.07	-0.15	-0.57
Mar.	+0.70	-0.12	+3.29	-0.06	-0.17	+0.86	+1.89	-0.15	+3.06	+0.68	-0.53	+1.58
Apr.	+0.67	+2.00	-0.82	-0.66	+1.28	-0.79	-0.29	+1.38	-0.46	-0.30	+1.00	-0.31
May	-2.74	-3.33	+2.42	-1.93	-1.77	-0.22	-1.91	+1.36	+2.64	-0.38	-0.73	+1.74
June	+1.38	+1.43	+1.28	+0.50	+1.84	-1.28	+2.67	+1.60	-1.67	+0.26	+1.06	-1.92
July	-3.05	-0.70	+0.75	-2.96	-1.14	+0.89	-3.16	+0.73	-0.27	-2.13	+2.44	-1.20
Aug.	-0.99	-1.69	+0.76	+5.06	-1.71	+0.96	+6.52	-3.02	-2.15	+4.20	-2.58	-1.50
Sept.	-2.84	+1.51	+1.12	-2.22	+1.25	-0.01	-2.54	+0.32	+3.07	-2.37	-0.34	+1.77
Oct.	+1.12	+1.22	-0.89	+1.53	+4.42	-0.85	+2.47	+3.74	-1.90	+1.10	+1.95	-1.28
Nov.	+1.55	+0.52	-0.66	+1.05	+0.37	-1.12	+1.14	-0.41	-0.83	+0.59	-0.71	-0.88
Dec.	+0.15	+0.26	-0.11	+0.26	-0.26	+0.05	+0.62	-0.06	+0.38	0.00	-0.30	-0.65
Total	-4.63	+1.09	+6.34	-0.27	+3.93	-3.01	+7.50	+5.54	+0.23	+0.98	+1.10	-3.95

Table 2. Summary of Farm Inventories, 1940-1942*

Items	Your farm	Average of 92 farms	18 most profitable farms	18 least profitable farms
Size of farm (acres)	_____	305	490	237
Size of business (work units)**	_____	623	925	472
Average Inventory - Beginning of Year				
Horses	$ _____	$381	$500	$412
Productive livestock (total)	_____	5128	11651	3175
Dairy and dual purpose cows	_____	581	479	551
Other dairy & dual pur. cattle	_____	371	395	376
Beef cattle (incl. feeders)	_____	2578	7744	1005
Hogs	_____	940	1490	721
Sheep (including feeders)	_____	524	1429	391
Poultry (including turkeys)	_____	134	114	131
Crop, seed, and feed	_____	4422	7670	3013
Mach. & equipment (total)	_____	3027	4880	2364
Power mach. (f. share)	_____	1155	1803	940
Crop & gen. mach. (f. share)	_____	1480	2435	1073
Livestock equip. & supplies	_____	392	642	351
Buildings, fences, etc.	_____	7676	10370	7089
Land	_____	16180	28083	12693
Total farm capital	_____	36814	63154	28746
Average Inventory - End of Year				
Horses	$ _____	$373	$510	$388
Productive livestock (total)	_____	6558	15120	3784
Dairy & dual purpose cows	_____	621	530	600
Other dairy & dual pur. cattle	_____	398	345	454
Beef cattle (incl. feeders)	_____	3123	9484	1171
Hogs	_____	1532	2381	1030
Sheep (including feeders)	_____	710	2230	363
Poultry (including turkeys)	_____	174	150	166
Crop, seeds, and feed	_____	4856	8545	3078
Mach. & equipment (total)	_____	3312	5337	2501
Power mach. (f. share)	_____	1248	1942	1002
Crop & gen. mach.	_____	1630	2713	1129
Livestock equipment & supplies	_____	434	682	370
Buildings, fences, etc.	_____	7795	10592	7102
Land	_____	16180	28083	12693
Total farm capital	_____	39074	68187	29546

* For the purpose of comparison the inventories as shown in this table and the earnings as shown elsewhere in this report are presented on a full-owner basis. The assets, expenses and receipts of the landlord were included in the statements for rented farms.

** See page 32 for an explanation of the term "work units".

Table 3. Net Worth Statement for those Farmers Who Kept a Complete Record of All Assets and Liabilities

	Your farm	33 owned farms	19 part-owned farms	13 rented farms
Net Worth Statement, January 1, 1940				
Total acres in farm	_____	236.5	405.5	214.5
Owned	_____	236.5	208.8	-
Rented	_____	-	196.7	214.5
Total farm capital	$_____	$28410	$29298	$7337
Accounts receivable	_____	569	615	274
Household and personal assets	_____	2840	3951	1985
Total assets	_____	$31819	$33864	$9596
Total liabilities	_____	12625	12032	2310
Real estate mortgages	_____	8715	7648	-
Chattel mortgages	_____	999	832	558
Sealed grain	_____	914	1228	614
Notes	_____	1602	1869	679
Accounts payable	_____	395	455	459
Farmer's net worth	$_____	$19194	$21832	$7286
Net Worth Statement, December 31, 1942				
Total acres in farm	_____	237.8	405.6	217.0
Owned	_____	237.8	240.9	-
Rented	_____	-	164.7	217.0
Total farm capital	$_____	$33675	$41511	$11975
Accounts receivable	_____	509	219	81
Household and personal assets	_____	4098	6606	4446
Total assets	_____	$38282	$48336	$16502
Total liabilities	_____	11419	10935	1567
Federal Land Bank	_____	3506	3210	-
Land Bank Commissioner	_____	265	157	-
Other real estate mortgages	_____	4584	1758	400
Production Credit Association	_____	217	502	79
Other chattel mortgages	_____	945	3507	376
Sealed grain	_____	521	495	366
Notes	_____	1160	1111	207
Accounts payable	_____	221	195	139
Farmer's net worth	$_____	$26863	$37401	$14935

Table 4. Summary of Farm Earnings on 92 Farms by Years*

Items	1940	1941	1942
FARM EXPENSES			
Horses bought	$ 31	$ 29	$ 52
Dairy and dual-purpose cattle bought	72	73	114
Beef cattle bought (including feeders)	1988	2278	2320
Hogs bought	103	221	333
Sheep bought (including feeders)	541	588	966
Poultry bought (including turkeys)	86	101	118
Miscellaneous crop expenses	272	315	401
Feed bought	1214	1886	2313
Power machinery (farm share) (new)	426	479	266
Power machinery (farm share) (upkeep)	419	507	561
Custom work hired	144	142	190
Crop and general machinery (new)	341	438	394
Crop and general machinery (upkeep)	77	92	146
Livestock equipment (new)	76	107	118
Livestock equipment (upkeep)	20	33	50
Miscellaneous livestock expense	74	97	144
Buildings and fencing (new)	441	490	336
Buildings and fencing (upkeep)	102	136	193
Hired labor	521	629	700
Taxes	345	347	370
Insurance	18	35	38
General farm	58	56	65
(1) Total farm purchases	$7369	$9079	$10188
(2) Decrease in farm capital	-	-	-
(3) Board furnished hired labor	155	171	153
(4) Interest on farm capital	1751	1894	2046
(5) Unpaid family labor	214	267	368
(6) Total farm expenses (Sum of (1) to (5)	$9489	$11411	$12755
FARM RECEIPTS			
Horses	$ 36	$ 43	$ 50
Dairy and dual-purpose cattle	277	286	460
Dairy products	561	693	863
Beef cattle (including feeders)	3375	3941	5216
Hogs	1276	2365	4367
Sheep and wool (including feeders)	597	875	1252
Poultry (including turkeys)	305	392	568
Eggs	214	348	627
Corn	511	446	683
Small grain	817	1161	1182
Other crops	220	320	472
Power machinery sold	176	214	59
Crop and general machinery sold	82	66	56
Miscellaneous	405	186	175
Income from work off the farm	169	197	140
Agricultural Adjustment payments	539	533	554
(7) Total farm sales	$9560	$12066	$16724
(8) Increase in farm capital	1675	3339	1767
(9) Family living from farm	504	545	624
(10) Total farm receipts (7) + (8) + (9)	$11739	$15950	$19115
(6) Total farm expenses	9489	11411	12755
(11) Operator's labor earnings (10) - (6)	2250	4539	6360

* The financial statements differ in that the unpaid family labor rate was $45 per month in 1940, $50 in 1941 and $60 in 1942; and the board for hired labor was calculated at $18 per month in 1940, $20 in 1941 and $25 in 1942.

Table 5. Summary of Farm Earnings (Cash Statement), 1940-1942

Items	Your farm	Average of 92 farms	18 most profitable farms	18 least profitable farms
FARM EXPENSES				
Horses bought	$_____	$ 37	$ 64	$ 32
Dairy and dual-purpose cows bought	_____	46	43	25
Other dairy & dual-pur.cattle bought	_____	40	28	53
Beef cattle bought (incl. feeders)	_____	2195	7118	680
Hogs bought	_____	219	383	125
Sheep bought (including feeders)	_____	699	2622	223
Poultry bought (including turkeys)	_____	102	264	65
Misc. crop expenses	_____	329	552	221
Feed bought	_____	1804	5052	961
Power mach. (farm share) (new)	_____	390	611	273
Power mach. (farm share) (upkeep)	_____	496	761	383
Custom work hired	_____	159	180	130
Crop and general mach. (new)	_____	391	741	215
Crop and general mach. (upkeep)	_____	105	181	79
Livestock equipment (new)	_____	100	137	68
Livestock equipment (upkeep)	_____	34	65	30
Misc. livestock expense	_____	105	175	81
Buildings and fencing (new)	_____	422	559	312
Buildings and fencing (upkeep)	_____	144	201	124
Hired labor	_____	617	1182	393
Taxes	_____	354	626	281
Insurance	_____	30	45	21
General farm	_____	60	72	50
(1) Total farm purchases	$_____	$8878	$21662	$4825
(2) Decrease in farm capital	_____	-	-	-
(3) Board furnished hired labor	_____	159	327	108
(4) Interest on farm capital	_____	1897	3284	1457
(5) Unpaid family labor	_____	284	360	236
(6) Total farm expenses(Sum of(1)to (5)	$_____	$11218	$25633	$6626
FARM RECEIPTS				
Horses	$_____	$ 43	$ 31	$ 68
Dairy and dual-purpose cows	_____	159	159	142
Dairy products	_____	706	623	699
Other dairy and dual-purpose cattle	_____	182	114	251
Beef cattle (including feeders)	_____	4177	13104	1374
Hogs	_____	2669	4201	1877
Sheep and wool (including feeders)	_____	908	2948	460
Poultry (including turkeys)	_____	422	1500	198
Eggs	_____	396	308	324
Corn	_____	546	883	247
Small grain	_____	1054	2171	430
Other crops	_____	337	499	211
Power machinery sold	_____	150	219	105
Crop and gen. mach. sold	_____	68	153	38
Misc.	_____	255	496	145
Income from work off the farm	_____	169	120	84
Agricultural Adjustment payments	_____	542	943	377
(7) Total farm sales	$_____	$12783	$28472	$7030
(8) Increase in farm capital	_____	2260	5033	800
(9) Family living from farm	_____	558	679	516
(10) Total farm receipts (7)+(8)+(9)	$_____	$15601	$34184	8346
(6) Total farm expenses	_____	11218	25633	6626
(11) Operator's labor earnings(10)-(6)	_____	4383	8551	1720

Table 6. Summary of Farm Earnings (Enterprise Statement), 1940-1942*

Items	Your farm	Average of 92 farms	18 most profitable farms	18 least profitable farms
EXPENSES AND NET DECREASES				
Total power	$____	$ 828	$1268	$ 672
Horses	____	162	262	142
Tractor	____	303	483	234
Truck	____	101	226	73
Auto (farm share)	____	150	166	129
Gas engine (farm share)	____	3	2	3
Elec. plant or current (farm share)	____	37	48	33
Hired power	____	72	81	58
Crop and general machinery	____	283	475	223
Livestock equipment	____	85	152	68
Buildings, fencing and tiling	____	315	381	299
Misc. productive livestock expense	____	100	174	68
Labor	____	1093	1908	767
Real estate taxes	____	287	492	227
Personal property tax	____	67	134	54
Insurance	____	30	45	21
General farm	____	60	72	50
Interest on farm capital	____	1897	3284	1457
(1) Total expenses & net decreases	$____	$5045	$8385	$3906
RETURNS AND NET INCREASES				
All productive livestock	$____	$8085	$16317	$5083
Dairy and dual-purpose cows	____	876	803	904
Other dairy & dual-purpose cattle	____	367	283	425
Beef breeding herd	____	409	561	181
Feeder cattle	____	2136	7138	725
Hogs	____	3099	4761	2155
Sheep - farm flock	____	152	184	127
Sheep - feeders	____	238	948	27
Turkeys	____	247	1196	64
Chickens	____	561	443	475
Crops, seed and feed	____	357	-926	-130
Income from work off the farm	____	169	120	84
Agricultural Conservation payments	____	542	943	377
Miscellaneous	____	275	482	212
(2) Total returns & net increases	____	9428	16936	5626
(1) Total expenses & net decreases	____	5045	8385	3906
(3) Oper. labor earnings (2)minus(1)	$____	4383	8551	1720

* 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 labor earnings are the same as those in Table 5.

Table 7. Family Living From the Farm, 1940-1942

Items	Your farm	Average 92 farms	18 most profitable farms	18 least profitable farms	Your farm	Average 92 farms	18 most profitable farms	18 least profitable farms
No.of persons(Family	____	3.6	3.9	3.2				
adult equiv.(Other*	____	.7	1.4	.5				
Wholemilk	____	1178 qts.	1536	978	$____	$39.88	$49.99	$32.81
Skim milk	____	487 qts.	797	227	____	1.91	3.12	.89
Cream	____	307 pts.	390	303	____	34.32	43.54	33.89
Farm made butter	____	16 lbs.	17	19	____	5.63	5.22	7.05
Eggs	____	176 doz.	208	167	____	34.82	41.62	32.49
Cattle	____	453 lbs.	599	476	____	40.23	58.24	39.23
Hogs	____	545 lbs.	621	451	____	46.99	50.91	37.54
Sheep	____	9 lbs.	3	12	____	.88	.33	.99
Poultry	____	121 lbs.	143	124	____	15.68	17.97	15.49
Potatoes	____	16 bu.	18	13	____	11.26	12.46	9.88
Vegetables & fruits					____	46.03	60.88	37.87
Farm fuel					____	20.44	16.31	17.31
Rental vl.of house					____	259.59	318.30	250.10
Total					____	$557.66	$678.89	$515.54

Table 8. Household and Personal Expenses for Those Farms Which Kept Complete Accounts of These Expenses, 1940-1942

Items	Your farm	Average of 60 farms	12 most profitable farms	12 least profitable farms
Number of persons - family	____	5.0	5.4	4.1
Number of persons, (Family)	____	3.9	4.2	3.2
adult equivalent (Other*	____	.7	1.3	.6
Food and meals bought	$____	$369	$482	$285
Operating and supplies	____	141	188	105
Clothing and clothing materials	____	214	312	117
Personal care, personal spending	____	74	136	36
Furnishings and equipment	____	128	156	81
Education, recreation and development	____	122	234	56
Medical care and health insurance	____	118	163	81
Church, welfare, gifts and income tax	____	133	225	83
Personal share of auto expense	____	103	148	77
Household share of elect.& gas eng. exp.	____	40	58	32
H.H.&pers.shr.of new auto,gas eng.& motors bot.	____	73	119	47
Life insurance and other investments	____	350	585	133
Total household and personal cash expenses	____	1865	2806	1133
Food furnished by the farm	____	294	354	248
Fuel furnished by the farm	____	22	23	13
House rental	____	262	317	256
Total household and personal expenses	____	$2443	$3500	$1650

* Hired help or others boarded.

ANALYSIS OF THE REASONS FOR DIFFERENCES IN OPERATOR'S EARNINGS

The operator's labor earnings varied widely among the farmers included in this study. The average labor earnings of those farmers ranking in the upper 20 per cent in the range according to earnings was $8,551 and of those in the lower 20 per cent, $1,720. This is a range of $6,831 between the average earnings of these two groups.

There were likewise variations between years on the same farm. The variations between years were determined by ranking the 92 farms from high to low on the basis of the 1940-1942 average earnings and for each of the three years included in this study. The deviations from the 1940-1942 rank were then noted. For example, one farmer was number 15 on the basis of the three-year average earnings, number 22 in 1940, 25 in 1941 and 14 in 1942 or an average deviation of six from the 1940-1942 rank. Another farmer was number 47 on the basis of the three-year average earnings, number 50 in both 1940 and 1941 and 44 in 1942 or an average deviation of 3 from the 1940-1942 rank. Fifty-one per cent of the farmers had an average yearly deviation from their three-year average rank of less than 10 and 90 per cent had less than 20.

In general the yearly deviations from the 1940-1942 rank were relatively small (Table 9). The farmers in the upper and lower 20 per cent in the range according to earnings had an average deviation of 8.7 and 8.1 respectively. The average deviation for all farms was 10.5. In other words, if a farmer ranked 15th in his average earnings and had a yearly deviation of 10, he would be expected to fluctuate between 5th place and 25th place in the rank of earnings during 1940, 1941 and 1942.

Table 9. Deviations from the 1940-1942 Ranked Earnings

Farms grouped according to earnings	Average deviation from the 1940-1942 rank
Highest 20 per cent	8.7
Next 20 per cent	11.1
Next 20 per cent	14.8
Next 20 per cent	10.0
Lowest 20 per cent	8.1
All farms	10.5

It is interesting to note that there was less year-to-year deviation in earnings among the farmers in the upper and lower group than in the intermediate groups. Earnings are high or low in any given year principally because of certain factors that are more or less inherent in the organization of the farm. The farmer with a good farm well organized and skillfully managed is likely to have a consistently high rank in earnings from year to year unless he is a victim in a particular year of some unusual and uncontrollable circumstance. Of the 18 farmers whose earnings ranked in the upper 20 per cent for the three-year period six failed to achieve that ranking in 1940. Three of these six men experienced heavy livestock losses in the November 11 storm and one had low yields of small grain because of rain damage to grain in shocks. Six of these 18 farmers failed to place in the top one-fifth in 1941. Four of these six suffered up to 85 per cent hail loss on crops. Three of these farmers failed to place in the top one-fifth in 1942. Two of the three farmers had severe crop losses because of unfavorable weather conditions.

Those farmers in the lower 20 per cent ranked according to earnings also showed little deviation from year to year. A low ranking in the factors affecting farm success that results from limitation in the size and quality of the farm and in the organization and management keep the earnings consistently low. In 1940 one farmer in this group ranked above the lower 40 per cent in earnings. Otherwise all of the farmers in the low earnings group were consistently low from year to year. In the intermediate group the rankings in earnings are much more variable from year to year.

The more important of these organization and management factors affecting earnings and their relationships with earnings are presented in the following tables.

Table 10. Relation of Crop Yields to Farm Earnings

Per cent crop yields were of the average for all 92 farms		No. of farms	Average operator's labor earnings
Group	Average		
Below 86	77	19	$2,658
86-113	101	53	4,786
114 and above	122	20	4,951

High production per acre, up to certain limits, tends to lower the cost per bushel of grain or per ton of hay. Any possible method of management that will increase crop yields and therefore lower cost of production more than the extra expense incurred in securing the higher yields should be given consideration.

Table 11. Relation of Choice of Crops to Farm Earnings

Per cent of tillable land in high return crops*		No. of farms	Average operator's labor earnings
Group	Average		
Below 33.0	29.8	22	$3,696
33.0-42.0	37.7	49	4,140
42.0 & above	45.1	21	5,670

*Crops are marked on page 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.

Farmers' earnings are affected by the choice of crops as well as by the yields of crops. As a rule, on these farms, such crops as alfalfa, clover, canning crops, sugar beets, corn, and flax bring a higher net return per acre than other crops usually grown. Additions can be made to earnings by putting as high a percentage as possible of the tillable land into these higher return crops.

Table 12. Relation of Returns from Productive Livestock to Farm Earnings

Index of returns for $100 feed fed to productive livestock* Group	Average	No. of farms**	Average operator's labor earnings
Below 89	82	20	$3,315
89-109	100	52	4,525
110 and above	118	19	5,087

* The index is weighted by the number of animal units.
** One farmer did not raise livestock.

The majority of these farms are livestock farms. A large proportion of the crops raised are fed on the farm and some additional feed is purchased. Feed is the major item of cost in livestock production and livestock constitutes an important source of income on these farms. Hence there is a marked relationship between returns for $100 of feed and operator's labor earnings on these farms. There are a number of reasons for differences among farms in livestock returns. High productivity per animal and economy in the use of feed and labor are important. Other factors of considerable importance are kind of feed used, quality of pastures, balance of ration, degree of sanitation, and kind of shelter and equipment.

Table 13. Relation of Amount of Productive Livestock to Farm Earnings

Productive livestock units per 100 acres* Group	Average	No. of farms	Average operator's labor earnings
Below 17.0	13.1	24	$3,566
17.0-29.9	23.0	45	3,896
30.0 and above	39.5	23	6,188

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

On some farms the returns from livestock are so low that they do not cover feed and other costs. Such livestock is unprofitable, especially if there is more than enough to utilize what would otherwise be waste feed. If the livestock is yielding a net return, an increased amount of livestock adds to size of business and the opportunity to increase the farm earnings. Livestock produces manure and aids in keeping up the fertility of the land, and utilizes waste products on the farm. Livestock also helps to provide productive employment throughout the year. Any method that aids in utilizing the available resources to full and efficient capacity should add to the farm income.

Table 14. Relation of Size of Business (Work Units) to Farm Earnings

No. of work units Group	Average	No. of farms	Average operator's labor earnings
Below 400	345	19	$2,566
400-699	559	47	3,876
700 and above	940	26	6,628

The size of the farming operations is one of the important factors affecting the earnings of farmers. On the average, the farmers with a large business had larger earnings than the farmers with a small business. The size of the farm business is here measured in terms of the number of work units. For farmers operating their farms at a loss, the larger the volume of business, the larger will be the loss; but a farmer who is making a profit could make a larger profit if he increased his size of business, providing that in so doing he does not lower materially the efficiency in some one or more important branches of his business. Those farmers who have large businesses usually have more flexibility of their organization than does the man with a small business, and can utilize more efficiently and to better advantage available labor, power, machinery and buildings. The size of the farm business may be increased by farming more land, by keeping more livestock, or by keeping livestock or growing crops of a more intensive type.

Table 15. Relation of Amount of Work Accomplished per Worker to Farm Earnings

Work units per worker Group	Average	No. of farms	Average operator's labor earnings
Below 230	197	24	$3,226
230-300	263	48	4,606
300 and above	336	20	5,237

Farmers' earnings are generally higher on those farms on which a large amount of work is accomplished per worker. More days of productive work accomplished per worker reduces the labor charge per unit of business. High labor accomplishment can be secured in several ways. In the first place, the business must be large enough so that there will be at least sufficient work available for the family labor. The farm should be so organized that the labor requirements are well distributed throughout the year. Handling pastures in such a way that as large a proportion as possible of the year's feed for livestock may be obtained from them helps to reduce labor requirements. Proper planning of the farm work and economical use of labor-saving machinery help to increase the work accomplished per worker.

Table 16. Relation of Power, Machinery, Equipment and Building Expense to Farm Earnings*

Expense per work unit Group	Average	No. of farms	Average operator's labor earnings
$2.85 and above	$3.36	20	$3,918
$2.00 - $2.85	2.39	53	4,507
Below $2.00	1.69	19	4,527

*Includes building, fencing, all crop machinery and livestock equipment, horse feed, and miscellaneous horse expense.

The expense factor does not show as high relationship with earnings when prices are high as when they are low. Some farms are under-equipped. On a few farms, excessive expenses constitute the main factor causing earnings to be very low.

Some of the cash expenses can be kept down by careful management. Oftentimes necessary repairs and improvements can be made by using the available farm

labor rather than by hiring extra help. Repairs and overhauling should be done before spring work begins insofar as possible; or on rainy days or in other spare time during the summer. Reducing the number of horses to the minimum required for efficient operation of the farm helps reduce the power expense. In some cases, farmers can offset some or all of the power and machinery expense by using their equipment for outside work.

EFFECT OF WELL-BALANCED EFFICIENCY ON FARM PROFITS

It is quite evident from this report that few farmers have a monopoly on efficiency. Quite often farm operators show efficient management in one part of the farm business, which is offset by poor results in other phases. These farmers get medium returns while those who fall down all along the line get the lowest returns; and on the other hand those few who can manage to attain high efficiency in all parts of their organization receive returns well above the average. This is well illustrated in Table 17.

Table 17. Relation of Operator's Labor Earnings to the Number of Factors in which the Farmer is Above Average

No. of factors in which farm excels	No. of farms	Your farm	The length of the shaded lines are in proportion to the average operator's labor earnings	Average operator's labor earnings
None or One	11		xxxxxxxxxxxxxx	$2,582
Two	18		xxxxxxxxxxxxxxxx	2,784
Three	19		xxxxxxxxxxxxxxxxxxxxx	3,781
Four	20		xxxxxxxxxxxxxxxxxxxxxxxx	4,457
Five	11		xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	6,574
Six or seven	13		xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	7,031

The array in Table 17 indicates that it will be 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 above factors and the elements of strength and weakness in his farm business.

Table 18. Measures of Farm Organization and Management Efficiency, 1940-1942

Measures used in chart on page 15		Your farm	Average of 92 farms	18 most profitable farms	18 least profitable farms
Operator's labor earnings	$	____	$4,383	$8,551	$1,720
(1) Crop yields*		____	100	110	88
(2) % of tillable land in high return crops**		____	37.5	39.4	36.6
(3) Ret. for $100 feed to productive livestock***		____	100	107	94
(4) Productive livestock units per 100 acres****		____	24.4	33.2	22.5
(5) Size of business - work units		____	623	925	472
(6) Work units per worker		____	260	272	236
(7) Pow.,mach.,equip.,& bldg.exp.per work unit	$	____	$2.45	$2.44	$2.64
Measures and items related to some of the above measures:					
(3) Index of return for $100 feed from -					
Dairy cattle		____	100	112	92
Dual-purpose cattle		____	100	99	103
Beef cattle - breeding herd		____	100	95	89
Beef cattle - feeders		____	100	108	79
Hogs		____	100	100	99
Sheep - farm flock		____	100	102	98
Sheep - feeders		____	100	112	-
Turkeys		____	100	101	96
Chickens		____	100	102	92
(5) Work units on crops		____	227	357	169
Work units on productive livestock		____	354	538	282
Other work units		____	42	30	21
(6) Total number of workers		____	2.4	3.4	2.0
Number of family workers		____	1.4	1.6	1.3
Number of hired workers		____	1.0	1.8	.7
(7) Power expense per work unit	$	____	$1.35	$1.35	$1.43
Crop machinery expense per work unit		____	.44	.50	.46
Livestock equip. expense per work unit		____	.14	.17	.15
Bldgs. and fencing exp. per work unit		____	.52	.42	.60

* Given as a percentage of the average.

** Crops are marked in Table 19 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 92 farms included in this summary are located between the dotted lines across the center of this page.

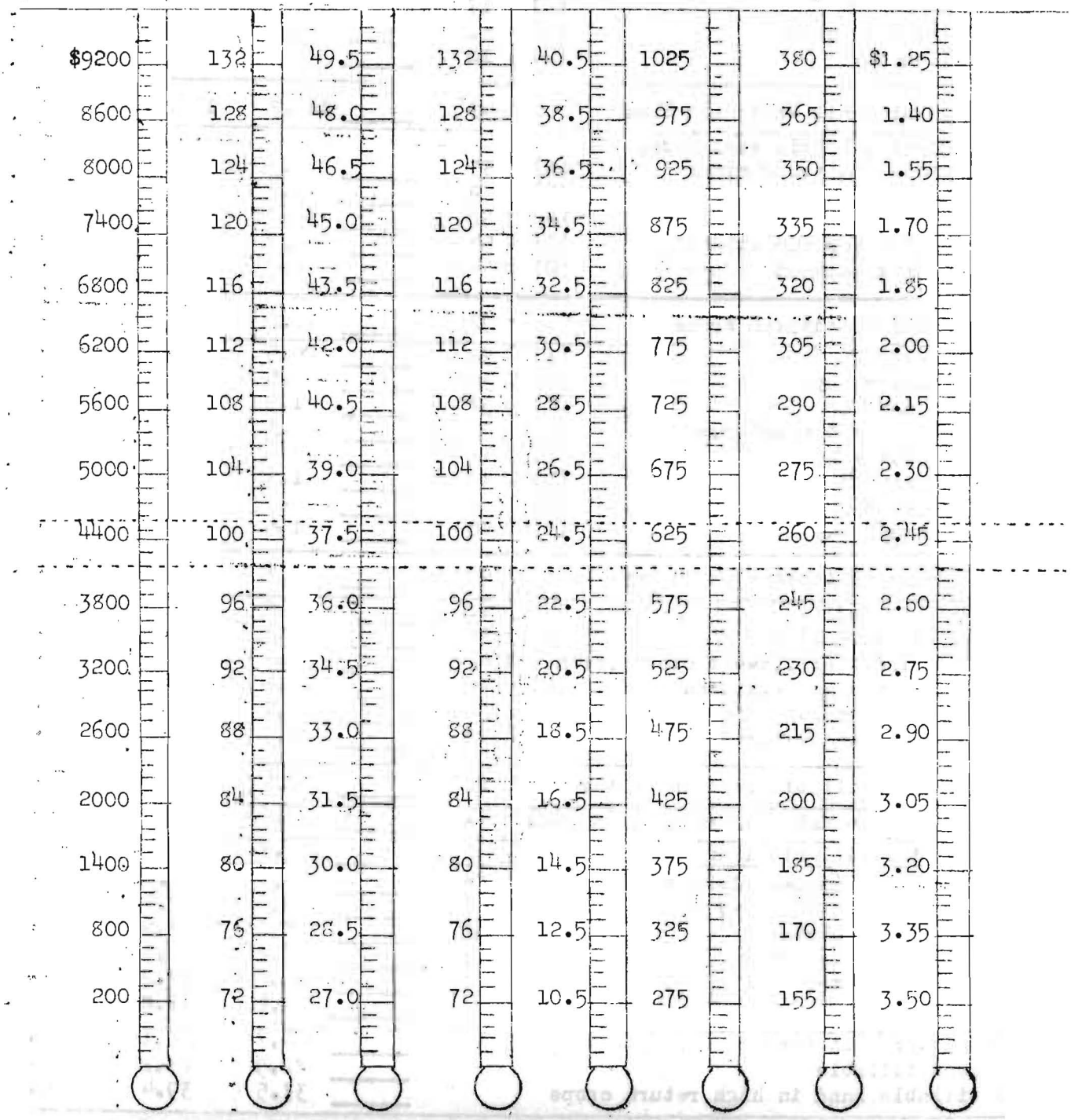

Table 19. Distribution of Acres in Farm, 1940-1942

Crop: (A) (B) (C) and (D) refer to ranking used in calculating % of tillable land in High Return Crops (see page 14)		No. growing this crop	Your farm	Average of 92 farms	18 most profitable farms	18 least profitable farms
Canning peas	(A)	9		1.8	2.1	5.5
Flax	(B)	89		35.8	65.0	20.7
Barley	(C)	64		19.9	38.9	13.2
Barley and oats	(C)	19		6.5	16.2	.2
Wheat	(D)	39		3.7	2.4	4.9
Oats	(D)	86		33.3	34.7	27.8
Oats and wheat	(D)	10		1.3	1.7	2.3
Rye	(D)	17		1.4	.3	1.1
Soybeans for grain	(D)	62		6.7	14.9	1.9
Miscellaneous	(D)	10		.4	.1	.3
Total Small Grain and Peas		92		110.8	176.3	78.4
Sugar beets, hybrid seed corn, potatoes and truck crops	(A)	55		2.3	.6	.6
Sweet corn	(B)	9		1.3	1.5	2.9
Corn grain	(B)	92		64.3	107.9	42.7
Corn and/or sorghum silage	(C)	54		6.9	13.9	4.9
Corn and/or sorghum fodder	(D)	54		2.4	2.8	4.2
Total cultivated crops		92		77.2	126.7	55.3
Alfalfa hay	(A)	92		20.5	37.9	15.6
Sweet clover hay	(B)	30		2.0	2.4	2.2
Soybean hay	(C)	57		1.9	2.1	2.3
Mixed legumes & non-legumes	(C)	50		4.3	6.1	1.1
Legumes for seed	(C)	12		.6	1.2	1.1
Timothy and/or brome	(D)	32		1.9	3.2	1.3
Timothy seed	(D)	1		-	-	-
Other annual hay	(D)	40		1.5	3.9	.9
Total tillable land in hay		92		32.7	56.8	24.5
Alfalfa pasture	(A)	49		2.0	3.1	1.4
Sweet clover pasture	(B)	54		8.7	14.2	7.6
Mixture incl. alf., sweet clover, brome	(B)	42		4.6	8.0	2.0
Other legumes and mixtures	(C)	39		3.1	3.9	2.1
Sudan grass and/or rape	(C)	50		2.1	2.4	1.3
Other tillable pasture	(D)	73		8.9	12.1	11.4
Total tillable land in pasture		91		29.4	43.7	25.8
Tillable land not cropped	(D)	54		2.6	4.5	1.2
Total tillable land				252.7	408.0	185.2
Phalaris hay (non-tillable)		6		.2	.3	.3
Wild hay (non-tillable)		41		5.6	4.4	8.4
Non-tillable pasture		66		25.6	47.9	25.7
Timber (not pastured)		21		.8	.5	1.8
Roads and waste				10.2	17.2	7.1
Farmstead				9.6	11.8	8.0
Total acres in farm				304.7	490.1	236.5
% land tillable				82.9	83.2	78.3
% tillable land in high return crops				37.5	39.4	36.6

Table 20. Crop Yields per Acre, 1940-1942

Crop	Your farm	Average of 92 farms	18 most profitable farms	18 least profitable farms
Canning peas, value above seed cost	$_____	$30.71	$39.22	$18.19
Flax, bu.	_____	12.4	13.8	10.5
Barley, bu.	_____	32.0	36.6	26.9
Barley and oats, bu.	_____	37.9	44.8	-
Wheat, bu.	_____	17.3	18.0	12.7
Oats, bu.	_____	45.4	51.8	41.0
Oats and wheat, bu.	_____	44.0	44.4	41.3
Rye, bu.	_____	16.5	27.1	14.5
Soybeans for grain, bu.	_____	11.7	14.0	8.1
Sweet corn, tons	_____	3.2	4.0	2.3
Corn, grain, bu.	_____	53.9	57.2	48.4
Corn and/or sorghum silage, tons	_____	9.3	9.5	8.3
Corn and/or sorghum fodder, tons	_____	2.9	3.6	2.4
Alfalfa hay, tons	_____	2.2	2.1	2.3
Sweet clover hay, tons	_____	1.3	1.7	.9
Soybean hay, tons	_____	1.5	1.5	1.0
Mixed legume & non-legume hay, tons	_____	1.9	2.0	2.2
Legumes for seed, lbs.	_____	129	99	146
Timothy and/or brome hay, tons	_____	1.1	1.8	.9
Other annual hay, tons	_____	1.3	1.4	1.2
Phalaris hay on non-tillable land, tons	_____	1.2	1.4	.9
Wild hay, tons	_____	.9	1.1	.9

SOURCE AND DISPOSAL OF FEED GRAINS

Corn is by far the most important single feed grain crop on the farms studied (Table 21). Seventy-three per cent of the feed grains fed on these farms was corn. Oats ranked second and barley was third. The other feed grain crops are of minor importance.

Although weather conditions during the period 1940-1942 were, in general, very favorable for crop production there was not much change in inventory carry-over at the end of the year as compared to the average amount on hand at the beginning of the year. Part of this is due to a smaller amount of sealed grain on hand at the end of the period than at the beginning. All sealed grain has been included in inventories and is one of the reasons for the large inventory stocks. Another reason that feed reserves have not increased with increased crop production is that livestock numbers have been increased even more rapidly than feed production. Wheat purchases during the period were larger than usual because of the sale of government-owned wheat to farmers for feed purposes. Crops sold include the landlord's share of the crop on share-rented farms unless it was purchased by the tenant.

Table 21. Source and Disposal of Feed Grains Per Farm*

Crop	Quantity available: On hand Jan. 1	Quantity available: Purchased	Quantity available: Raised	Disposal made of the grains: Sold	Seeded	Fed	On hand Dec. 31
Corn, bu.	4313	1393	3364	997	16	3748	4309
Oats, bu.	1235	360	1592	251	123	1675	1138
Barley, bu.	523	56	660	479	46	234	480
Wheat, bu.	60	81	63	43	6	82	73
Oats & barley, bu.	90	6	154	6	7	145	92
Oats & wheat, bu.	14	2	32	2	2	26	18
Rye, bu.	21	5	16	15	1	9	17
Soybeans, bu.	33	24	77	49	18	10	57
Total, tons	158.5	49.6	143.8	46.8	4.4	143.8	156.9

* Average for all farms in S. W. Minn. Farm Management Service, 1940-1942.

An average of 352 tons of feed grain was available on these farms, 45 per cent represents carry-over from the previous year, 41 per cent was raised during the year and 14 per cent was purchased. Forty-one per cent of this supply of grains was fed, 45 per cent was held over as inventory stocks, 13 per cent was sold and one per cent was seeded.

Table 22. Average Price of Feeds, 1940-1942

	1940	1941	1942	3-year Average
Ear corn per bu.	$ .42	$ .50	$ .65	$ .52
Oats per bu.	.26	.32	.41	.33
Barley per bu.	.31	.39	.52	.41
Bran per cwt.	1.20	1.50	2.10	1.60
Linseed oilmeal per cwt.	1.70	2.00	2.40	2.05
Soybean oilmeal per cwt.	1.70	2.10	2.75	2.20
Tankage per cwt.	2.50	3.20	4.10	3.30
Meat scraps per cwt.	2.55	3.20	4.10	3.30
Skim milk per cwt.	.15	.18	.22	.18
Alfalfa per ton	7.50	8.50	8.00	8.00
Red or alsike clover per ton	6.40	7.25	6.80	6.80
Timothy per ton	4.80	5.45	5.15	5.15
Wild hay per ton	3.75	4.25	4.00	4.00
Corn fodder per ton	3.20	3.60	3.40	3.40
Corn silage per ton	2.10	2.55	2.75	2.45

Table 23. Summary of Amount of Livestock

Items	Your farm	Average of 92 farms	18 most profitable farms	18 least profitable farms
Average Amount of Livestock, 1940-1942				
No. of horses	_____	4.3	6.1	4.3
No. of colts	_____	1.0	1.3	1.3
No. of dairy & dual purpose cows	_____	8.6	6.8	9.1
Head of other dairy & dual purpose cattle	_____	9.3	7.1	11.3
Head of cattle in beef breeding herd	_____	9.4	11.8	5.6
Pounds of feeder cattle produced	_____	14643	47294	5532
Pounds of feeder sheep produced	_____	1419	5521	341
Litters of pigs	_____	17.6	24.1	14.3
Pounds of hogs produced	_____	29039	45582	20204
Head of sheep (2 lambs = 1 head)	_____	21.5	28.1	22.1
No. of hens	_____	183	157	157
Total no.of prod.lvstk.animal units	_____	70.6	155.2	47.6
% of total that are:				
Dairy and dual purpose cows	_____	18.1	7.8	23.6
Other dairy and dual purpose cattle	_____	10.9	5.3	15.4
In beef breeding herd	_____	11.5	8.6	8.5
Feeder cattle	_____	22.1	41.8	14.6
Native sheep	_____	4.8	3.9	5.3
Feeder sheep	_____	3.7	10.5	1.5
Hogs	_____	23.9	16.2	25.3
Turkeys	_____	1.0	4.1	.9
Hens	_____	4.0	1.8	4.9
Average Number of Livestock on Hand, January 1, 1940				
Horses	_____	4.5	5.9	5.1
Colts	_____	.9	.9	1.2
Dairy and dual purpose cows	_____	8.6	6.6	9.2
Other dairy and dual purpose cattle	_____	9.9	8.8	12.1
Beef breeding herd	_____	8.7	11.6	5.2
Feeder cattle	_____	25	73	11
Sheep - feeders	_____	34	93	60
Sheep-farm flock	_____	18	24	14
Hogs	_____	64	106	58
Hens	_____	189	152	210
Average Number of Livestock on Hand, December 31, 1942				
Horses	_____	4.1	6.4	4.1
Colts	_____	.9	1.8	.8
Dairy and dual purpose cows	_____	8.9	8.6	9.5
Other dairy and dual purpose cattle	_____	9.3	5.7	11.0
Beef breeding herd	_____	8.5	9.6	5.6
Feeder cattle	_____	30	92	15
Sheep - feeders	_____	59	252	0
Sheep - farm flock	_____	22	18	30
Hogs	_____	99	140	81
Hens	_____	267	231	245

VARIATIONS IN RETURNS FROM LIVESTOCK

The variations between years in the return over feed secured from livestock were determined in a manner similar to that for operator's earnings. The farms were ranked from high to low on the basis of the 1940-1942 average return over feed from milk cows, hogs and chickens and for each of the three years included in this study. The deviations or variations from the 1940-1942 rank for each of these three classes of livestock were then noted.

Seventy per cent of the farmers maintaining milk cows had an average yearly deviation from their three-year average rank of less than 10, and all had less than 20 (Table 24). Thirty-seven per cent of the farmers raising chickens had an average yearly deviation of less than 10 and 88 per cent had less than 20. Only 18 per cent of the farmers raising hogs had an average yearly deviation of less than 10 and 67 per cent had a deviation of less than 20.

Table 24. Distribution of Farms According to Deviation From 1940-1942 Average Return Over Feed From Milk Cows, Hogs and Chickens

Deviation from 1940-1942 rank	Percentage of farms maintaining		
	Milk Cows	Hogs	Chickens
Below 5.0	31.7	9.0	12.4
5.0 - 9.9	38.1	9.0	24.7
10.0 - 14.9	19.1	24.7	25.9
15.0 - 19.9	11.1	24.7	24.7
20.0 - 24.9	0	19.1	8.6
25.0 and over	0	13.5	3.7

Except in the case of hogs, the year-to-year deviations in return over feed were less among the farmers in the upper and lower groups than in the remaining intermediate groups (Table 25). In general, the returns secured from the various livestock enterprises are high or low because of differences in the organization and management of the enterprises. A farmer with a well organized and skillfully managed enterprise is likely to have a consistently high rank in return over feed unless some unusual and uncontrollable event occurs.

Table 25. Deviations from the 1940-1942 Return Over Feed From Milk Cows, Hogs and Chickens

Farms Grouped According to Return Over Feed	Average deviation from 1940-1942 rank		
	Milk Cows	Hogs	Chickens
Highest 20 per cent	4.6	15.9	11.6
Next 20 per cent	9.6	15.3	15.1
Next 20 per cent	9.5	15.5	13.4
Next 20 per cent	9.9	17.2	12.4
Lowest 20 per cent	6.7	17.2	10.5
All farms	8.0	16.3	12.6

The farmers in the upper 20 per cent in the range according to return over feed from milk cows had an average deviation of 4.6 and those in the lower 20 per cent 6.7. The average for all farms was 8.0. Of the 13 farmers in the upper 20 per cent for the three-year period four failed to achieve that ranking in 1940 and 1941 and three in 1942. During the three years only two of these 13 men ranked below the upper 40 per cent in return over feed. Of the 13 farmers in the lower 20 per cent according to the 1940-1942 average return over feed three ranked higher in 1940 and 1941 and four in 1942. There was less year-to-year deviation in return over feed among the farmers in the upper and lower groups than in the remaining groups.

There was more variation in the returns secured from chickens than in the returns from milk cows. Ten of the 15 farmers in the upper one-fifth according to return over feed for the period 1940-1942 failed to achieve that ranking 1940, 5 in 1941 and 7 in 1942. In 1940 four of these farmers ranked below the upper one-half of the entire group of 81 farmers. Five farmers in the lower 20 per cent based on the 1940-1942 average return over feed ranked in the upper 60 per cent in 1940 and one in 1941. There was considerably more fluctuation in ranking in 1940 than in the other two years.

The returns from hogs were much more variable than the returns from milk cows or chickens. Nine of the 18 farmers in the upper one-fifth according to the 1940-1942 average return over feed did not achieve that ranking in 1940; four of the nine ranked in the lower one-half. Eight farmers dropped out of the top one-fifth in 1941 with four going below the upper one-half. Eight also dropped out of the top one-fifth in 1942 with only one going below the 50 per cent mark. Five farmers in the low one-fifth on the basis of 1940-1942 average return over feed ranked higher in 1940 and 1942 and seven ranked higher in 1941.

The more important of these factors affecting the returns secured from livestock are shown in the tables on the following pages.

Table 26. Factors of Cost and Returns from Dairy Cows, 1940-1942

Items	Your farm	Average of 33 farms	8 farms highest in butterfat per cow	8 farms lowest in butterfat per cow
Pounds of butterfat per cow		262	317	212
Feeds per cow, lbs.:				
Corn		1260	1870	1085
Small grain		1307	1621	1162
Com. feeds - under 25% protein		32	72	4
Com. feeds - over 25% protein		104	263	19
Legume hay		3668	3658	3495
Other hay		237	199	191
Fodder and stover		449	253	90
Total concentrates		2703	3826	2270
Total dry roughages		4354	4110	3776
Silage		5337	5652	6474
Total digestible nutrients*		5140	5962	4746
T.D.N. per lb. B.F.		19.6	18.8	22.4
% T.D.N. that is protein		14.0	14.5	13.6
Feed cost per cow:				
Concentrates	$	$27.20	$39.66	$22.03
Roughages		21.80	22.23	21.85
Pasture		5.82	5.39	5.87
TOTAL FEED COSTS	$	$54.82	$67.28	$49.75
Value of produce per cow:				
B.F. sales	$	$92.74	$117.11	$66.66
Dairy produce used in house		6.89	6.37	8.48
Milk to livestock		14.27	16.08	11.88
Net increases in value of cows		3.12	7.12	1.34
TOTAL VALUE PRODUCED	$	$117.02	$146.68	$88.36
RETURNS ABOVE FEED COST PER COW	$	$62.20	$79.40	$38.61
RETURNS FOR $100 OF FEED	$	$217	$220	$183
Price received per lb. B.F. sold (cts.)		39.7	40.9	37.1
As manufacturing cream (cents)		37.3	36.6	36.9
As mkt. mk. & cm. & mk.for cheese(cts.)		57.7	57.1	-
Feed cost per lb. B.F. (cents)		20.9	21.2	23.5
% fall freshening		51.8	64.3	50.3
Number of dairy cows**		13.1	13.6	12.2

* Not including nutrients received from pasture.

** 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 27. Feed Costs and Returns from Other Dairy Cattle, 1940-1942

Items	Your farm	Average of 32 farms*	8 farms highest in butterfat per cow	8 farms lowest in butterfat per cow
Feeds per head, lbs.:				
Concentrates	_____	761	1152	653
Hay and fodder	_____	1478	1359	1201
Silage	_____	1428	1590	1732
Whole milk	_____	417	509	378
Skim milk	_____	1318	1294	1398
Feed cost per head:				
Concentrates	$_____	$7.54	$11.45	$6.39
Roughages	_____	6.86	7.01	6.37
Milk	_____	8.40	8.97	8.28
Pasture	_____	2.48	2.38	2.63
TOTAL FEED COSTS	$_____	$25.28	$29.81	$23.67
Net inc. in value of other dairy cattle	$_____	$42.16	$53.05	$36.89
RETURNS ABOVE FEED COST PER HEAD	$_____	$16.88	$23.24	$13.22
RETURNS FOR $100 OF FEED	$_____	$168	$177	$161
Number of head of other dairy cattle	_____	13.6	14.1	13.8

Table 28. Feed Costs and Returns from All Dairy Cattle

Items	Your farm	Average of 33 farms	8 farms highest in butterfat per cow	8 farms lowest in butterfat per cow
Feeds per animal unit, lbs.:				
Concentrates	_____	2258	3240	1882
Hay and fodder	_____	3739	3548	3072
Silage	_____	4447	5091	5209
Feed cost per animal unit:				
Concentrates	$_____	$22.65	$33.22	$18.30
Roughages	_____	18.51	18.98	17.96
Pasture	_____	5.46	5.08	5.60
TOTAL FEED COSTS	$_____	$46.62	$57.28	$41.86
Value of produce per animal unit:				
Dairy products	$_____	$70.20	$84.35	$51.40
Net increase in value of dairy cattle	_____	28.47	38.64	24.32
TOTAL VALUE PRODUCED	$_____	$98.67	$122.99	$75.72
RETURNS ABOVE FEED PER ANIMAL UNIT	$_____	$52.05	$ 65.71	$33.86
RETURNS FOR $100 OF FEED	$_____	$213	$214	$184
Animal units of dairy cattle	_____	20.2	21.2	19.5

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

Table 29. Factors of Cost and Returns from Dual-Purpose Cows, 1940-1942

Items	Your farm	Average of 30 farms	8 farms highest in butterfat per cow	8 farms lowest in butterfat per cow
Pounds of butterfat per cow	_____	190	233	147
Feeds per cow, lbs.:				
Corn	_____	812	1134	402
Small grain	_____	1001	1169	762
Com. feeds - under 25% protein	_____	6	14	1
Com. feeds - over 25% protein	_____	36	86	10
Legume hay	_____	3219	3158	2605
Other hay	_____	529	236	886
Fodder and stover	_____	275	246	228
Total concentrates	_____	1855	2403	1175
Total dry roughages	_____	4023	3640	3719
Silage	_____	4500	4203	5017
Total digestible nutrients*	_____	4191	4397	3574
T.D.N. per lb. B.F.	_____	22.1	18.9	24.3
% T.D.N. that is protein	_____	14.2	14.1	13.6
Feed cost per cow:				
Concentrates	$_____	$18.64	$24.86	$11.71
Roughages	_____	19.39	18.04	18.09
Pasture	_____	6.10	6.38	5.94
TOTAL FEED COSTS	$_____	$44.13	$49.28	$35.74
Value of produce per cow:				
B.F. sales	$_____	$54.82	$69.45	$40.82
Dairy produce used in house	_____	9.78	10.76	8.15
Milk to livestock	_____	12.97	14.25	11.60
Net increases in value of cows	_____	7.01	3.95	7.74
TOTAL VALUE PRODUCED	$_____	$84.58	$98.41	$68.31
RETURNS ABOVE FEED COST PER COW	$_____	$40.45	$49.13	$32.57
RETURNS FOR $100 OF FEED	$_____	$195	$203	$193
Price received per lb. B.F. sold (cts.)	_____	36.5	35.9	36.9
Feed cost per lb. B.F. (cents)	_____	23.2	21.2	24.3
% fall freshening	_____	44.0	59.6	37.5
Number of dual-purpose cows	_____	11.8	8.3	11.5

* Not including nutrients received from pasture.

Table 30. Feed Costs and Returns from Other Dual-Purpose Cattle, 1940-1942

Items	Your farm	Average of 20 farms*	7 farms highest in returns above feed	7 farms lowest in returns above feed
Feeds per head, lbs.:				
Concentrates	_____	648	657	704
Hay and fodder	_____	1509	1695	1455
Silage	_____	1957	2272	1751
Whole milk	_____	263	324	268
Skim milk	_____	1248	1810	782
Feed cost per head:				
Concentrates	$_____	$6.59	$6.67	$7.30
Roughages	_____	7.35	8.05	7.04
Milk	_____	6.40	8.00	5.92
Pasture	_____	2.75	2.42	3.06
TOTAL FEED COSTS	$_____	$23.09	$25.14	$23.32
Net increase in value	$_____	$39.37	$50.49	$30.22
RETURNS ABOVE FEED COST PER HEAD	$_____	$16.28	$25.35	$ 6.90
RETURNS FOR $100 OF FEED	$_____	$178	$218	$133
No. of head of other dual-purpose cattle	_____	16.2	12.0	18.6

Table 31. Feed Costs and Returns from All Dual-Purpose Cattle

Items	Your farm	Average of 30 farms	8 farms highest in returns above feed	8 farms lowest in returns above feed
Pounds of butterfat per cow	_____	190	223	162
Feeds per animal unit, lbs.:				
Concentrates	_____	1665	1982	1596
Hay and fodder	_____	3474	3131	3699
Silage	_____	4110	4812	4180
Feed cost per animal unit:				
Concentrates	$_____	$16.77	$19.46	$15.95
Roughages	_____	16.52	16.26	17.81
Pasture	_____	6.05	6.13	5.50
TOTAL FEED COSTS	$_____	$39.34	$41.85	$39.26
Value of produce per animal unit:				
Dairy products	$_____	$47.12	$61.58	$34.80
Net increase in value	_____	29.89	33.67	27.28
TOTAL VALUE PRODUCED	$_____	$77.01	$95.25	$62.08
RETURNS ABOVE FEED PER ANIMAL UNIT	$_____	$37.67	$53.40	$22.82
RETURNS FOR $100 OF FEED	$_____	$197	$229	$161
Animal units of dual-purpose cattle	_____	17.5	15.4	18.7

* Ten farmers having both a dual-purpose and a beef herd used a beef bull and included the young stock in the beef herd.

The farmer who excels in all phases of the management of the milking herd receives a larger return than one who excels in none or only a few of the management factors. The combined effect on return over feed per cow in the milking herd from excelling in a number of management factors is shown in Table 32. The factors included are (1) pounds of butterfat per cow, (2) total digestible nutrients per pound of butterfat, (3) percentage of protein in the T.D.N., (4) price received for butterfat, (5) feed cost per pound of butterfat, and (6) percentage of fall freshening. Seventeen farmers were below the average of the group in all six factors or above the average in only one factor; their return over feed amounted to $35.78 per cow. Two farmers who were above the average of the group in all six factors received a return over feed of $96.85 per cow. The difference between these two extremes amounts to $55.07 per cow or $688 for the average herd of 12.5 cows.

Table 32. Relation of Return Over Feed per Milk Cow to Number of Management Factors in Which Farmers Excelled

No. of factors in which farmer excels	No. of farms	The length of the shaded lines are in proportion to the average return over feed per milk cow	Average return over feed
None or one	17	xxxxxxxxxxx	$35.78
2	8	xxxxxxxxxxxxx	41.97
3	9	xxxxxxxxxxxxxxx	50.83
4	15	xxxxxxxxxxxxxxxxx	57.31
5	12	xxxxxxxxxxxxxxxxxxxx	70.45
6	2	xxxxxxxxxxxxxxxxxxxxxxxxxxxxx	96.85

Table 33. Feed Costs and Returns from Beef Breeding Herd, 1940-1942

Items	Your farm	Average of 21 farms	7 farms highest in returns above feed	7 farms lowest in returns above feed
Feeds per animal unit, lbs.:				
Concentrates		1425	1075	1296
Legume hay		1850	1767	1324
Other hay		550	522	839
Fodder and stover		434	749	126
Silage		2879	3063	3868
Skim milk*		120	106	130
Whole milk*		26	11	27
Feed cost per animal unit:				
Concentrates	$	$13.84	$10.43	$13.05
Roughages		12.59	12.92	12.01
Milk*		.62	.35	.62
Pasture		5.86	5.79	6.33
TOTAL FEED COSTS	$	$32.91	$29.49	$32.01
Value of produce per animal unit:				
Dairy products	$	$12.70	$12.36	$9.81
Net increase in value of animals		52.31	63.65	42.59
TOTAL VALUE PRODUCED	$	$65.01	$76.01	$52.40
RETURNS ABOVE FEED COST PER ANIMAL UNIT	$	$32.10	$46.52	$20.39
RETURNS FOR $100 OF FEED	$	$204	$261	$172
Number of cows and herd bulls		16.3	20.9	16.0
Number of animal units in the herd		26.8	33.9	25.3

* Several farmers had both dairy or dual purpose cows and beef cows and fed some milk produced by the milking herd to beef calves.

Table 34. Feed Costs and Returns from Feeder Cattle, 1940-1942

Items	Your farm	Average of 37 farms	9 farms highest in returns above feed	9 farms lowest in returns above feed
Feeds per cwt. beef produced, lbs.:				
Corn	_____	702	653	797
Small grain	_____	99	54	145
Com. feeds - under 25% protein	_____	12	5	6
Com. feeds - over 25% protein	_____	26	29	14
Legume hay	_____	256	165	418
Other hay	_____	54	74	55
Fodder and stover	_____	42	27	79
Total concentrates	_____	839	741	962
Total dry roughages	_____	352	266	552
Silage	_____	511	339	845
Per cent protein in the T.D.N.*	_____	11.6	11.3	11.7
Feed cost per cwt. beef produced:				
Concentrates	$_____	$8.35	$7.51	$9.16
Roughages	_____	1.75	1.19	2.84
Pasture	_____	.35	.38	.43
TOTAL FEED COSTS	$_____	$10.45	$9.08	$12.43
Net increase in value of feeders	$_____	$14.21	$15.42	$12.77
RETURNS ABOVE FEED COST PER CWT. BEEF PROD.	$_____	$3.76	$6.34	$.34
RETURNS FOR $100 OF FEED	$_____	$140	$170	$105
Price received per 100 lbs. beef sold	$_____	$10.50	$11.16	$9.23
Price received per 100 lbs. bought	$_____	$10.37	$10.32	$10.29
No. of animal units	_____	64.6	61.0	17.6
Pounds of beef produced	_____	34,135	36,193	9,406

* This is an average for 1940 and 1941.

Superior management in the cattle feeding enterprise results in a comparatively high return just as superior management in the dairy herd resulted in a high return over feed per cow. The combined effect on return over feed per 100 pounds produced from excelling in three factors is shown in Table 35. The factors included are: (1) feed cost per 100 pounds of cattle produced, (2) the percentage of protein in the total digestible nutrients, and (3) the price received per 100 pounds sold. The seven farmers who were below the average in all three factors received a return over feed of $1.23 per 100 pounds of cattle. Six farmers were above the average in the three factors and their return over feed amounted to $5.15. The difference between the two extremes is $3.92 or $1338 for the average production of 34,135 pounds per farm.

Table 35. Relation of Return Over Feed Per 100 Pounds of Beef Cattle Produced to Number of Management Factors in Which Farmers Excelled

No. of factors in which farmer excels	No. of farms	Length of shaded lines are in proportion to the average return over feed per 100 pounds of beef cattle	Average return over feed
0	7	xxxxxxxx	$1.23
1	11	xxxxxxxxxxxxxxxxxxxxxx	3.29
2	13	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	4.88
3	6	xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx	5.15

Table 36. Feed Costs and Returns from Sheep, 1940-1942

Items	Your farm	Average of all farms	Farms highest in returns above feed	Farms lowest in returns above feed
Farm flock: no. of farms:		29	7	7
Feeds per head,* lbs.:				
Concentrates		95	61	114
Legume hay		188	161	142
Other hay		44	29	17
Fodder and stover		35	16	30
Silage		155	172	315
Feed cost per head:				
Concentrates	$	$.84	$.65	$1.04
Roughages		1.04	1.00	.91
Pasture		.96	.99	.94
TOTAL FEED COSTS	$	$2.84	$2.64	$2.89
Value of produce per head:				
Wool	$	$2.64	$2.64	$2.70
Net increase in value of sheep		4.85	6.94	1.96
TOTAL VALUE PRODUCED	$	$7.49	$9.58	$4.66
RETURNS ABOVE FEED COST PER HEAD	$	$4.65	$6.94	$1.77
RETURNS FOR $100 OF FEED	$	$280	$378	$187
Price per 100 lbs. of lambs sold	$	$11.87	$11.76	-
Price per lb. wool sold (cents)		36.6	36.4	36.6
Pounds of wool per sheep sheared		9.0	9.3	8.7
Number of ewes kept for lambing		31	24	36
% lamb crop		106	116	87
% death loss		15	12	18
No. of head of sheep* (farm flock)		59	35	60
Feeder sheep: no. of farms		11	5	5
Feeds per cwt. sheep produced, lbs.:				
Concentrates		724	587	826
Legume hay		291	166	445
Other hay		52	13	76
Fodder and stover		35	73	4
Silage		180	323	26
Feed cost per head:				
Concentrates	$	$7.18	$5.83	$8.22
Roughages		1.52	1.17	1.95
Pasture		.65	.60	.57
TOTAL FEED COSTS	$	$9.35	$7.60	$10.74
Net increase in value of sheep	$	$17.09	$17.19	$16.47
RETURNS ABOVE FEED COST PER CWT. PRODUCED	$	$7.74	$9.59	$5.73
RETURNS FOR $100 OF FEED	$	$194	$235	$156
Price per cwt. sheep sold	$	10.42	$10.54	$10.18
Price per cwt. for sheep bought	$	10.36	$10.47	$10.16
% death loss		3.1	2.7	3.3
Pounds of sheep produced		9541	12564	6896

* Two lambs under 6 months of age considered as one head.

Table 37. Feed Costs and Returns from Hogs, 1940-1942

Items	Your farm	Average of 89 farms	18 farms highest in return above feed	18 farms lowest in return above feed
Feed per cwt. hogs produced, lbs.:				
Corn	_____	356	297	424
Small grain	_____	118	98	148
Com. feeds - under 25% protein	_____	3	3	2
Com. feeds - over 25% protein	_____	17	16	15
Total concentrates	_____	494	414	589
Skim milk and buttermilk	_____	115	140	214
Feed cost per cwt. hogs produced:				
Concentrates	$_____	$5.07	$4.30	$5.86
Skim milk and buttermilk	_____	.20	.24	.37
Pasture	_____	.19	.20	.16
TOTAL FEED COSTS	$_____	$5.46	$4.74	$6.39
Net incr. in value per cwt. hogs prod.	$_____	$10.10	$10.59	$9.54
RET. ABOVE FEED COST PER CWT. HOGS PROD.	$_____	$4.64	$5.85	$3.15
RETURNS FOR $100 OF FEED	$_____	$189	$224	$151
Price received per cwt. hogs sold	$_____	$9.08	$9.57	$8.98
No. of spring litters raised	_____	14	16	10
No. of fall litters raised	_____	4	5	3
Total no. of litters raised	_____	18	21	13
No. of pigs born per litter	_____	7.6	8.2	7.3
No. of pigs weaned per litter	_____	6.1	6.4	5.7
Pounds of hogs produced	_____	29,931	37,046	19,988

High returns are associated with high quality management. The combined effect on return over feed from excelling in a number of hog management factors is shown in Table 38. The factors included are: (1) pounds of concentrates required to produce 100 pounds of hogs, (2) price received for hogs sold, (3) number of pigs born per litter, and (4) number of pigs weaned per litter. Thirteen farmers were below the average of the group in all four factors; their average return over feed was $3.77 per 100 pounds of hogs. The 18 farmers who were above average in all four factors had an average return over feed of $5.66 per 100 pounds. The difference between the two extremes amounts to $1.89 per 100 pounds or $566 for the average production of 29,931 pounds of hogs on these farms.

Table 38. Relation of Return Over Feed Per 100 Pounds of Hogs to the Number of Management Factors in Which Farmers Excelled

No. of factors in which farmer excels	No. of farms*	The length of the shaded lines are in proportion to the average return over feed per 100 pounds of hogs	Average return over feed
0	13	xxxxxxxxxxxxxxxxxx	$3.77
1	12	xxxxxxxxxxxxxxxxxxxx	4.14
2	21	xxxxxxxxxxxxxxxxxxxxx	4.37
3	21	xxxxxxxxxxxxxxxxxxxxxxx	4.92
4	18	xxxxxxxxxxxxxxxxxxxxxxxxx	5.66

* The data from 4 farmers who purchased feeder pigs were omitted from this table.

Table 39. Feed Costs and Returns from Chickens, 1940-1942

Items	Your farm	Average of 81 farms	16 farms highest in return above feed	16 farms lowest in return above feed
Feed per hen, lbs.:				
Grain		102	96	116
Commercial feeds		20	24	15
Total concentrates		122	120	131
Skim milk and buttermilk		25	40	17
Feed cost per hen:				
Concentrates	$	$1.58	$1.64	$1.65
Skim milk		.04	.07	.03
TOTAL FEED COST	$	$1.62	$1.71	$1.68
Value of produce per hen:				
Eggs sold and used in house	$	$2.18	$2.73	$1.58
Net increase in value of chickens		.81	1.22	.46
TOTAL VALUE PRODUCED	$	$2.99	$3.95	$2.04
RETURNS ABOVE FEED COST PER HEN	$	$1.37	$2.24	$.36
RETURNS FOR $100 OF FEED	$	$192	$238	$137
Price rec'd. per doz. eggs sold (cents)		21.5	22.2	20.8
% of eggs sold on grade basis		39	56	22
Eggs laid per hen		120	146	90
Ave. no. of hens on farm during the yr.		205	202	192
Ave. no. of hens at beginning of year		241	236	227
% of hens that are pullets		77	83	70
% death loss		17	14	24

Superior management leads to high returns. The combined effect on return over feed from excelling in a number of poultry management factors is shown in Table 40. The factors included are (1) pounds of concentrates per hen, (2) price received per dozen of eggs sold, (3) per cent of the eggs sold on a grade basis, (4) number of eggs laid per hen, (5) percentage of the hens that are pullets, and (6) the percentage death loss. Although variations between the top one-fifth of the farms and the low one-fifth according to return over feed are not extremely large, the combined effect from excelling in a number of the management factors shows a marked correlation with return over feed.

Table 40. Relation of Return Over Feed Per Hen to the Number of Management Factors in Which Farmers Excelled

No. of factors in which farmer excels	No. of farms	The length of the shaded lines are in proportion to the average return over feed per hen	Average return over feed per hen
None or one	13	xxxxxxxx	$.57
2	24	xxxxxxxxxxxxxxx	1.13
3	12	xxxxxxxxxxxxxxxxxxxx	1.47
4	18	xxxxxxxxxxxxxxxxxxxxxxxxx	1.82
5 or 6	14	xxxxxxxxxxxxxxxxxxxxxxxxx	1.84

Table 41, Feed Costs and Returns for Turkeys, 1940-1942

Items	Your farm	Average of 4 farms
Feed per cwt. turkeys produced, lbs.:		
Grain	_____	335
Com. feeds - under 25% protein	_____	63
Com. feeds - over 25% protein	_____	116
Total concentrates	_____	514
Skim milk	_____	32
Feed cost per cwt. turkeys produced	$_____	$8.25
Value of produce per cwt. turkeys produced		
Eggs and poults	$_____	0
Net increases in turkeys	_____	$17.93
TOTAL VALUE PRODUCED	$_____	$17.93
RETURNS ABOVE FEED COST PER CWT. TURKEYS PRODUCED	$_____	$9.68
RETURNS FOR $100 FEED	$_____	$220
Price received per lb. turkey sold (cents)	_____	21.3
Pounds of turkeys produced	_____	31431

Table 42. Feed Costs for Horses and Misc. Power and Machinery Expense, 1940-1942

Items	Your farm	Average of 90 farms*	18 most profitable farms	18 least profitable farms
Feed per horse,** lbs.:				
Grain	_____	1991	2161	1851
Hay	_____	3067	2695	3116
Fodder and stover	_____	272	528	418
Feed costs per horse:				
Grain	$_____	$19.48	$21.31	$17.95
Roughage	_____	9.57	9.99	9.26
Pasture	_____	4.10	4.20	4.19
TOTAL FEED COSTS	$_____	$33.15	$35.50	$31.40
Number of work horses	_____	4.3	6.1	4.3
Number of colts	_____	1.0	1.3	1.3
Crop acres per farm	_____	226.5	364.5	166.9
Tractor and horse exp. per crop acre	$_____	$2.25	$2.10	$2.41
Crop and general mach. exp. per crop acre	$_____	1.32	1.36	1.41

* Two farms did not have horses. The number of horses, crop acres and expenses per crop acre are averages of 92 farms.

** Two colts equal one horse.

EXPLANATION OF TERM "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 43.

Table 43. 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 pur. cows	13.5 per cow	Small grain	.7 per acre
Other dairy & du. pur. cattle	4.0 per an. unit*	Sugar beets	3.0 per acre
Beef breeding herd	4.0 per an. unit*	Sweet corn	2.5 per acre
Feeder cattle	.35 per 100 lbs.	Corn, husked	1.3 per acre
Sheep - farm flock	1.6 per an. unit*	Corn, hogged	.8 per acre
Sheep - feeders	.4 per 100 lbs.	Corn, shredded	2.5 per acre
Hogs	.25 per 100 lbs.	Corn silage	1.9 per acre
Turkeys	.7 per 100 lbs.	Corn fodder	1.3 per acre
Hens	26.0 per 100 hens	Alfalfa hay	1.0 per acre
Canning peas	2.0 per acre	Soybean hay	1.4 per acre
Soybeans for grain	.9 per acre	Other hay crops	.6 per acre

* Animal unit represents one cow, one bull, one feeder steer or heifer, two head of other cattle, seven head of sheep, fourteen lambs, five hogs, ten pigs, 100 hens or 1400 pounds of turkeys produced.