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# MINNESOTA farm business NOTES



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## Profit-Increasing Adjustments for Minnesota Grade A Dairymen

James Holt and W. B. Sundquist\*

Minnesota grade A dairymen are concerned with income-increasing changes in their farm organizations. Changes in crop, livestock, and marketing practices often provide new opportunities to reduce costs and/or increase income. But further adjustments may require both reorganization and expansion of the farm business in order to use existing resources more efficiently.

This article considers three such adjustments that are available to some grade A dairymen:

1. Switching from a stanchion to a milking parlor-loose housing dairy setup.

2. Purchasing additional land.

3. Increasing hog production.

Profits, credit requirements, and other adjustments that might result are compared.

The profitability of a particular farm organization change depends on a farm operator's resources—in this case the resources typical of 14 randomly selected south-central Minnesota grade A dairymen. These dairymen had an average of 200 acres of cropland, a stanchion barn for 37 cows, farrowing capacity for 6 sows and feeding capacity for their litters, and sufficient machinery to operate up to 300 acres of cropland.

About two man-equivalents of family and hired labor were available the year around. Farmers had livestock and fairly liquid assets worth \$16,000 and could borrow about \$6,000 on machinery. Initially, real estate credit was limited to \$13,080 (one-half the value of real estate on farms studied less the value of any outstanding mortgages). Later the real estate credit available was raised to \$25,000.

Hogs, an important supplementary enterprise on Minnesota dairy farms,

were considered as an alternative enterprise to dairying. Many dairymen are sufficiently familiar with modern hog production technology to handle a large hog enterprise. Sows could be farrowed on a 1- or 2-litter system and the hogs fed or feeder pigs could be purchased and fed.

Dairy cows considered would produce 10,000 pounds of milk when fed 1 pound grain for every 4 pounds milk. They could be fed alternatively at a 1:6, 1:4, or 1:2.5 grain-to-milk ratio. Although feed grain could be purchased, corn silage or hay would have to be produced on the farm. Farms with larger dairy operations would require crop rotations with more forage.

At the lower level of real estate credit availability, \$13,080, it was assumed that sufficient capital was not available for an economical loose housing unit. So stanchion dairying was the only dairy alternative considered. Farm plans computed to be most profitable are shown for blend milk prices of \$3.30 and \$3.70 per hundredweight and for hog prices of \$15.50 and \$17.00 per hundredweight (table 1).

With hogs at \$15.50 it would be profitable to keep the stanchion barn filled to capacity but not to expand it. Profits would be increased by putting remaining resources into hog production. Fewer cows and a larger hog enter-

prise would be profitable with \$17 hogs. Each organization requires \$16,000 to \$18,000 of real estate and chattel credit. This credit is mainly required to expand hog farrowing and feeding facilities.

### Addition of More Capital

An increase in availability of real estate credit from \$13,080 to \$25,000 would not alone significantly change the most profitable stanchion barn plans. However, when a labor-efficient loose housing dairy is also considered, the most profitable size of dairy increases considerably and the supplementary hog enterprise is decreased or eliminated (table 2). The use of borrowed capital also increases substantially, with an increase in income net of variable costs of about \$3,000 resulting from this change.

### Purchase of More Land

When purchase of up to 100 additional acres of cropland is considered (with \$25,000 real estate credit available), it would be profitable to purchase the land in all cases (table 3). A 20-percent downpayment of \$48 per acre is required, with the balance to be paid on land contract.

For stanchion barn operators this adjustment makes profitable the feeding

Table 1. Most profitable stanchion barn farm plans with \$13,080 real estate credit available (no land purchase allowed)

|                  | Price of milk (cwt.)            |          |                                 |          |
|------------------|---------------------------------|----------|---------------------------------|----------|
|                  | \$3.30                          |          | \$3.70                          |          |
|                  | Price of hogs (cwt.)<br>\$15.50 | \$17.00  | Price of hogs (cwt.)<br>\$15.50 | \$17.00  |
| Net income*      | \$14,700                        | \$17,160 | \$16,210                        | \$18,220 |
| Cows milked      | 37                              | 26       | 37                              | 31       |
| Litters farrowed | 76                              | 102      | 74                              | 90       |
| Credit used      | \$16,330                        | \$18,320 | \$16,140                        | \$17,130 |

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\* A charge has been deducted for real estate taxes, depreciation on buildings and machinery, interest and principal payments on borrowed capital, and a 5½-percent return on owned capital.

**Table 2. Most profitable loose housing farm plans with \$25,000 real estate credit available (no land purchase allowed)**

|                  | Price of milk (cwt.) |          |                      |          |
|------------------|----------------------|----------|----------------------|----------|
|                  | \$3.30               |          | \$3.70               |          |
|                  | Price of hogs (cwt.) |          | Price of hogs (cwt.) |          |
|                  | \$15.50              | \$17.00  | \$15.50              | \$17.00  |
| Net income*      | \$17,020             | \$17,960 | \$20,760             | \$20,990 |
| Cows milked      | 84                   | 50       | 91                   | 84       |
| Litters farrowed | 12                   | 72       | 0                    | 12       |
| Credit used      | \$48,270             | \$35,950 | \$56,290             | \$49,560 |

\* See footnote in table 1.

**Table 3. Most profitable farm plans with \$25,000 real estate credit (land purchase permitted)**

|                        | Price of milk (cwt.) |          |                      |          |
|------------------------|----------------------|----------|----------------------|----------|
|                        | \$3.30               |          | \$3.70               |          |
|                        | Price of hogs (cwt.) |          | Price of hogs (cwt.) |          |
|                        | \$15.50              | \$17.00  | \$15.50              | \$17.00  |
| <b>Stanchion Barns</b> |                      |          |                      |          |
| Net income*            | \$17,720             | \$20,620 | \$19,280             | \$21,300 |
| Cows milked            | 37                   | 17       | 37                   | 27       |
| Litters farrowed       | 45                   | 64       | 40                   | 40       |
| Feeder pigs purchased  | 219                  | 971      | 240                  | 1,074    |
| Credit used†           | \$24,630             | \$36,400 | \$24,660             | \$37,190 |
| <b>Loose Housing</b>   |                      |          |                      |          |
| Net income*            | \$20,840             | \$21,490 | \$24,540             | \$24,720 |
| Cows milked            | 84                   | 68       | 91                   | 84       |
| Litters farrowed       | 12                   | 29       | 0                    | 12       |
| Feeder pigs purchased  | 0                    | 86       | 0                    | 0        |
| Credit used†           | \$45,850             | \$40,630 | \$53,470             | \$45,640 |

\* See footnote in table 1.

† \$19,200 additional indebtedness assumed under land contract.

of purchased feeder pigs and a slight decrease in the size of the dairy operation (table 3). These changes free labor to farm the larger acreage of cropland. Compared to the stanchion dairy in table 1, the change would boost net income about \$3,000 annually. It also would increase credit requirements in addition to the \$19,200 indebtedness assumed under the land contract.

When land purchase and loose housing are both considered, the most profitable farm plan again contains a large dairy enterprise and a relatively small hog enterprise (table 3). Income is further increased by up to \$3,000 with milk at \$3.30 per hundredweight and up to \$5,000 with milk at \$3.70 per hundredweight over income of the stanchion barn plans with land purchased. Credit requirements are also increased substantially.

All plans shown can be operated with the labor and machinery available on the farms studied. Credit represents the principal additional resource required to make adjustments from current organizations. While the farm plans shown in table 3 provide the greatest incomes, they also require the largest amount of credit. Some farmers may be reluctant to assume such a large

indebtedness or find it difficult to secure the credit.

Other farm adjustments using less capital then may be considered. Some farmers will consider income from current farm operations adequate. But both farmers and lenders must realize that expansion of the farm business via the use of credit is an important route to increasing net income.

### Summary

With the farm resource base considered here, when credit is limited, and when hog prices are at \$15.50 or lower, dairying is most profitable—at least to the capacity of existing buildings. With hogs at \$17 or higher the hog enterprise become more competitive with dairying. Labor rather than capital limits expansion when loose housing is not considered.

When credit is available loose housing is a profit-increasing adjustment. It would be profitable to put all resources into dairying and limit or eliminate the hog enterprise except with \$17 hog and \$3.30 milk (where a large hog operation can also be profitable).

With ample credit, purchase of land on contract is profitable with both

## FARM PROGRAMS AND THE SOYBEAN MARKET

James P. Houck, Jr.

Farm prices for soybeans have been relatively good in recent years. The accumulation of large government stocks for price support purposes has been avoided. But some observers feel that (1) soybean production is increasing faster than market outlets, and (2) this may result in significant price declines or burdensome surpluses without new policy action.

There is disagreement over what specific policy would be most appropriate. Part of this disagreement stems from uncertainty about how alternative programs would influence soybean prices and the volume of beans marketed and processed at various prices.

One objective of a recent research project conducted by the University's agricultural economics department was to estimate some major consequences of various policy alternatives. Research findings are based on statistical analyses of actual marketings, prices, and related data from 1946 to 1960.

Individual demand relationships for soybean meal and soybean oil were estimated and linked with estimates of export demand. This provided an overall statistical picture of major outlets for soybeans and soybean products. Finally, by accounting for processing and marketing margins, storage demand, and government programs, the derived farm level demand for soybeans was estimated.

On the basis of these results, effects of various policy alternatives on prices and marketings throughout the entire soybean market can be estimated. Possible effects of two extreme alternatives to present policies are discussed in this article. The first is essentially a free market alternative; the second is a program of effective production control.

Estimates of each alternative's influence are based upon and compared with market conditions during the

types of dairy operations. With stanchion housing, operation of additional land puts a premium on labor and makes profitable a slight reduction in the dairy operation and a shift to feeding of purchased rather than home-produced feeder pigs. Adoption of more labor-efficient loose housing permits greater concentration on dairying.

1961-62 marketing year. Similar analyses are being made for other alternatives or combinations of alternatives.

### A Free Market Alternative

It sometimes is argued that soybeans are the only major crop not deeply involved in the Federal government's farm program. Evidence cited includes: (1) history of soybean prices remaining generally above support levels, (2) modest size of government carryover in most years, and (3) absence of production or marketing controls.

However, soybean prices and producer incomes have been aided by the large-scale program of vegetable oil exports. This is financed by USDA's Commodity Credit Corporation (CCC) under Public Law (PL) 480. In the 1954-61 period, export sales outside normal commercial channels and grants for emergency relief authorized by PL 480 represented about 65 percent of all soybean oil exports and half of all vegetable oil exports. Furthermore, soybean acreage has been influenced indirectly by government programs for other commodities, principally feed grains.

Suppose that a free-market policy had been in effect for the 1961-62 marketing year with production remaining the same. Elimination of direct government influence would have involved:

- Suspension of domestic price support and storage operations for soybeans.
- Cancellation of PL 480 export programs for vegetable oils, mainly soybean and cottonseed oils.

Under these assumptions almost 1 billion pounds of vegetable oils otherwise exported under PL 480 would have been placed on domestic oil markets. And 40 million bushels of soybeans accumulated by CCC in 1961-62 would have been added to domestic and foreign markets' supplies.

Research findings suggest that the following *estimated* changes from actual 1961-62 levels would have occurred (see table):

Domestic crushing . . . about 33 million bushels higher.

Soybean exports . . . 7 million bushels larger.

Wholesale price of soybean meal . . . \$3.40 per ton lower.

Wholesale price of crude soybean oil . . . 2.6 cents per pound lower.

Farm price of soybeans . . . 54 cents per bushel lower (about 18 cents of this drop can be traced to the depressing influence of unexported vegetable oils).

**The U.S. soybean market: data for the 1961-62 marketing year and estimated results under the free market and supply control alternatives**

| Item   | Actual data | Free market alternative | Supply control alternative |
|--|-------------|-------------------------|----------------------------|
| Volume of soybeans crushed (million bushels) .....                 | 439         | 472                     | 415                        |
| Volume of soybeans exported (million bushels) .....                | 155         | 162                     | 149                        |
| CCC carryout stocks (September 30) (million bushels) .....         | 40          | —                       | —                          |
| Price of soybean meal (bulk Decatur) (dollars per ton) .....       | 63.60       | 55.20                   | 68.75                      |
| Price of soybean oil (crude Decatur) (cents per pound) .....       | 9.5         | 6.9                     | .10                        |
| Price of soybeans (received by farmers) (dollars per bushel) ..... | 2.28        | 1.74                    | 2.55                       |

Source of actual data: *Fats and Oil Situation*, ERS, USDA, November 1962.

It was estimated that farmers' gross cash income from soybeans would have been \$374 million lower than actual 1961-62 earnings. But gross returns to the crushing industry would have been about \$41 million greater because of the larger volume processed. And some savings by government in administrative expenses and program costs probably would have occurred.

Although estimates are not available, retail prices of soybean oil-using products such as margarine probably would have been lower. Similarly, lower prices for soybean meal, a major ingredient in many livestock feeds, might have resulted in lower retail meat and poultry prices.

### A Supply Control Alternative

Another policy alternative under consideration is a supply control program. This involves limiting production and marketings of soybeans by administrative arrangements regulated by the Federal government or some other institution, possibly a producers' organization.

Suppose that in the 1961-62 marketing year an effective supply control program had reduced the production of soybeans by 10 percent, or about 70 million bushels. (This reduction would have made the loan and storage program inoperative. PL 480 shipments of oil were assumed to continue.) If so, research indicates the following *estimated* changes from actual 1961-62 levels would have occurred:

Government carryout stocks . . . eliminated.

Domestic crushing . . . 24 million bushels less.

Soybean exports . . . down about 6 million bushels.

Wholesale price of soybean meal . . . \$5.15 per ton higher.

Wholesale price of crude soybean oil . . . up 0.5 cents per pound.

Farm price of soybeans . . . about 27 cents per bushel higher.

Because of the smaller crop, gross returns to farmers would have been only \$1 million higher than actual levels. But returns to the crushing industry would have been \$34 million less. This program probably would have involved additional administrative expenses by government but loan and storage program costs would have been eliminated. In addition, some decision-making freedom would have been lost by participating producers.

At the retail level, prices of soybean oil-using products such as margarine might have increased slightly. Some advance in retail meat and poultry prices also might have resulted.

### Conclusion

**Shortrun** price and quantity changes indicated by this research are estimates and subject to error. They are based on historical data and may not be entirely applicable in future years. Yet, these estimates indicate the probable directions of changes in prices, marketings, and gross returns and the relative magnitudes involved.

Ultimate consequences of any economic policy may spread far beyond the sector or commodity for which it is originally intended. And much of the impact of a policy decision may not be reflected in immediate changes in prices, marketings, and gross returns.

The alternatives discussed here are only two among many alternatives, including continuation of present policies. What is the best policy depends largely upon the values and goals of the person or group making the judgement. Perhaps results from this and similar analyses will help clarify some consequences of alternative policy decisions.

# THE OUTLOOK CORNER

Harold C. Pederson

The supply of soybean meal available for domestic consumption and export purposes increased substantially in recent years (see table). The past 10-year upward trend increased from slightly less than 5 million tons in 1953 to nearly double that amount last year.

The total supply of all high-protein feeds increased 43 percent from 1953 through 1962. But soybean meal accounts for nearly three-fifths of the high-protein feeds available for feed in the United States.

Total supplies of animal and grain proteins rose a little. However, oilseed meals other than soybean meal showed a downward trend.

A noticeable increase in domestic and foreign use of high-protein feeds accompanied the growing supplies of soybean meal. In this country, the number of animal units fed high-protein feeds increased 8 percent during the past decade. Feeding rates went up at a faster rate. In 1953 the feeding rate was 176 pounds (44 percent soybean equivalent) per animal unit. It rose steadily to 233 pounds in 1962—an increase of over 30 percent.

In recent years, soybean meal exports trended upward. During the 1959-60 and 1960-61 marketing years, exports of soybean cake and meal totaled around 600,000 tons and accounted for about 85 percent of the total tonnage of high-protein feeds exported.

The situation was even more pronounced last year. Stimulated by a strong European demand, meal exports set a record—up more than four-fifths from the previous year. Largest increases in meal exports went to France, Netherlands, and West Germany. Canada, the largest single buyer of soybean meal, also showed a sharp gain. Other

countries purchasing over 25,000 short tons of soybean meal were Belgium-Luxembourg, Denmark, Spain, Switzerland, and the Phillipines.

Exports of soybeans to many countries for crushing purposes reflect a growing worldwide demand for high-protein feeds such as soybean meal. (A 60-pound bushel of soybeans crushed yields about 10.7 pounds of oil and 46.8 pounds of meal.) So far soybeans, particularly soybean meal, have not been regarded as a surplus crop but the situation with respect to soybean oil is somewhat different.

Although soybean oil exports increased to 721 million pounds in 1960-61, only 40 percent was sold for dollars. Last year exports soared to \$1,335 million pounds with slightly less than 50 percent being dollar sales. In short, government disposal programs such as PL 480 play a leading role in exports of soybean oil.

The growing supply of high-protein feeds, in which soybean meal figures importantly, should have a relatively good domestic market for a long time. The need for high-protein feeds will increase as more animal units are fed and heavier feeding rates are used.

Sizeable exports of high-protein feeds, especially soybean meal, also seem likely as more knowledge of its feeding value reaches European producers. A preference for U.S. toasted soybean meal has already been established because of its high quality.

Major soybean meal-importing countries are also developing an upward

trend in the production and demand for animal products along with a larger mixed feed industry. This will particularly benefit soybean meal. Improved feeding practices and more stable soybean meal prices are other favorable factors. Poultry numbers already increased sharply in Western Europe with an especially good demand for broilers and turkeys.

As to supplies of high-protein feeds that compete with soybean meal, there has been no definite trend in the domestic supply, exports, or imports of cottonseed meal. Domestic production of this meal is largely determined by the amount of cotton produced. No sudden upward trend in cotton production is expected. The same situation applies to linseed meal. The production of meat meal, tankage, fish meal, and grain protein feeds is not likely to show more than a modest upward trend.

For some years to come high-protein feeds should sell readily in many markets of the world. Soybean meal should assume a major role in these sales.

**High-protein feeds: quantity available for feeding,\* 1953-62**

| Year beginning: | Oilseed meal     |                      |                 |                |
|-----------------|------------------|----------------------|-----------------|----------------|
|                 | Soybean meal     | Other oilseed meals† | Animal proteins | Grain proteins |
|                 | millions of tons |                      |                 |                |
| 1953 .....      | 5.0              | 2.9                  | 3.0             | .8             |
| 1954 .....      | 5.4              | 2.4                  | 3.0             | .9             |
| 1955 .....      | 6.0              | 2.4                  | 3.3             | .9             |
| 1956 .....      | 7.1              | 2.3                  | 3.1             | .9             |
| 1957 .....      | 8.0              | 2.2                  | 2.9             | .9             |
| 1958 .....      | 8.9              | 2.2                  | 3.1             | .9             |
| 1959 .....      | 8.5              | 2.2                  | 3.2             | 1.0            |
| 1960 .....      | 8.8              | 2.4                  | 3.3             | 1.0            |
| 1961 .....      | 9.2              | 2.5                  | 3.5             | 1.1            |
| 1962 .....      | 9.6              | 2.5                  | 3.5             | 1.1            |

\* Quantity available for feeding, in terms of 44 percent protein soybean meal

† Cottonseed, linseed, peanut, and copra meal

## MINNESOTA

## farm business

### NOTES

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