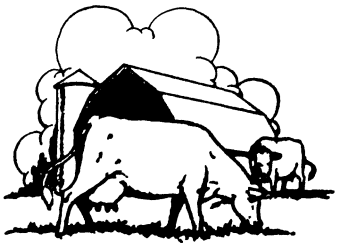

MINNESOTA
farm business NOTES

NO. 365 ST. PAUL CAMPUS, UNIVERSITY OF MINNESOTA NOVEMBER 30, 1955

SPECIALIZATION IS NOT ALWAYS PROFITABLE

R. A. Hinton and S. A. Engene

Farmers must review their farm plans frequently. Changes in prices, in production methods, and in conditions on the farm may make an adjustment profitable.

The problems involved in deciding upon the most desirable farm plan are complex—much too complex to discuss fully in this article. Data obtained from records kept by farmers throw some valuable light on livestock choices, however.

On most farms in this state all or a large part of the crops are converted into livestock and livestock products and are sold in that form. The decisions as to crops to be raised, however, must be based primarily upon the soil and climate. The choice of livestock is, therefore, mostly a choice as to the kinds of livestock that will bring the biggest returns for the crops.

Many farmers have land suitable only for hay and pasture. Others include grass and legume crops as an aid in maintaining crop yields. Still others consider forage crops to be more profitable than grain crops.

Main Market Is Dairy Cattle

In general, the only market for forages is livestock. In Minnesota, the main market is dairy cattle. By feeding a high grain ration they also provide a market for grains. As an alternative, the dairy cattle might be fed a low grain ration, and most of the grain might be marketed through hogs (or other grain consuming livestock). The farmer with considerable forage then wonders whether dairy cattle afford a more active market than hogs.

The farm records mentioned earlier provide a basis for comparing these methods. Let us assume a 160 acre farm with a five-year rotation of corn, oats, and three years of hay and pasture.

If all of this land is tillable, and we use the average yields of the past ten years, the crop production would be 1,555 bushels of corn, 1,584 bushels of oats, and 180 tons of hay (or its equivalent in pasture). All of the corn might be picked or part of it might be harvested as silage.

How might these crops be used? The average quantities of feed fed per dairy cow by members of the Southeast and Southwest Minnesota Farm Management Services for a five year period were: corn, 1,830 lbs.; oats, 1,130 lbs.; hay, 6,550 lbs.; corn silage, 8,950 lbs.; pasture, 1.4 acres. In addition, 480 lbs. of purchased commercial feed was used. This was the feed consumed by the cow and her proportionate share of the young stock. With these rations, 28.3 cows would use all of the grain and forage produced on this farm.

However, by changing rations, the farmer has three alternative ways to use this feed: (1) feed a heavy grain ration and corn silage to the cattle, and raise no hogs, (2) feed a heavy grain ration with no corn silage, and raise some hogs in addition to the cattle, and (3) feed a light grain ration to the cows and raise a larger number of hogs. The data for these alternatives are summarized in the table.

The shift from ration (1) to ration (3) means a substantial cut in the number of cows. Since the production per cow is cut when grain is reduced, the production of milk is cut almost by one-half. The extra production of hogs is more than enough to make up for the loss of income, however.

The profitability of these three production plans can be compared in terms of the "return to land and labor," about half way down the table. This is the amount that will be left to the farmer to pay for the use of the land and to pay for all labor used, including his own, his family, and any labor hired.

The prices used in these comparisons were: milk (3.5 per cent) $3.40 per 100 lbs.; cull cows, $13 per 100 lbs.; veal, $21 per 100 lbs.; hogs, $19 per 100 lbs. These prices bear about the same relationship to each other as they have as an average for the last 20 years.

Hogs Bring Better Price

On the basis of these prices and these average rates of performance, hogs brought a much better price for corn fed

(Continued on page 2)

Production and Returns from Dairy Cattle and Hogs, Three Combinations, Each Using the Same Crop

Item	Dairy ration		
	High grain, corn silage	High grain, no silage	Light grain
Number of cows	28.30	21.35	19.29
Litters of pigs	0.00	10.60	16.27
Total production			
Milk (3.5 per cent) cwt.	2,345	1,771	1,235
Hogs, cwt.	0	180	277
Gross income			
Dairy cattle*	$9,594	$ 7,242	$ 5,305
Hogs	0	3,424	5,255
Total	$9,594	$10,666	$10,560
Costs (except land and labor)	$5,130	$5,045	$4,839
Return to land and labor	$4,464	$5,621	$5,721
Hours of labor (excluding maintenance)	4,340	3,740	3,670

* Includes income for dairy products, cull cows, and young stock.

HOW MUCH TIME WILL IT TAKE?

S. A. Engene

When farmers plan to add land or livestock to their farm, they must know how much more labor they will need. Records kept by a group of 30 southern Minnesota farmers provide some helpful information. These records, from members of the Southern Minnesota Farm Management Services, were obtained in 1951, 1952, and 1953.

The average time spent for raising and harvesting an acre of the principal crops was:

Oats or barley	5.0 hours
Flax	4.7 hours
Soybeans	4.5 hours
Corn (husked)	6.4 hours
Corn silage	10.5 hours
Alfalfa hay or silage	6.1 hours

To these we must add more than an hour of labor per acre for hauling manure and for other work connected with crops.

Although there are differences between these crops, for ordinary figuring it will be close enough to say about seven to seven and one-half hours of labor an acre for the cropland, not including permanent or rotation pasture. That means that if a farmer thinks of buying or renting an additional 80 acres with 70 acres of cropland, he will have to work about 500 hours more.

This is an average figure and will vary with the efficiency of the individual farmer. It also will vary with the topography of the farm. On moderately hilly farms, as in southeastern Minnesota, the average labor time will be eight to nine hours an acre. On moderately rolling land, as in southwestern Minnesota, the average will be six to seven hours. On the very level lands of the Red River Valley, the labor requirements will be even lower.

Less Labor Used on Large Farms

The data available from these records show that less labor is used per acre on large than on small farms. The difference is probably less than one hour per acre between a quarter section and a half section farm.

Most of these farmers worked from 3,000 to 3,500 hours per year. During the crop growing season, they averaged about 275 hours a month, or about 10 hours a day during the week and a few hours of chores on Sundays.

The farmer who considered the possibility of adding 80 acres of land to his farm would add 500 hours for crop work alone, or add about two hours of work a day during the summer. This is about equal to a fifth of a man's work during this period. Before making his decision the farmer must decide whether or not he has that much time available or where he can get it.

These records also show the average time spent on livestock. These farmers averaged 121 hours a year to do chores for a dairy cow and her share of the young stock. This includes only the work done directly with the cattle—such as feeding, cleaning the barn, milking, and taking care of the milk. It does not include the work of raising the crops or related work, such as repairing the barn.

These records and other studies show that the chore time per cow is a little lower for large herds than small, but the difference is not very large.

The average time spent with hogs was 1.7 hours per hundred pounds of gain. Put in another way, this is about four hours per hog raised or 25 to 30 hours per litter. This, too, includes only the direct chore work.

Contrasted with dairy work, the time needed to raise a hog is considerably lower for a large herd than for a small one. As hog production is pushed beyond 10 or 15 litters, each extra litter probably adds half as much time as shown above.

These farmers spent 1.9 hours per hen with flocks averaging 225 hens. This is calculated on the basis of the average number of hens for the year rather than on the number of hens housed. Those with more than 300 hens averaged 1.6 hours per hen, compared with 2.6 hours for those with less than 150 hens.

Only a few of these farmers fattened cattle. These men averaged 2.1 hours per hundredweight of gain. That means about 10 hours per head with 500 pounds of gain. The average number of head fattened was 52.

There are big differences in labor efficiency from one farm to another due to differences in barn arrangement, in equipment, and in working habits. For example, in 1953 one-fifth of these farmers spent more than 140 hours per cow while another one-fifth did their chores in less than 100 hours.

In addition to this work on crops and livestock, the typical farmer will spend 1,000 to 1,500 hours a year on other farm work. This includes maintaining the farmstead, buildings, fences, and machinery; doing farm shopping; and attending to other farm business.

MINNESOTA
farm business
NOTES

Prepared by the Department of Agricultural Economics and Agricultural Extension Service.

Published by the University of Minnesota Agricultural Extension Service, Institute of Agriculture, St. Paul 1, Minnesota.

Specialization—

(Continued from page 1)

as grain than did cows when it was fed to them as silage. If the farmer fed silage and used all of his feed for cows he had $4,464 left for his land and labor. If, however, he substituted hay or hay crop silage for the corn silage, cut the number of his cows to fit his hay and pasture supply, and fed the surplus grain to his hogs, he would net $1,157 more.

In addition to having a larger net income, he also would save 600 hours of work. This is equivalent to about two and a half months of work. Under these circumstances it would be more profitable for the farmer to keep a combination of hogs and dairy than to specialize in dairy alone.

The earnings also would be increased slightly by shifting from a heavy grain to a light grain ration, and using the grain to increase hog production. Here, too, the farmer would save labor by shifting toward hogs.

How would a change in prices affect this comparison? With milk prices remaining at $3.40 a hundred, hog prices would have to drop to about $12.00 before dairy cows would pay as much for the silage as hogs would for the corn.

But how about the shift to low grain feeding? There the difference in earnings is not large. With milk at $3.40, a drop in hog prices from $19 to $17 would mean equal earnings from high grain and low grain rations.

What would be the conclusion for a farmer who is a good dairyman but a poor hog man? This would throw the advantage toward dairy. Most of them would find it profitable to push for high dairy production and feed grain generously to do it. It is doubtful if many of them could afford to put high yielding corn into the silo.

The farm discussed here uses 60 per cent of its land for hay and pasture. If the land is reasonably level, a rotation carrying more corn and less forage may be more profitable. For example, when corn silage is used in addition to heavy grain for the cows, the returns to

Large Flocks More Profitable Than Small Flocks

Cora Cooke and Ermond Hartmans

A survey was recently made on 20 farms with poultry flocks varying in size from 420 to 10,000 hens. The average flock size was 2,400 hens. Only four flocks had less than 1,000 hens. This survey was made to determine if labor efficiency was responsible for greater profits from larger flocks than from the average farm flock of 200-400 hens.

The labor requirements were considered in two categories: (1) regular daily chores such as feeding, watering, and handling eggs; (2) seasonal chores such as cleaning the laying house.

---

land and labor would be $4,464 when 60 per cent of the land is in forage. They would be $5,817 with 40 per cent, and $7,096 with 20 per cent in forage.

Similarly, with the light grain rations the returns to land and labor would be:

60 per cent forage	$5,721
40 per cent forage	6,619
20 per cent forage	7,379

Conditions for Profitable Dairy Production

Judging by these figures there are several conditions under which specialized dairy production is most profitable. Some of these are:

1. When the land is such that a very large proportion of the land must be kept in forages.
2. When forage yields are high relative to grain yields. This is generally the case in the northern part of the state. This may also be the case for some farmers who have much better than average ability in raising high quality forage.
3. When the farmer has a special market for dairy products that gives him an unusually high price.
4. When some of the above conditions are combined with unusual skill in dairy production or some serious handicap in hog production.
5. When the farmer has sufficient family labor to do the dairy work, in addition to some of the above conditions.

Since these conditions do vary from one farm to another, each farmer must weigh his situation. These figures and general conclusions will serve as a general guide for his thinking.

Chore time for handling the growing flock was treated separately.

Large Flocks Require Less Labor Per Hen

The reported daily chore time on these farms amounted to two hours per thousand hens in the winter. During the rest of the year less labor was required for daily chores. However, the care for the replacement stock offset this reduction in labor completely.

Seasonal chores accounted for another 50 hours per thousand layers annually. The total yearly labor load per thousand layers amounted to 780 hours or to 0.78 hour per bird.

The following table, which shows data from various sources, illustrates that labor per hen can be reduced materially when the size of the flock is increased. This is possibly due to effective use of labor saving equipment.

Labor Requirements per Layer for Different Size Flocks

Average size of flock	Labor requirements per layer per year
49 layers*	2.5 hours
408 layers*	1.5 hours
225 layers†	1.9 hours
2,400 layers‡	.78 hours

* USDA Statistical Bulletin 161, *Labor Use for Livestock.*

† Detailed cost study of Agricultural Economics Department, University of Minnesota, 1951-53.

‡ Minnesota survey reported in this article, 1951-53.

Labor Saving Practices and Equipment

Of the various labor saving practices and devices listed, the following were used in more than half of the cases:

Complete confinement	100 per cent
Built-up litter	100 per cent
Automatic watering	85 per cent
Feed storage in house	85 per cent
Fan ventilation	80 per cent
Droppings pits	75 per cent
Automatic watering—range	65 per cent

The cooperators were asked what they considered their greatest labor saver. Most frequently listed as first was automatic watering, followed by built-up litter, droppings pits, and automatic feeders. Automatic feeders, although used in only six of the cases, proved to be an important labor saving device. Those with automatic feeders needed only 16.8 minutes per 1,000 layers for the daily feeding chore. The others needed 26.4 minutes per 1,000 layers for the same job. This amounts to a labor reduction of 36 per cent.

Obviously all these labor saving practices reduce the daily chore time, leaving the seasonal chores to be done as they fit in with the rest of the farm work. The daily chores were mostly done by the farmer's wife and his children.

Of the total 120 minutes daily chore time per 1,000 birds, 33 minutes were spent for gathering, 25 minutes for cleaning, 19 minutes for packing eggs, 25 minutes for feeding, and 18 minutes for miscellaneous jobs.

Larger Flocks Have Good Labor Return

The replacement cost of present housing for 19 of the flocks was estimated at $4.61 per bird, which is approximately $6.00 per bird for good housing for a 200 hen farm flock. Replacement cost of equipment was estimated at $1.19 per bird, which is approximately the same as for the average farm flock. Thus the building and equipment cost per hen on these flocks is not more than for the average farm flocks in Minnesota.

Although this survey did not include any data on egg production per layer or on feeding efficiency, it is safe to assume that the larger flocks compare very favorably in this respect with the average farm flock.

However, let us assume, for these surveyed farms, the same production efficiency as was found for a group of southern Minnesota farms which participated in a detailed cost study for the period 1951-53. On the basis of lower labor requirements—.78 hour as compared to 1.9 hours per hen per year in the detailed cost study—the return per hour of labor would have been $1.90. Such a return would have compared rather favorably with the livestock returns reported in the three year cost study: $.78 per hour for the farm flocks, $1.02 for dairy, $1.88 for feeder cattle, and $3.14 for hogs.

On this basis we may conclude that the larger poultry flocks are in a strongly competitive position with other livestock enterprises.

On a typical Minnesota farm a flock of sufficient size may contribute appreciably to the total family income.

Minnesota Farm Prices, Sept. and Oct. 1955

Prepared by Harlan C. Lampe

Average Farm Prices for Minnesota, September 1955, October 1953, 1954, 1955*

	Sept. 1955	Oct. 1955	Oct. 1954	Oct. 1953
Wheat	$ 2.14	$ 2.15	$ 2.26	$ 2.11
Corn	1.16	1.03	1.36	1.21
Oats	.51	.54	.67	.65
Barley	.89	.89	1.11	1.07
Rye	.78	.84	1.11	.97
Flax	2.80	2.81	3.10	3.56
Potatoes	.65	.80	.70	.75
Hay	14.20	14.50	15.50	14.20
Soybeans†	1.95	1.99	2.45	2.33
Hogs	15.70	14.20	18.20	20.70
Cattle	15.50	14.60	15.30	15.00
Calves	16.50	16.30	15.30	16.00
Sheep-lambs	16.52	16.37	16.74	16.17
Chickens	.163	.163	.105	.163
Eggs	.41	.37	.22	.495
Butterfat	.61	.62	.62	.72
Milk	3.25	3.30	3.35	3.70
Wool†	.38	.36	.49	.48

* Average prices as reported by the USDA.
† Not included in Minnesota farm price indexes.

With a seasonal drop in prices hogs declined to the lowest level since 1946. The October price of $14.20 is slightly below the December 1949 price of $14.60.

Most ratios changed about normally for the season.

Comparison of September and October Prices

Commodity class	Average October prices as a per cent of average September prices
Crops	101
Livestock	93
Livestock products	100
All commodities	97

The Outlook Corner — Labor Efficiency

The efficiency of farm labor has increased sharply and steadily over the past 35 years. This is shown in the accompanying table.

Man hours of work on farms fell by about one-third, from an index of 135 in 1920-24 to 89 in 1950-54. This means there are now fewer workers on farms.

In spite of fewer workers, total farm output rose sharply. With more output and fewer hours of work, the output per man hour has more than doubled. The index doubled from 50 in 1920-24 to 100 by 1947-49. It rose another 19 per cent by 1950-54.

Stated in another way, in 1920-24 one farm worker produced enough food and other agricultural material to supply 8.3 people. By 1950-54 he supplied enough for 17.2 people.

Many factors made this increased labor productivity possible. The amount of land in use was increased only slightly, but production per acre rose sharply. Shifts to more productive crops, improved varieties, better cultural practices, and more weed and disease control have increased yields. The phenomenal increase in the use of fertilizer illustrates these changes.

With increased crop production has come increased numbers of livestock. Here, too, new and improved methods stepped up rates of production. The output per unit of livestock increased by about one-third since 1920-24.

Mechanization has probably been one of the most important factors increasing output per man. No good figure of the degree of mechanization is available. None is really needed, however; most people are familiar with the rapid introduction of tractors, trucks, corn pickers, combines, balers, and so on.

Good nonfarm opportunities for work have helped unneeded workers to move to other profitable employment.

Further increases in labor efficiency seem certain to come. Better crop practices and more efficient machines have been developed but are not in full use; others are soon to come.

Livestock chore work has not changed greatly in the past. Here are big opportunities for the future.

Labor efficiency will continue to increase. The main question is, will the increase be more or less rapid than in recent years?

Changes in Farm Production and Efficiency, United States* 1920-1954†

	1920-1924	1930-1934	1940-1944	1950-1954
Man hours of farm work	135	131	120	89
Farm output	67	71	91	105
Output per man hour	50	55	76	119
Persons supported by one farm worker‡	8.3	9.8	12.7	17.2
Crop land used	96	100	98	100
Production per acre	79	73	93	101
Use of fertilizer	28	30	59	142
Animal units of breeding livestock	95	95	105	104
Production per unit of livestock	72	83	95	108

* *Changes in Farm Production and Efficiency*, ARS 43-15, USDA, 1955.
† Index numbers 1947-49=100.
‡ Actual, not index number.

Indexes for Minnesota Agriculture*

	Average October 1935-39	October 1955	October 1954	October 1953
U. S. farm price index	100	216.6	227.9	235.4
Minnesota farm price index	100	188.4	203.1	221.1
Minnesota crop price index	100	195.4	221.9	215.7
Minnesota livestock price index	100	187.7	215.5	229.4
Minnesota livestock products price index	100	183.6	167.0	212.0
Purchasing power of farm products				
United States	100	96.5	101.9	106.4
Minnesota	100	84.0	90.9	99.9
U. S. hog-corn ratio	14.1	12.7	12.7	15.9
Minnesota hog-corn ratio	17.8	13.8	13.4	17.1
Minnesota beef-corn ratio	14.7	14.2	11.2	12.4
Minnesota egg-grain ratio	20.9	14.7	7.6	18.5
Minnesota butterfat-farm-grain ratio	36.4	35.1	27.8	34.1

* Minnesota index weights are the average of sales of the five corresponding months of 1935-39. U. S. index weights are the average sales for 60 months of 1935-39.

UNIVERSITY OF MINNESOTA, INSTITUTE OF AGRICULTURE, ST. PAUL 1, MINN.
Cooperative Extension Work in Agriculture and Home Economics, University of Minnesota, Agricultural Extension Service and United States Department of Agriculture Cooperating, Skuli Rutford, Director. Published in furtherance of Agricultural Extension Acts of May 8 and June 30, 1914.

UNIVERSITY OF MINNESOTA
Institute of Agriculture
Agricultural Extension
St. Paul 1, Minn.
SKULI RUTFORD, Director
Minn. 7—11-55-2M
Permit No. 1201

PENALTY FOR PRIVATE USE TO AVOID PAYMENT OF POSTAGE, $300

FREE—Cooperative Agricultural Extension Work, Acts of May 8 and June 30, 1914.