UNIVERSITY OF MINNESOTA
Department of Agriculture
and
UNITED STATES DEPARTMENT OF AGRICULTURE
Bureau of Agricultural Economics
Cooperating

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A Preliminary Report of Data Secured in 1936 on the FARM ACCOUNTING ROUTE in WINONA COUNTY, MINNESOTA

By

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SOURCE OF DATA

Method of Study

A three-year study of the organization and management of a selected group of farms in Winona County was started on March 1, 1935. This study is being conducted under the supervision of the Division of Agricultural Economics of the University of Minnesota in cooperation with the Bureau of Agricultural Economics of the United States Department of Agriculture. Farms which were representative of the better managed farms of the area were chosen with the aid of the county agricultural agent, Mr. H. C. Pederson. The farmers cooperating in this study keep a complete record of cash receipts and expenses, a daily record of the labor used on each crop and class of livestock, and a record of farm produce used in the house. These records are checked at least twice per month by a field man and supplemented with inventories, feed records, reports of cropping practices and yields, and other significant facts about the farm business. The data collected are sent to the central office at University Farm, St. Paul, where a detailed set of records for each farm is kept. This report on farmers' earnings and crop and livestock returns for 1936 was prepared from these farmers' records.

Description of the Area

Winona County lies in the southeastern part of the state. The topography varies from gently rolling to very hilly. Much of the county is covered with a deposit of very productive loessial material. The surface soil is deficient in lime, but lime deposits underlie it at a relatively shallow depth. The soil washes easily, with the steeper slopes subject to considerable erosion. The growing season varies from 140 to 160 days. The average rainfall is approximately 29 inches, 70 per cent of which is received during the months of April to September, inclusive. Livestock and livestock products constitute the major source of income.

Note: Completion of this project was made possible by workers supplied on Federal Student Work Project, 1936-37, Project Number 39-100. Sponsor: University of Minnesota.

Description of the Farms

The average size of the farms studied in 1936 was 301 acres, and of those studied in 1935, 334 acres. The average size of all Winona County farms in 1934 was 170 acres, as given in the 1935 census. A larger proportion of the land was in legumes on the farms studied than for the county as a whole. Other facts about the organization and production of these farms are presented on page 3.

There is a soil erosion problem on most of the farms studied. Most of the operators are cooperating with the Federal Soil Conservation Service in an erosion control program. Since they have not yet had time to put this program into full operation, few of the effects are apparent in this report.

Description of the Crop Seasons

Heavy precipitation, plus the moisture from the winter snows on unfrozen ground, provided sufficient moisture for good yields in 1935. Heavy summer rains, however, interfered with the curing of hay and drying of grain in the shock. Moisture was plentiful during the early part of the 1936 season, but scant rains and high temperatures during July reduced yields of grain and corn. Seeding began in 1936 almost two weeks later than in 1935. Grain harvest, however, began almost a week earlier in 1936.

METHODS OF COMPUTING AND PRESENTING DATA

Financial Statements

Average earnings, inventories and household and personal expenses are presented on pages 4 to 6 for all farmers, for the five farmers with the highest labor earnings, and for the five farmers with the lowest.

Some of the farms studied were either partly or entirely rented. The rental contracts varied. In order to have the data for these farms comparable with the owned farms, they were adjusted to a full ownership basis. All farm property, regardless of ownership, was included in the inventory. Cash rent was excluded from the expenses and the landlord's expenses were included. The landlord's share of the crops was included in the receipts. The value of farm produce used in the house was included in receipts and the value of board furnished hired laborers was included in expenses. Board for hired labor was charged at $15 per month. Wages for unpaid family labor were calculated at 20 cents per hour. All interest actually paid was omitted and five per cent interest was charged on the total inventory.

The returns to capital and family labor is the amount left as pay for the use of the farm capital and for the labor of the farm operator and his family. Family labor earnings is what is left as pay for the labor of the operator and his family, after deducting an allowance for interest on the investment from the returns to capital and family labor. The operator's labor earnings is the amount left to the farm operator as pay for his labor and management after all farm expenses, interest on the investment and an allowance for the unpaid family labor have been paid. A minus (-) operator's labor earnings indicates the extent to which the receipts were insufficient to cover the expenses.

Livestock Statements

The comparative costs and returns for each of the different classes of livestock maintained in 1936 are presented in this preliminary report. All data are shown on the basis of a standard unit such as one head or 100 pounds gain in weight. Both quantities--pounds of feed, days of pasture, man and horse hours,

Facts About the Organization and Production of the Farms

	1935	1936		
	Average	Average	Range for each item	
Acres in barley	51	38	0 to	98
Acres in oats	35	26	0 to	72
Acres in mixed oats and barley	3	5	0 to	33
Acres in mixed oats and wheat	7	2	0 to	21
Acres in wheat	11	8	0 to	26
Acres in corn	26	32	15 to	99
Acres in flax	1	4	0 to	66
Acres in other grains	11	7	0 to	53
Acres in alfalfa	18	14	0 to	36
Acres in clover and timothy	11	23	0 to	81
Acres in wild hay	3	2	0 to	7
Acres in other hay	5	3	0 to	28
Acres in other crops	3	15	0 to	55
Total crop acres	185	179	65 to	360
Acres in wood and pasture	135	109	8 to	376
Acres in farmstead, road and waste	14	13	5 to	44
Total acres per farm	334	301	96 to	705
% of land tillable	58	68	31 to	95
Number of cows	19	20	10 to	44
Number of other cattle	25	26	8 to	60
Number of sheep	21	18	0 to	83
Number of pounds hogs produced	9459	13124	3345 to	37700
Total number of chickens	187	204	0 to	520
Number of laying hens	117	130	0 to	314
Total hours of man labor	8829	9319	5659 to	15804
Total man hours on livestock	3802	4544	2716 to	6697
Total man hours on crops	2559	2469	1016 to	4958
Total man hours miscellaneous labor	2468	2306	865 to	4533
Total hours exchange labor received	324	246	56 to	488
Total hours hired labor	3617	3410	12 to	10438
Total hours unpaid family labor	1688	2373	0 to	9166
Total hours operator labor	3200	3290	2189 to	4052
Hours per man per work day	9.5	10.5	7.3 to	12.0
Hours per man per Sunday	3.2	4.3	2.4 to	6.0
Tractor farms:				
Number of farms	14	18		
Total crop acres per farm	210	198	66 to	360
Number of work horses per farm	6	6	3 to	9
Average no. of hours worked per horse	904	847	533 to	1067
Number crop acres per horse	39	36	19 to	72
Non-tractor farms:				
Number of farms	5	6		
Total crop acres per farm	118	120	73 to	190
Number of work horses per farm	6	5	4 to	8
Number hours worked per horse	840	852	616 to	1151
Number of crop acres per horse	18	23	19 to	30

Financial Statement

	1935	1936		
	All farms	All farms	Five highest	Five lowest
RECEIPTS				
Dairy products	$1049	$1360	$1262	$1065
Cattle	771	671	837	517
Hogs	725	1169	906	1105
Sheep and wool	93	102	211	6
Poultry and eggs	310	528	415	1041
Horses	110	111	76	16
Barley	344	560	981	191
Wheat	147	96	244	34
Flax	36	19	47	-
Other crops	99	275	732	43
Income from work off the farm	252	151	126	147
Miscellaneous	143	536	754	136
Agricultural Conservation and A.A.A. payments	105	231	293	138
Total Cash Farm Receipts	4184	5809	6884	4439
Farm Produce Used in House	363	384	415	328
Increase in Inventory	14	1009	2019	435
TOTAL FARM RECEIPTS	4561	7202	9318	5202
EXPENSES				
Cattle bought	153	334	466	58
Hogs bought	45	95	87	70
Sheep bought	7	16	49	-
Poultry bought	29	88	39	225
Horses bought	64	65	82	39
Feed for livestock	292	698	464	983
Other livestock expense	37	48	46	53
Crop expense	199	215	263	214
Hired labor	366	360	359	289
Real estate	213	425	134	321
Machinery	358	384	566	303
Tractor	207	313	431	17
Truck	121	126	252	30
Auto	83	95	96	122
Electricity	40	39	31	19
Taxes	244	268	349	180
Insurance	39	55	71	52
Miscellaneous	29	29	31	29
Total Cash Farm Expenses	2526	3653	3816	3004
Board for Hired Labor	167	156	179	110
TOTAL FARM EXPENSES	2693	3809	3995	3114
Returns to Capital and Family Labor	1868	3393	5323	2088
Interest on Farm Inventory	862	900	1134	664
Family Labor Earnings	1006	2493	4189	1424
Wages for Unpaid Family Labor	338	453	544	511
OPERATOR'S LABOR EARNINGS	668	2040	3645	913

Average Farm Inventories

	1935	1936		
	All farms	All farms	5 with highest earnings	5 with lowest earnings
Land	$5944	$5999	$8017	$4902
Buildings	5128	5216	6066	3637
Horses	750	793	703	510
Cattle	1446	1763	2283	1218
Sheep	110	91	160	15
Swine	294	370	341	357
Poultry	80	135	107	263
Feeds, seeds and miscellaneous	1358	1447	2187	992
Auto (farm share)	70	72	60	76
Truck (farm share)	115	149	315	28
Tractor	315	366	534	30
Machinery and equipment	1633	1637	1905	1267
Total	17243	18038	22678	13295

Farm Produce Used in the House

	1935		1936			
	All Farms		All Farms		5 with highest earnings	5 with lowest earnings
	Quantity	Value	Quantity	Value		
Milk	1625 qt.	$47.55	1536 qt.	$50.05	$54.57	$36.53
Cream	291 pt.	27.57	277 pt.	29.49	37.68	24.15
Butter	3 lb.	.84	-	.04	-	-
Skimmilk	79 qt.	.30	152 qt.	.67	.46	.27
Eggs	205 doz.	42.14	214 doz.	43.01	47.69	28.70
Poultry	159 lb.	19.94	209 lb.	24.85	24.36	20.38
Hogs	992 lb.	92.99	804 lb.	75.24	74.50	78.89
Cattle	247 lb.	14.00	393 lb.	26.82	27.69	6.36
Sheep	10 lb.	.54	-	-	-	-
Potatoes	46 bu.	17.70	39 bu.	26.35	31.04	21.83
Fuel		68.45		67.08	75.00	65.00
Fruits and vegetables		31.25	-	40.63	42.00	46.00
Total		363.27		384.23	414.99	328.11
Size of family (man equivalent)		4.9		4.6	4.9	4.2

Household and Personal

	1935	1936		
	All farms	All farms	5 with highest earnings	5 with lowest earnings
Inventories:				
House, woodshed and smokehouse	$2823	$2614	$3020	$2792
Furnishings and equipment	451	415	354	515
Clothing, jewelry, etc.	224	218	245	200
Electric plant and motors*	8	7	14	9
Gas engine*	2	-	-	-
Auto and truck*	246	233	407	183
Total	3754	3487	4040	3699
Cash Expenses:				
Food	292	312	294	358
Operating and supplies	39	50	39	72
Furnishings and equipment	59	95	130	100
Additions and repairs on house	53	171	35	5
Hired help	22	19	12	14
Electricity*	30	33	31	19
Clothing and materials	141	134	94	185
Health	47	50	12	65
School expenses	21	17	34	26
Reading materials	6	5	5	6
Church, charity, etc.	39	47	41	56
Recreation	18	19	19	45
Personal	136	128	160	247
Life insurance and savings	144	126	86	115
Auto and truck*	314	296	652	190
Total cash expenses	1361	1502	1644	1503
Cash Receipts:				
Household and personal	271	121	46	150
Net Cash Expenses	1090	1381	1598	1353
Value of Farm Produce Used	363	384	415	328
Decrease in Inventory	19	-145+	-96+	54
Interest on Average Inventory	188	174	202	185
Total Household and Personal Expenses	1660	1794	2119	1920

*Household and personal share.
+Increase in inventory.

pounds produced, etc.--and money costs and returns are shown. The amounts of feed, with the exception of pasture, are given in pounds rather than in bushels or tons. All corn has been reduced to a shelled corn basis. The man hours include both regular daily chore labor and irregular labor such as tending sick animals, marketing livestock and livestock products, and hauling feed and bedding. The horse hours likewise include both regular and irregular work.

Local prices were used, insofar as possible, in determining the costs and returns. Marketable feeds were charged at local prices and non marketable feeds on a comparative-feeding-value basis. No charge was made for straw or for corn stalk pasture. Man labor was figured at 20 cents per hour and horse work was charged to the individual farm at the rate determined for that farm. The shelter charge was based on the annual cost of the buildings housing livestock, prorated on the basis of the space occupied. The equipment charge was based upon the annual cost of the particular equipment used by that class of livestock. The expense for portable brooder houses and hog houses was included in the equipment charge and omitted from the shelter charge. The equipment charge also includes a charge for the use of the auto and truck in connection with the livestock work. Interest was calculated at five per cent on the average of the beginning and ending inventories. Miscellaneous cash costs include such cash expenses as veterinary fees, medicine, salt, minerals, hatching expense, fuel for brooders, incubators and tank heaters, horse-shoeing, sheep-shearing, etc. In arriving at the manure credit, consideration was given to the kind and the amount of feed consumed and the proportion of the fertilizing elements returned in the manure. Credit was allowed for manure produced, regardless of whether or not it was utilized.

The value of livestock production was determined by adding the sales, the products used in the house and the ending inventory and then deducting from this sum the sum of the beginning inventory and purchases. In the case of the different classes of cattle, transfers from one group to another were considered the same as purchases and sales. The weight produced was calculated in the same manner as the value produced except that weights were used instead of values.

The returns have been expressed in several ways. The gain is the amount left after deducting all the charges listed in the table. The return over feed cost is what is left after deducting the feed cost from the value of the product, excluding manure. In other words, the return over feed cost and the manure are what the farmer has to pay him for his labor, the horse work, shelter, equipment, interest and miscellaneous cash costs. In each case a minus (-) indicates a failure to meet the particular expenses involved.

In considering the returns from livestock, one should keep in mind that these are comparative figures and include some charges which do not represent actual cash outlay. The feed, man labor, horse work, use of buildings and equipment, and interest on the investment have been charged to the enterprise, although they may represent very little direct cash expense. Therefore, a minus return means that the particular class of livestock has failed to pay the usual market prices charged for the different factors. There may be no other more profitable alternative use for the buildings, much of the labor, or for the non-marketable feeds. A return above the price of marketable feeds and cash expenses may justify continued production although these figures fail to show a gain.

Cost and Return per Cow

	1936 Range for specified items	1936 Average	1935 Average
Number of farms		24	20
Number of cows per farm	9 to 44	20	19
Butterfat per cow, lb.	127 to 317	207	189
Man labor, hours	60.0 to 233.8	140.5	126.1
Horse work, hours	0.8 to 11.1	5.2	3.9
Costs:			
Feed		$37.46	$27.57
Man labor		28.11	25.23
Horse work		.52	.32
Shelter		7.25	7.83
Equipment		4.06	3.89
Interest at 5%		2.43	2.19
Miscellaneous cash		1.24	1.04
Total costs	$40.86 to $134.77	$81.07	$68.07
Manure credit		3.75	2.61
Appreciation		.42	2.26
Total credit	1.67 to 10.58	4.17	4.87
Net cost	39.19 to 125.84	76.90	63.20
Value of dairy products:			
Sold		69.73	54.93
Used in house		4.17	4.18
Fed to livestock		15.22	11.70
Total product	53.34 to $137.78	$89.12	$70.81
Return over all cost	-9.12 to 32.11	12.22	7.61
Return over feed cost	30.56 to 83.89	52.08	45.50
Price received per pound of B.F.	.35 to .45	.36	.33
Feeds:			
Corn, lb.		187	86
Small grain, lb.		626	323
Other concentrates, lb.		229	214
Hay, lb.		3266	2029
Fodder and stover, lb.		260	230
Silage, lb.		5908	6311
Total concentrates, lb.	107 to 2717	1042	623
Total roughage,* lb.	3422 to 8616	5495	4363
Pasture, days	57 to 216	168	142

*Three pounds of silage considered as one pound of roughage.

Cows

The costs and returns are for cows only. They neither include any feed or expense for the bull nor any credit for calves born. Due to the fact that calves were in some cases allowed to nurse for a short time, it was necessary to estimate their consumption of whole milk while nursing. It was assumed that the calves that were nursing received two gallons of milk per day. The value of the dairy products fed includes all milk and skimmilk fed to calves as well as to the other classes of livestock. The butterfat per cow was calculated by dividing the total butterfat utilized (including that sold, used in the house, and fed to livestock) by the average number of cows in the herd.

Cost and Return per Head of Other Cattle

	Dairy Herds		Milk-and-Beef Herds	
	1936	1935	1936	1935
Number of farms	17	13	7	7
No. of head per farm	18	20	45	34
Man labor, hour	22.9	18.2	15.4	11.0
Horse work, hour	2.1	1.5	1.2	.9
Costs:				
Feed	$22.52	$19.47	$19.82	$16.35
Labor	4.58	3.64	3.08	2.20
Horse work	.20	.13	.10	.07
Shelter	5.22	5.91	3.95	4.63
Equipment	.05	.21	.09	.16
Interest at 5%	1.62	1.34	1.52	1.17
Miscellaneous cash	.41	.26	.25	.13
Total costs	34.60	30.96	28.81	24.71
Manure credit	1.94	1.50	1.74	1.39
Net cost	32.66	29.46	27.07	23.32
Value of product	30.02	28.86	24.34	27.55
Return over all costs	-2.64	-.60	-2.73	4.23
Return over feed cost	7.50	9.39	4.52	11.20
Feeds:				
Grain, lb.	300	228	271	247
Mill feeds, lb.	26	33	6	8
Hay, lb.	1540	825	1398	871
Fodder and stover, lb.	132	89	286	460
Silage, lb.	2177	3070	1989	2349
Total concentrates, lb.	326	261	277	255
Total roughages,* lb.	2398	1937	2347	2114
Whole milk, lb.	273	275	155	220
Skimmilk, lb.	2152	1909	818	837
Pasture, days	124	111	135	121
Range for specified items, 1936:				
No. of head per farm	8 to	40	35 to	60
Net cost	$22.25 to	$47.48	$14.00 to	$41.87
Value of product	18.75 to	57.14	3.99 to	53.67
Return over all costs	-15.73 to	22.52	-20.99 to	11.80
Return over feed cost	-2.96 to	32.59	-13.10 to	23.13
Total concentrates, lb.	35 to	725	6 to	662
Total roughage,* lb.	1507 to	3656	1381 to	3571
Whole milk, lb.	115 to	448	59 to	283
Skimmilk, lb.	1305 to	3420	325 to	1315
Pasture, days	79 to	237	26 to	209

*Three pounds of silage considered as one pound of roughage.

Other Cattle

Other cattle include all cattle except the cows. The data for the herds where calves were raised only for replacement or for sale as veal or breeding stock were placed in one group; the data for the herds where some cattle, raised or purchased, were fattened for sale as beef were placed in another.

Cost and Return per Unit of All Cattle

	Dairy Herds		Milk-and-Beef Herds	
	1936	1935	1936	1935
Number of farms	17	13	7	7
Units per farm	27	39	44	37
Man labor, hours	125.7	98.8	67.1	64.6
Horse work, hours	5.5	4.1	2.9	2.1
Costs:				
Feed	$40.74	$31.36	$39.92	$28.78
Man labor	24.79	19.76	13.42	12.93
Horse work	.56	.34	.26	.16
Shelter	8.74	9.53	7.14	7.60
Equipment	2.99	2.49	1.86	2.42
Interest at 5%	2.88	2.43	2.73	2.09
Miscellaneous cash	1.21	.83	.77	.67
Total costs	81.91	66.74	66.10	54.65
Manure credit	3.76	2.67	3.92	2.72
Net cost	78.15	64.07	62.18	51.93
Value of product:				
Animal	20.57	21.24	27.27	26.14
Dairy	65.94	47.54	37.83	33.85
Total product	86.51	68.78	65.10	59.99
Return over all costs	8.36	4.71	2.92	8.06
Return over feed cost	45.77	37.42	25.18	31.21
Feeds:				
Corn, lb.	178	68	261	192
Small grain, lb.	594	351	532	262
Mill feeds, lb.	179	172	67	32
Hay, lb.	3054	1719	3367	2065
Fodder and stover, lb.	306	199	399	607
Silage, lb.	5502	6510	5118	5044
Milk, lb.	176	171	152	191
Skimmilk, lb.	1596	1450	916	872
Total concentrates,* lb.	1246	861	1038	663
Total roughage,+ lb.	5194	4088	5473	4352
Pasture, days	204	166	223	201
Range for specified items, 1936:				
Units per farm	15 to	59	32 to	62
Man labor, hours	62.3 to	190.9	43.6 to	86.4
Net cost	$45.36 to	$121.68	$40.07 to	$88.22
Total value of product	59.00 to	117.47	47.66 to	101.10
Return over all costs	-12.42 to	21.02	-13.99 to	16.73
Return over feed cost	31.63 to	64.70	8.58 to	40.48
Total concentrates,* lb.	305 to	2698	194 to	2348
Total roughage,+ lb.	3641 to	8197	3884 to	8094
Pasture, days	142 to	253	59 to	329

*Six pounds of milk or skimmilk considered as one pound of concentrates.
+Three pounds of silage considered as one pound of roughage.

All Cattle

Expenses and returns per unit of all cattle, including cows and other cattle, are presented. One cow, one bull, two yearlings, three calves six months to one year old, or four calves under six months were considered as one unit. In this statement any milk used by the calves was included in the feed and in the credit for dairy products fed to livestock.

Cost and Return per Sheep

	1936 Range for specified items	1936 Average	1935 Average
Number of farms		12	12
Number of sheep per farm	9 to 83	35	33
Man labor, hours	1.1 to 4.0	2.4	2.6
Horse work, hours		.1	.3
Costs:			
Feed		$1.49	$1.56
Man labor		.48	.51
Horse work		.01	.03
Shelter		.70	.59
Equipment		.11	.12
Interest at 5%		.24	.25
Miscellaneous cash		.19	.18
Total cost	$1.83 to $5.31	$3.22	$3.24
Manure credit		.13	.11
Net cost	$1.82 to $5.07	$3.09	$3.13
Value produced:			
Sheep		3.50	2.77
Wool		1.84	1.73
Total product	$.43 to $11.19	$5.34	$4.50
Return over all costs	-2.83 to 9.37	2.25	1.37
Return over feed cost	-.12 to 10.28	3.85	2.94
Weight of fleece, lb.	6.1 to 10.7	7.8	8.3
Per cent lamb crop	59 to 165	100	86
Per cent death loss, lambs	8 to 57	13	19
Per cent death loss, sheep	3 to 35	13	10
Feeds:			
Grain, lb.	1 to 50	16	21
Hay and fodder, lb.		168	108
Silage, lb.		58	240
Total roughage,* lb.	47 to 355	187	188
Pasture days	183 to 236	211	156

*Three pounds of silage considered as one pound of roughage.

Sheep

The cost and return per head for sheep are presented above. The number of head of sheep is the average number of mature head for a year when two lambs up to six months of age are considered equal to one mature sheep. The fleece weight was calculated by dividing the total clip by the number of sheep sheared. The per cent death loss is based on the total number of sheep and lambs, regardless of the length of time that they were on the farm. The lambs raised per ewe is the number of lambs raised to six months of age divided by the number of ewes at lambing time.

Cost and Return per 100 Pounds of Hogs Produced

	1936 Range for specified items	1936 Average	1935 Average
Number of farms		24	19
Pounds produced per farm	3345 to 37700	13124	9741
Man labor, hours	2.1 to 6.0	3.4	2.9
Horse work, hours		.3	.3
Costs:			
Feed		$6.62	$4.94
Man labor		.67	.57
Horse work		.03	.03
Shelter		.20	.24
Equipment		.09	.19
Interest at 5%		.15	.18
Miscellaneous cash		.06	.05
Total cost	$5.94 to $10.34	$7.82	$6.20
Manure credit	.27 to .46	.35	.37
Net cost	5.48 to 9.79	7.47	5.83
Average selling price, per cwt.	8.05 to 12.12	9.18	8.99
Return over all costs	-1.42 to 6.62	1.71	3.16
Return over feed	-.48 to 8.18	2.56	4.05
Average weight of hogs sold	113 to 428	226	235
Pigs raised per litter	2.3 to 8.2	6.0	5.9
Feeds:			
Corn, lb.		214	236
Small grain, lb.		147	151
Commercial feed, lb.		12	17
Total concentrates, lb.	133 to 486	373	404
Skimmilk equivalent,* lb.	217 to 1605	578	597
Pasture, days	0 to 45	27	27

*One pound of tankage considered as ten pounds of skimmilk.

Hogs

The cost and return per one hundred pounds of hogs are presented above. The number of pigs per litter was calculated by adding together the number of pigs raised to six months of age and those that were sold or butchered at an earlier age. This sum was divided by the number of litters farrowed. The average market weight and the price received per hundred pounds are based on the total sales of hogs and pigs. The pounds of hogs produced include any gain in weight of breeding hogs and likewise the expenses include the cost of maintaining the breeding herd. The return over all costs is the difference between the net expenses per hundred pounds and the selling price. It does not include any receipts from corn-hog benefit payments. The return over feed is the difference between the feed cost and the selling price.

Cost and Return per 100 Hens

	1936 Range for specified items		1936 Average	1935 Average
Number of farms			23	19
Number of laying hens per farm	44 to	314	136	124
Number of other chickens per farm	30 to	206	77	79
Eggs per hen	63 to	186	121	119
Man labor, hours	164 to	909	355	329
Horse work, hours			9	9
Costs:				
Feed			$201.93	$175.76
Man labor			71.04	65.82
Horse work			.90	.77
Shelter			18.31	18.51
Equipment			15.96	20.08
Interest at 5%			3.83	3.65
Miscellaneous cash			13.05	17.36
Total cost	$149.59 to	$506.84	$325.02	$301.95
Manure credit	4.34 to	15.89	9.22	9.49
Net cost	145.25 to	506.84	315.80	292.46
Value of product:				
Poultry	4.96 to	206.07	69.32	76.49
Eggs	109.16 to	358.54	209.08	218.44
Total product	136.48 to	501.45	278.40	294.93
Return over all costs*	-276.78 to	186.10	-37.40	2.47
Return over feed cost*	-39.87 to	286.59	76.47	119.17
Selling price per dozen eggs	.18 to	.25	.21	.23
Feeds:				
Corn, lb.			3687	3244
Small grain, lb.			4226	5851
Other concentrates, lb.			2778	2477
Meat scrap and tankage			425	337
Skimmilk			6217	6126
Total concentrates	5736 to	15517	10691	11572
Skimmilk equivalent, lb.+	1202 to	35022	13448	11855

*A minus (-) indicates a loss, or a failure to cover the charges.
+One pound of meat scrap or tankage considered as 17 pounds of skimmilk.

Chickens

The data for chickens are presented on this page on the basis of one hundred hens. In a few instances, a small number of ducks or geese were raised. In such cases the feed, labor and other expenses, and the receipts for ducks and geese are included. Portable brooder houses were considered as equipment in arriving at the costs for shelter and equipment. The division of the costs between the production of eggs and the production of poultry was made on the basis of the income from each.

Cost of Horse Work per Horse

	1936 Range for specified items	1936 Average	1935 Average
Number of farms		24	19
Horses per farm	3 to 9	6	6
Crop acres per horse	19 to 72	33	34
Man labor, hours	34 to 93	63	54
Costs:			
Feed		$40.12	$40.87
Labor		12.56	10.78
Shelter		8.44	10.14
Equipment		4.82	5.49
Interest at 5%		5.20	4.91
Miscellaneous cash		1.02	.79
Depreciation		9.00	6.50
Total cost	$52.39 to $143.42	$81.16	$79.48
Credits:			
Manure		4.15	5.50
Appreciation		0	0
Total credit	$2.21 to $19.73	$4.15	$5.50
Net cost	39.47 to 138.77	77.01	73.98
Hours worked	616 to 1151	848	887
Cost per hour, cents	4.8 to 16.2	9.1	8.3
Feed:			
Grain, lb.	433 to 4012	2326	2286
Hay, fodder and stover, lb.		4498	3808
Silage, lb.		115	794
Total roughage,* lb.	2564 to 9013	4536	4073
Pasture, days	7 to 146	82	70

*Three pounds of silage considered as one pound of roughage.

Work Horses

Average cost per horse and per hour of horse work are presented on this page. Tractors were used for drawbar power on eighteen of the farms in 1936 and on fifteen in 1935. As the cost per hour of work was practically the same on the non-tractor farms as on the tractor farms, all farms were included in calculating the averages presented.

Automobiles and Trucks

The cost per mile of operation of automobiles and trucks is shown on page 15. The labor charge is the value, at twenty cents per hour, of the time the regular farm workers spent in repairing and servicing the machines. It also includes a charge for any use of horses or automobile in repairing them. Miscellaneous cash costs include the cost of the license, repairs, parts, tires, insurance and also greasing when it was done at a service station. The miles driven are based on a check of the speedometer reading at the beginning and end of the year.

Costs per Mile for Automobiles and Trucks

	Automobiles		Trucks	
	1936	1935	1936	1935
No. of farms	23	18	14	12
Miles driven per car	8422	7409	4792	4126
Miles per gallon of gasoline	15.0	14.0	12.4	12.7
Cost per mile of operation:				
Labor	$.001	$.001	$.002	$.004
Gasoline and oil	.012	.013	.017	.016
Repairs, etc.	.012	.013	.022	.026
Depreciation	.005	.008	.009	.011
Interest at 5%	.002	.002	.004	.004
Total cost	.032	.037	.054	.061
Range for specified items, 1936:				
Miles driven per car	1274 to	26256	700 to	12553
Miles per gallon of gasoline	9.5 to	18.8	3.1 to	18.4
Cost per mile of operation	$.017 to	$.055	$.030 to	$.131

Costs per Hour for Tractors

	Two-Plow Tractors		Three-Plow Tractors	
	1936	1935	1936	1935
Number of farms	9	4	9	9
Hours worked per year:				
Drawbar	194	292	443	372
Belt	59	79	137	183
Total	253	371	580	555
Per 100 hours of operation:				
Labor, hr.	10.6	9.4	10.6	10.7
Fuel, gal.	235	192	245	252
Oil, gal.	6.2	6.6	7.7	8.8
Cost per hour of operation:				
Labor	$.021	$.029	$.021	$.021
Fuel and oil	.366	.284	.352	.295
Repairs, etc.	.033	.066	.053	.195
Use of auto, truck and horses	.003	.005	.002	.005
Depreciation	.085	.108	.087	.002*
Interest at 5%	.099	.046	.056	.050
Total cost	.607	.538	.571	.564
Range for specified items, 1936:				
Total hours worked per year	52 to	510	332 to	934
Fuel per 100 hours, gal.	170 to	455	194 to	335
Oil per 100 hours, gal.	2 to	17	5 to	10
Cost per hour of operation	$.432 to	$.882	$.382 to	$.774

*Appreciation resulting from extensive repairs.

Tractors

The number of hours tractors were operated and the cost per hour of operation are presented above for both two-plow and three-plow tractors. The labor of the regular farm workers used in servicing and repairing is charged at twenty cents per hour. The use of the automobile, truck and horses in repairing or servicing is charged at the rates found on the farm involved. Miscellaneous cash costs

include the cash cost of repairing, parts, etc. Interest is calculated on the average of the beginning and ending inventories.

Crop Statements

Summaries of costs and returns for crop production are presented on this and the following four pages. The data from these farms show a wide variation in the efficiency with which labor was used in crop production. The average amount of man labor used per acre in 1936 and 1935 in performing the different crop operations with varying sizes of power units follows. The range in amount for each item in 1936 is also presented.

Summary of Hours of Man Labor Used per Acre in Performing Crop Operations

	1936		1935
	Range for each item	Average	Average
Seedbed preparation:			
Plowing:			
4 horses	2.1 to 4.3	3.1	3.0
5 horses	1.7 to 2.8	2.4	2.1
2-plow tractor	.9 to 2.0	1.4	1.3
3-plow tractor	.8 to 1.3	1.1	1.0
Disking:			
3-plow tractor	.16 to .34	.24	.27
Springtoothing & field cultivating:			
3 horses	.62 to 1.06	.84	-
4 horses	.59 to .88	.72	.78
2-plow tractor	.42 to .93	.60	-
3-plow tractor	.19 to .79	.45	.50
Harrowing:			
3 horses	.25 to .93	.41	.39
4 horses	.24 to .46	.32	.31
Seeding and harvesting grain:			
Drilling:			
3 horses	.55 to 1.12	.81	.80
4 horses	.52 to .86	.63	.62
Cutting:			
4 horses	.49 to 1.02	.76	.88
2-plow tractor:			
Man hours	- to -	-	1.24
Tractor hours	- to -	-	.71
3-plow tractor:			
Man hours	- to -	-	.99
Tractor hours	- to -	-	.50
Shocking	.6 to 1.7	1.1	1.3
Threshing:			
Man hours	1.1 to 3.7	2.3	2.5
Horse hours	1.8 to 7.7	3.4	3.8
Planting and harvesting corn:			
Planting	.4 to 1.4	.9	.9
Cultivating (horses):			
1-row	1.1 to 2.6	1.6	1.5
2-row	.8 to 1.6	1.1	-
Cutting (3 horses)	1.4 to 3.9	2.3	2.0
Shocking	1.4 to 5.0	3.2	3.6
Filling silo:			
Man hours	3.8 to 9.2	6.0	9.1
Horse hours	5.6 to 13.8	8.4	13.1
Husking by hand	8.4 to 15.9	11.3	11.8

Summary of Hours of Man Labor Used per Hour for Crop Operations (continued)

	1936 Range for each item	1936 Average	1935 Average
Harvesting hay:			
Alfalfa:			
First cutting:			
Mowing (horses)	.6 to 3.4	1.3	1.5
Raking and turning	.4 to 1.5	.9	1.0
Hauling to barn:			
Man hours	1.3 to 11.0	3.8	4.6
Horse hours	1.6 to 16.7	5.0	6.1
Second cutting:			
Mowing (horses)	.7 to 2.3	1.2	1.4
Raking and turning	.3 to 1.2	.7	.8
Hauling to barn:			
Man hours	.6 to 8.0	2.3	3.4
Horse hours	.7 to 9.1	3.3	4.2
Third cutting:			
Mowing (horses)	.7 to 2.3	1.4	1.2
Raking and turning	.4 to 1.5	.8	.7
Hauling to barn:			
Man hours	1.1 to 6.4	3.2	2.6
Horse hours	1.1 to 6.8	4.1	3.3
Clover hay:			
Mowing (horses)	.6 to 2.6	1.4	-
Raking and turning	.3 to 1.1	.7	-
Hauling to barn:			
Man hours	2.8 to 7.4	4.8	-
Horse hours	3.6 to 8.2	6.5	-
Timothy and clover hay:			
Mowing (horses)	- to -	-	1.5
Raking and turning	- to -	-	.9
Hauling to barn:			
Man hours	- to -	-	4.3
Horse hours	- to -	-	6.5

The comparative cost and return for 1936 and 1935 for each of the principal crops grown on these farms are presented on pages 18 and 20. The costs presented are relative rather than absolute costs. Because many of the cost items, such as the farmer's own labor and the use of his own land, machinery and equipment, do not represent actual current "out-of-pocket" cash expense, it was necessary for purposes of comparison to estimate their value.

The factors of cost were charged at local prices. Man labor was charged at twenty cents per hour. Horse work was charged at eight cents per hour, a two-plow tractor at forty-five cents per hour in 1935 and fifty cents in 1936, and a three-plow tractor at sixty cents in 1935 and sixty-five cents in 1936. Seeds were charged at purchase prices, or at farm prices plus the cost of cleaning. Manure was charged at fifty cents per ton plus the cost of application. Forty per cent of the cost was charged to the land covered and the balance was prorated on an acre basis to the remaining land normally receiving manure. Flat charges per acre were made for seed for hay crops, machinery and land.

The local farm price on December 1 was used in determining the returns. The value of crops, such as silage, which have no regular market price, were computed by comparing their feeding value with other crops for which local market prices were available. The data for each farm were computed as if the farmer was a full owner.

Comparative Cost and Return per Acre for Small Grain Crops

	Barley		Oats		Winter Wheat		Spring wheat	Oats & wheat
	1935	1936	1935	1936	1935	1936	1935	1935
Number of farms	19	19	18	17	10	13	9	5
Acres per farm	53	40	40	34	14	13	10	23
Costs and returns:								
Man labor	$1.61	$1.62	$1.63	$1.65	$2.22	$1.94	$1.70	$1.76
Horse and tractor	1.84	2.07	1.94	2.13	2.08	2.31	1.85	2.04
Seed	2.12	1.55	1.34	.87	1.97	1.95	1.83	1.85
Twine	.16	.17	.17	.18	.21	.16	.18	.19
Threshing	.61	.49	.90	.87	.75	.67	.42	.71
Manure	.79	1.29	.75	1.10	.58	1.08	.68	.73
Machinery	1.06	1.05	1.06	1.05	1.05	1.16	1.05	1.05
OPERATING COSTS	8.19	8.24	7.79	7.85	8.86	9.27	7.71	8.33
Land	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
TOTAL COSTS	11.69	11.74	11.29	11.35	12.36	12.77	11.21	11.83
Crop value (December 1)	11.28	19.32	7.63	12.67	21.86	19.94	8.25	12.30
CROP VALUE LESS COST*	-.48+	7.58+	-3.66	1.32	9.50	7.17	-2.96	.37
Yield, bushels	20.5	16.8	31.8	28.8	23.5	16.8	11.0	22.6§
Cost per bu.: Average	$.57	$.70	$.36	$.39	$.53	$.76	$1.02	$.52
Lowest	.35	.40	.24	.29	.34	.46	.70	.38
Highest	.91	1.16	.64	.69	1.10	1.79	1.51	1.52
December 1 price	.55	1.15	.24	.44	.93	1.18	.75‡	.54
Physical requirements:								
To harvest:								
Man labor, hrs.	3.1	3.7	3.2	4.0	2.7	4.2	3.2	2.9
Horse work, hrs.	10.3	10.2	11.6	12.2	9.6	13.7	10.8	7.7
Tractor work, hrs.	.8	1.1	.7	1.0	.7	.8	.6	1.1
Harvest:								
Man labor, hrs.	4.9	4.4	4.9	4.2	8.4	5.5	5.3	5.9
Horse work, hrs.	5.3	5.2	5.9	4.8	9.4	7.0	5.2	5.6
Tractor work, hrs.	.3	.3	.3	.3	.3	.2	.4	.5
Seed, bushels	1.7	2.0	2.3	2.2	1.6	1.7	1.6	2.0
Twine, pounds	2.2	1.8	2.4	2.5	3.1	2.3	2.6	2.5

*A minus (-) indicates a cost greater than the value of the crop.
+Malting barley prices. Using feed barley prices - 35¢ in 1935 and 73¢ in 1936; crop values less costs are - $4.51 and $.52, respectively.
§At 40 pounds per bushel.
‡Low price because of low quality.

Comparative Cost and Return per Acre for Small Grain and Corn Crops

	Oats & Barley		Rye	Flax	Husked Corn		Shredded Corn	
	1935	1936	1935	1935	1935	1936	1935	1936
Number of farms	4	7	5	4	15	10	7	11
Acres per farm	18	19	27	6	10	15	11	10
Costs and returns:								
Man labor	$1.52	$1.83	$1.39	$2.78	$4.45	$4.62	$4.84	$4.68
Horse and tractor	1.90	2.04	1.50	3.01	4.40	4.16	4.08	4.01
Seed	2.00	1.28	1.84	1.57	.42	.76	.48	.64
Twine	.16	.22	.17	.02	-	-	.27	.25
Threshing+	.67	.82	.36	1.48	.19	-	1.74	1.49
Manure	.35	1.59	.65	.38	1.80	3.12	2.48	3.08
Machinery	1.05	1.05	1.05	1.05	1.55	1.55	2.50	2.48
OPERATING COSTS	7.65	8.83	6.96	10.29	12.81	14.21	16.39	16.63
Land	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50
TOTAL COSTS	11.15	12.33	10.46	13.79	16.31	17.71	18.71§	18.05§
Crop value (December 1)	6.60	15.95	5.21	9.48	16.38	31.40	13.89	27.90
CROP VALUE LESS COST*	-4.55	3.62	-5.25	-4.31	.07	13.69	-4.82	9.85
Yield, bushels	21.3‡	27.5‡	12.4	6.0	38.1	31.4	32.3	27.5
Cost per bu.: Average	$.52	$.45	$.84	$2.30	$.43	$.56	$.58	$.64
Lowest	.35	.34	.60	1.33	.26	.35	.40	.33
Highest	.83	.86	1.59	4.59	1.07	1.90	1.38	2.21
December 1 price	.31	.58	.42	1.58	.43	1.00	.43	1.00
Physical requirements:								
To harvest:								
Man labor, hrs.	3.3	4.0	2.4	5.6	11.8	11.8	11.9	10.5
Horse work, hrs.	12.6	12.0	6.1	17.5	28.1	24.3	28.1	24.1
Tractor work, hrs.	.5	.8	.8	1.0	1.1	1.4	.9	1.2
Harvest:								
Man labor, hrs.	4.3	5.1	4.6	8.3	10.4	11.3	12.2	12.9
Horse work, hrs.	4.0	5.2	4.7	11.3	17.0	17.8	16.4	17.7
Tractor work, hrs.	.5	.5	.3	.4	.3	-	-	-
Seed, bushels	2.2	2.1	1.7	.8	.19	.20	.19	.19
Twine, pounds	2.3	2.7	2.3	-	-	-	4.4	3.2

*A minus (-) indicates a cost greater than the value of the crop.
+Includes also charges for mechanical husker and shredder
§Net cost after deducting stover credit of $1.18 in 1935 and $2.08 in 1936.
‡At 40 pounds per bushel

Comparative Cost per Acre for Roughage Crops

	Silage Corn 1935	Silage Corn 1936	Alfalfa Hay 1935	Alfalfa Hay 1936	Clover-1936 Hay only	Clover-1936 Hay & seed	Clover and Timothy 1935	Timothy Seed 1936	Wild Hay 1935	Soy-bean Hay 1935
Number of farms	20	22	19	15	14	13	7	5	10	5
Acres per farm	13	18	15	11	18	20	12	9	4	6
Costs and returns:										
Man labor	$4.34	$3.92	$2.80	$2.50	$1.45	$2.12	$1.70	$.89	$1.96	$3.46
Horse and tractor	4.06	4.00	1.86	1.69	1.12	1.44	1.28	.56	1.15	3.18
Seed	.64	.74	1.10	1.20	2.63	2.70	1.10	1.30	-	1.76
Twine	.34	.26	-	-	-	-	-	.14	-	.14
Silo filling*	2.40	2.05	-	-	-	.64	-	.82	-	-
Manure	2.41	3.28	.75	1.44	1.25	1.16	.81	.85	-	1.12
Machinery	2.50	2.50	1.21	1.20	.57	1.06	.82	.20	.74	1.51
OPERATING COST	16.69	16.75	7.72	8.03	7.02	9.12	5.71	4.76	3.85	11.17
Land	3.50	3.50	3.50	3.50	3.50	3.50	3.50	3.50	2.00	3.50
TOTAL COSTS	19.39+	16.90+	11.22	11.53	10.52	12.62	9.21	8.26	5.85	14.67
Yield, bushels	-	-	-	-	-	.61	-	4.1	-	-
tons	7.4	5.1	3.1	1.9	1.3	1.3	2.3	-	1.5	1.7
Cost per bu.: Average	$2.77	$3.31	$3.62	$6.07	$8.09	$ -	$4.00	$2.01	$3.90	$8.63
(or ton) Lowest	2.02	.96	2.29	2.35	4.68	-	2.76	1.15	2.10	5.85
Highest	3.96	5.68	8.68	13.43	13.37	-	5.34	5.57	12.69	16.65
Physical requirements:										
To harvest or first cutting:										
Man labor, hrs.	10.1	11.3	7.6	6.6	7.2	6.9	7.2	4.4	9.1	7.7
Horse work, hrs.	24.0	24.8	11.4	10.0	10.8	9.6	11.8	3.7	13.0	19.4
Tractor work, hrs.	1.1	1.5	.2	.1	.4	.4	.2	.5	-	1.2
Harvest or second cutting:										
Man labor, hrs.	11.6	8.3	5.2	3.8	.1	3.7	1.3	-	.7	9.6
Horse work, hrs.	19.0	14.4	7.6	6.3	.1	5.1	3.2	-	1.4	11.2
Tractor work, hrs.	-	-	.2	.1	-	-	-	-	-	.1
Third cutting:										
Man labor, hrs.	-	-	1.2	2.1	-	-	-	-	-	-
Horse work, hrs.	-	-	1.7	2.9	-	-	-	-	-	-
Tractor work, hrs.	-	-	-	.1	-	-	-	-	-	-
Seed, bushels	.24	.22	-	-	-	-	-	-	-	1.0
Twine, pounds	4.8	3.0	-	-	-	-	-	1.7	-	2.1

*Includes also hulling and threshing charges.

+Net cost after deducting credit for corn knocked off by binder of $.80 in 1935 and $3.35 in 1936.

SOME FACTORS AFFECTING EARNINGS

The data presented in this report show a wide variation among farms in the operator's labor earnings. These variations, in large part, are the result of differences in the size of business, in the selection of crop and livestock enterprises and in the efficiency with which the individual enterprises are conducted.

Size of Business

When conditions are such that farming is profitable, the larger farm business, within limits, tends to yield the larger earnings. This is illustrated by the data from the farms studied in 1936 (see Table 1). In this table the size

Table 1

Size of Business and Operator's Labor Earnings

Size of farm	No. of farms	Per farm	
		Total P.M.W.U.*	Operator's labor earning
Under 550 P.M.W.U.*	7	470	$1418
550 to 749 P.M.W.U.	10	596	1780
750 P.M.W.U. and over	7	940	3028

*Productive man work units.

of farm is measured in terms of the number of productive man work units. A productive man work unit is the average amount of productive work on crops or livestock, accomplished per man in 10 hours or 10 hours of work off the farm for pay. As such, it serves as a measure of either crop or livestock enterprises or both. On the average, the farmers with a large business had larger earnings than the farmers with a small business. When conditions are such that farming is unprofitable, the operators of large farms may be expected to incur somewhat larger losses.

Selection of Crops

The comparative return per acre varies among the different crops. The differences among crops from the standpoint of economy in the production of feed are indicated by the data in Table 2. This table shows the production per acre and

Table 2

Production per Acre and Relative Cost per Hundred Pounds of Digestible Nutrients - Winona County

Crop	Average yield* (1917-35)	Total lbs. digestible nutrients+	% protein is of total nutrients+	Cost per 100 lbs. of total nutrients
Grains:	bushel			
Corn	37.4	1711	8.7	$1.00
Barley	26.4	1006	11.3	1.22
Oats	35.8	806	13.8	1.42
Wheat	17.0	808	11.1	1.50
Roughages:	ton			
Alfalfa	2.6	2652	20.8	.43
Clover and timothy	1.7	1676	10.3	.55
Silage	7.8	2621	7.2	.79

*Yields of alfalfa, clover and timothy, and silage estimated from available data. All other yields from annual reports of State Department of Agriculture.
+Analysis of feeds from "Feeding the Dairy Herd", by Eckles, Minnesota Bulletin 218 (1932).

the relative cost per hundred pounds of digestible nutrients for the common feed crops based on nineteen-year average yields and the average costs obtained on the farms studied, adjusted for differences in yield.

On the basis of past yields and present costs, the lowest cost feed-grain crop is corn. It produces more nutrients per acre and at a lower cost than either oats, barley or wheat. Barley is next to corn in the amount of feed produced and in cheapness. When the higher percentage of protein in barley and the greater susceptibility to erosion of land in corn are considered, the difference between these two crops in the cost per 100 pounds of digestible nutrients becomes less significant.

Alfalfa, on the basis of the above data, is the cheapest source of roughage. It also has the further advantages of producing the largest quantity of nutrients per acre and of containing the highest percentage of protein. Silage has the disadvantage of a high cost and a very low protein content. However, it offers a method of utilizing the entire corn crop.

Many farms raise some crops for sale. One important consideration in selecting these must be the net returns per acre. It is impossible to predict with any assurance, what the prices for crops will be in the future. However, it is possible to calculate the relative profitableness of the various crops, using average crop yields and prices and 1935-36 costs on the farms studied. The results of such a calculation are shown in Table 3.

Table 3

Comparative Returns per Acre of Crops
Winona County

	Malting barley	Flax	Corn	Winter wheat	Spring wheat	Oats
Cost per acre	$12.25	$15.30	$17.00	$12.50	$11.80	$11.50
Yield (1917-35) bushel	26.4	12.0	37.4	18.2	15.8	35.8
Price per bushel (1926-35)	$.69	$1.71	$.55	$.83	$.86	$.32
Net return per acre	5.97	5.22	3.57	2.61	1.79	-.04

Selection of Livestock Enterprises

The data presented in this report show differences in profitability among the different classes of livestock. Data for several years, however, are needed in order to determine accurately the most profitable combination of livestock enterprises for a particular farm, especially in view of the abnormal feed situation that existed in 1935 and 1936.

Efficiency in Conducting Enterprises

The net returns from the individual enterprises will determine the operator's labor earnings. Efficient operation will increase the net return of the enterprises.

High crop yields will, within limits, increase the cash crop income or the quantity of feed produced, with a less than proportional increase in costs. The effect of yield upon the cost per acre and per bushel of producing barley is shown in Table 4. A few things that favor a large yield of crops per acre are (1) a well prepared seedbed, (2) early seeding, (3) the use of the varieties best adapted to the farm, and (4) the planting of clean seed of high vitality.

Table 4

The Yield, Cost per Acre, and Cost per Bushel of Barley
Winona County

	Number of farms	Average yield, bushels	Cost	
			Per acre	Per bushel
Under 13 bushels	6	11	$11.00	$1.00
13 to 19 bushels	7	15	11.54	.77
Over 19 bushels	6	25	12.71	.51

Return over feed cost is a valuable measure of livestock efficiency. Feed is usually the largest single item of cost for livestock. A large part of the feed is either purchased or marketable. Shelter, equipment, and some labor involve no cash outlay during most years; they frequently have no profitable use except for livestock. Feed is, therefore, the most important item of cost that can be changed from year to year by the farmer.

Increased butterfat production per cow tends to increase return over feed cost (see Table 5). Naturally, there is a limit beyond which greater production

Table 5

Butterfat Production and Return over Feed Cost per Cow

Production	No. of farms	Average production	Feed cost	Return over feed cost
Under 190 pounds	9	160	$24.61	$45.68
190 - 239 pounds	8	208	39.90	50.54
240 pounds and over	7	276	51.35	68.20

can be obtained only at an additional cost which exceeds the value of the additional product. Increased production requires the feeding of a higher proportion of concentrates, which will usually increase the average cost of nutrients. This is illustrated in Table 6.

Table 6

Butterfat Production per Cow and Cost per 100 Pounds of Total Digestible Nutrients Fed

Production	No. of farms	Average production	Total digestible nutrients fed	Cost per 100 lbs. total digestible nutrients
Under 190 pounds	9	160	2652	$.69
190 - 239 pounds	8	208	3563	1.01
240 pounds and over	7	276	4368	1.13

One of the important factors affecting return over feed cost for hogs is the number of pigs raised per litter. According to Table 7, the return over feed cost is greater for the herds where the greatest number of pigs per litter were saved.

Table 7

Pigs per Litter and Return over Feed Cost per 100 Pounds of Pork Produced

Pigs per litter	No. of farms	Average no. pigs saved	Return over feed cost
Under 6.0	11	4.5	$2.17
6.0 and over	13	7.2	2.89

Increased egg production per hen tends to increase the return over feed cost. The eight flocks with less than 110 eggs per hen yielded very little return over the cost of feed (see Table 8).

Table 8

Egg Production and Return over Feed Cost per Hen

Eggs per hen	No. of farms	Average no. of eggs	Return over feed cost
Under 110	8	82	$.16
110 - 139	8	124	.70
140 and over	7	162	1.50

Numerous other factors affect the cost and return for the various farm enterprises and thereby affect the operator's earnings. A careful comparison of the data for his farm contained in this report and in mimeographed reports nos. 81 and 85 with that for the other farmers should enable each cooperator to improve his methods and increase his earnings.