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DEPARTMENT OF AGRICULTURAL ECONOMICS

YEAR-TO-YEAR AND SEASONAL FLUCTUATIONS IN HOG PRICES[1]

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PROBLEMS IN MARKETING HOGS

Two of the most important economic questions the farmer has to answer in connection with the marketing of his hogs are: (1) When to increase or decrease his total production of hogs, and (2) at what times during the year to have hogs finished and ready for market.

The natural tendency is to decrease production following a season or two of unprofitable prices. Prices are understood only after they have been experienced for some time. Likewise, a period of increased production follows after a season or two of profitable prices. Again prices are heeded only after they have been in existence for some time. Since production trails behind prices, when there is a price decline, production tends to decrease too long, and thus adds to the strength of prices when they begin to again rise. When prices rise, production continues too long after the peak is reached and thus adds force to the crash in prices that follows.

Acknowledgment.—Mr. Harold Hedges, formerly of the Department of Agricultural Economics, Kansas State Agricultural College, now of the University of Nebraska, contributed much to this circular by his efforts in compiling many of the live-stock statistics used as a basis for this work.

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There is also a sort of natural tendency regarding the time during the year when farmers will market their hogs. In producing hogs the line of least resistance is to have the pigs farrowed at a season when they require the least care and equipment, and feed them in such a way as to take seven or eight months to get them to market weight.

Following such methods, the one-litter system was once much more prevalent than to-day. Pigs were farrowed in the spring, March or April, so they would soon require little attention. With average feeding methods this put a high per cent of hogs onto the October, November, and December markets.

In recent years more attention has been given to the two-litter system. This has tended to create a somewhat higher spring peak in receipts and moderate the fall and winter peak. Even under this system, however, there are the two heavy farrowing periods — March and September. With ordinary feeding methods this means heavy receipts from the spring pig crop in October and November, and heavy receipts from the fall pig crop in May and June.

Live-stock men have come to realize that a study of past prices furnishes in part a basis for forecasting future price trends. The price movements that hog men can study to good advantage are two: (1) The long-time price tendency, the length of which coincides rather closely with the production period for hogs. (2) The short-time, or month-to-month price changes. The ups and downs of prices over a long period of years and the causes back of this movement may be first considered.

HOG PRODUCTION — PERIODS OF HIGH AND LOW PRICES

The production of hogs varies from year to year, this variation being due primarily to the producers' reaction to existing prices. Referring to figure 1, it can be seen that market receipts of hogs, which reflect production on the farm, are extremely irregular. Yearly receipts of hogs at markets have increased in the last 25 years by a series of ups and downs.

There is a certain degree of regularity about these upward and downward movements. In other words, the time intervening between the peak point and the lowest point in receipts, is about two or three years for each production period. Likewise, the intervals between the lowest point and peak point in receipts vary from two to three years for each production period. The fair degree of regularity existing in the production cycle for hogs makes the past

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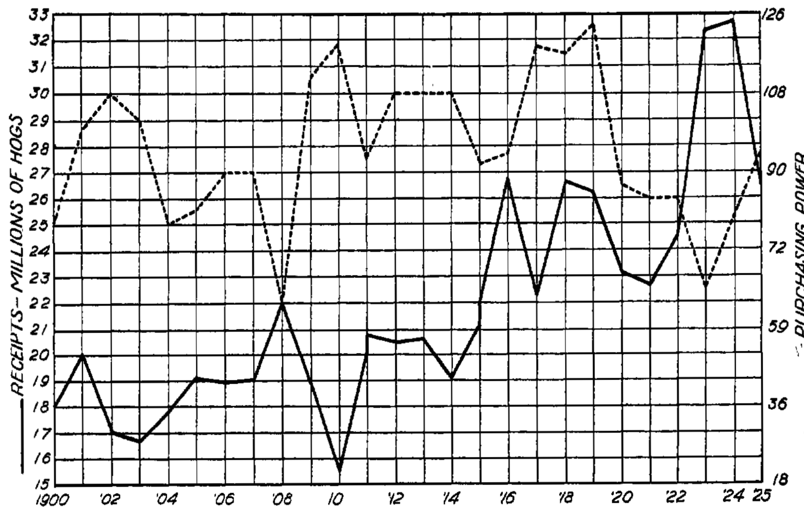

FIG. 1.—Receipts at nine markets and purchasing power of hogs. 1900-1925.

valuable as an aid in foretelling the future. This same regularity can be expected in the future, provided the underlying causes do not change. Receipts are emphasized because they are one of the most important factors in the making of prices.

Figure 1 also gives information concerning prices. The purchasing power of hogs in terms of other commodities is given and not the actual hog prices. Calculating the price of hogs, in terms of the quantity of other commodities they will buy, is the best basis for determining the value of hogs at any given time. It will be observed that prices also have the upward and downward movements, but that they usually go in an opposite direction from receipts. While receipts are on their downward trend, prices are traveling upward and *vice versa*. Between June, 1862, and the summer of 1924, the price cycle has been repeated no less than eleven times. The average length of this so-called cycle in hog prices was sixty-seven months, or about five and a half years. The average length of time prices were moving upward was thirty-six months, and the average time during which they moved downward was thirty-one months. There is no fixed regularity as to the length of the hog price cycle. During the period since 1862, the length of time between high point in price and the next high point in price has varied in length from about three years to about nine and a half years. Such factors as size of the corn crop and corn prices, general business conditions and

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consequent demand for pork products and the relative price of beef as a substitute for pork all have an influence on the time it will take to overproduce or underproduce hogs.

The important thing to know at any time is the position of hogs in the production cycle. This can be determined by a study of receipts and prices of the past. When receipts are at a low point and prices at a high level as a consequence, hog raisers will be encouraged to produce more hogs. Because of this increased production, markets first become well supplied and then oversupplied with hogs. The heavy receipts cause prices to decline and hog raisers to become discouraged. As a consequence of the low prices, the number of hogs produced on farms becomes fewer and market receipts again fall, while prices rise and the cycle is repeated. This cycle of hog receipts and prices is repeated about every four or five years unless unusual conditions are present to shorten or lengthen the period somewhat. A series of poor corn years, for instance, would lengthen the time it would take to overproduce hogs. Likewise a series of good corn crops and low corn prices might shorten the time required for overproduction.

SEASONAL FLUCTUATIONS

Receipts are the important factor in month-to-month variations as well as in the longer-time price movements. Taking an average of monthly receipts for 25 years on four markets (Fig. 2) it will be noted that the yearly trend of receipts can be divided into two periods. Receipts are highest in December and January, when the heaviest run of spring pigs reaches market. A second heavy receipt period occurs in May and June when the smaller fall pig crop reaches market. Taking a single year, the receipts may vary somewhat from the normal trend due to certain factors having a bearing upon the market, the most important of which is the size of the corn crop.

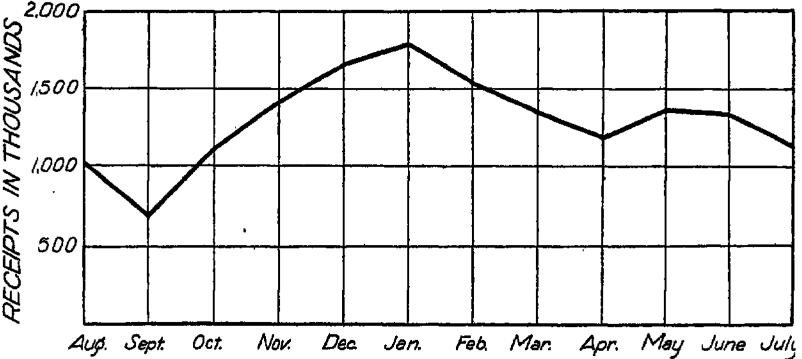

FIG. 2.—Average monthly receipts of hogs at four markets, 1900-1925.

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THE INFLUENCE OF CORN PRICES ON HOG RECEIPTS

The price of corn has a pronounced influence upon the receipts of hogs at markets. When the years of large and small corn crops are studied separately, a difference in receipts is noticeable. (Fig. 3.) In years of big corn crops and lower corn prices there is a distinct tendency to slow up market receipts of hogs from August to January. This results in a smaller per cent of the season's receipts coming to market from August to January than comes in years of smaller corn crops. The holding out of hogs is both for the purpose of increasing breeding stock and for the later feeding of the cheaper

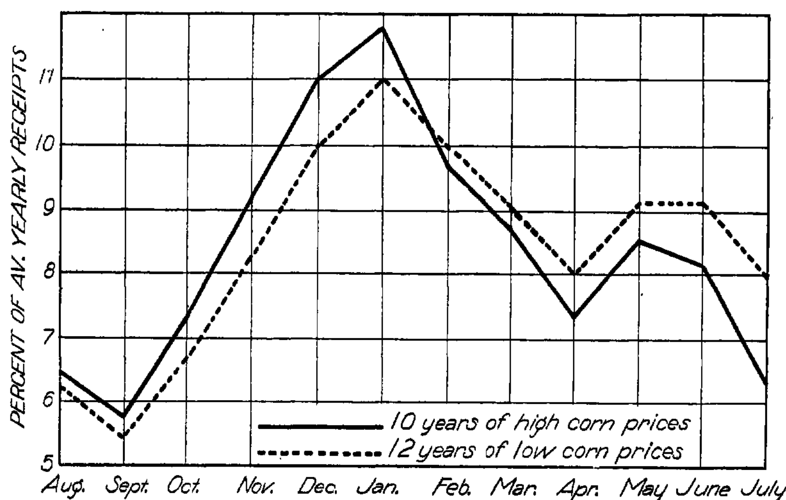

FIG. 3.—Hog receipts in years of high and low corn prices, in per cent of average yearly receipts. (Four markets, 1901-1923.)

new corn. The withholding of gilts for breeding purposes and the tendency to feed for longer periods on the cheaper corn results in an increase in average live weight of hogs received at the markets.

There is then both a tendency to withhold hogs from fall feeding and a tendency to breed heavier in the fall for the following spring farrowing. This results in a larger proportion than usual of the season's receipts coming to market between about February and the following August.

Not only is supply of hogs important, but supply of corn and the resulting price of corn is of significance as well. This is true because a very high corn price may offset the benefits of an otherwise satisfactory hog price. Likewise, a very low corn price may offset

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what would otherwise seem a very poor hog price. The corn-hog ratio is something in which every corn and hog producer should be interested, for it is on the basis of this ratio that the producer decides whether to sell his corn as corn or in the form of pork. The corn-hog ratio is an expression of the number of bushels of corn that it would take to buy 100 pounds of live pork if the corn were sold and turned into money. It has been found, over a long period of years, that it takes about 11 bushels of corn to buy 100 pounds of live hogs. The average or normal corn-hog ratio then is said to be 11 to 1. When corn is relatively cheap and hogs relatively high, the corn-hog ratio is said to be high, and there is as a consequence considerable profit for the hog producer. On the other hand, when

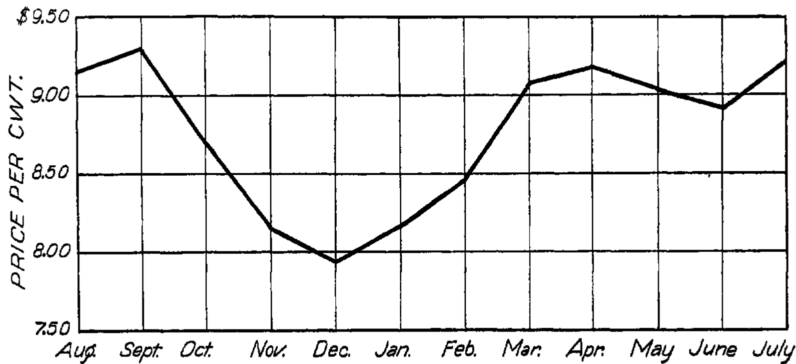

FIG. 4.—Monthly average price of hogs at Chicago for 23 years, 1901-1923.

the ratio falls below 11 to 1 only the efficient producer can realize profits.

A study of prices will show a tendency in the opposite direction from receipts, for as receipts climb, prices frequently fall and *vice versa*. Taking the monthly average price of hogs at Chicago over a 23-year period it will be noted that there is a distinct upward tendency from June to August or September. (Fig. 4.) During fall and early winter months following, September prices tend to decline sharply. Hog prices tend to rise from January to March or April, and from then until June the most frequent tendency is a downward trend in prices.

Figure 5, which can very well be studied in connection with figure 4, shows the periods of seasonal weakness and strength in the hog market. The shaded areas above the line show the number of years that the price for any month was higher than for the month pre-

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ceding. The open areas below the line show the number of years that the price for any month was the same or lower than for the month preceding. For instance, the month of November, when the movement of the spring pig crop is at its height, is an exceptionally weak period. Only two years out of the 23 studied has there been any price improvement in November over the price for October.

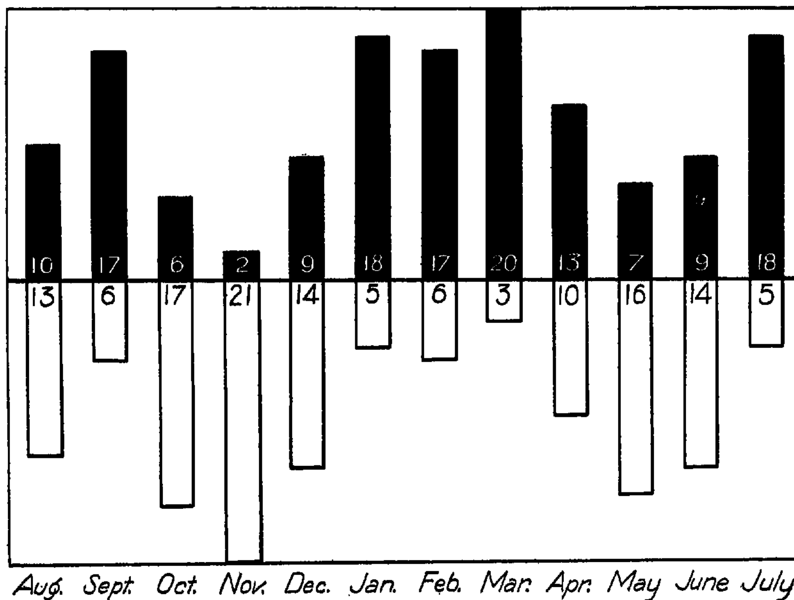

FIG. 5.—Number of years out of total of 23 that the price for any one month was higher than for preceding month (shaded area) and the same or lower than for the preceding month (open area) at Chicago (1901-1923).

Figure 6 demonstrates the effect that low and high corn prices have upon the price of hogs. The shifting of hog receipts as shown in figure 3 accounts for this effect upon prices. The difference in price tendencies as a consequence of these shifted receipts is so marked during certain seasons of the year that special consideration will be given to this factor in analyzing the month-to-month fluctuations. August marks the time when the marketing of the pigs of the previous fall is coming to a close, and the early movement of the spring crop is just beginning. August is taken, therefore, as a starting place in the discussion of seasonal price fluctuations.

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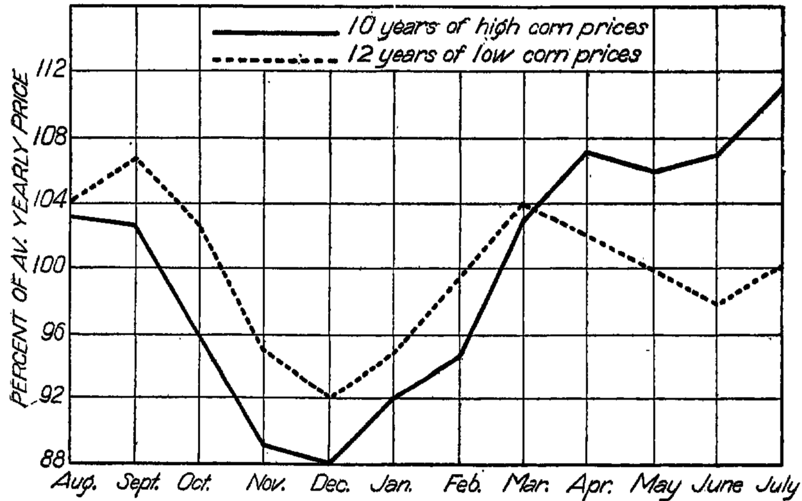

FIG. 6.—Hog prices in years of high and low corn prices, in per cent of average yearly price. (Chicago average, 1901-1923.)

MONTH-BY-MONTH FLUCTUATIONS

August. The latter days of July, the entire month of August, and the early part of September constitute a potentially strong period in the hog market. The top price for the year frequently occurs somewhere within this period, but not always at the same time, because conditions vary. In years when the price of corn is high, hog prices average highest in July or early August. In years of low-priced corn the price peak is more likely to come in early September. The chance for price improvement, however, during the month of August is less likely than during the month preceding, although the receipts are on the average nearly 11 per cent less than in July. A lighter demand during this month probably accounts for the weaker price in the face of light receipts. August is a month in which the chances for a price improvement or a decline are about equal. Much depends upon the extent to which order buyers are in the market to supply eastern fresh pork trade.

September. In years of high corn prices, the first 10-day period in September, as an average, remains about steady, while the last two-thirds of the month shows a distinct decline from the August level. In years of cheap corn, the price tendency is upward until the middle of the month, after which time the usual seasonal decline sets in. When corn prices are low, the middle of September usually marks the peak of prices for the year.

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October. Receipts begin to increase in October resulting in a consequent downward tendency in prices. In only six of 23 years has the price been higher in October than in September. Five of these exceptional years were characterized by large corn crops, which has a tendency to hold back receipts for November and December markets. In 1906, one of these years, an upward trend in the general price level, together with a very large corn crop and medium receipts, caused a small price increase in October over September. In 1907 there was no increase in October receipts over September, although on the average this increase is over 23 per cent. In this year commodity prices had come to a standstill. Hog prices had been declining since February, and October was preceded by sharp August and September price declines. In 1912, the trend of commodity prices had been upward since the latter part of the preceding year. The big coin crop of 1912 checked the early fall movement of hogs to market.

In 1915 the tremendous upward trend in prices, coupled with a large corn crop and medium receipts, caused an increase in October prices. The other exceptional years, 1921 and 1922, were characterized by large corn crops, medium October receipts and insignificant price increases. In 1921 there had been an unusually sharp decline in hog prices from August to September, so that the October rise was in the nature of a price reaction. In 1922 commodity prices had been moving upward since January. There had been sharp price declines from July to August with only a partial recovery during September.

From September to October the decline in light hog prices tends to be greater than that for the heavier hogs. This is because the first movement of the spring pig crop usually brings to market a liberal supply of the lighter weights.

November. The price decline continues through the month of October without being checked. In only two of 23 years has there been any price improvement in November over October. Both of these years, 1909 and 1917, were years when hog and all commodity price trends were strongly upward. The great increase in receipts in November over those in October (an increase of about 25 per cent on the average) accounts for the weak market in November. November to March constitutes the winter packing season. During this season, there is usually a strong demand for fresh pork and bacon, but the receipts of light hogs suitable for this trade are heavier.

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Supplies of the heavier hogs are smaller, and as a result of this situation the heavier hogs often go at a premium over light hogs by November.

December. The first 10 days in December shows a little strength practically every year. This little pickup is followed by a decline which takes prices to the lowed point in the year. This low mark usually occurs from the tenth to the twentieth of the month. During the last ten days, a recovery is made which brings the price back to about the level of the first 10-day period. The holiday season is a time when poultry and game materially reduce the demand for pork.

Receipts arriving at markets during this month tend to increase somewhat more rapidly in years of low corn prices than in years when corn prices are high. This is because lower corn prices induce more winter feeding.

January. In 18 of 23 years, the January price showed improvement over the December price. This month marks the beginning of a period of price improvement in spite of the fact that the receipts during January average the highest for any month during the year. This departure from the usual price tendency, when receipts are high, may be attributed to the fact that January is in the midst of the winter packing season when demand is heavy, and also because the lighter receipts of the months following are already anticipated.

Receipts fall off during this month, the decrease being considerably less in years of low corn prices than in years when the price of corn is high. Postponed marketing during such years is due to later farrowing of pigs in the spring and to the tendency to hold the spring pig crop later in the fall and feed them to heavier weights.

February. The improvement in price usually continues through the month of February, the advance being greatest in years of low corn prices. February prices showed some improvement over the month of January, in 17 out of 23 years. In most years receipts in February are considerably less than those of January. In 1902, one of the exceptional years, receipts had been heavy throughout the year previous and continued large through February. The year 1911 was also characterized by comparatively large February receipts and by a falling price level for hogs. In 1912 there were heavy receipts during the month of January, which, together with a rapidly falling off of export demand, had a depressing effect on February prices. February, 1915, witnessed the end of a decided

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drop in hog prices. Prices had been falling since early in the previous year. Hog prices were on a decided downward trend in 1920 and 1923, the other exceptional years.

March. The first 10 days of March is a strong period in the hog market nearly every year. In years of high corn prices there is a strong upward movement in prices throughout the remainder of the month, the advance continuing until the middle of April. In years when corn prices are low, practically no price improvement occurs after the first 10-day period, and during the last 10-day period the price tends downward. In years of low corn prices, the middle of March is the high point for the spring months. In only three out of 23 years has the hog market failed to advance during March. In 1907, one of these years, the panic beginning in the month of March was responsible. The other two years, 1911 and 1915, were years when hog receipts did not fall off after January as is the usual case. In 1911, hog receipts increased throughout March, while in 1915, although there was some decrease in receipts, the amount was small. The heavy receipts in the early months of 1911 and 1915 were due to the large corn crops of 1910 and 1914 and the deferred marketing of hogs.

April. In years of high corn prices the first 10-day period in April is a strong period, the high point being reached usually sometime between the tenth and twentieth of the month. Price declines occur usually in the last 10-day period, the losses offsetting the gains of the first half of the month. In these years, the high point of the spring months usually comes about the middle of April. In years of low corn prices, the entire month of April is a period of declining hog prices.

May. The month of May is a weak period in the hog market. In only seven of 23 years has the May price been higher than the April price. The fall pig crop begins its movement to market during this month, causing somewhat larger receipts.

June. The first 10-day period in June is a weak period nearly every year. The decline that had its beginning in March or April culminates in the first days of June in the second low point of the year. The last two-thirds of the month shows considerable strength. This is particularly true in years of high corn prices. June is a weak period because it is the period when the heavy movement of fall pigs arrives at the markets.

July. The price advances that begin in June continue through-

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out the month of July, reaching the highest point in the last 10 days of the month. In years when corn prices are high, this marks the high point for the year. The month of July showed price improvement over June in 18 of the 23 years studied. Four of the five exceptional years, 1903, 1907, 1917, and 1922, were characterized by large corn crops and as a consequence heavier than usual hog receipts. During three of these years, 1903, 1907 and 1922, the price level for hogs was falling. In 1910, the fifth exceptional year, there was a falling price level for hogs and all commodities.

OTHER INFLUENCES ON THE HOG MARKET

The factors which have been mentioned are not the only determinants, although they are the ruling influences over a, period of years. For any one particular year, some lesser influences may have a much more telling effect. Necessarily, other factors should be studied, but always in relation to the fundamental underlying factors.

The general business situation has its ups and downs and its position in the cycle at any given time has a pronounced influence upon the hog market. A prosperous business condition reflects a strong demand for pork and may cause an otherwise weak hog market to take on some strength. The business cycle and hog production cycle are of about the same length and the two usually move together in the same direction. The changes in hog prices usually come at about the same time or a short time before the change in prices of all commodities. This holds true whether the change means a price improvement or a shift to a lower level.

The existing price level for hogs is another factor of importance, for it will determine to a considerable extent how sensitive the price will be to seasonal influences. When the price of hogs has been pushed to a high level, the market will be more sensitive to seasonal tendencies pulling downward than to those which tend to stimulate prices.

PRACTICABILITY OF FOLLOWING USUAL SEASONAL PRICE TRENDS

There are other factors than simply production of hogs and seasonal distribution of receipts that affect hog prices, as has just been pointed out. For this reason a study of the most usual seasonal trend in hog prices will not enable one to anticipate price movement exactly. The question is how useful in practice is a knowledge of the most usual seasonal fluctuations in hog prices. It may be said that a knowledge of the most frequent tendencies in seasonal

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fluctuations of hog prices will generally enable one to forecast the direction price is going to take at least eight to nine months out of the year.

In Table 1 is shown the months and number of months that one would have been in error in anticipating direction of trend in receipts and prices if he had without exception followed the most usual trends during the 23 years.

It is quite noticeable that the error in anticipating trend in receipts is smaller than that in anticipating trend in price. This is because a change in receipts does not always cause a change in

TABLE I.—Years and months in which hog receipts and prices moved contrary to average trend, 1901-1923.

Year.	Receipts (four markets).		Prices (Chicago).	
	Number of times.	Months.	Number of times.	Months.
1901	2	Apr., July	4	June, July, Aug., Dec.
1902	4	Jan., Mar., June, Aug	3	Feb., May, June.
1903	3	Jan., Apr., Oct	2	Apr., July.
1904	3	Feb., Apr., Aug	2	Apr., June.
1905	1	June	3	Aug., Sept., Dec.
1906	2	June, Aug	4	June, Sept., Oct., Dec.
1907	2	Apr., Nov	5	Mar., Apr., July, Sept., Oct.
1908	0		4	Jan., Apr., June, Aug.
1909	3	Jan., Mar., Sept	4	May, June, Nov., Dec.
1910	3	Jan., June, Aug	3	Apr., July, Dec.
1911	3	Feb., Mar., Dec	7	Feb., Mar., Apr., June, Aug., Sept., Dec.
1912	0		4	Jan., Feb., Aug., Oct.
1913	1	June	2	June, Sept.
1914	2	Jan., June	3	Apr., Aug., Sept.
1915	0		6	Jan., Feb., Mar., May, June, Oct.
1916	1	Aug	3	May, Aug., Dec.
1917	0		4	May, July, Aug., Nov.
1918	4	Feb., Mar., May, July	4	Jan., May, Aug., Nov.
1919	2	June, Sept	2	May, Sept.
1920	1	Mar	3	Feb., Apr., June.
1921	1	June	4	Jan., Apr., Sept., Oct.
1922	1	June	5	Apr., May, July, Oct., Dec.
1923	2	Mar., July	4	Feb., Apr., Aug., Dec.

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prices. Other factors than receipts act on prices and sometimes obscure what would otherwise have been the effects of receipts.

In only two years out of the 23, namely 1911 and 1915, was there error in anticipating trend six or more months out of the twelve. Conditions these two years were so unusual that normal or most usual trends held true less than half the time.

An understanding of seasonal trends in the hog market, therefore, is at least the beginning of a better knowledge of the hog market.

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