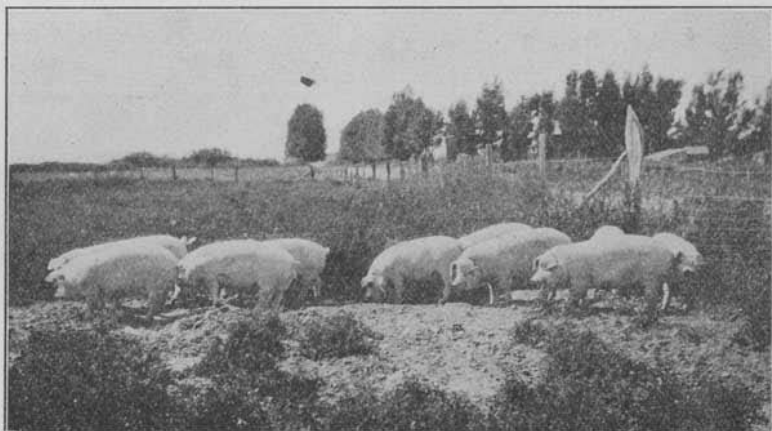


UNIVERSITY OF IDAHO
AGRICULTURAL EXPERIMENT STATION
Department of Agricultural Economics

Hog Prices and the Hog Enterprise on Idaho Farms

By

T. L. GASTON



A ton litter from Bingham County.

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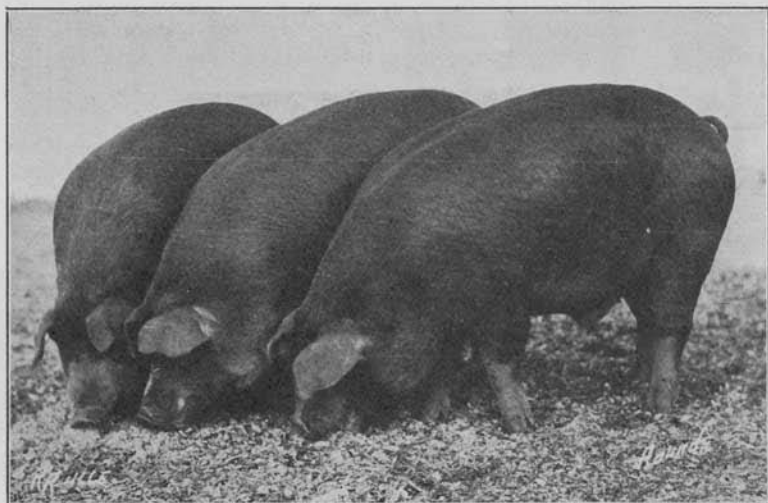
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Hog Prices and the Hog Enterprise on Idaho Farms*

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I. Introduction

PORK PRODUCTION, while not the most important enterprise on Idaho farms, constitutes a source of income which has reached considerable magnitude. Gross income to the farmers of this state from the hog enterprise is estimated to be six and one-half millions of dollars for 1929 and somewhat over five and one-half millions for 1930.¹ These amounts account for 10.8 per cent and 12.0 per cent respectively of the gross income received from livestock and livestock products, and are equal to 5.0 per cent and 5.6 per cent respect-



A champion pen of fat barrows, University of Idaho, College of Agriculture.

ively of the gross income from all agricultural production of the state during these years.

Considered from the viewpoint of income produced, wheat is the most important crop of this state, providing a gross income of over 19 and 12 millions of dollars for the years 1929 and 1930 respectively.² This is equal to 15 and 12 per cent of the gross income from all agricultural products of the state for these years. Large farming

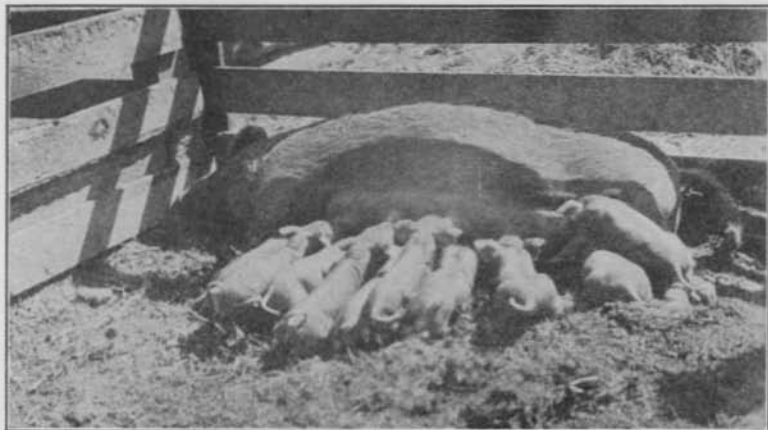
*The author wishes to acknowledge the guidance of Paul A. Eke in outlining the study, the patient and accurate work of Harold Brown in assisting to compile the statistical data herein contained; also the critical judgment and assistance of H. A. Vogel in putting the manuscript in final form.

- (1) U. S. Department of Agriculture estimates: Gross income of \$6,412,000 for 1929 and \$5,553,000 for 1930. These estimates include value of commodities used on the farms where they are produced.
- (2) U. S. Department of Agriculture estimates: Gross income of \$19,534,000 and \$12,136,000 for 1929 and 1930 respectively.

areas are particularly adapted to wheat production because of topographic, climatic, and marketing conditions, as well as the favorable aptitudes and inclinations of the farmers. In many of the agricultural areas, the wheat tonnage per acre exceeds that of any other grain.

Since wheat is utilized primarily for human consumption, the price is generally so high that it cannot seriously compete with other grains as feed for livestock. During recent periods of low wheat prices, however, many farmers have found it profitable to dispose of their wheat by some means other than through regular marketing channels. In many instances they have fed the wheat to hogs. The profitableness of such a practice depends upon the relative price of wheat and hogs.

Farmers in the Western States, considered as a unit, usually do not produce enough pork to supply the local demand. In this connection, it is estimated that 750,000 head of live hogs are imported into the eleven Western States annually.¹ In order to encourage hog



Off to a good start.

shipments to western markets, local prices must at times be higher than prices at the middle western markets. The price differences between these two areas vary from time to time, so that a study of the factors influencing these differences is desirable. This means that wheat is the most profitable grain crop in these areas even when it is used for feed.

Periodic changes in hog prices have been a serious handicap to profitable hog production. Every hog producer can recall certain instances when it would have been more profitable to produce some other commodity because of unexpected price changes before the hogs were fit for market. Likewise, he can recall certain years in which

(1) Sarle, C. F., and Nowell, R. Q., "Possibilities of Expanding Hog Production in the Wheat-Producing Regions of Eleven Western States." Federal Farm Board Pamphlet.

he realized a satisfactory net income because hog prices were favorable.

Price fluctuations make farming a highly speculative business. They also hinder economical and efficient control of the farmer's production program. It is costly to shift from one enterprise to another as well as impossible under many circumstances.

Because prices have a direct bearing upon farm profits, it becomes necessary to reduce or minimize the harmful effects of price fluctuations. This can be accomplished if producers become acquainted with the main types of fluctuation and adjust their production programs with this in view. Further, the sooner producers learn to interpret price information, and react accordingly, the sooner will the so called periods of over- and under-production be eliminated. The aim of this Bulletin, therefore, is to present to the Idaho farmers certain information on the following subjects:

1. Normal changes in hog prices.
2. Periodic movements in the wheat-hog ratio.
3. Spread between prices paid for hogs at western markets and at middle western markets.
4. The relationship between the size of the differential and number of hogs on western farms.

II. Normal Variations in Hog Prices

Variations in hog prices can be accounted for mainly by changes in the general price level, shifts in purchasing power of the consumers, cost of substitute products, and the relationship between volume of production and the demand for pork products. Local price fluctuations are merely a reflection of changes in the central market price. The degree to which prices in these markets differ, depends partly upon the nature of the local market. If it is situated in an area which does not produce enough of a commodity to supply the local demand, the price in the local market will be equal to or greater than the central market price.

Retail prices generally fluctuate less violently than farm prices, and are more likely to be "out of line" with the central market price.

The variations in the Idaho monthly farm price of hogs and wheat are illustrated in Fig. 1. It is evident that during the period 1910 to 1931 the prices of these two products fluctuated widely. As a matter of fact, the fluctuations in the monthly average price of hogs was as much as \$7.40 per hundredweight. It will also be noticed that the general long time movement of these price series is directly related, but that the monthly fluctuations do not move uniformly in the same or in opposite direction.

Seasonal Variations in Hog Prices.

Seasonal changes in the receipts of hogs at central markets are accompanied by seasonal variations in hog prices. Periods of increasing receipts are usually periods of declining prices. Periods of decreasing receipts are characterized usually by rising prices.

The average seasonal changes in Idaho farm prices and Portland prices of hogs are illustrated in Fig. 2. These seasonal averages are divided into two distinct periods, namely, those of rising prices, and those of declining prices. From a study of this figure, attention is immediately directed to the close correspondence between the seasonal movements of the Idaho and the Portland price, during periods of rising and falling prices. The Idaho farm price is constantly be-

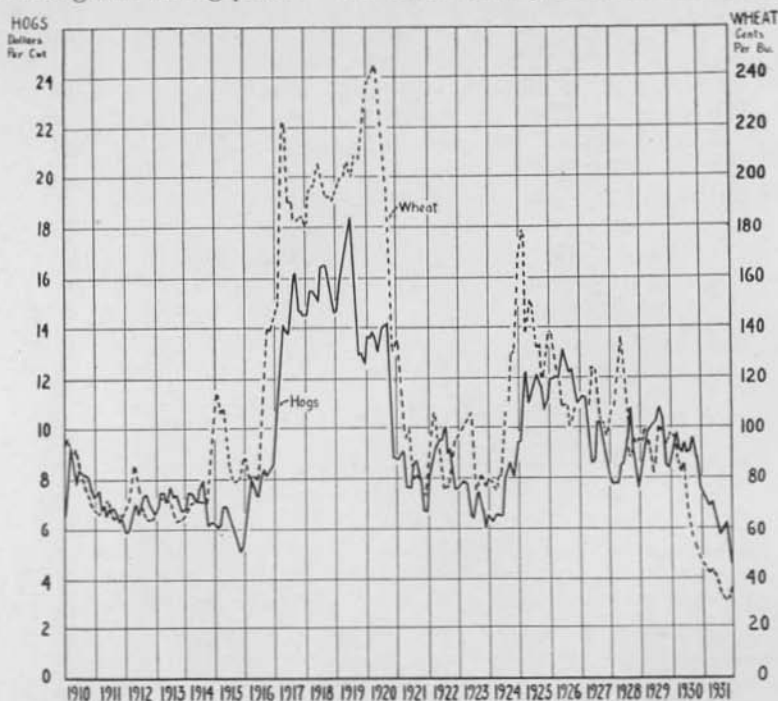


Fig. 1.—Monthly Idaho Farm Price of Wheat and Hogs, 1910-1931. Wheat and hog prices have been closely associated in their general movements. During certain periods the price of wheat has been high in relation to the price of hogs, and during other times, the opposite situation prevailed. The war period stands out as an example of sudden and wide price fluctuations. The past two years have offered unfavorable prices for both wheat and hogs, with the price of wheat falling to a new low level during 1931.

low the Portland price, but the spread changes during the various seasons. In this connection, it is noticed that generally the spread between the prices is smallest during the last of the year. The peak in Idaho farm prices comes one month earlier during periods of declining prices than during rising prices. The peak of Portland prices, however, comes approximately at the same time in both series. During periods of rising prices, the Idaho price lags approximately a month behind the Portland price; but the lag is practically, if not totally, eliminated during those years having a downward trend in prices.

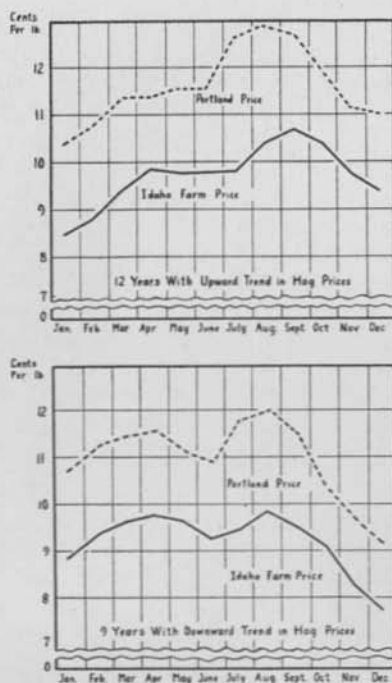


Fig. 2.—Portland and Idaho hog prices have a very similar seasonal movement, although there is a distinct lag in the Idaho price behind the Portland price. This lag is particularly noticeable during those periods of increasing prices, and narrows considerably during the years of falling prices. Both prices have been higher in the late summer and early fall than at any other season of the year. It is during this season when receipts at public markets are below average. The twelve years of upward trend in prices were 1912, 1913, 1916, 1917, 1918, 1921, 1924, 1925, 1926, 1928, 1929 and 1930. The ten years of downward trend in hog prices were 1910, 1911, 1914, 1915, 1919, 1920, 1922, 1923, 1927, and 1931.

Hog prices are usually highest in the spring and early fall. This fact tends to create the impression that these are the most desirable marketing periods. It does not follow, however, that the producer who plans his production program so that his hogs will be ready for market during seasons of high prices, is making the greatest net profit from the enterprise.

Studies of production costs and income carried on in the College of Agriculture¹ indicate that very little added return, if any, was received by producing early spring and fall litters in Bonneville county, Idaho. The results are explained by necessary differences in production methods and costs.

Producers who wish to sell their hogs in August and September must have their gilts farrow early in March. The spring pigs are usually run on forage through the summer with self feeders and are sold at an average weight of 200 pounds. This plan of management is expensive from the standpoint of feed requirements for the sows, number of sows which fail to farrow, the number of losses due to early farrowing, and the large amount of grain necessary to prepare the hogs for market.

If the producer follows a system whereby the gilts farrow during April, the pigs are usually run on alfalfa pasture through the sum-

(1) Brown, H. F., "Labor Income from the Hog Enterprise." Preliminary mimeographed report. Idaho Agricultural Experiment Station, 1932.

mer, receiving a light growing ration, and are turned onto the fields from September 15 to November 1. This plan has the decided advantage of economical use of waste farm feeds. The daily gains, however, are less, and the hogs must be sold in the November and December markets at a lower price.

During the period 1925 to 1930, it was found that the producers received an average of \$10.91 per hundredweight for lightweight butchers marketed in August and September. These hogs were produced on wheat and skim milk as basic feeds at a cost of \$9.41 per hundred-weight, leaving a net income of \$1.50 for the labor involved. The other system, (using the basic ration) returned \$9.00 per hundred-weight for light butchers which cost \$7.57 to produce. The labor income in this case was \$1.43 per hundredweight. Comparing the labor incomes of these two systems, it is noted that they do not differ nearly as much as one would expect from a study of the price movements alone. This small difference in labor income has been absorbed by the additional labor involved in producing early hogs.

Cyclical Price Changes.

The hog markets in the Middle Western States are more important than the Western markets in determining hog prices. Over seventy-five per cent of all hogs produced in the United States come from the middle west farms; consequently, hogs, pork, and pork products are shipped from this surplus area to other areas of consumption. Chicago is the greatest hog market in this country from the standpoint of receipts, and it is generally looked upon as being the most representative of the nation's hog markets. The Portland market is considered representative for the Western States. The cycles of hog prices for these two markets are presented in Fig. 3.

Every farmer who has been producing hogs for any number of years has no doubt heard of the hog cycle. This cycle refers to the period of time which is ordinarily required for favorable hog prices to encourage increased production, and finally for the increased production to lower prices. The lower prices bring about smaller production, which in turn results in higher prices again. The concept of the cycle is often related to hog production instead of hog prices, but the relationship between production and prices is so close that knowledge of the hog cycle must involve both factors.

The period 1910 to 1931 contains two major and three minor cycles in both Portland and Chicago prices. The major cycles are usually about eight years in duration, and are followed by minor cycles which continue approximately four years. It will be noticed also, that the period of rising prices usually continues from nine to twelve months longer, than the period of falling or declining prices.

These periodic shifts in hog prices indicate that the majority of farmers respond to current market conditions rather than to those which are likely to prevail when the hogs are ready for market. If all producers reacted to the available price information, and shifted their production according to the hog cycle, such action would soon smooth out the cycle and tend to stabilize prices.

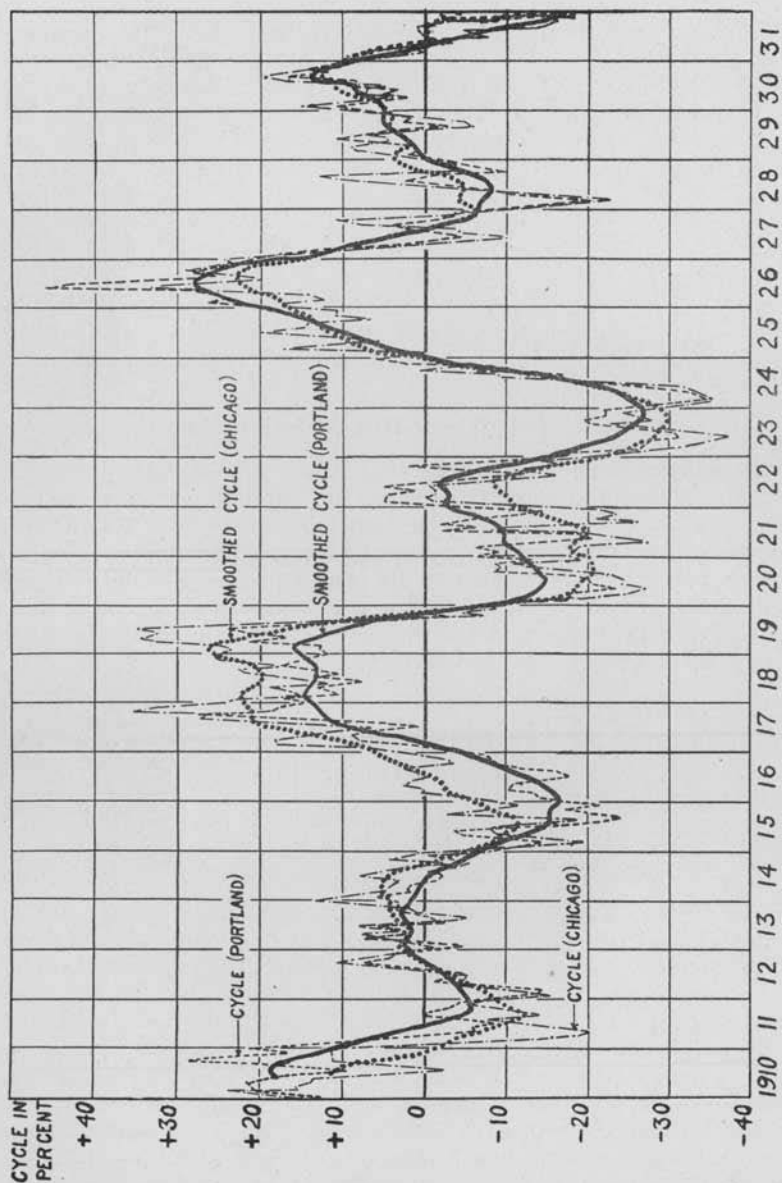


Fig. 3.—Cycles of Portland and Chicago Hog Prices, 1910-1931. The tendency for periods of high and low prices to follow each other at fairly definite intervals is known as the "hog-price cycle." During the period 1910-1931, hog prices followed two major cycles and three minor cycles. The end of a minor cycle apparently came during the latter part of 1931 and early part of 1932.

Present practices of farmers are directly responsible for the major periods of over- and under-production and the resulting price cycles. High prices and favorable feeding ratios tend to encourage production of hogs until the supply cannot be absorbed and prices become unfavorable. Because of the possibility of shifting prices, it is difficult for the producer to accurately estimate at the time of breeding what he will receive for his hogs when they are ready for market. The accuracy of these estimates will be increased, however, as producers become more accustomed to the interpretation of price and production information. Assistance in this matter is found in the *Idaho Agricultural Situation*, a monthly publication issued by the Boise office of the Agricultural Extension Division, University of Idaho, College of Agriculture, and distributed free upon request.

III. The Wheat-Hog Relationship

It has previously been shown that prices vary considerably from month to month, and that the prices of different agricultural products do not always move in the same direction. The relationship between wheat and hog prices affects the profitableness of feeding wheat to hogs. This means that the wheat producer's alternative of selling his crop in the form of pork is at times more advisable than at others, and in particular instances perhaps not advisable at all from the viewpoint of return received.

The Wheat-Hog Ratio.

The relationship between the Idaho monthly farm price of wheat and hogs is presented in Fig. 4. This relationship is expressed as a ratio between the price of one hundred pounds of hogs and the price of a bushel of wheat. The resulting value is an expression which represents the number of bushels of wheat necessary to equal the value of one hundred pounds of hogs.

Regarding the interpretation of the wheat-hog ratio, it must be remembered that a high ratio indicates that hog prices are relatively high compared to wheat prices, and that it is more profitable to feed the wheat to hogs than it is to sell the actual grain. Likewise, a low ratio indicates that wheat is in the more favorable position regarding price. The fact that the wheat-hog ratio is above average does not mean, however, that it is profitable to produce hogs. It simply indicates that the price of hogs is high compared with the price of wheat, and cannot be interpreted otherwise. It is evident that a price situation might exist in which the price of both wheat and hogs fell below the cost of production, but still the ratio might be above normal because of the extreme spread between these two prices. The prices of wheat and hogs in October, 1931, illustrate this condition.

The average ratio for the entire period was one requiring 8.9 bushels of wheat to equal the value of 100 pounds of hogs. The relationship for the post-war period, 1921 to 1930, was 9.3 as compared with a ratio of 7.5 for the war period 1916 to 1920. The two long-

est periods of a high wheat-hog ratio occurred during the years 1910, 1911 and 1912 to 1914. These periods averaged approximately twenty months in length. Following 1914, the ratio was above average only for short intervals in 1926, 1927 and 1930, 1931. These periods ranged from one to ten months in duration. These short intervals, having high ratios, do not offer much opportunity for expansion of pork production if the program is not under way before the favorable relationship becomes generally known.

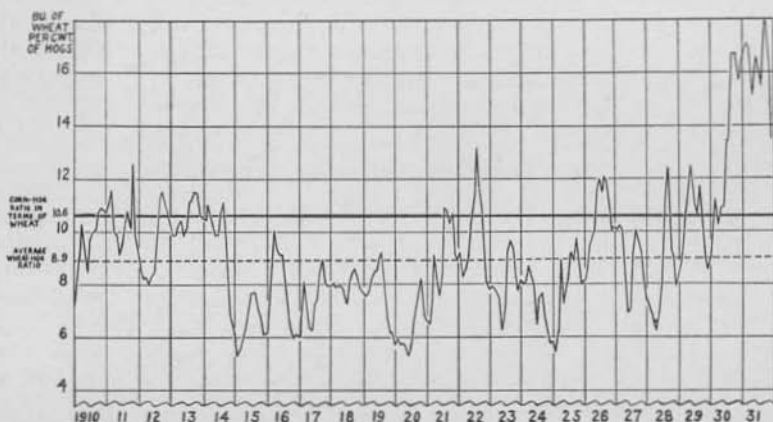


Fig. 4.—Monthly Wheat-Hog Ratio Based on Idaho Farm Prices, 1910-1931. The average wheat-hog ratio was 8.9 during this period. The area above this line shows the instances in which 100 pounds of hogs were worth more than 8.9 bushels of wheat, and the area below shows the reverse situation. The line drawn at 10.6 indicates the average wheat-hog ratio converted to an average of the corn-hog ratio on the basis of the difference between the weight of corn and wheat per bushel.

It has been mentioned that the Corn Belt States produce the major portion of hogs in this nation, and it also has been shown by several investigations that the corn-hog ratio has a great influence upon quality and quantity of hogs marketed in those states. Hog producers usually begin to increase production when the corn-hog ratio rises above the average, and start to decrease production when it gets below the average.

The average corn-hog ratio during the period studied was one requiring 11.4 bushels of corn to equal the value of a hundred pounds of hogs. Since a bushel of wheat is heavier than a bushel of corn, it will require only 10.6 bushels of wheat to equal 11.4 bushels of corn in weight. A line is drawn across Fig. 4 to illustrate the wheat-hog ratio when it is converted to the average corn-hog ratio on a pound per pound basis. It is evident that if the changed basis represents the point of profitableness for the feeding of wheat to hogs, there are few periods of sufficient length during the period 1910 to 1930 to permit profitable expansion of the hog enterprise.

Seasonal Characteristics.

The wheat-hog ratio portrays a normal seasonal variation, due to the fact that the price series for each commodity (hogs and wheat) fluctuates within the year. The farm price of hogs is usually high at the season of the year when the corresponding price of wheat is low, and conversely the farm price of hogs is usually low during the periods of the year when wheat prices are high. The average seasonal variation in hogs, wheat and the wheat-hog ratio for 1921 to 1930 is represented below and illustrated in Fig. 5.

TABLE I

Seasonal Indexes of Idaho Farm Prices of Hogs, Wheat and of the Wheat-Hog Ratio for the Period 1921-1930

Month	Hogs	Wheat	Wheat-Hog Ratio	
	Seasonal Index	Seasonal Index	Seasonal Index	In Bushels
January	94	107	86	8.05
February	98	110	88	8.18
March	101	110	92	8.52
April	103	103	97	9.04
May	100	105	94	8.75
June	99	103	95	8.87
July	100	99	100	9.33
August	108	92	114	10.62
September	108	91	120	11.16
October	104	93	112	10.40
November	95	92	106	9.82
December	90	95	96	8.93

The farmer raising wheat should be careful to examine the price relationship in an effort to determine whether or not the condition is seasonal before entering into or expanding hog production as an

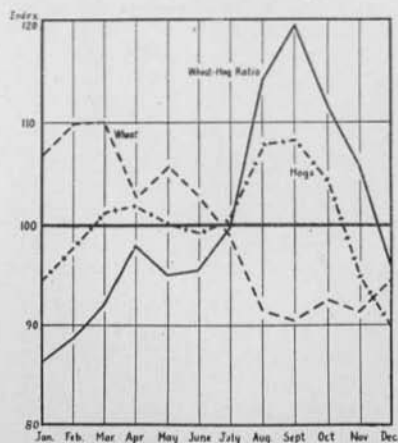


Fig. 5.—Seasonal Indexes of Idaho Farm Prices of Hogs, Wheat and the Wheat-Hog Ratio, 1921-1930. Although monthly fluctuations in prices appear to be very irregular a closer examination will reveal a somewhat definite movement from one month to the next. This month to month movement has been averaged for years 1921-1930 and converted into the index presented above. The price of wheat is usually highest in the spring and lowest in the fall while the price of hogs is highest during August, September, and October.

alternative method of profitably disposing of his crop. If he should find that the favorable ratio is due to the seasonal movement of wheat and hog prices, it naturally follows that hog production would not be increased on this type of ratio.

IV. The Price Differential Between Markets

The Western States, when considered collectively, usually constitute what is known as a deficit area of hog production. That is, the quantity of pork and pork products produced in these states usually is not as great as the quantity consumed. This extra supply is shipped in from the surplus areas, and consists of either cured pork products or live hogs. Generally speaking, most of the hogs come from the Corn Belt States because these states are the nearest in terms of transportation costs. This means that there are some few areas from which the West occasionally receives supplies, which are on the margin between shipping West or to some other deficit area, depending upon the prices at the various markets. Suppose, for instance, that there are more hogs produced in Nebraska and Iowa than are needed to supply the local demand, but that neither the Southern nor the Western States produce enough. Let the transportation and handling costs from the Nebraska and Iowa shipping points to Portland be \$1.50 and \$1.85 per hundredweight respectively and to Fort Worth be \$1.05 and \$1.00 respectively, and to Chicago be \$.40 and \$.20 per hundredweight. Suppose the price of hogs on the Chicago market to be \$8.00 per hundredweight; other things being equal, the price on the Fort Worth market would tend to move there from Nebraska, and likewise the price would have to be \$8.80 per hundredweight before they would move from Iowa and Texas. If the Chicago price were \$8.00, the Portland price would have to be \$9.10 or more before hogs would move there from Nebraska, and \$9.65 before they moved there from Iowa.

Although the above illustration is only hypothetical, it illustrates the way in which hog shipments have been attracted to the various markets during the past years. The drawing power of the Western hog markets is illustrated by the monthly differential between the Chicago and Portland hog markets in Fig. 6. This diagram shows

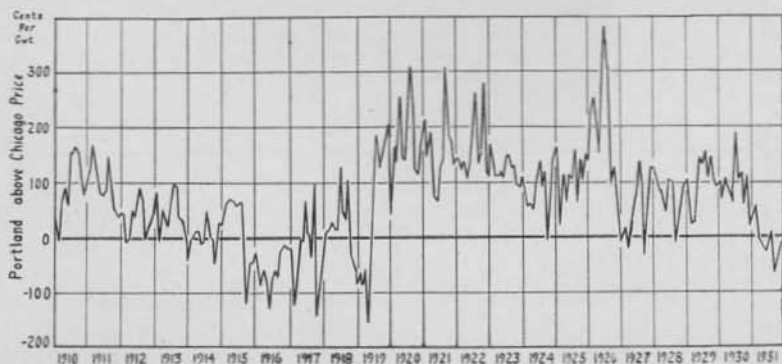


Fig. 6.—The Monthly Differential Between Portland and Chicago Hog Prices. The area above the heavy zero line represents the period in which the price of hogs on the Portland market was above the price at Chicago.

the difference between the mid-point of the monthly ranges of top prices paid for hogs at Portland and the average monthly price for top-priced hogs on the Chicago market.

Chicago and Portland prices are used in this analysis because Chicago is the most representative market for the Corn Belt area, and the prices taken from the Portland market are the only data available for the Western States covering the desired period of time. Furthermore, it is believed that hog prices at other important Western markets have maintained a direct relationship with the Portland market price.

It will be noted from studying Fig. 6 that Portland hog prices were higher than Chicago prices between 1910 and 1915, but that the Portland prices were generally below the Chicago prices from the end of 1915 to the middle of 1919. This means that during this latter period, the hogs were moving from the middle West to the

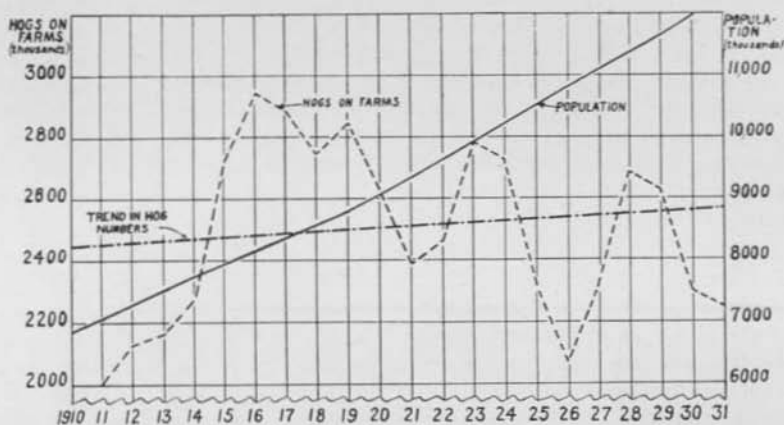


Fig. 7.—Number of Hogs on Farms January 1, and Population of Eleven Western States, 1910-1931. The number of hogs produced in the Western States has not increased at the same rate as did the population of these states. Unless consumption per capita decreased materially it follows that the West was still a deficit area of production January 1, 1931. Since Chicago prices became higher than Portland prices during the last half of 1931 (see Fig. 6) it appears that by January 1, 1932, hog supplies met requirements in the West.

Eastern and Southern markets and not to the far West. This situation can be partly accounted for by the undeveloped condition of Western packing plants, and the foreign demand for pork during the war.

Since 1919, Portland prices have been rather consistently above the Chicago prices, but by varying amounts. This seems to indicate that Western supplies of hogs more nearly meet the demand during some periods than during others, and that imports of hogs into the Western States are during some intervals drawn from longer distances than they are at other times.

The best available data on the supplies of hogs in the Western States are the estimates of "hogs on farms" as of January first of each year, made by the United States Department of Agriculture. These data afford a basis for decisions regarding the likely available supply during the following year. The size of the population is a factor of importance which affects the quantity of pork which is likely to be consumed. Other things being equal, a population of ten million people will consume twice as much as five million people. Since the population of the Western States has been steadily increasing over a number of years, the total supply of pork and pork products consumed has also followed this rising tendency. Data representing the population and the numbers of hogs on farms January first in the eleven Western States are illustrated in Fig. 7 for the years 1910 to 1931.

The relationship of the differential between Portland and Chicago prices of hogs and the number of hogs on farms in the eleven Western States, January first is illustrated in Fig. 8. The data for number of hogs is presented as a per cent of trend. The trend value in this diagram represents the normal upward increase in production, so that if the number of hogs on farms in any particular year is greater than the trend value for that year, we say that it is a certain percentage deviation from trend. The percentage deviation is positive when numbers on farms are above trend and negative when the opposite situation is present.

The dots on Fig. 8 represent the situation in that particular year. For example it will be noted that in 1926 the number of hogs on western farms January first was 25 per cent below the trend or normal. This means that the West was short of hogs during this year. By reading the scale to the left of the diagram it is readily noted that the Portland price was above the Chicago price during this same year, and the difference between the two prices was \$2.00 per hundredweight. The year 1916 exemplifies the other extreme, with numbers of hogs 16 per cent above normal and the Chicago price \$.50 per hundredweight above Portland price.

The solid curved line represents the line of average relationship between all the years included in the study. It also is a normal line showing the expected price differential with a given number of hogs on Western farms.

The trend in both population and hog numbers has been upward, consequently, it is only when one increases at a more rapid rate than the other that the normal relationship between the two factors is affected. From the data relating to the price differential in Fig. 7, it is noted that the prevailing tendency is for higher premiums to occur during the years that hog numbers are less than the trend, and lower premiums occur during the years in which hog numbers are greater than the trend. The curve in Fig. 8 illustrates what appears to be the normal relationship between those two variables.

The variations in the premiums paid for hogs on the Portland market are not all explained by changing numbers of hogs on farms

although the available data are not adequate to explain the minor variations, there are a number of factors which have an influence upon this differential. The relative price of steers in Portland and Chicago apparently is one of these factors. Further, the relative prices of substitutes and of wheat and corn, logically influence the

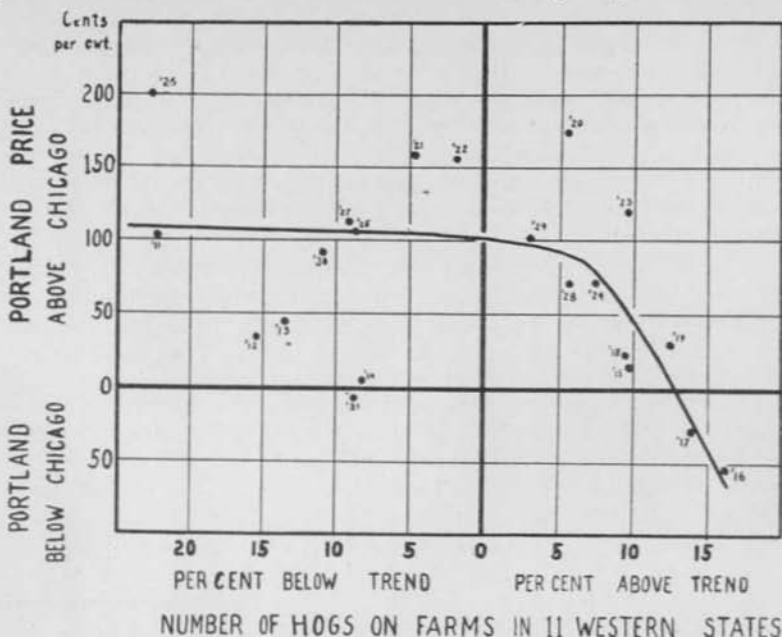


Fig. 8.—The relationship of the Differential Between Portland and Chicago Prices of Hogs and the Number of Hogs on Farms January 1, in the Eleven Western States. When the number of hogs on Western Farms was above the average trend, the price differential fell to practically zero or shifted in favor of the Chicago market. The limit to which producers in Western states can expand production and still obtain a price differential over Chicago appears to be approximately 12 per cent above the average trend.

prices paid for hogs in the two areas. The most significant fact to be gathered from Fig. 8, is that in general, when hog producers increase their production more than approximately 12 per cent above the normal growth of the industry, the result is that the premium paid on Western markets is wiped out. The trend in numbers of hogs on farms January first in the eleven Western States for the next few years is as follows. 1932—2,567,000; 1933—2,572,000; and 1934—2,578,000.¹

This matter of premiums paid for hogs on the Portland market, finally resolves itself into the farmer's production program in either of two ways. The producers in the Western States may find that their highest net return will come through the endeavor to secure

(1) Idaho, Washington, Oregon, Montana, Wyoming, Utah, Colorado, Nevada, California, Arizona, and New Mexico.

a more favorable premium. This will be attained if production is maintained at a level which is low enough to insure that these states will be deficit production areas. The producers may, however, find it profitable to reverse this situation, and sacrifice premiums for the advantages gained through reduced costs. On January 25, 1932, freight rates on hogs from Nebraska and Dakota points were approximately cut in half. This action will tend to reduce premiums to Western growers.

Regardless of the development of the hog industry in the West, whether on a basis of prices below Chicago or on a premium basis, the hog producer will benefit by knowing the position of the industry with respect to the price cycle. He will profit if he has more hogs to sell at the high price points. To assist the farmer in keeping the price position of hogs in mind, outlook information is published monthly in *The Idaho Agricultural Situation* which publication has been previously mentioned. Twice a year special editions of this publication are made available, the first in February and the second late in the summer. A few quotations of the outlook for hogs for the past few years during February are given below together with the total United States inspected slaughtering and Idaho farm prices for those years. Careful reading of this information for each year will show that these statements in February have been reasonably accurate in forecasting the actual prices received in the succeeding months of the year. Only in 1930 and 1927 was the outlook in error in pointing out the trend in prices for the year ahead. The error in the 1930 outlook was very slight.

Year	Quotation from Hog Outlook in Idaho Agricultural Situation and Annual Outlook Bulletin of U. S. Dept. of Agriculture in February of each year.	Number of Hogs slaughtered under Federal inspection in United States	Idaho average yearly farm price dollars (Cwt.)
1927—	"The outlook for the swine industry for 1927 is favorable. Present information indicates a 1927 market supply of hogs no larger and perhaps smaller than in 1926. Hog prices are likely to be maintained during 1927 near the 1926 level." (The average Idaho farm price in 1926 was \$12.10 per hundred-weight or \$2.20 higher than the 1927 price.)	43,633,460	9.90
1928—	"A slightly larger than average seasonal drop in prices from October to December resulted in the hog price level at the end of 1927 being 30 per cent lower than it was a year earlier.—The swine industry is passing (Feb. 1928) through the low period of a hog price cycle—no material change in hog prices other than average seasonal fluctuations seems likely until next fall and winter—"	49,795,408	8.65
1929—	"The hog outlook for 1929 is favorable.—The seasonal levels of hog prices in 1929 and 1930 are expected to average higher than in 1928."	48,444,604	9.55

1930—"Hog prices in 1930 are expected to average at least as high as in 1929 and possibly higher."	44,265,694	9.05
1931—"Slaughter supplies of hogs during the remainder of the present marketing year ending September 30, 1931, will probably be smaller than during the corresponding period of 1930, but with weaker demand for hog products, prices of hogs for the period will probably average lower than for the same period of last year."	43,557,668	6.50
1932—"Slaughter supplies of hogs during the remainder of the present marketing year which ends September 30, 1932, are expected to be considerably larger than the relatively small supplies of the corresponding period of 1931. No material improvement in the demand for hog products appears likely during this period, either at home or abroad. Present indications are that the 1932 spring pig crop in this country will not be greatly different from that of 1931, but that European hog production in 1932 for the 1933 market will show some decrease.	(_____)	?

(1) Crops and Markets of U. S. Department of Agriculture.

V. Summary

THE efficiency and profitableness of any agricultural enterprise depends to a considerable extent upon the relative price variations of agricultural products. Although the risks of loss from price changes or in the price relationship between products cannot be accurately determined, the producer who is endeavoring to make the greatest profit can well afford to study price variations in the products which he contemplates producing.

The general trend of hog prices has been slightly upward during the period 1910 to 1931, although the year 1931 proved disastrous to the hog producer from the standpoint of income received because we were on the downward side of the hog cycle.

Normal seasonal variations in hog prices during periods of falling prices differ from those present in periods of rising prices. When the movement of prices is downward, the peak in Idaho and Portland prices of hogs comes in August with a secondary peak in April. Those years having an upward trend in prices display only one peak period, but the peak in Idaho price comes in September while the peak in Portland price comes in August.

The period 1910 to 1931 contains two major and three minor hog cycles. Since 1920 we have had one major and two minor periods of peak prices. The last period of peak prices came in the fall of 1930. Since that time prices have been downward so that by the spring of 1932 it appears that we are in the trough of a minor hog cycle.

The cost of producing hogs and finally the profit received is partly based upon the price of feed used in the production process. Generally the price of wheat at Idaho points having average or less than average freight charges is too high for it to be profitably used as hog feed. Since the spring of 1930, however, the price of wheat has been declining so that the wheat-hog ratio reached a new high

point of 21.3 during August, 1931. This ratio indicates that 21.3 bushels of wheat were required to equal the value of 100 pounds of hogs. The normal or average ratio for the entire period was 8.9, so that many producers have recently followed the practice of feeding a portion of their wheat rather than selling it in the cash market.

The wheat-hog ratio contains a normal seasonal variation due to the fact that hogs usually are high in price during those seasons when wheat prices are likely to be low. The farmer who bases his decision on the wheat-hog ratio must carefully examine this seasonal movement along with the trend and cyclical movements in hog and wheat prices. The price of wheat usually is lower in the fall than it is during other seasons, while the price of hogs reaches a peak at this season. The result is that normally a favorable wheat-hog ratio is present from July to November.

The Western States constitute what is known as a "deficit area" for hogs, consequently, the prices paid for hogs on the Western markets usually are higher than those paid on the Middle Western markets. This situation existed during the periods 1910 to 1915 and 1919 to 1930. During the latter half of 1931, the Chicago price was above the Portland price. This situation is due to the fact that during this period, the Western States increased hog production. Analysis of the available data indicates that if the Western States increase hog production more than twelve per cent above the trend (as computed from data for the years 1910-1931) they no longer constitute a deficit area, and the premium will consequently be reduced or eliminated. This problem of receiving price premiums over Middle Western markets may mean that in the future, Western hog producers will find it profitable to adjust their hog enterprise according to national and regional outlook information rather than to follow the high stimulating prices or the low depressing price experiences of the previous season or some predetermined plan of production. To take advantage of the high price peaks in the hog price cycle a knowledge of the annual and monthly outlook information contained in *The Idaho Agricultural Situation* is of great assistance.

TABLE II
Data Used in this Analysis

Year	Hogs on Farms Jan. 1				Price of Hogs		Average yearly dif- ferential between Port- land and Chi- cago hog prices	Population		Whole- sale price of all com- modities 1926 =100;
	U. S.*	Idaho*	Eleven West- ern States*	Devi- ation from trend in 11 Western States	Port- land†	Chi- cago*		U. S.*	Eleven West- ern States†	
	(000 omitted)	(000 omit- ted)	(000 omit- ted)	per cent	(dollars per cwt.)	(dollars per cwt.)	(dollars per cwt.)	(000 omit- ted)	(000 omit- ted)	
1910	47,782				9.80	9.80	+ .89	92,267	6,870	70.4
1911	65,620	196	2,002	-22.2	7.65	6.63	+1.02	93,682	7,084	64.9
1912	65,410	212	2,124	-15.5	7.89	7.54	+ .35	95,097	7,289	69.1
1913	61,178	233	2,168	-13.5	8.60	8.23	+ .46	96,512	7,512	69.8
1914	58,933	252	2,271	- 8.5	8.23	8.21	+ .01	97,928	7,726	68.1
1915	64,618	328	2,726	+ 9.4	7.16	7.00	+ .16	99,343	7,940	69.5
1916	67,766	344	2,946	+16.0	8.98	9.56	- .58	100,758	8,154	85.5
1917	67,503	292	2,884	+13.9	15.39	15.68	- .29	102,173	8,368	117.5
1918	70,978	219	2,747	+ 9.4	17.75	17.53	+ .21	103,588	8,582	131.3
1919	74,584	208	2,852	+12.6	18.30	18.00	+ .30	105,003	8,796	138.6
1920	59,813	240	2,634	+ 5.1	15.60	13.85	+1.75	106,543	9,049	154.4
1921	58,711	220	2,389	- 4.9	10.44	8.84	+1.60	108,208	9,341	97.6
1922	59,355	260	2,464	- 1.7	11.26	9.67	+1.59	109,873	9,633	96.7
1923	68,447	320	2,783	+ 9.6	9.07	7.83	+1.24	111,537	9,925	100.6
1924	65,937	400	2,727	+ 7.5	9.18	8.47	+ .71	113,202	10,217	98.1
1925	55,568	325	2,320	- 8.9	13.32	12.23	+1.08	114,867	10,509	103.5
1926	52,148	276	2,065	-22.7	14.96	12.94	+2.02	116,532	10,801	100.0
1927	54,788	318	2,322	- 9.3	11.52	10.45	+1.13	118,197	11,093	95.4
1928	60,420	353	2,689	+ 5.4	10.42	9.69	+ .73	119,862	11,385	97.7
1929	56,880	300	2,628	+ 3.0	11.55	10.52	+1.03	121,526	11,677	96.5
1930	53,238	255	2,284	-10.8	10.87	9.93	+ .94	123,191	11,968	86.2
1931	52,323	268	2,333	- 9.15	6.88	6.92	- .09			

*U. S. Department of Agriculture year books.

†Annual Reports of Portland Union Stockyards Company.

‡Statistical Abstract of the United States, 1930, Mid-Year Estimates.