THE DAIRY FARMER'S RESPONSE TO CHANGES IN NATURAL AND ECONOMIC CONDITIONS
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A group of 150 dairy farmers in southeastern Minnesota have been keeping farm account records in cooperation with the University of Minnesota for the past ten years. This period has been characterized by wide fluctuations both in the prices of farm products and in weather conditions. A study of these records indicated the effect of these fluctuating conditions on the income and expense of these farms and also the adjustments these farmers made to changes in price and production.

Table 1. Average Cash Receipts, Cash Expenses and Net Cash Income per 100 Acres

	1928 & 1929	1930 & 1931	1932 & 1933	1934 & 1935	1936 & 1937
Cash farm receipts	$2,802	$2,183	$1,412	$2,191	$2,823
Cash farm expenses	1,432	1,192	789	1,175	1,586
Net cash income	1,370	991	623	1,016	1,237

The cash farm receipts, cash farm expenses, and net cash income per 100 acres are shown in Table 1. This is shown on the basis of 100 acres since there was some change from year to year in the farms included and hence some change in the acreage per farm. The average size of farm was 195 acres. The net cash income represents the amount of money available for meeting personal and household expenses, for interest and principal payments on debts, and for savings. The cash income in 1932 and 1933 was only one-half of that in 1928 and 1929, but by the end of the period had risen to the previous level. The most important factor causing this variation in income was price changes. The prices of some of the principal sale products for each of the two-year periods are shown in Table 2.

Table 2. Prices of Principal Sale Products

	1928 & 1929	1930 & 1931	1932 & 1933	1934 & 1935	1936 & 1937
Butterfat, lb.	$.515	$.345	$.220	$.305	$.380
Hogs, 100 lb.	8.92	7.14	3.30	6.37	9.37
Eggs, doz.	.275	.190	.125	.185	.195

Since the sale of livestock and livestock products was the principal source of income on these farms, changes in the number of livestock and the amount of livestock products were also factors affecting income. These changes are indicated in Table 3.

Table 3. Numbers of Livestock and Production of Butterfat, Hogs and Eggs per 100 Acres

	1928 & 1929	1930 & 1931	1932 & 1933	1934 & 1935	1936 & 1937
Dairy cows	8.4	8.7	9.1	8.9	8.5
Butterfat, lb.	2,050	2,101	2,195	2,065	2,018
Other cattle	8.7	9.7	10.0	9.1	9.8
Hogs, lb.	7,495	8,861	7,417	5,268	6,086
Sheep	4.1	5.2	7.2	9.2	8.5
Hens	81	80	87	88	90
Eggs	634	758	815	911	969

Changes in livestock production follow changes in feed production more closely than they do price changes. If the average yield of feed crops for the ten-year period is assumed to be 100, the relative production for each of the individual years is as follows:

1928 - 109 1930 - 111 1932 - 120 1934 - 60 1936 - 79
1929 - 117 1931 - 84   1933 - 105 1935 - 114 1937 - 101

The feed production of any one year affects the livestock production of the following year more than it does the year in which it occurs. However, the same conditions which cause low crop yields usually affect pasture in the same way so that there is some direct current effect on cattle and sheep production. The decrease in hog production in 1934 and 1935 represents the combined effect of feed shortage and the corn-hog program.

One factor that enabled these farmers to maintain more livestock in proportion to crop yields in the later years was increased feed purchases. Another was the increase in the use of alfalfa and sweet clover for hay and pasture as shown in Table 4. These crops produced more and better feed per acre than those for which they were substituted. Their increased use represents the farmer's effort to use his land most effectively and to some extent in the last two years his response to the soil conservation program. The increase would doubtless have been much greater had not the drouth in 1934 and 1936 caused the loss of new seedings. Low prices did not appear to induce any tendency toward depletion of the soil. Not only was the legume acreage increased and the livestock production maintained so that there was no decrease in manure available, but the proportion of land in soil depleting crops decreased from 71.4 per cent in 1928 to 65.6 per cent in 1934 and in spite of the loss of legume seedings was still down to 67.4 per cent in 1937.

Table 4. Average Percentage of Tillable Crop Land in Alfalfa and in Sweet Clover Pasture

	1928 & 1929	1930 & 1931	1932 & 1933	1934 & 1935	1936 & 1937
Alfalfa	5.0	6.2	7.9	9.9	12.2
Sweet clover pasture	3.0	3.0	4.6	4.0	4.5

The efforts of these farmers to adjust their expenses to changes in prices are shown in Table 5. Expenditures for buildings, machinery and power were reduced sharply when prices dropped. New construction and new purchases were delayed and repairs were postponed. The large increase of expenditures for these purposes as income rose reflected the meeting of both current and accumulated needs.

The annual expenditures for the repair of buildings ranged from .5 per cent of the inventory valuation in 1932 to 2.5 per cent in 1937. The average for the period was 1.2 per cent. New construction ranged from 1.4 per cent of the inventory valuation in 1932 to 7.1 per cent in 1936. The average for the period was 3.6 per cent. Machinery repairs likewise dropped to 3.6 per cent of the inventory valuation in 1932 and rose to 5.2 per cent in 1937. The average was 4.6 per cent. Similar figures for purchases of new machinery were 6.3 per cent, 24.4 per cent and 13.6 per cent, respectively. Apparently, for the whole period, the expenditures averaged large enough to provide amply for repairs and replacements.

Table 5. Cash Farm Expenditures per 100 Acres					
	1928 & 1929	1930 & 1931	1932 & 1933	1934 & 1935	1936 & 1937
Power and machinery	$387	$315	$195	$296	$475
Buildings and fences	107	84	36	84	159
Labor	161	141	106	140	192
Feed	262	181	120	203	276
Livestock expense	219	184	107	222	243
Crop expense	103	95	58	87	96
Taxes, insurance and miscellaneous	193	192	167	143	145
Total	1,432	1,192	789	1,175	1,586

Variations in expenditures for labor reflect largely changes in the wage level as the total months of labor per 100 acres, both family and hired, varied only one month per farm during the 10 years. During the last four years, one more month of labor was hired and one less of family labor was used. Farm wages are more closely adjusted to the price of farm products than are the prices of most items that make up the farm expense budget. Variations in expenditures for feed vary with prices and with the quantity of crops produced. Livestock expense dropped sharply in 1932 and 1933 largely because the purchase of breeding stock, especially sires, was postponed. Crop expense varied with the price level. Taxes and insurance are the most inflexible of all farm expenses and respond slowly to changes in income levels.

The records of these farms bring out rather strikingly the relative stability and perhaps inflexibility of the dairy farm organization. With a more or less fixed investment of $4,300 per 100 acres in buildings, machinery and livestock, it is difficult to make quick adjustments to changing prices. Most of the overhead expense would remain at approximately the same level if operations were curtailed with falling prices. The income would be reduced more than would the expense. Some of the upkeep and replacements may be delayed for a time but eventually they must be met if the farmer is to stay in business. It takes time to build up a foundation herd of productive livestock. To sacrifice them with falling prices and short crops would be reflected in curtailed earnings for years to come. They may be carried thru on short rations for a time, but such a practice is sure to decrease production materially. Surplus feed supplies carried over from years of flush production help to stabilize livestock production. Good management for a dairy farm consists in planning an organization that over a period of years will provide the most effective utilization of the farmer's resources, and then in following this consistently with only minor adjustments from year to year except as the farmer's resources, such as capital or family labor, change or as fairly permanent changes in relative prices occur. Major adjustments from year to year, made because of fluctuating prices, are likely to prove disastrous from the income standpoint.

MINNESOTA FARM PRICES FOR APRIL, 1938
Prepared by W. C. Waite and W. B. Garver

The index number of Minnesota farm prices for the month of April, 1938 was 76. When the average of farm prices of the three Aprils, 1924-25-26 is represented by 100, the indexes for April of each year from 1924 to date are as follows:

April	1924 - 82	April	1932 - 46
"	1925 - 106	"	1933 - 40
"	1926 - 112	"	1934 - 53
"	1927 - 110	"	1935 - 92
"	1928 - 106	"	1936 - 84
"	1929 - 112	"	1937 - 101*
"	1930 - 101	"	1938 - 76*
"	1931 - 71		*Preliminary

The price index of 76 for the past month is the net result of increases and decreases in the prices of farm products in April, 1938 over the average of April, 1924-25-26 weighted according to their relative importance.

Average Farm Prices Used in Computing the Minnesota Farm Price Index, April 15, 1938, with Comparisons*

	Apr. 15, 1938	Mar. 15, 1938	Apr. 15, 1937	Av. Apr. 1924-25-26	% Apr.15, 1938 is of Mar. 15, 1938	% Apr.15, 1938 is of Apr. 15, 1937	% Apr.15, 1938 is of Apr. 15, 1924-25-26
Wheat	$.84	$.87	$1.35	$1.29	97	62	65
Corn	.44	.42	1.19	.64	105	37	69
Oats	.22	.23	.47	.35	96	47	63
Barley	.50	.54	.93	.57	93	54	88
Rye	.48	.55	.99	.73	87	48	66
Flax	1.81	1.87	2.00	2.29	97	90	79
Potatoes	.40	.41	1.35	.95	98	30	42
Hogs	7.90	8.50	9.30	9.69	93	85	81
Cattle	6.40	6.20	7.20	6.09	103	89	105
Calves	7.70	8.10	7.90	8.51	95	97	90
Lambs-sheep	7.02	7.38	9.36	11.44	95	75	61
Chickens	.136	.132	.110	.183	103	124	74
Eggs	.143	.146	.193	.22	98	74	65
Butterfat	.29	.32	.35	.42	91	83	69
Hay	6.00	6.05	9.92	11.62	99	60	52
Milk	1.70	1.75	1.85	1.98	97	92	86

*Except for milk, these are the average prices for Minnesota as reported by the United States Department of Agriculture.

Indexes and Ratios of Minnesota Agriculture*

	April 1938	March 1938	April 1937	Av.April 1924-26
U.S. farm price index	68.0	68.0	94.0	100.0
Minnesota farm price index	76.0	76.0	101.0	100.0
U.S. purchasing power of farm products	85.0	84.0	110.0	100.0
Minnesota purchasing power of farm products	95.0	94.0	119.0	100.0
Minnesota farmer's share of consumer's food dollar	45.9	47.2	47.5	52.9
U.S. hog-corn ratio	14.7	16.3	7.6	12.4
Minnesota hog-corn ratio	18.0	20.2	7.8	15.5
Minnesota egg-grain ratio	14.1	14.2	9.5	12.7
Minnesota butterfat-farm-grain ratio	36.2	38.6	20.0	36.8

*Explanations of the computation of these data may be had upon request.