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# MINNESOTA farm business NOTES



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## BACKGROUND FOR OUTLOOK

### What Is Outlook?

S. A. Engene & K. H. Thomas

"Outlook" is important to all farmers. Since their production plans take time to fulfill, they must forecast prices for their future purchases and sales. The question is not, shall they make forecasts; rather, how can they improve them. This issue of *Minnesota Farm Business Notes* presents some of the demand and supply factors affecting the outlook for farm products.

In "Outlook" we try to predict future prices. What basis can a farmer use for his predictions? One common but incorrect method is to assume that future prices will be like those of the present and recent past. Apparently many use this method; when the price of a product is high, they expand its production. Even a brief examination of prices shows that this is not sound—prices do change.

More accurate forecasts can be made by considering the probable future trend of each of the forces that influence price. These forces can be divided into two groups—demand factors and supply factors.

The demand factors operate largely outside agriculture. The habits, customs, and likes of the consuming public are important. These are modified by the level of personal income and business activity, by government fiscal policies, and by other factors. Many of these forces tend to change slowly; they are most important for long run forecasts. Some, however, do affect the short run outlook. The demand factors are discussed in the next article, "Demand Considerations."

The supply factors operate largely within agriculture. They influence the kinds and the amounts of products produced. The volume of production, in turn, influences prices. These supply

factors are important both in the short run and the long run. Supply factors, for cattle and hogs, are discussed in the last two articles.

Even with the best knowledge, price forecasts cannot be exact. Knowledge of the forces affecting prices is incomplete. The facts available are scanty. Many of the forces at work are unpredictable. Also, a published forecast can cause farmers to shift plans, thus making the forecast wrong.

The forecasts, however, can be better than guesses. The U. S. Department of Agriculture has published outlook information for many years. Evaluations of these have shown them to be correct about three times out of four.

Because there is some uncertainty, it is wise for a farmer to consider not only the most probable price, but also to estimate how high and how low it might go. Before he formulates his production plans he must consider his profits with each of these prices. He can then avoid action which would be most harmful to him.

Forecasting prices is a big task; it requires the cooperation of many people. The farmer depends upon public agencies to assemble the facts about past production and prices. He has neither the time nor the money to do this for himself, as can a large company. He can, however, help the public agencies by submitting complete and accurate information.

Economists help him to interpret these data and to understand the forces that have determined prices. This, also, is too big and complicated a task for the individual farmer to perform.

The farmer can draw upon these and many other sources to formulate his conclusions about the outlook. He, however, will want to formulate the final conclusion himself since he has to make his production plans and accept the responsibility for the result.

### Demand Considerations

Frank J. Smith, Jr. & M. K. Christiansen

How does demand affect the outlook for cattle? What will the demand for hogs be like? Questions such as these arise when appraisals of price prospects are made for agricultural commodities.

Two aspects of demand must be considered when making these appraisals. One is the price responsiveness of demand for the commodity being considered. The other is the level of demand.

Price responsiveness of demand refers to the extent to which price changes as the total quantity of the commodity marketed increases or decreases. For example, if factors which affect the level of demand (population, consumers' preferences, consumers' incomes, and supplies of competing commodities) remain at constant or average levels; then for each 1 percent change in the number of hogs marketed, we can expect a change in hog prices at the farm of about 2½-3 percent. Similarly, if the number of cattle marketed changes by 1 percent, we can expect a price change in the neighborhood of 1.2 percent.

The level of demand determines how high or low the price of a commodity will be when a particular quantity is marketed. This level "shifts" up or down in response to changes in (1) population, (2) consumers' incomes, (3) consumers' preferences, and (4) supplies of competing products. The effects of these "shifters" of the level of demand are discussed below.

#### Population

Population is increasing at the rate of about 1.5 percent per year. This means that if other factors affecting the level of demand remain unchanged, a 1.5 percent increase in the supplies of

(Continued on page 2)

## Demand Considerations

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a particular commodity would exert no price depressing effect. Simultaneous changes in the other shifters would, of course, modify the extent to which increases in supply could be absorbed without causing a change in price.

### Consumer Incomes

Over the past decade, the real per capita income (which allows for price changes) has increased by over 20 percent. Research studies have suggested that such a change will result in a gain of about 3 percent in the per capita consumption of all farm-produced foods combined. The effect of a change in income, however, varies from commodity to commodity. The per capita consumption of some foods does not increase as much as this average for all foods combined and some may even decrease as income rises. However, the consumption of meat animal products and poultry increases by more than the average in response to increases in income.

The increase in real per capita income over the past decade has not been continuous. Rather it has been characterized by periods of decline followed by renewed gains as the general economy moved through cycles of recession and boom. Since World War II, declines in business activity have occurred in 1949-50, 1953-54, and 1957-58. In each case, disposable income fell from its pre-recession peak. General consumption expenditures also fell, but the precise effects on the demand for food products is not clear. Short term fluctuations such as these probably do not affect the demand for food to the extent that a sustained downward change would. The cushioning effect of accumulated savings, unemployment compensation, and well-established consumption patterns tend to maintain consumption levels.

### Consumer Preferences

Changes in consumer preferences are another factors which can "shift" the demand for a commodity either up or down. Isolating the net effects of these changes from the effects of changes in income is very difficult. However, when beef and pork are considered the evidence suggests that consumers' preferences have shifted in favor of beef.

Figure 1A shows annual data on per capita consumption of beef and pork for 1948 through 1958. For both of these items a straight line has been drawn

which describes the trend in per capita consumption for the years shown. Per capita consumption of beef has trended upward at a rate of 2.8 pounds per year, while the trend in pork consumption has declined at the rate of .8 of a pound.

The trend in the price of pork compared to beef (figure 1B) has been fairly constant over the period of the past decade (and has actually declined when a longer period is considered) in spite of the changes in relative production of the two commodities. This suggests that the demand for beef has changed in response to a change in consumers' preferences, rather than to a change in supplies of competing commodities.

The effect of changes in population and per capita consumption can be combined to estimate the effect of these factors as demand shifters. For hogs, increases in population and decreases in per capita consumption are approximately off-setting so that the combined effect of these factors has caused only a relatively small shift in demand. In the case of cattle, the increase in per capita consumption and increases in population amount to an upward shift in demand of nearly 5 percent per year.

### Supplies of Competing Commodities

Perhaps the most important demand shifter affecting short run outlook is the supply of competing commodities. To some extent all products compete for a share in the consumer's dollar. This competition is more intensive among commodities that are good substitutes than for those that are not. For example, the intensity of competition between pork, beef, lamb, and poultry is greater than between, say, pork and tomatoes.

The effect of competing supplies on the level of demand for a commodity is illustrated in figures 1A and 1B. During 1950, 1951, and 1952 per capita supplies of beef were below the beef trend and per capita pork supplies were above the pork trend (See figure 1A). As a result, pork prices were low relative to beef (See figure 1B). In 1953 and 1954, the situation was reversed and pork prices were higher relative to beef. In 1955, supplies of both beef and pork were above their long term trends. The price of pork relative to beef declined markedly. Actual hog prices fell by over \$6 per hundredweight from the previous year. Of course, increases in hog marketings accounted for part of this decline, but a major factor was the supply of cattle—1955 was the peak of

the cattle cycle. There is little doubt that hog prices would not have declined as far as they did had fewer cattle been marketed.

The extent to which demand price responsiveness and the various demand shifters should be considered in outlook depends upon the period ahead for which the appraisal is made. If it is made for, say, six months or a year ahead, then possibly demand price responsiveness and quantities of competing supplies are the most important. On the other hand, if the projection is for a considerable period ahead, population changes, consumers' incomes, and preferences should play an important part in outlook forecasts.

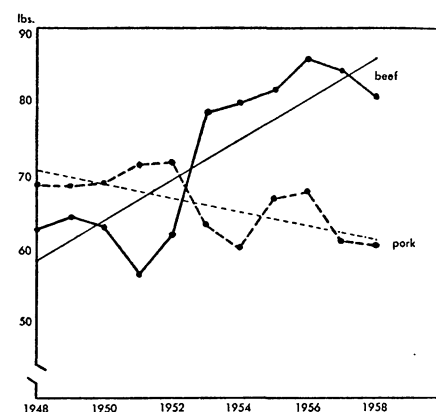


Fig. 1A. Per capita pork and beef consumption. Farm level equivalent, U. S. 1948-1958.

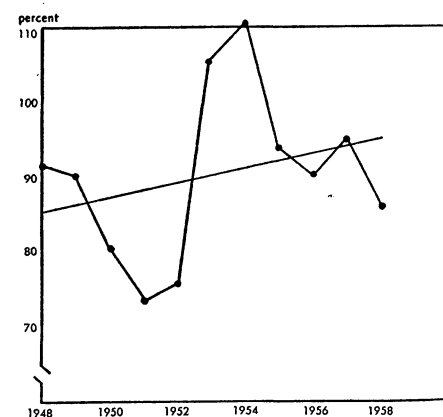


Fig. 1B. Price of hogs as percent of cattle price.

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## Appraising Beef Supplies

H. G. Routhe & K. E. Egerton

Why have cattle prices fluctuated so widely? How can beef producers more accurately anticipate when and how much the change will be in the future? An analysis of past and expected changes in the demand and supply of beef will provide indications.

Beef prices are determined by the interaction of supply and demand. The effect of changes in demand on beef prices is discussed in the preceding article. Demand for beef has increased steadily because of increased population, higher incomes, and changed preferences. These factors have been important in the upward trend of beef prices over the years. But beef prices are also very sensitive to changes in supply.

Over time, periodic ups and downs, or cycles, in cattle inventories have taken place. We have had six cycles since 1880, varying in length from 9-16 years. Because of changing supplies cattle prices also tend to follow a cyclical pattern, although it is less distinct.

**Table 1. Length of Cattle Cycles, U. S., 1880-1958**

Cycle	Length of		Cattle Numbers Peak-Year
	Ex- pansion	Liquida- tion	
	Years		Million
1880-1896.....	6	10	60.0
1897-1912.....	8	8	66.4
1913-1927.....	6	10	73.0
1928-1938.....	6	4	74.4
1939-1949.....	7	4	85.6
1950-1958.....	7	2	96.8

Two distinct phases make up each complete cattle cycle—expansion and liquidation of cattle numbers.

The expansion phase of the cycle generally begins when prices are relatively favorable. Farmers and ranchers respond by reducing slaughter of calves. Calves become an increasing percentage of the total cattle inventory. A sudden change in the rate of calf slaughter, therefore, provides a key to future changes in fed cattle supplies and, ultimately, beef prices.

Cow and heifer slaughter is also cut back considerably in the expansion phase. However, marked change in cow numbers can occur only when heifer calves that were held back reach calving age. With reduced slaughter of calves, cows, and heifers, prices of these classes tend to strengthen. This encourages farmers to hold back more animals to expand their herds.

After two-four years young stock

from increased inventories of breeding stock reach slaughter age. Slaughter increases, beef prices, and profit levels tend to weaken. Once started, however, the expansion in numbers cannot stop immediately. Continued expansion forces price still lower and farmers and ranchers start liquidating their breeding herds.

Once the liquidation phase of the cycle is started, slaughter of calves, cows, and heifers increases significantly. Production from decreased breeding herds eventually declines and prices start to rise. This signals the start of a new cycle.

One must be careful not to assume that all expansion phases and all liquidation phases are exactly alike. Specific cycle characteristics differ.

One of the most important differences among cycles is the force that causes a change in the phase of the cycle. High (or low) prices caused by the decreasing (or increasing) slaughter may cause the change. However, other unusual conditions can trigger liquidation or expansion. A change in the available feed supplies or an extreme change in demand for beef can trigger a change. For example, the 1956-1958 liquidation was triggered by unusual drought conditions in the west and large hog supplies which reduced prices.

One must keep in mind productivity of beef herds when predicting future supplies and prices. Production per unit is almost 50 percent greater now than 30 years ago. The major factors contributing to this trend have been: (1) a higher percentage of beef type cattle on farms, (2) a 10-15 percent increase in calving rate per 100 cows, (3) an increase in the number of calves and heifers fed out, and (4) an increase in dressed weights of cattle slaughter.

Data in table 2 show that the distinguishing features of the current build-up phase compared to previous

**Table 2. Change in cattle numbers during first 2 years of expansion phase of cycle**

First 2 years of cycle	Total	All			Beef calves
		cows	heif- ers	Steers	
		percent			
1928-29.....	6.4	3.3	9.0	2.8	12.6
1938-39.....	4.7	2.9	9.8	-4.9	8.8
1949-50.....	6.8	5.8	10.0	-3.4	19.0
1958-59*.....	9.3	4.0	26.2*	18.5*	17.9

\* Based on a forecast of 102 million head on January 1, 1960 and numbers by classes as estimated by current slaughter.

cycles are the rapid rates of buildup of younger animals in the inventory. Cattle numbers increased in 1958 to 96.8 million head and are expected to in-

crease another 4.5 million during 1959. This 9 percent increase in the two year period compares with 6.8 percent increase in 1949-50.

The expected increase in steer and heifer numbers far surpasses that in the same stage of earlier cycles. Rising prices and plentiful feed such as we have had the last two years encourage holding steers and heifers for maximum gain in weight. These probably will come to market next year. The heifers, then, may not provide a base for further expansion.

This increased marketing of steers and heifers in 1960 may cause an earlier than usual price decline. In the last cycle beginning in 1949 the cyclical jump in slaughter and break in prices began in 1953. By similar timing 1962 should mark the turning point for prices but the more rapid buildup of young animals may force the start of the price decline next year.

A sustained overload of cattle marketings is not likely in the next year or two since cow herd expansion has been less than in the last cycle. Cow numbers should increase only 4 percent over the present two year period compared to 5.8 percent in 1949-50 (table 2).

Future trends in cow numbers will depend on rate of cow slaughter and retention of heifers for replacement. Unless drought forces liquidation, only a modest pickup of cow slaughter from this year's low levels is expected. The key to the rate of buildup will be the rate of heifer slaughter in early 1960. Heifer slaughter in 1959 is expected to be about 10 percent above 1958 with most of the increase as slaughter of fed heifers. Little change in heifer slaughter in early 1960 would indicate a more moderate buildup of the breeding herds for future beef supplies.

If the present rate of expansion continues for another year or two, cattle numbers could reach 115 million head with beef supplies about 94 pounds per person. This would mean a severe cyclical decline in prices and very unfavorable profits by 1962-64.

However, with a slowing rate of expansion after this year, population growth and continued increasing preference for beef should more nearly keep pace with projected supplies.

These cyclical trends should be watched closely in the year ahead. Although the biological nature of cattle production tends to standardize the workings of the cattle cycle, the unusual features of each cycle often provide the key indicators of changes in supplies and prices of beef.

## The Outlook Corner — Hog Supply Indicators

How can hog producers more accurately forecast future hogs prices to aid them in making production and marketing plans? The most effective way is to anticipate what will occur in the future by (1) knowing the main forces which cause hog prices to vary and (2) becoming more familiar with indicators that signal changes in these forces.

The article, "Demand Considerations," in this issue outlines the various demand factors that are important forces affecting future hog prices. However, much of the year-to-year hog price variability results from changes in the quantity of hogs marketed.

In post-war years, a 10 percent change in hog production has caused about a 25 percent change in hog prices received by farmers. This extreme price sensitivity points out the importance of obtaining reliable indicators that signal future changes in hog supply levels.

Two indicators whose relationships to hog prices exhibit enough stability to be helpful in estimating future yearly production levels are (1) the size of hog-corn ratio during breeding seasons and (2) the stage of the hog production cycle.

The hog-corn ratio is a widely used and fairly reliable signal of the way in which hog production might be expected to change. Briefly explained, this ratio expresses the number of bushels of corn that can be bought with 100 lbs. of live hog. It is calculated by dividing the price received per hundredweight of hogs by the price received per bushel of corn. A low ratio signifies that hog prices are low relative to corn prices, and a high ratio shows the opposite.

Many hog producers use this ratio as an indication of the profitability of feeding corn to hogs. It costs the average producer the equivalent value of approximately 13 bushels of corn to put on 100 pounds of pork. Therefore, a hog-corn ratio of 14 or larger indicates that hog feeding is quite profitable. A ratio of 13 or less indicates that the average producer is just breaking even or losing money on his hog enterprise relative to marketing corn at market prices.

The relationship between the hog-corn ratio and changes in hog production is quite distinct. Since 1940, the fall hog-corn ratio has been 13 or above 10 times; in all cases sow farrowings have expanded the following spring. When the ratio dropped below 13 in the remaining 8 fall breeding seasons,

spring farrowing decreased in all cases. If this consistency continues in the future, the hog-corn ratio will remain a good indication of sow farrowing changes.

Before government storage programs became an important factor in corn marketing, changes in hog production were more closely linked with the seasonal corn crop than they are now. It was not uncommon to see erratic fluctuations in corn production associated with extreme non-cyclical variations in hog production. The size of the hog-corn ratio reflected this relationship with the price of corn being the major adjusting factor.

To a degree, the effect of yearly corn production on the level of expected hog supplies has changed. Government corn support and storage programs have been the main reason for this relaxed linkage. The alternative of storing a portion of a large corn crop, instead of immediately expanding farrowings,

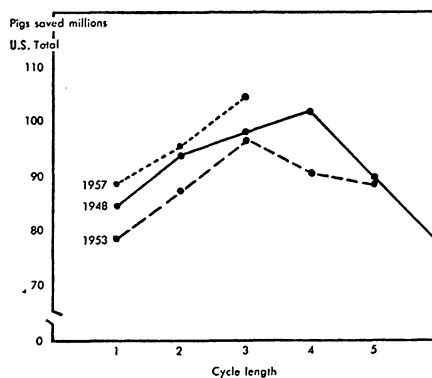


Fig. 1. Hog production cycles, 1948-1959, U. S.

gives producers more flexibility. It also provides more stability in corn available for feeding and in year-to-year market corn prices.

Because of this, the adjustment in hog production is now more closely associated with the hog price side of the hog-corn ratio. As a result, expansions and contractions in hog production are more self-generated, and exhibit a more defined cyclical pattern.

Because hog production does exhibit a cyclical pattern, the stage of the hog cycle relative to its expected length is a second indicator of future supplies.

Figure 1 indicates that a rather smooth cyclical response to a favorable or unfavorable hog-corn ratio has emerged. The figure shows each cycle through its expanding and contracting phase. Two complete cycles—1948 to 1953 and 1953 to 1957—have occurred in the hog industry since 1948; and the third, which began in 1957, is approaching its peak.

When these cycles are charted separately, they show a reasonably uniform time span of 4-5 years. The expansion phase lasts from 2-3 years and the liquidation phase about 2 years.

In addition to these yearly supply indicators, producers should also review short-run seasonal indicators of supply such as: reports on the pattern of expected farrowings, actual farrowings, and the pattern of expected marketings. Published marketing material by UDA, land-grant colleges, and private sources provide this information.

A careful consideration of all of these indicators will aid producers in making a more reliable forecast of future hog prices. With this knowledge, they can do a more effective job of planning future production and marketing.

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