Seasonal market variations and their importance to Iowa farmers

Eugene Hamilton
Iowa State College

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Seasonal Market Variations and Their Importance to Iowa Farmers

BY EUGENE HAMILTON

Farmers who follow the markets know that livestock and grain prices vary from month to month with a certain amount of regularity. Droughts, business depressions and booms may alter or distort seasonal price movements in any individual year. But farmers know that on the average some prices are highest in the winter while others are highest in the summer. Marketings of farm products, purchases of feeder stock, average weights of market receipts, cold storage holdings and feeding ratios also follow definite seasonal patterns. The wise farm manager knows it will pay him to study these seasonal market patterns and plan his production in their light.

It isn't always wise to plan production so as to hit the market in the season of highest prices. In many cases such a production plan would increase costs more than enough to offset the gain from higher prices. But a careful study of seasonal variations in prices and supplies will help farmers plan production so as to hit the market which ordinarily offers the greatest opportunity for profits, considering both production costs and probable sale prices. This bulletin has been prepared to provide farmers with the material necessary to study and understand some of the more important seasonal market variations.

Over a period of years seasonal price patterns may be altered by changes in production techniques, consumption habits and other market factors. For this reason it is usually desirable to base seasonal price charts on the most recent period for which data are available. In preparing this study, an attempt was made to use the 10-year period, 1929-38, wherever possible. In a few cases other periods were used, because comparable data

1 Project 337 of the Iowa Agricultural Experiment Station.

2 The writer acknowledges the many helpful suggestions received during the preparation of this manuscript from L. G. Allbaugh, L. K. Soth, A. D. Oderkirk and G. S. Shepherd, all members of the Iowa State College staff, and Preston Richards of the Bureau of Agricultural Economics.

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were not available for the entire 1929–38 period. Where periods of more than 10 years have been used the additional years were added because it was felt that the 1929–38 seasonal average gave an inaccurate picture as a result of the unusual conditions which prevailed during a large part of the last 10 years.

Since these seasonal charts show only what has been true on the average, farmers will want to study them in the light of current conditions before making any forecasts of future developments.

CHART 1. SEASONAL CHANGES IN BEEF STEER PRICES AT CHICAGO (1929–38).

Prices of the upper and lower grades of grain-fed beef steers follow somewhat different seasonal patterns. Prices of the lower grades have a tendency to follow stocker and feeder cattle prices. The spreads between the various grades are usually narrow during the spring months when marketings of grain-fed cattle are heavy in relation to marketings of grass cattle. In the fall seasonally heavy marketings of grass cattle compete with Common and Medium grade steers and cause a decline in the prices of these grades. This usually results in a widening of the spreads between the prices of the various grades.

While Chart 1 shows that on the average the prices of the various grades of grain-fed steers follow fairly definite seasonal patterns, these patterns are not so readily apparent when the prices paid in individual years are studied. Take the case of
Choice and Prime cattle. During the last 10 years the year's high point occurred four times in January and once in each of 6 other months. The year's low occurred twice in November, twice in June and once in each of 6 other months.

This simply means that other factors in the marketing situation often obscure the effect of seasonality on prices. One of these factors is the length of time farmers feed their cattle. In years of large corn supplies and high cattle prices, farmers feed for a longer period. This means later marketing, a high proportion of the better grades and a relatively narrow spread between prices of the various grades. When feed is scarce more rough cattle are marketed and price spreads widen.

CHART 2. SEASONAL CHANGES IN BEEF STEER RECEIPTS AT CHICAGO (1929–38).

The average number of grain-fed steers farmers sold per month at Chicago in the 10-year period, 1929–38, varied from about 67,000 head in February to nearly 86,000 head in August. This is fairly important to the cattle feeders, but there is a much larger seasonal variation in the quality of the grain-fed steers sold at Chicago. This is largely due to the length of time farmers feed cattle before marketing them. Most feeders fill their feedlots in the late summer and fall months. Since grass-fat cattle are plentiful at this time of year, many feeders buy grass cattle, give them a "warm-up" feed of grain and send them back to market within 2 or 3 months. Although many of these short-fed steers grade Good or better, the marketing of short-fed animals causes an increase in the proportion of fed steers grading
Common and Medium during November, December and January. (Range grass steers are excluded from the averages in Chart 2.) During the early months of the year farmers sell almost equal numbers of upper and lower grade grain-fed steers. By the beginning of summer farmers have marketed most of their short-fed steers and are beginning to sell more high-quality, well-finished animals. This produces a sharp increase in the proportion of steers grading Good, Choice and Prime. As the summer progresses farmers sell steers which have been fed for a constantly increasing length of time, and the proportion of top-quality cattle continues to increase until it reaches a seasonal peak in August. Prices of Good and Choice steers often advance during July, August and September in spite of seasonal increases in marketings of this type of cattle. The demand for high-quality beef is usually good at this time of year.

**CHART 3. SEASONAL CHANGES IN STOCKER AND FEEDER CATTLE SHIPMENTS FROM PUBLIC STOCKYARDS AND PRICES OF STOCKER AND FEEDER STEERS AT KANSAS CITY (1929–38).**

Public stockyards ship more stocker and feeder cattle back to the country during October than in any other month of the year. There are two reasons why stocker and feeder shipments are heaviest in the fall: (1) Supplies of stocker and feeder cattle are largest in the fall when farmers and ranchers are selling their surplus cattle and grass-fat stock in preparation for winter. (2) Feeders want to fill their feedlots with cattle in the fall, because feed and labor are ordinarily plentiful in the Corn Belt after harvest.
Feeder and stocker shipments fall off sharply as soon as the markets have been cleared of grass cattle. Except in years when the weather is normal in some sections and abnormally dry in other large areas, stocker and feeder shipments are small during the spring and early summer.

The seasonal movement of stocker and feeder cattle prices is largely determined by changes in the supply of this type of cattle. In the fall when the markets are crowded with grass cattle, feeder and stocker prices are low. In the spring, when marketings of thin cattle are relatively light and there is a good demand for cattle which can be put out on grass, feeders and stockers sell high. In any individual year this pattern may be modified by feed conditions, the business situation or the demand for fat cattle. In years when feed is plentiful and fat cattle prices are high, feeder cattle prices are likely to be relatively high in the fall. Likewise widespread drouths or an unfavorable feeding outlook may cause low feeder prices in the spring and early summer.

**CHART 4. SEASONAL CHANGES IN CHOICE HEIFER PRICES AT CHICAGO (1928–37).**

Prices of fat heifers are very largely a reflection of fed steer prices. Consequently, the seasonal variation of Choice heifer prices is influenced more by the slaughter supplies of well-finished steers than by marketings of other sheep.

Chart 4, which is based on prices paid for Choice heifers weighing less than 850 pounds, shows that heifer prices normally reach a peak in September — the same month in which Good and Choice steers sell best on the average.
Prices of slaughter cows usually reach a peak in the spring and hit a seasonal low near the end of the year. This price pattern is the result of the seasonal distribution of marketings. Rather than sell an old cow in the spring most farmers will turn her out on pasture to fatten up a bit or perhaps raise one more calf. In the fall there is a general tendency for farmers to market undesirable cows rather than carry them through another winter. That is, farmers usually cull their cow herds at a time when total supplies of lower grade beef animals are large due to the seasonal marketing of both range and native grass-fed stock. As a result prices of slaughter cows are lower during the fall months than at any other time in the year.

The seasonality of cow prices is less important to farmers than that of many other types of livestock, because the range from the low to the high point of the year is usually less than in the case of many other kinds of livestock. This is particularly true of the lower grades of slaughter cows.

Feeder calves follow a seasonal price pattern similar to that of heavier classes of feeder and stocker cattle. That is, feeder
calves bring high prices in the spring, when marketings of feeder cattle are light and farmers are looking for cattle which can be put out on grass. Feeder calf prices are the lowest in the fall when marketings of all classes of feeder cattle are relatively large.

The prices in Chart 6 are based on Good and Choice beef-type, steer calves, weighing less than 500 pounds.

**CHART 7. SEASONAL CHANGES IN VEAL CALF PRICES AT CHICAGO (1901–37).**

Veal calf prices follow a rather definite seasonal pattern with a high point in September, a somewhat lower peak in January, a low point in April and a somewhat less pronounced low in November. This seasonality of prices is brought out by Chart 7 which shows the average monthly prices paid for veal calves at Chicago from 1901 to 1937.

Seasonal variations in veal calf prices are largely a reflection of the number of calves marketed. Veal calves are almost entirely of
dairy origin and are marketed when only a few weeks of age. Consequently, prices follow seasonal changes in the volume of calving with a lag of from 1 to 2 months. More dairy calves are born in the winter and early spring than at any other season, and because of this veal calf marketings are usually large and prices low during April and May. Few dairy calves are born in July and August, and this causes light marketings and a peak in prices in September. Similarly the fairly large volume of calving which usually takes place in September and October produces a fall low in prices in November, and the relatively small volume of calving during November and December produces a winter high in veal prices in January.

**CHART 8. SEASONAL CHANGES IN HOG PRICES AT CHICAGO (1929–38).**

Seasonal changes in marketings ordinarily produce two distinct peaks in hog prices in the course of a year. On an average prices reach a spring peak in March, when marketings of spring pigs are at a low level and farmers are not yet moving their fall pigs to market in volume. A second peak usually comes in the summer after the bulk of the fall pig crop has been marketed.

In the case of light hogs the summer peak is usually higher than the spring peak. In the case of heavy hogs, prices average
about the same at the spring peak as at the high point in the following summer.

Light hogs bring better prices than heavy hogs during the greater part of the year. The spread between light and heavy hogs is widest during the summer months, when heavy marketings of packing sows cause a seasonal peak in the average weight of market receipts. In the fall, when marketings consist almost entirely of young hogs, this price relationship changes, and packers actually pay a premium for heavy hogs for a few weeks.

**CHART 9. SEASONAL CHANGES IN HOG PRICES IN YEARS WHEN PRODUCTION IS INCREASING AND YEARS WHEN PRODUCTION IS DECREASING.**

In Chart 9 the 39-year period, 1900-38, has been divided into 17 years in which hog production was larger than in the preceding year and 17 years in which hog production was smaller than in the preceding year — 5 years were eliminated from these calculations, because in those years production changes were too small to be considered significant.

In years when hog production is decreasing, the summer peak in prices averages considerably higher than the spring peak. There is also a tendency in years of decreasing production for the summer peak to come later than usual. In 17 years of
decreasing hog production prices averaged highest in September, while August prices averaged highest from 1929 to 1938. April prices averaged highest in the 17 years of increasing hog production.

The 17-year average for years of increasing production shows almost steady hog prices during the summer months in contrast to the rise normally expected.

**CHART 10. SEASONAL CHANGES IN HOG SLAUGHTER UNDER FEDERAL INSPECTION (1929-38).**

The seasonal variation in hog marketings is composed of three distinct movements. Farmers usually begin selling a few spring pigs in September, or sometimes as early as late August. Marketings of spring pigs increase throughout the fall until the year's peak in hog slaughter is reached in December or January.

Marketings usually decline from January to March, and then increase slightly during April and May as farmers sell their fall pigs. But even with this increase, marketing remains relatively light in comparison with December and January, for the fall pig crop has never been large in comparison with the spring crop.

During the summer, marketings usually contain a rather large proportion of packing sows. But farmers do not sell enough packing sows to offset the decrease in marketings of young hogs. As a result, the year's low in hog slaughter usually comes in August, just before farmers begin to sell their spring pigs.

The seasonal movement of various classes of hogs to market is reflected in the seasonal trend of the average weight of the hogs slaughtered under federal inspection. Average weights are lowest during November when the seasonal movement of spring pigs is increasing rapidly. Since a considerable number of spring pigs are carried over and marketed in the spring, the spring movement of young hogs (fall pigs) does not result in as low average weights as occur in the fall.

Average weights are heaviest in July when marketings of packing sows are near a seasonal peak.

CHART 12. SEASONAL CHANGES IN COLD STORAGE HOLDINGS OF PORK (1929–38).

Packers store pork during the winter when hog slaughter is heavy and reduce their storage stocks during the summer when current supplies are relatively light. On an average cold storage
holdings of pork reach a peak in March. Since hog slaughter usually declines during March, packers often reduce their storage holdings during the month. May 1 storage holdings average slightly heavier than those of a month earlier, because of the heavy slaughter of fall pigs which usually occurs in April.

After May 1 storage stocks usually decline until a seasonal low is reached around Nov. 1.

CHART 13. SEASONAL CHANGES IN COLD STORAGE HOLDINGS OF LARD (1929–38).

Seasonal changes in cold storage holdings of lard result from (1) changes in the number of hogs marketed and (2) changes in the average weight at which hogs are marketed. Packers store a considerable amount of lard during the winter, but the year's peak in cold storage holdings does not normally come until summer. Packing sows yield large quantities of lard, and the seasonally heavy marketing of packing sows usually causes an increase in lard stocks during the early summer even though farmers sell a relatively small number of hogs at this time of year. In the fall, lard stocks do not begin to increase as soon as cold holdings of pork, because the spring pigs sold early in the fall do not produce much lard.

Storage operations exert an important influence on hog prices during both winter and summer. In years when the outlook for summer hog prices is favorable because of an improving demand situation or a prospective reduction in hog slaughter, packers store large quantities of pork and lard in winter. This tends to hold hog prices up during the season of heavy marketings. It also reduces the extent to which prices can rise the following summer.
The price of corn is one of the most important factors determining the cost of producing hogs. As a result the hog-corn price ratio (the number of bushels of corn equal in value to 100 pounds of live hogs) is the chief factor determining whether or not hogs will be profitable in a given year.

From 7.5 to 9 bushels of corn are required to produce 100 pounds of pork. The exact amount required depends upon the amount of supplementary feeds used and other feeding practices.

Like most other feeding ratios the hog-corn ratio is more favorable to feeders at certain times of the year than at others. During the 10-year period, 1929–38, farmers could exchange 100 pounds of live hogs for an average of 15 bushels of corn in October and 14.9 bushels in March in comparison with only 12.2 bushels in July. But this seasonality is not particularly important to farmers because of the amount of time required to finish a hog for market.

Chart 14 shows that the Iowa hog-corn ratio has been consistently more favorable to hog producers than the United States hog-corn ratio for many years.
CHART 15. SEASONAL CHANGES IN SHEEP AND LAMB PRICES AT CHICAGO (1929–38).

The lamb prices plotted in Chart 15 are Chicago bulk of sales prices. During the winter, fed lambs make up the bulk of sales; in the summer spring lambs predominate, and in the fall marketings consist largely of grass lambs.

Lamb prices are usually highest in June, when Iowa farmers are just beginning to market their spring lambs. Prices usually decline during the summer and early fall, as the result of a seasonal increase in marketings.

The May drop in prices shown by the chart probably results from farmers shearing their fed lambs before marketing them. The fed lambs sold during May are largely late, shorn lambs, which have not done as well as those sold earlier in the year. Chicago packers receive some California spring lambs during May, but Corn Belt spring lambs are not yet ready for market.

Sheep prices drop sharply in the spring at shearing time, because wool is much more valuable per pound than mutton. On an average sheep prices remain low during the summer and then rise during the fall and winter.


October is the peak month for sheep and lamb slaughter, for this is the month many western ranchers sell their surplus...
sheep in preparation for winter. After reaching this seasonal peak, marketings usually drop sharply until the movement of fed lambs back to market causes an increase in January. Sheep and lamb slaughter usually reaches a low for the year in February as the result of a seasonal decline in marketings of fed lambs and the shorter number of days in the month.

CHART 17. SEASONAL CHANGES IN STOCKER AND FEEDER SHIPMENTS OF SHEEP FROM PUBLIC MARKETS (1929–38).

October is also the peak month for shipments of stocker and feeder sheep back to the country from public stockyards. This is largely because market supplies of thin western grass lambs are heaviest in the fall when ranchers have to get their grass lambs off the range before winter. Stocker and feeder shipments of sheep and lambs are also relatively heavy during August, September and November. Only a few stockers and feeders are shipped through the markets during the other months of the year.
Prices of stocker and feeder sheep have a tendency to follow the fat lamb market. But in individual years the relationship between prices in the two markets is affected by the proportion of the lamb crop which is marketed in slaughter condition and the profits or losses lamb feeders have made in the previous year.

**CHART 18. SEASONAL CHANGES IN CREAMERY BUTTER PRODUCTION AND PRICES OF 92-SCORE BUTTER AT NEW YORK CITY (1929–38).**

Feed and weather conditions exert an important influence on butter production. Production ordinarily reaches a peak in June and then falls off sharply as the summer brings higher temperatures, more flies and a decline in pasture conditions. During the winter feeding period, production is relatively low because of cold weather, advanced lactation periods and the smaller number of cows milked.

During the season of heavy butter production—May 1 to Sept. 1—large quantities of butter are placed in cold storage. As a result butter consumption in the various seasons of the year is much more uniform than production.

Butter prices are ordinarily high during the winter when production is light and low during the summer when production is heavy. The spread between summer and winter prices represents the gross profit received by dealers to cover the risk and expense of storing butter.
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The Iowa butter-feed grain price ratio follows a seasonal pattern very similar to that followed by butter prices. This ratio is most favorable during the fall and early winter when butter prices are high and feed prices are relatively low. The butter-feed ratio is based on the farm prices of butter and a feed mixture consisting of 40 pounds of oats and 60 pounds of corn.

CHART 20. YEAR-TO-YEAR CHANGES IN THE IOWA BUTTER-FEED PRICE RATIO.

The butter-feed ratio is a good index of the profitability of feeding grain to dairy cows. However, labor is an important cost in the production of butterfat, and in years of low butter prices, farmers may get very little for their labor even though the feeding ratio is favorable.

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CHART 21. SEASONAL CHANGES IN EGG PRICES AND RECEIPTS AT NEW YORK CITY (1929–38).

The spring months are months of heavy egg production. The seasonal peak in egg receipts at New York usually comes in May. During the second half of the year, egg production decreases markedly and prices rise. The seasonal peak in egg prices usually comes in November. During recent years, the proportion of eggs produced during the winter months has been increasing due largely to changed production and marketing techniques in the specialized producing regions.

Eggs are placed in cold storage during the months of heavy production. As a result, available supplies on the markets do not fluctuate as much as production.

CHART 22. YEAR-TO-YEAR CHANGES IN THE IOWA EGG-FEED PRICE RATIO.
The Iowa egg-feed price ratio measures the relationship between the cost of a balanced poultry ration and the farm price of eggs. Since feed cost is one of the most important costs of egg production, the egg-feed ratio is a fairly reliable indication of the profitability of egg production. But the relationship of egg prices to the cost of labor and equipment should also be considered.


On an average the egg-feed ratio follows a very definite seasonal pattern similar to that followed by egg prices. Feed costs are much lower in relation to egg prices during the winter than in the summer, but other production costs are higher during the winter.

The egg-feed price ratio is also valuable as a forecasting device. When this ratio is high — that is when egg prices are high in relation to feed costs — poultrymen build up their laying flocks and take better care of their hens, thereby increasing egg production. When the egg-feed ratio is low, poultrymen hatch fewer chickens, cull laying flocks more closely and feed hens less intensively.

CHART 24. SEASONAL CHANGES IN FARM PRICES OF CHICKENS AND RECEIPTS OF DRESSED POULTRY AT FOUR MARKETS (1929–38).

Farmers sell a relatively small percentage of their yearly poultry production in the first quarter of each year. Hens are held off the market in the winter and early spring to produce eggs and because farmers are not in the habit of culling flocks at this time of year. Marketings of young chickens are light,
because many farmers lack the equipment needed to produce chickens easily and economically during the winter. As a result of these seasonally light marketings, the farm price of chickens usually rises from December to a seasonal peak in April and then declines during the summer and fall as farmers increase their marketings of both young chickens and hens culled from laying flocks. This decline is not continuous, however, for in September Jewish holidays increase the demand for live hens and cause prices to rise slightly before taking the final drop to the seasonal low in December. Since the farm price of chickens is a general average of prices paid for all weights of chickens and hens, the September rise shown in Chart 24 is less pronounced than the rise which actually takes place in the price of live hens during the Jewish holiday season. For when all poultry prices are averaged together the rise in hen prices is partly offset by lower prices for the larger supply of young chickens which farmers normally ship to market during September.


In the large consumption centers poultry is sold on two entirely separate markets—the live market and the dressed market. Both markets affect the farm price of poultry, although at times they act quite differently. At New York receipts of dressed poultry have increased in recent years until they are now greater in volume than live poultry receipts. Since the bulk of Iowa’s surplus poultry is processed in local packing plants before it is
shipped out of the state, the New York dressed market probably exerts a stronger influence on prices in this state than the live market, although the Chicago live market is of considerable importance. Chart 25 shows the seasonal variations in prices of various classes of dressed poultry at New York City. Note that in the fall, when average poultry prices are declining, prices of heavy chickens and hens hold up better than prices of light birds.

CHART 26. SEASONAL CHANGES IN CORN PRICES AT CHICAGO (1924–38 marketing years) AND MONTHLY SALES OF CORN IN IOWA (1928–37 marketing years).

Corn prices usually rise during the summer, reach a seasonal peak in August and then decline during the fall months as the new crop comes to market. The seasonal distribution of corn marketings varies somewhat from year to year, but on the average Iowa farmers sell more corn in December and less in April than in any other months. For the 10-year period, October 1928 to September 1938, December marketings averaged 10 percent of the total
yearly sales, while April sales amounted to only 6 percent of the yearly total.

In order to determine whether or not it pays to hold corn for the August peak in prices, farmers need to consider the carrying charges which consist of shrinkage, interest, insurance and loss from rats and mice. On an average the evaporation of moisture causes a loss of about 10 percent in the weight of corn stored from harvest time to the following summer. But this loss in weight is normally offset by the higher price the corn will bring after the reduction in moisture content has raised its grade. (A crib which has been sealed for several months will contain as much corn as ever, only less moisture.)

Interest, insurance and loss caused by rats make up an average net cost of about $\frac{1}{2}$ cent per bushel per month.

While Chart 26 indicates that on the average farmers profit by holding their surplus corn for the summer market, this is not always true. In a study made at Iowa State College several years ago, Geoffrey S. Shepherd found that there is a difference in the amount corn prices rise in years following large corn crops and the years following small crops. In general it pays to store corn after big or average crops, but not after crops below 95 percent of average size. For the farmer who is buying corn to feed, these rules will need to be reversed.³

The seasonal variation in corn prices has been modified by the AAA loan program during the last 2 years. When corn prices are below the loan rate, the loan has a tendency to hold prices up and decrease feeding during the early part of the marketing year. This in turn reduces the seasonal rise which can be expected during the second half of the marketing year.

**CHART 27. SEASONAL CHANGES IN OATS PRICES AT CHICAGO (1924–38 marketing years) AND MONTHLY SALES OF OATS IN IOWA (1928–37 marketing years).**

On the average August is the month of lowest prices and heaviest sales of oats. During the 10 marketing years beginning with July 1928 Iowa farmers made an average of 27 percent of their total annual sales of oats in the month of August. About 61 percent of the oats sold in Iowa during this 10-year period

³ Shepherd, Geoffrey S., When shall we sell our corn? Iowa Agr. Exp. Sta., Cir. 113. 1929.
changed hands in the 4 months from July 1 to Nov. 1. Oats prices usually advance during November and December to reach a seasonal peak in January. But this advantage is at least partly, if not wholly, offset by lower marketing costs where oats are sold directly from the threshing machine in July or August.


Soybean prices are normally highest in the spring at planting time and lowest in the fall at harvest. Chart 28 shows that as an average for the 10 crop-marketing years, 1928–37, farmers obtained a premium of 32 cents per bushel by holding soybeans from November to June. This means a neat profit for the farmer who sold in the spring, since carrying charges probably do not greatly exceed 1 cent per bushel per month. During recent years the seasonal changes in soybean prices have averaged much greater than the seasonal changes in oats and corn prices (see charts 26 and 27). This
wide seasonal fluctuation in soybean prices is at least partly the result of the large increases in soybean acreage which have occurred in recent years. Increasing acreage has meant a strong demand for seed and high prices during the spring but a constantly larger production of beans to depress prices at harvest time.

In the future average seasonal changes in soybean prices may be smaller than in the period represented by the 1928–37 marketing years. It is hardly likely that soybean acreage will continue to expand indefinitely. As acreage becomes stabilized a smaller proportion of the total crop will be needed for seed. The proportion of the crop needed for seed is also being decreased by increased per acre yields through improvements in soybean varieties and production techniques.
SOURCES OF DATA

Most of the statistics used in this bulletin were compiled and are published currently by various agencies of the United States Department of Agriculture.

The data on livestock movements, prices and slaughter were largely taken from the Department of Agriculture's 1938 Handbook of Livestock, Meats and Wool Market Statistics and Related Data. Cold storage holdings of pork and lard and prices of No. 3 Yellow corn at Chicago were obtained from the same source.

The data on the slaughter of cows and heifers under federal inspection and prices of slaughter cows at Chicago are from the Department of Agriculture's 1939 series of agricultural outlook chart books.

The prices of light and heavy hogs at Chicago are from the Chicago Daily Drovers' Journal Yearbook. The USDA Yearbook of Agricultural Statistics supplied the data on oats and soybean prices, receipts of dressed poultry at four markets, creamery butter production and butter prices. Data on Iowa marketings of corn and oats are estimates made by the Division of Agricultural Statistics of the United States Department of Agriculture.

The Iowa feeding ratios were calculated from Iowa farm prices collected by USDA crop reporters on the fifteenth of each month.

Poultry prices used in Chart 25 are from the American Produce Review.