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*Minnesota Agricultural Indexes of Prices,
Quantities, and Cash Incomes
1910-1927*

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MINNESOTA AGRICULTURAL INDEXES OF PRICES, QUANTITIES, AND CASH INCOMES, 1910-1927

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SUMMARY

An agricultural price index series is needed which includes only the products sold by Minnesota farmers and excludes such products as cotton, cottonseed, tobacco, and fruits. The inclusion of such products as specified invalidates, for use in Minnesota, the price index of the United States Department of Agriculture.

Monthly and yearly price indexes, therefore, have been constructed, in which price changes from 1910 to date, of the sixteen principal agricultural products of Minnesota—wheat, corn, oats, barley, rye, flax, hay, potatoes, hogs, cattle, calves, lambs-sheep, chickens, eggs, butterfat, and milk—have been measured from average prices in the corresponding period of 1924-25-26. The annual indexes are based on an average for the years of this period and the monthly indexes on an average of the corresponding months in the years 1924-25-26. A formula of the type known as Fisher's "ideal" has been used in the construction of the index. This provides for a weighting of price changes by a combination of the quantities sold in both the current month and the corresponding month of the base period, which approaches more closely the conditions of economic reality than weighting by quantities of either base or current period alone. Constant "normal" weights of any kind are objectionable, especially in agriculture, where, because of shifts in production, bumper crops, and crop failures, current marketings are likely to vary widely from those represented by a base period normal. Under these circumstances, constant normal weights cause erroneous weighting of prices." Neither does a constant monthly percentage of the crop sold furnish a reliable weighting for prices within a year.

The Minnesota farm price index for 1911 showed the lowest average for the period from 1910 to 1927. A pronounced rise occurred during 1916, 1917, 1918, and 1919. The 1919 yearly index was the highest of the series. The maximum point for any monthly index was reached in April, 1920, and was followed by a sharp decline, the low point of which was reached in December, 1921. After a period of low prices in 1922, 1923, and the early part of 1924, the index rose to a somewhat higher level, which was maintained generally until the decline

¹ Resigned August 1, 1929.

in the latter months of 1927. Price indexes for groups of products—livestock, crops, and dairy and poultry—have been constructed for months and years by the same methods as those used for the price index of the entire sixteen commodities. An examination of these three major groups suggests somewhat different characteristics of price behavior both among the groups themselves and between periods of rising and falling prices.

In order to ascertain the changes in volume of agricultural products marketed by Minnesota farmers, an index series of quantities also has been constructed. The methods used in the construction of the quantity index have been identical with, or analagous to, those used in making the price index. The index of quantities sold revealed a surprising trend in production. The index was lowest in 1911. From 1911 to the beginning of 1919 the trend was generally upward, except for slight recessions in 1914, 1916, and the early part of 1917. The quantity of marketings declined in 1919 and 1920, but that period was followed by four years in which a decided upward trend was evident. The high point was reached in October, 1924, after which time there was a gradual downward trend in the quantity index to the end of 1927. The general upward trend in farm marketings for the period as a whole represents conditions in Minnesota probably not duplicated in many other sections of the country. Much of the increase resulted from an increase in livestock, livestock products, and corn. The products which constituted the bulk of farm production in the early part of the period have either decreased or increased slightly. Not many states have experienced such rapid changes in types of commodities produced as have taken place in Minnesota.

An index series of gross cash income for Minnesota has also been constructed. When formulas of the type of Fisher's "ideal" are employed for the price and quantity indexes, i.e., formulas which meet the factor reversal test, the product of the two indexes will result in the index of gross cash income.

The construction of these three series indicates that the quantity of farm production in Minnesota has been exerting a greater effect upon farm incomes than has been recognized. Particularly was this true in the period 1921 to 1924, when the index of gross farm income rose because of a combination of a low price index and a steadily increasing quantity index.

The total amount in dollars received from the sales of the sixteen principal farm products may be considered as the gross cash income, if it is kept in mind that only sixteen major products are included, and that on account of insufficient data several quantities have had to be estimated by a variety of methods. The percentages contributed to the gross annual income by individual products show that wheat as a pre-

dominant source of cash income in the earlier years of the period has been replaced by butterfat and hogs in the later years.

INTRODUCTION

Need for an Index of Minnesota Farm Prices

Until the Minnesota farm price index series was prepared, the only measure of agricultural prices available for use in analyzing local price situations was that constructed for the United States as a whole by the Bureau of Agricultural Economics of the United States Department of Agriculture. The inadequacy of such an index to represent the agricultural price level of Minnesota lies chiefly in the fact that it includes price changes of cotton and cottonseed as a relatively important item, and those of tobacco and citrus fruits as less important. In the months when the price of cotton moved in the opposite direction from the price of the majority of other agricultural products, this index was especially unreliable as an indicator of the Minnesota farm price level. Figure 1 shows the price indexes for the United States as a whole, cotton and cottonseed, and the approximate index of Minnesota farm products, for the period 1922-27. The Minnesota figures used in this graph have been adjusted as far as possible with respect to base period and formula to conform to those of the Bureau of Agricultural Economics, and differ to that extent from the regular Minnesota series, which appears later in this bulletin. The graph shows clearly that the index of the United States Department of Agriculture for all groups of agricultural commodities was too high to represent the Minnesota price level for practically all the months from 1922 to 1925, and that from 1926 to the fall of 1927 the United States index was consistently below the Minnesota price level. A number of factors may have operated to bring this about, but the trend of prices of cotton and cottonseed, as shown on the graph, seems sufficient in itself to account for the differences. The index for the United States as a whole must include, of necessity, the prices of cotton and cottonseed, but when situations such as those from 1922 to 1927 prevail, error and possible injustice result in assuming that the Minnesota agricultural price level is represented by the price index of all groups of agricultural products produced in the United States. The only practical remedy is for each state and possibly for certain sub-divisions of a state to have individual price indexes. Such indexes can then include only the prices of the agricultural commodities actually grown in the area, in the degree of importance which the marketings of each product warrant. The price index for the whole state of Minnesota does not represent the price situation of all sections as satisfactorily as would be possible if the state were divided into five or six geographical sub-divisions and separate

price indexes were constructed for each district—a project which is now under way.

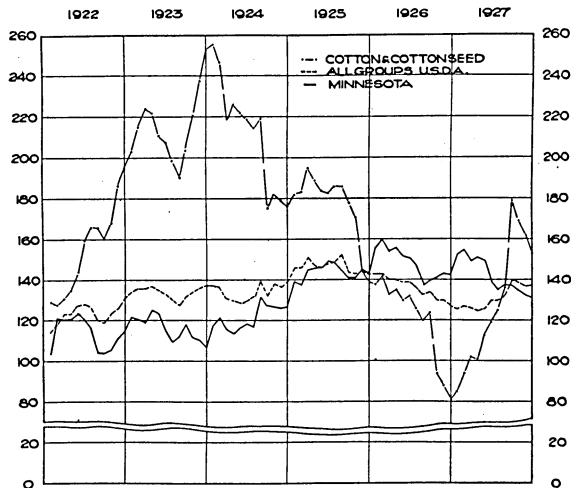


Fig. 1. Price Indexes of All Groups of Agricultural Commodities in the United States, Cotton and Cottonseed, and Minnesota Farm Products, 1922-1927

The indexes for all groups, and cotton and cottonseed, are prepared by the United States Bureau of Agricultural Economics on a base of August, 1909 to July, 1914. The Minnesota index shown on this graph has been reduced to a simple aggregative type of index, and expressed on a base of 1910-1914, in order to make the comparison more nearly accurate. Several technical differences still remain in the construction of these indexes, so that the comparison is intended to be only approximate.

METHOD OF CONSTRUCTION OF THE PRICE INDEX

Products Included

The Minnesota price index represents price changes in the sixteen principal agricultural products marketed by the farmers of the state: wheat, corn, oats, barley, rye, flax, hay, potatoes, hogs, cattle, calves, lambs-sheep, chickens, eggs, butterfat, and milk. Indexes for the individual months as well as for each year have been computed for the period from January 1910 to date.

Period Chosen as Base

The annual price indexes for Minnesota have been measured from the average prices of these sixteen products in the years 1924-25-26. For the monthly indexes an average of the corresponding months of the years 1924-25-26 has been taken as a base. For example, an average of the prices in the three Januarys of these years serves as a base from which the price changes of other Januarys are measured. The

same method of measurement applies to all other months. The measurement of price changes of any month in relation to the average price of the corresponding months of the base period provides for an elimination of seasonal fluctuations. Altho this does not insure a perfect elimination of seasonal fluctuations in the index number, it removes such fluctuations as were experienced in the years 1924-25-26. Furthermore, seasonal variations are eliminated from the index only so far as the fluctuations of these years were confined to season alone (i.e., did not include secular trend or irregular fluctuations of importance), and the elimination is valid only if the seasonal variations of these years were of a "normal" character. The seasonal elimination provided for in the index number, as based on corresponding months of 1924-25-26, has been analyzed carefully in order that a comparison may be made from time to time between it and the current series of prices to ascertain whether such an elimination of season continues to be warranted.

A broadened base of three years has been selected because agricultural production is somewhat subject to variation beyond the control of those engaged in the industry, and conditions in a single year may not be truly representative. A price index of agricultural products based upon an average of a period of years is a safer guide than one based upon a single year, particularly when the index is prepared for a single state. Local crop conditions may affect state production whereas conditions for the entire nation may be normal.

It seemed desirable to choose a base in the post-war period. If a pre-war base had been selected the latest year not affected by war conditions was 1913. Since that date there has been a tremendous economic upheaval. Conditions of production, likewise, have been seriously disturbed. New financial institutions have been established. Methods of distribution have been affected in certain lines by the development of co-operative marketing. In short, the economic world of today is vastly different from that of 1913. It is extremely difficult to look backward from the present and obtain any clear-cut picture of conditions as they were fifteen years ago. Too many things have happened in the meanwhile. Owing to the fact that we are living and producing under post-war conditions, it appeared logical to relegate the war and pre-war periods definitely to the past and select a base representative of present conditions.²

A further consideration in selecting the base period was the fact that price and quantity data are much more satisfactory for recent years

² The selection of a recent base period conforms to the practice followed by other institutions publishing index numbers, notably the Bureau of Labor Statistics, which has recently shifted the base of its index number of wholesale prices from 1913 to 1926; the Federal Reserve Board, which issues its new indexes of industrial production on a base of 1923-24-25; the National Bank of Commerce in New York, which uses 1923-24-25 as the base period for its wholesale price index.

than for the pre-war period. It was believed more advisable to adopt a base period for which data were accurate and easily available and to build back from this base into the period when data were less authentic and less plentiful, than to select a distant base and to build forward from it. The latter choice could not have produced reliable results.

System of Weighting Used

The prices entering into an index number must be weighted according to their importance, if the composite index is to represent adequately the existing price level. The only means of judging the importance of a price is by the amount of a commodity sold at that price. For the Minnesota index, a formula³ has been employed which combines the weightings of the quantities sold in the base period with the quantities sold in the current period. This seems to be an especially desirable system of weighting for an index of agricultural prices. The alternative of this method is a system of weighting prices by constant quantity weights, either by the average in some base period or some other concept of normal. In some fields of index number construction, where changes occur gradually, no error of consequence is introduced by this method. In the field of agriculture, however, where quantities marketed vary widely, even between two consecutive years, because of crop failures, bumper crops, shifts in production, retarded or advanced seasons, and the like, constant weights throw an erroneous weighting upon prices in those periods when the actual marketings vary widely from the amounts represented in the "normal" or base period weightings. For example, if constant normal weights are used, a bumper crop which results in a reduced price per unit can not be given the influence in the index number that its importance demands. The resulting price index will show a price reduction smaller than the actual decrease. Similarly, a crop failure causes the price index to reflect a rise in prices which is unwarranted. The high price when constant weights are used is weighted by a larger quantity than that actually sold.

For illustrative purposes a case may be taken where there are only two commodity prices entering into the index number. The price of each in the base period is 50 cents per unit and the quantities marketed are 1,000 units. In the given period the price of commodity A increases to \$1.00, the price of commodity B remaining the same. If constant

$$\sqrt{\frac{\sum [p_1 \frac{q_0(\text{em})}{q_0(\text{em})}]}{\sum [p_0(\text{em}) \frac{q_0(\text{em})}{q_0(\text{em})}]} \times \frac{\sum [p_1 \frac{q_1}{q_1}]}{\sum [p_0(\text{em}) \frac{q_1}{q_1}]}}$$

p_1 = price in current month.

q_1 = quantity marketed in current month.

$p_0(\text{em})$ = average price in corresponding months of 1924-25-26.

$q_0(\text{em})$ = average quantity marketed in corresponding months of 1924-25-26.

weights are used the price index will rise to 150.⁴ In the case of agricultural products whose demand is almost unchanged over a period, variations in price are caused largely by fluctuations of supply. There is a normal inverse relationship between price and amount sold.⁵ In the case cited this normal inverse relationship is ignored because it is assumed that the same quantity of commodity A was exchanged when the price rose to \$1.00 as when the price was 50 cents. Obviously this is an erroneous assumption because the price of commodity A could not have increased 100 per cent if the quantity sold had remained constant. Therefore, if the quantities of products actually sold in the current period are not given consideration in an index, the resulting average must be incorrect because some prices will exert more influence than they should and others less than they should.

The change in wheat production in Minnesota offers a case in point. In 1913 the production was 68 million bushels and in 1926 it was 25 million bushels. Clearly, wheat was not so important in 1926 as in 1913. To weight its price by constant weights taken, let us say, in 1913 would give the wheat price an importance in the index for 1926 and others years of low production which it does not deserve.

Moreover, a reliable weighting for prices within the year is not furnished by a constant monthly "normal" percentage of the crop sold. In the case of potatoes, for example, different years show different tendencies on the part of farmers in marketing their crops. By January 1, 1917, the growers of Minnesota potatoes had sold 38 per cent of their crop, and on January 1 of the following year, only 20 per cent.⁶ The monthly marketings of many agricultural products vary from year to year with the experience and circumstances of the previous season, the size of the crop, the current price, the price expected later in the year, and the judgment of farmers in general. Retarded and advanced seasons also cause variations in the monthly quantities sold in different years.

If the investigation of price fluctuations centers around mere price changes, without regard to the importance of the prices involved, there can be no objection to the use of constant weighting, or, for that matter, equal weighting. But if the object is to prepare an index which is to take account of the importance of the specific prices making up the price level, constant weighting does not serve the purpose. The economists who object to the introduction of current quantities into a price index number probably would not object to a quantity weighting which was an average of the quantity marketed in the base period and that marketed in the given period. Some highly desirable index numbers

⁴ Computed from aggregative type of formula with base period weights.

⁵ Russell C. Engberg, *Industrial Prosperity and the Farmer*. Appendix B., p. 279 ff.

⁶ U.S.D.A. Yearbook 1922, p. 674.

have such a weighting.⁷ The weighting embodied in the formula adopted for the Minnesota index is in essence a geometric mean of the base and given period quantities and is almost the same as the arithmetic mean of the two. This system of weighting takes account of decided changes in quantity between the base period and the current period, and thus gives a more accurate picture of the real changes in the price level than is possible when constant weights are used.

Furthermore, the Minnesota price index meets both the time reversal and the factor reversal tests that have been proposed by Prof. Irving Fisher⁸ as the criterion of index number accuracy. The total value criterion⁹ proposed by Prof. Fisher does not need to be applied to the Minnesota index, as this index is not based on a sample of prices and quantities but embraces, as nearly as data are available, the total commodity marketings of the farmers of Minnesota.

The principal objection to the use of a formula with the system of weighting used in the Minnesota index number is the difficulty and additional labor of securing current quantities for the weights. Without doubt, the work of compiling a price index is increased materially when the quantities sold in each current month are incorporated. It is a difficult but not impossible task, especially in recent years when data are recorded more completely than formerly. Moreover, when an index of income is also a consideration, as it was in Minnesota, quantities marketed currently are absolutely essential, and thus these additional data are available for weights in a price index if desired. There is, however, an unavoidable delay in securing these current quantities. Prices may be secured promptly but the quantity sold at the price will not be available until later, so that a final index of price by this formula can not be computed for some time after the close of the current month. It will be observed, however, that the first half of the Minnesota formula is an aggregative type with base period weights.¹⁰ This can be computed currently and used as a preliminary index until the quantities necessary for the construction of the final index, are available. In approximately 80 per cent of the 216 months of the period from 1910 to 1927, these two indexes differed from one another by not more than three points—within a range from -1.5 to $+1.5$. In other months these indexes showed differences as large as $+7$ and -4 , and a combination of unusual circumstances might result in still greater differences between the preliminary and final indexes. Notwithstanding these cases, no more satisfactory preliminary measure that can be issued currently has been found.

⁷ For example, Formula 2153, Fisher's Making of Index Numbers, p. 484.

⁸ Irving Fisher, The Making of Index Numbers, Chapter IV.

⁹ Irving Fisher, Journal of American Statistical Association, January, 1928.

¹⁰
$$\frac{\sum [p_1 \cdot q_0(\text{cm})]}{\sum [p_0(\text{cm}) \cdot q_0(\text{cm})]}$$

PRICE INDEX SERIES FOR ALL COMMODITIES
COMBINED

The index series of Minnesota farm prices, by months and years, is shown in the first column of Table 1. The index series in columns two and three are discussed in later sections of the bulletin. The monthly price indexes appear on the graph of Figure 2.

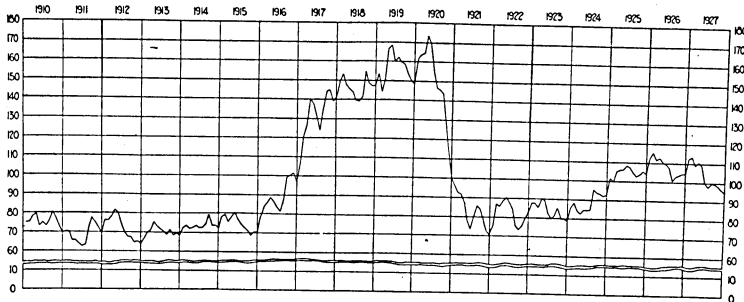


Fig. 2. Price Indexes of Minnesota Farm Products by Months, 1910-1927
(Average of corresponding months of 1924-25-26=100)

Table 1

Monthly and Yearly Indexes of (1) Prices and (2) Quantities Sold of Minnesota Farm Products, and (3) Gross Cash Incomes of Minnesota Farmers, 1910-1927
(Average of corresponding months of 1924-25-26=100.)

	Price	Quantity	Gross cash income		Price	Quantity	Gross cash income
1910				1912			
Average	75.7	58.0	43.9	Average	70.9	60.6	43.0
January	75.1	59.5	44.7	January	76.1	52.9	40.0
February	75.5	61.7	46.6	February	76.3	55.0	42.0
March	78.6	59.4	46.7	March	78.2	55.4	43.3
April	79.6	48.7	38.8	April	81.8	48.9	40.0
May	73.2	53.4	39.1	May	80.1	54.2	43.4
June	75.0	53.7	40.3	June	74.5	52.9	39.4
July	73.4	51.4	37.7	July	69.9	46.9	32.8
August	76.0	61.1	46.4	August	67.8	60.9	41.3
September	80.7	65.2	53.3	September	67.3	65.5	44.1
October	77.6	59.3	46.0	October	64.5	72.6	46.8
November	73.2	57.9	42.4	November	65.1	78.8	51.3
December	68.9	59.1	40.7	December	63.9	73.6	47.0
1911				1913			
Average	69.5	54.8	38.1	Average	70.1	68.8	48.2
January	70.3	56.5	39.7	January	66.4	66.7	44.3
February	70.1	49.5	34.7	February	69.9	64.1	44.8
March	65.8	54.4	35.8	March	71.0	66.2	47.0
April	65.7	51.1	33.6	April	75.2	58.9	44.3
May	64.0	59.7	38.2	May	73.0	61.4	44.8
June	62.8	60.6	38.1	June	71.7	65.0	46.6
July	63.4	56.3	35.7	July	70.2	57.4	40.3
August	72.2	46.7	33.7	August	68.9	65.9	45.4
September	77.7	54.4	42.2	September	71.2	85.5	60.9
October	75.2	53.9	40.5	October	68.6	74.2	50.9
November	72.2	61.6	44.5	November	69.3	77.1	53.4
December	69.7	54.4	37.9	December	68.6	73.5	50.4

Table 1—Continued

	Price	Quantity	Gross cash income		Price	Quantity	Gross cash income
1914				1918			
Average	73.5	66.4	48.8	Average	146.9	81.1	119.2
January	72.1	68.9	49.7	January	149.2	69.4	103.6
February	73.6	68.6	50.4	February	153.2	68.3	104.6
March	71.9	69.5	50.0	March	147.9	75.8	112.1
April	72.3	61.0	44.1	April	145.4	70.4	102.3
May	73.5	61.6	45.3	May	144.0	77.3	111.3
June	72.2	62.9	45.4	June	139.9	74.9	104.8
July	72.5	58.9	42.7	July	139.3	63.7	88.7
August	74.3	61.6	45.8	August	141.4	94.3	133.3
September	79.2	71.5	56.6	September	154.7	94.1	145.5
October	73.4	69.2	50.8	October	148.7	95.0	141.3
November	73.9	69.9	51.0	November	147.1	80.8	118.8
December	72.4	67.7	49.0	December	147.7	95.5	141.0
1915				1919			
Average	74.0	71.9	53.2	Average	155.9	74.2	115.7
January	78.2	72.4	56.6	January	153.6	68.9	105.8
February	79.3	62.9	49.9	February	144.6	70.7	102.3
March	75.7	59.6	45.1	March	150.1	83.1	124.7
April	78.1	57.5	44.9	April	166.8	78.2	130.4
May	80.7	68.9	55.6	May	168.8	84.4	142.4
June	77.0	63.4	48.8	June	159.7	82.2	131.3
July	74.3	61.4	45.6	July	162.1	77.1	124.9
August	72.5	51.2	37.1	August	159.8	75.0	119.9
September	71.2	71.2	50.7	September	158.7	70.1	111.2
October	68.6	83.5	57.3	October	153.7	69.0	106.1
November	70.4	100.3	70.6	November	150.2	69.3	104.1
December	70.2	98.1	68.9	December	148.3	68.3	101.3
1916				1920			
Average	89.9	67.0	60.2	Average	144.9	69.2	100.3
January	78.1	67.5	52.7	January	160.4	72.5	116.3
February	83.8	76.7	64.3	February	163.5	66.5	108.7
March	85.8	77.9	66.8	March	164.4	68.1	111.9
April	88.5	71.2	63.0	April	173.4	64.0	110.9
May	86.3	77.4	66.8	May	169.3	74.7	126.5
June	83.6	75.1	62.8	June	155.0	75.9	117.7
July	81.4	74.6	60.7	July	146.3	72.5	106.0
August	87.3	54.2	47.3	August	145.2	62.3	90.4
September	99.4	57.6	57.3	September	143.6	68.2	98.0
October	100.3	58.9	59.1	October	128.1	72.6	93.0
November	101.5	69.5	70.5	November	112.9	74.3	83.9
December	96.9	56.4	54.7	December	99.4	60.0	59.6
1917				1921			
Average	133.8	60.9	81.5	Average	82.3	73.6	60.6
January	107.3	50.0	53.7	January	95.9	72.8	69.8
February	120.8	47.4	57.2	February	92.2	68.5	63.2
March	126.7	55.0	69.7	March	91.8	69.0	63.3
April	140.0	56.9	79.7	April	87.5	65.1	57.0
May	137.4	60.3	82.8	May	78.0	80.8	63.0
June	131.0	56.2	73.6	June	73.4	92.1	67.6
July	124.0	48.1	59.6	July	80.0	74.0	59.2
August	135.1	59.5	80.4	August	85.8	82.8	71.0
September	144.0	67.4	97.1	September	83.9	73.5	61.7
October	144.9	74.3	107.6	October	78.6	79.8	62.7
November	139.0	81.1	112.7	November	72.4	68.6	49.7
December	141.2	62.6	88.4	December	70.5	61.6	43.4

Table 1—Continued

	Price	Quantity	Gross cash income		Price	Quantity	Gross cash income
1922				1925			
Average	81.6	83.1	67.8	Average	104.3	100.2	104.5
January	75.0	74.1	55.6	January	101.6	110.1	111.9
February	86.8	74.5	64.7	February	99.5	97.0	96.5
March	85.3	77.4	66.1	March	105.0	96.4	101.2
April	88.1	70.6	62.2	April	105.9	98.4	104.2
May	90.1	94.3	85.1	May	106.1	98.7	104.7
June	87.9	96.4	84.7	June	108.1	101.0	109.2
July	84.4	87.4	73.8	July	107.3	94.9	101.8
August	75.4	87.1	65.7	August	104.5	113.3	118.4
September	74.3	81.2	60.4	September	102.7	104.8	107.6
October	75.2	80.9	60.9	October	103.6	89.2	92.4
November	79.4	85.1	67.6	November	105.1	95.8	100.7
December	82.5	88.8	73.3	December	104.0	103.2	107.3
1923				1926			
Average	83.6	90.7	75.8	Average	107.6	97.7	105.1
January	87.8	103.9	91.2	January	112.6	97.9	110.2
February	87.5	82.7	72.4	February	115.2	97.1	111.9
March	85.1	90.0	76.6	March	111.4	106.2	118.3
April	90.0	86.2	77.6	April	112.4	103.9	116.8
May	89.0	92.4	82.2	May	110.1	105.9	116.6
June	82.2	90.9	74.7	June	109.5	103.5	113.3
July	79.7	85.8	68.4	July	107.4	104.4	112.1
August	81.0	94.1	76.3	August	100.5	91.8	92.3
September	85.4	91.9	78.5	September	102.8	85.1	87.5
October	79.7	87.6	69.8	October	103.5	93.2	96.5
November	79.6	94.0	74.9	November	104.4	95.9	100.1
December	78.3	87.5	68.5	December	104.3	93.3	97.3
1924				1927			
Average	88.7	101.9	90.4	Average	103.0	93.9	96.7
January	85.5	90.9	77.7	January	112.4	94.0	105.7
February	88.2	103.7	91.5	February	113.4	90.9	103.1
March	84.0	95.8	80.5	March	108.9	93.9	102.3
April	82.4	96.1	79.2	April	110.4	94.4	104.2
May	84.3	94.1	79.3	May	109.0	104.4	113.8
June	84.2	93.0	78.3	June	99.8	103.3	103.1
July	84.8	103.6	85.3	July	97.8	94.0	91.9
August	95.2	93.9	89.4	August	99.9	87.7	87.6
September	93.6	111.9	104.8	September	99.5	94.3	93.8
October	93.0	119.8	111.4	October	98.1	94.5	92.7
November	91.9	107.8	99.0	November	96.3	94.5	91.0
December	92.3	103.6	95.6	December	95.0	84.3	80.1

This price index series shows that Minnesota farm prices were lowest during 1911. There was a gradual increase up to 1915. The years 1916, 1917, and 1918 were marked by sharp increases in prices. Prices during 1919 averaged the highest for any year in the series. They continued to increase during the early months of 1920, reached the peak in April, and fell sharply during the remainder of the year. The decline continued throughout 1921, the low point being reached in December, when the index was 70.5. Prices continued low during 1922, and altho there was some recovery from the December 1921 figure, the average of 1922 was slightly below that of 1921. The year 1923 wit-

nessed a slight recovery, which became more evident during 1924 and continued through 1925 and a part of 1926. The index during the latter part of 1926 was below that of the corresponding months of 1925. Prices for the first half of 1927 were above the base period normal, but from June to October they declined to a point close to normal and in November and December dropped below.

The price index will be continued and made available monthly in the current publications of the Division of Agricultural Economics.

PRICE INDEXES FOR THREE MAJOR GROUPS OF PRODUCTS

A price index of the sixteen principal agricultural products of Minnesota embraces a field of considerable diversification. The index for all these products taken together may obscure the fluctuations in price movements which existed in the separate groups of products. Price indexes have, therefore, been made for the three major groups of Minnesota products, namely, livestock, dairy and poultry products, and crops. The livestock group includes prices of hogs, cattle, calves, lambs-sheep; the dairy and poultry group includes butterfat, milk, eggs, and chickens; the crops group includes the remainder of the sixteen products—wheat, corn, oats, barley, rye, flax, hay, and potatoes. The method of constructing the price indexes of these separate groups was the same as that used for the composite index of all products. An average of the corresponding months of 1924-25-26 has been used as the base for the monthly indexes, and the averages of the period 1924-25-26 for the annual indexes. The monthly and yearly indexes of these three groups are given in Table 2.

The monthly indexes are shown in Figure 3. The index of the crops group appears noticeably above the other groups in 1911-12, 1915, and again in the latter part of 1916, when it started the rapid rise to an index of 190.5 in May, 1917. Following this, for a period of almost two years, the index had a downward trend, doubtless owing to some extent to governmental control of prices. In March, 1919, the index started on a renewed upward climb which continued until the extremely high point of 242.9 was reached in April, 1920. The price index for the livestock group was somewhat above the other groups in 1913 and 1914. Near the close of 1916 this index followed the rise of the crops group, but rose less sharply and experienced less setback in 1918 than the crops group. The high point of the livestock index was reached in July, 1919, when the index stood at 185.6. Comparisons of price movements of the livestock group with the other groups are affected to some extent by the existence of hog and beef cattle cycles. The dairy and poultry index also began to rise in 1916, rose

more slowly than either of the others, and continued, with a very gradual upward trend, to its high point of 165.3 in May, 1920.

The behavior of these group indexes during the period of rising prices is in striking contrast with their behavior during the period of falling prices, 1919-20-21. The livestock price index which reached the second highest peak was the first to take a decided drop and by the latter part of 1921, approximately 27 months after the fall began, had reached a point slightly lower than either of the other groups. The crops index fell after April, 1920 and by December, 1921 it had fallen almost as low as the low point of the livestock index. The period of fall was shorter in the crops index than in livestock by seven or eight months so that this group which had experienced the most spectacular rise, in turn experienced the sharpest decline. The dairy and poultry index, which was last to rise and rose least, was the last to fall (by a margin of one month) and as a whole fell considerably less than the other two groups. Moreover, the fall in this index was completed in a period of approximately one year. For the latter part of 1922, and for 1923 and the first half of 1924, the dairy and poultry index maintained a position conspicuously above the indexes of the other two groups.

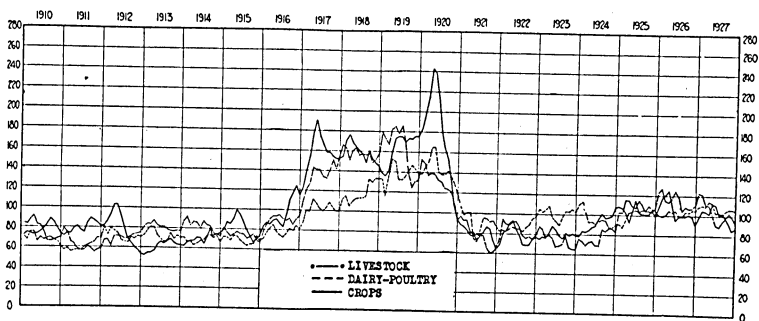


Fig. 3. Price Indexes of Livestock, Dairy and Poultry Products, and Crops by Months, 1910-1927
(Average of corresponding months of 1924-25-26=100)

QUANTITY INDEX FOR ALL COMMODITIES MARKETED

Altho the agricultural price index is a subject of considerable interest, from a practical standpoint a question often arises as to the volume of products marketed concurrently with a changing price level. When prices are high, is the assumption justified that quantities as a whole are necessarily small, and when prices are low, the quantities large, as is frequently the case with a single commodity? To answer such questions, the price index of agricultural products needs to be supplemented by a quantity index of the agricultural products marketed. Such an index has been computed for Minnesota farm products by methods

Table 2
 Monthly and Yearly Price Indexes of Livestock Products, Dairy and Poultry
 Products, and Crops, for Minnesota, 1910-1927
 (Average of corresponding months of 1924-25-26=100.)

	Live- stock	Dairy poultry	Crops		Live- stock	Dairy poultry	Crops
1910				1914			
Average	76.9	68.6	79.1	Average	81.8	68.3	71.4
January	84.0	70.1	71.4	January	87.5	70.5	62.0
February	83.2	67.6	74.4	February	91.5	66.4	65.6
March	87.8	74.9	73.9	March	83.2	66.7	67.2
April	91.3	75.3	72.1	April	86.3	63.0	67.8
May	82.3	65.8	73.3	May	85.8	64.8	70.6
June	81.7	69.8	75.6	June	80.4	67.3	70.3
July	75.2	67.8	78.8	July	87.1	68.6	64.6
August	66.0	68.6	83.3	August	83.2	72.5	71.8
September	65.8	69.8	88.2	September	82.0	73.6	80.3
October	66.4	66.4	85.2	October	75.5	71.0	73.1
November	68.2	65.8	79.9	November	74.3	72.7	74.1
December	69.8	60.3	73.2	December	72.2	66.4	76.0
1911				1915			
Average	62.2	60.5	81.0	Average	73.7	69.0	78.1
January	78.8	57.0	71.2	January	80.4	72.4	79.6
February	74.4	58.6	74.4	February	76.7	71.9	87.1
March	65.5	55.5	73.9	March	72.3	68.5	86.5
April	63.1	56.7	78.8	April	74.7	73.5	90.9
May	58.1	57.0	81.1	May	77.7	72.5	99.3
June	56.2	56.9	77.3	June	75.8	68.6	94.2
July	57.3	60.0	74.8	July	75.1	66.0	87.3
August	60.3	62.0	84.5	August	70.8	63.5	79.8
September	58.2	63.3	89.2	September	72.2	64.7	73.2
October	55.6	65.5	87.2	October	74.7	65.2	67.0
November	57.5	69.3	84.2	November	69.6	73.9	71.1
December	58.5	69.1	80.8	December	66.5	67.9	75.1
1912				1916			
Average	70.2	71.8	71.6	Average	89.2	78.3	99.4
January	66.9	80.8	81.9	January	77.8	71.0	83.3
February	67.3	72.2	86.9	February	85.3	76.8	87.1
March	61.8	79.7	93.5	March	90.4	81.6	85.3
April	71.1	77.0	103.1	April	91.9	84.9	88.9
May	71.5	74.4	103.3	May	91.9	78.5	90.4
June	70.7	67.2	93.1	June	92.2	75.1	86.2
July	68.9	65.9	79.4	July	90.9	72.2	82.9
August	69.2	65.3	69.1	August	89.9	76.0	94.6
September	71.3	70.7	65.1	September	91.7	81.3	110.9
October	73.0	68.6	60.3	October	85.6	79.5	117.8
November	74.0	71.5	57.7	November	90.5	84.5	122.4
December	75.0	70.3	53.7	December	94.2	80.4	115.0
1913				1917			
Average	80.6	72.6	62.3	Average	136.6	101.9	155.7
January	81.2	72.7	52.5	January	108.8	87.9	121.7
February	84.0	77.6	55.2	February	121.4	100.0	140.0
March	83.6	80.9	55.1	March	126.6	98.4	155.2
April	87.6	80.4	57.0	April	143.1	111.4	177.2
May	82.5	72.2	62.4	May	141.5	107.7	190.5
June	81.1	69.2	66.0	June	141.2	102.1	175.1
July	81.2	66.0	64.0	July	134.2	99.5	166.5
August	78.5	67.5	66.3	August	132.6	102.5	158.5
September	77.2	75.1	68.7	September	139.7	108.1	158.3
October	76.6	69.0	65.3	October	150.4	103.8	154.4
November	77.4	72.2	63.2	November	142.1	99.3	152.3
December	76.9	70.2	62.2	December	155.3	100.0	152.2

Table 2—Continued

	Live- stock	Dairy, poultry	Crops		Live- stock	Dairy poultry	Crops
1918				1922			
Average	157.0	117.9	156.7	Average	83.5	86.6	81.3
January	166.0	112.0	154.8	January	75.5	82.4	68.9
February	162.6	115.4	170.2	February	94.4	83.9	80.8
March	151.6	105.1	176.3	March	90.0	82.5	83.2
April	160.1	109.9	168.1	April	89.4	85.2	90.6
May	163.5	112.3	164.5	May	92.2	86.5	93.6
June	156.1	113.6	160.4	June	92.6	85.0	84.9
July	157.5	113.5	157.5	July	86.8	85.4	78.5
August	156.6	115.2	149.1	August	78.4	82.1	69.1
September	157.6	132.4	160.4	September	76.0	86.6	68.7
October	149.2	129.8	153.0	October	77.2	89.2	69.1
November	152.4	133.1	148.3	November	75.4	95.6	74.8
December	157.9	133.3	146.0	December	78.1	97.9	77.5
1919				1923			
Average	160.5	138.5	164.7	Average	73.7	100.4	79.1
January	179.5	133.2	138.3	January	87.9	105.6	74.8
February	173.4	115.6	136.3	February	85.3	102.1	77.4
March	167.9	137.8	141.7	March	76.8	105.0	76.2
April	182.4	153.3	160.6	April	78.9	108.3	81.3
May	184.7	150.5	173.4	May	76.4	97.2	88.5
June	178.5	133.0	175.5	June	67.7	93.6	84.6
July	185.6	132.7	175.2	July	68.5	89.9	78.9
August	170.3	135.8	169.6	August	70.1	97.2	75.8
September	138.4	141.1	173.7	September	78.3	103.1	81.3
October	125.2	147.1	172.9	October	67.2	102.8	79.2
November	130.4	143.6	175.8	November	65.7	105.6	80.3
December	132.2	138.7	175.7	December	64.4	101.2	79.4
1920				1924			
Average	128.7	142.8	163.0	Average	77.3	95.9	94.2
January	152.8	138.4	183.9	January	75.8	110.1	78.2
February	149.1	145.5	196.1	February	73.4	113.2	83.5
March	137.2	150.2	215.2	March	69.5	103.2	82.6
April	139.4	164.5	242.9	April	72.5	92.5	84.2
May	138.3	165.3	238.5	May	73.6	93.1	87.9
June	133.2	141.0	212.7	June	69.3	91.0	89.3
July	130.6	138.0	178.5	July	68.9	93.9	96.7
August	124.6	138.1	163.9	August	85.3	94.9	100.9
September	123.8	141.5	153.6	September	83.6	94.3	96.6
October	120.7	136.1	129.8	October	86.3	86.8	97.8
November	109.4	129.6	107.7	November	86.4	87.9	98.9
December	92.1	119.3	92.8	December	83.0	89.9	107.9
1921				1925			
Average	77.0	90.0	80.8	Average	107.8	101.7	103.0
January	97.1	106.6	88.1	January	102.3	91.0	108.4
February	93.0	98.2	86.5	February	102.3	87.5	107.2
March	93.1	100.1	82.9	March	115.5	95.2	102.2
April	81.2	100.2	77.9	April	115.6	102.5	92.7
May	81.3	75.4	77.3	May	109.6	103.8	104.1
June	71.4	71.7	78.6	June	107.5	105.4	115.0
July	76.8	83.7	78.1	July	114.9	103.5	103.2
August	78.7	95.3	80.7	August	110.9	105.3	101.4
September	66.4	94.7	86.4	September	104.4	104.8	101.3
October	60.5	91.8	84.4	October	104.3	109.4	100.9
November	61.3	92.5	72.8	November	103.8	106.4	105.7
December	64.5	86.7	64.2	December	107.1	104.6	99.2

Table 2—Continued

	Live- stock	Dairy poultry	Crops		Live- stock	Dairy poultry	Crops
1926				1927			
Average	114.6	102.6	104.4	Average	103.3	107.4	98.0
January	123.5	100.5	108.8	January	123.0	109.3	98.3
February	126.7	99.1	117.9	February	121.9	110.3	105.4
March	114.7	100.4	121.1	March	111.4	109.7	104.1
April	113.7	104.8	124.7	April	110.1	114.4	102.0
May	116.7	103.7	110.9	May	102.4	113.5	113.0
June	122.4	104.8	95.6	June	90.6	103.2	111.3
July	118.4	100.6	99.2	July	89.7	103.6	101.4
August	104.2	99.2	99.4	August	94.2	101.1	102.8
September	108.2	103.9	99.7	September	97.8	104.9	98.0
October	107.0	103.6	101.4	October	103.4	106.3	91.2
November	107.9	105.4	99.2	November	98.4	106.2	85.5
December	110.3	105.3	91.6	December	92.6	105.0	88.0

similar to those used in computing the price index.¹¹ The result is an index which shows changes in the quantities of products sold by Minnesota farmers, measured from a base period of 1924-25-26 for the yearly indexes, and from an average of the marketings of each corresponding month of 1924-25-26 for the monthly indexes. A quantity index of 94.5 for October, 1927, shows that the quantity marketed in this month was 5.5 per cent less than the average of the three Octobers in 1924-25-26. The seasonal fluctuations in marketing which prevailed in the period 1924-25-26 are thus eliminated from the quantity index in the same manner and subject to the same limitations as in the price index.

The quantity index is not an index of changes in agricultural production but of the amounts of agricultural products sold by farmers. The data of amounts sold are difficult to obtain by months for all products, and the methods employed in arriving at the approximate figures are explained in full in a later section of this bulletin. These quantities, however, are necessary as weights in the formula selected for the price index (and the index of gross income) so that no additional data need be gathered for the computation of the quantity index.

The quantity index as computed to show changes in the marketings of Minnesota farm products by months and years is shown in the second column of Table 1. The monthly quantity indexes are shown graphically in Figure 4.

$$\sqrt{\frac{\sum [q_1 \frac{p_0(em)}{p_1}]}{\sum [q_0(em) \frac{p_0(em)}{p_1}]} \times \frac{\sum [q_1 p_1]}{\sum [q_0(em) p_1]}}$$

q_1 = quantity marketed in current month.

p_1 = price in current month.

$q_0(em)$ = average quantity marketed in corresponding months of 1924-25-26.

$p_0(em)$ = average price in corresponding months of 1924-25-26.

This index of quantity of products sold discloses a surprising trend in production. The quantities sold during 1911 were the lowest for any year of the period. Thereafter there was a rather steady rise in marketings with slight recessions in 1914, 1916, and the early part of 1917. The quantity of marketings increased sharply in 1918, declined in 1919 and 1920, and then increased steadily to a high point of 119.8 in October, 1924. From that time to the end of 1927 there has been a gradual decline in the quantity index. For the period as a whole there has been a decided upward trend in physical volume of production as indicated by farm marketings.

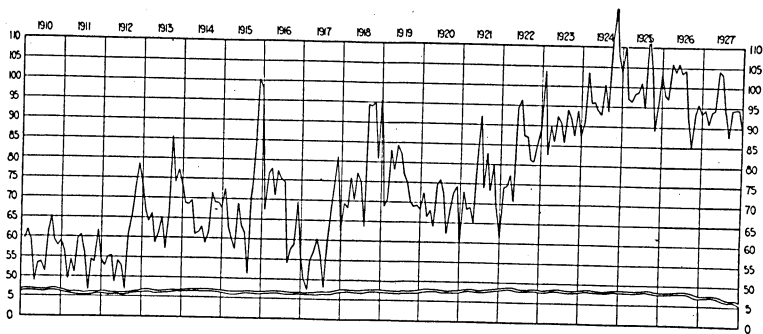


Fig. 4. Quantity Indexes of Minnesota Farm Products Marketed by Months, 1910-1927
(Average of corresponding months of 1924-25-26=100)

The increase that represents Minnesota conditions is probably not representative of the entire country. Much of the increase has been due to the increase of livestock, livestock products, and corn. Absolute decreases or only slight increases in production have existed in several of the products which made up the bulk of farm production during the early part of the period under consideration. Probably not many states have experienced the rapid changes which have taken place in Minnesota in the types of commodities produced. Hence the Minnesota quantity index reflects conditions which may not be duplicated in many other sections of the country.

INDEX OF GROSS CASH INCOME

The index of gross cash income of the Minnesota farmers is only a short step beyond the computation of price and quantity indexes. When a type of formula has been selected for the calculation of these two indexes which conforms to the factor reversal test, the index of gross cash income is the product of the price index by the quantity index for the same period. The index of gross cash income by months and years is shown in the third column of Table 1, and is equivalent to a

product of the figures in the first and second columns. The monthly indexes of gross cash income are shown in Figure 5.

Gross cash incomes for Minnesota were lowest in 1911. A steady rise followed until 1916 and a sharp rise during 1917 and 1918. The peak was reached in September, 1918 when the index of gross cash income was 145.5. In May, 1919 the index rose again to a point almost as high, 142.4. The decline in income during the latter part of 1919 appears to have been influenced by the lower average quantity of farm marketings during that period. There was a continued reduction of income in 1920 and a further decline in 1921, when the average gross cash income reached the level of 1916. There was an improvement in 1922 to 1924, when a low price index prevailed with an increasing quantity index. A general rise continued until 1926, but during 1927 the index of gross income was consistently lower than in 1926.

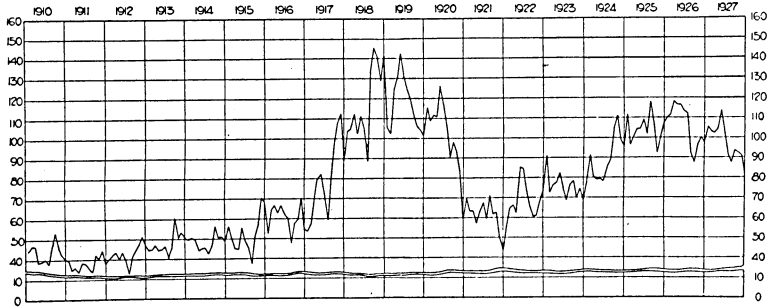


Fig. 5. Indexes of Gross Cash Income of Minnesota Farmers by Months, 1910-1927
(Average of corresponding months of 1924-25-26=100)

Heretofore the importance of quantity sales as a determinant of farm incomes probably has been underemphasized. The foregoing indexes of prices and quantities show that, at least for Minnesota, the quantity of production has been exerting a marked effect upon farm incomes.

GROSS CASH INCOME IN DOLLARS

The gross cash income of the farmers of Minnesota has thus far been expressed only in terms of index numbers which unquestionably furnish the most satisfactory method of representing the general trend of income. The actual work of making this series of index numbers, however, involved specific prices and definite quantities, and as a result the gross farm income from the sales of the sixteen commodities included in the index was computed in actual dollars. Fewer commodities than sixteen could have been used for the index and approximately the same trend of price level would have resulted, but as nearly all of the major products were included, the actual amounts in dollars are

of interest as a gross cash income figure for the state, provided their limitations are kept in mind. A further discussion of these limitations will be given, but in general they are two: First, only the sixteen major products are included and, second, insufficient data have necessitated that a number of the quantities be estimated by a variety of methods.

In calculating the *total* income of an industry necessarily many items must be estimated. In calculating *cash* income the number of estimated items is reduced. This is particularly true of the cash income from agriculture. Total income is made up of the cash sales of products together with the estimated value of the products used directly by the farm. This latter group constitutes a significant proportion of the total income and because the basis for the valuation of these items is uncertain and in most cases the quantities of the products used are not known, the calculated total income would probably involve a larger error than would a cash income grounded on more satisfactory basic information.

Altho calculation of cash income involves fewer estimates than total income, a considerable number still remain to be made. Probably no data purporting to show the exact marketings and value of cash income by sources represent complete enumerations. They are estimates, but, as there are ordinarily several ways in which such estimates can be checked for gross errors, they closely approximate the actual condition. Estimates of production and sales can, for example, be compared with railroad shipments, with receipts at markets, with raw materials purchased by manufacturers, or with the output of industries. Material errors in the original estimate will thus be revealed through the inconsistencies arising from comparison with these or other indexes of sales.

The principal sources of data from which the cash income of farmers must be calculated are the publications of the United States Bureau of the Census and the United States Department of Agriculture. Many years of experience in making estimates and developing the technic of estimation make the data from these sources reasonably reliable. The census data are derived from actual enumeration but practically all of the final figures are estimates based upon enumeration, and comparatively few figures represent the mere summation of the original data. Inconsistencies in the raw data are adjusted so that only figures in which obvious discrepancies have been eliminated, are finally published. The census data probably err by being too low. The failure of enumerators to interview every producer or to ask all questions, together with the reticence of the people being interviewed, tend to give a downward bias to the raw census data.

The United States Department of Agriculture has developed an elaborate system of obtaining information. Its crop estimators become continually more efficient and when their reports are consolidated and

analyzed by the expert estimators in the central department the final results without doubt are as accurate as if based on enumeration. Its prices of products, time of marketing, and similar data are not available elsewhere and furnish the only source of many items essential to the calculation of farm income.

By supplementing these two principal sources with data secured from reports of bureaus of markets, state food commissions, trade publications, reports of manufacturers, receipts at markets, and railway statistics, sufficient material may be collected to prepare reliable estimates of cash incomes. The data of minor products such as wool, truck crops, fruits, honey and wax, and of more important commodities, such as dairy products, poultry and eggs, and hay, are particularly unsatisfactory. Inaccuracies in the figures, or even entire omission of the first group for which the data are especially poor, introduce little error, because the total value of those commodities is small in comparison with other sources of cash income. The latter group is important and without doubt the most painstaking estimate of farm income will be somewhat inaccurate because of the poor basic data. For whole milk, poultry, and eggs there are no well established central markets through which the bulk of the production flows as in the case of other farm products. Milk is generally sold locally. There is no way of obtaining accurate data of the amount produced and sold. An estimate can be made, but the assumptions necessary to such an estimate may be so arbitrary that the estimate itself is open to serious question. The census estimates of milk sold are probably quite unsatisfactory. Few farmers can give the enumerator little more than a guess as to the amount of whole milk sold in a year. The time of taking the census probably causes these estimates of the farmers to have a downward bias. In the winter or early spring, milk production is low and the producer is inclined to base his estimate of the annual production upon the current production. A similar situation exists with respect to poultry and eggs. Farmers do not keep accurate records of sales of these products. They are sold in small amounts and often are consumed locally. There is no way in which sales of such products can be checked properly against receipts in central markets. The data on hay—production, sales, and prices—are also unsatisfactory. Altho records of shipments to market are ordinarily available, the amount sold locally between farms is unobtainable. Hay is a product that is poorly classified by grade, hence it is difficult to apply price data in such a way as to represent properly the total value of the crop sold.

These observations apply particularly to the problem of the calculation of an estimate of the income of the whole agricultural industry. Where the problem is restricted to the estimation of the income for a

state, all of the above difficulties are effective, and, in addition, many others which are brought into existence by the attempt to divide the data of the industry by state lines.

The census and department of agriculture estimates are prepared by states, but such estimates are not as easily checked for accuracy by reference to supplementary data as are the totals for the country. The receipts at markets are not readily classified by points of origin. Manufacturers do not report the sources of their raw material. Railroad shipments by states are not generally available. The data of raw material and products used by factories or received at markets within the state are of some assistance, but adjustment must be made for the quantity obtained from farmers outside the state boundaries. Likewise correction must be made for the amounts of products sold by farmers in markets outside of the state. Often these necessary adjustments must be made without adequate evidence upon which to base them. Because of these additional sources of error it is probable that the division of total income by states is less accurate than the estimate of income from agriculture as a whole.

In general, however, price, production, and sales data are reasonably satisfactory. Particularly is this true of the various grain and livestock crops, where such errors as may exist in the data of one crop are compensated largely by errors in another crop. The errors in the gross sales of the agricultural industry are not serious, considering even those possibilities for error which have been noted.

The quantities and prices of the sixteen major products, which are given in a later section of the bulletin, furnish the basis for the estimated gross cash income of the farmers of Minnesota, as shown in Table 3. The quantity of each commodity sold in a month has been multiplied by the price in that month, and the sum of the sales of the sixteen products has been taken as the approximate gross cash income for the month.

Table 3
Monthly Gross Cash Income of Farmers of Minnesota,* 1910-1927

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$ 14,797,464	\$ 13,144,012	\$ 13,237,200	\$ 14,675,441	\$ 16,457,196	\$ 18,715,009	\$ 17,437,884	\$ 17,769,996	\$ 34,287,644
February	13,733,473	10,204,825	12,380,333	13,203,945	14,857,424	14,696,035	18,931,872	16,856,968	30,805,399
March	14,985,547	11,491,287	13,899,295	15,085,746	16,037,416	14,473,003	21,439,636	22,354,131	35,956,621
April	10,542,171	9,139,285	10,878,821	12,045,791	11,987,570	12,221,915	17,140,285	21,671,103	27,841,697
May	10,158,050	9,920,803	11,269,512	11,630,575	11,765,921	14,457,299	17,350,213	21,506,314	28,905,549
June	11,228,032	10,618,875	10,967,847	12,992,678	12,640,623	13,587,064	17,491,205	20,509,496	29,210,321
July	9,958,693	9,429,099	8,656,717	10,643,496	11,279,146	12,020,915	16,024,652	15,716,326	23,417,286
August	14,126,808	10,281,366	12,590,168	13,822,486	13,946,366	11,298,136	14,425,407	24,506,391	40,634,220
September	18,728,045	14,828,833	15,484,876	21,407,954	19,877,768	17,828,159	20,118,827	34,119,239	51,119,835
October	18,144,376	15,975,428	18,470,446	20,099,463	20,057,266	22,594,290	23,317,644	42,466,899	55,776,189
November	13,905,733	14,596,426	16,806,871	17,493,982	16,720,516	23,132,303	23,117,015	36,955,577	38,957,139
December	15,552,215	14,482,721	17,988,600	19,297,522	18,760,028	26,343,265	20,928,317	33,832,035	53,956,916
Total	\$165,860,607	\$144,112,960	\$162,630,686	\$182,399,079	\$184,387,240	\$201,367,393	\$227,722,957	\$308,264,475	\$450,868,816

	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$ 35,029,418	\$ 38,483,231	\$ 23,089,476	\$ 18,518,347	\$ 30,192,778	\$ 25,730,714	\$ 37,033,404	\$ 36,458,656	\$ 34,968,230
February	30,130,833	32,025,891	18,628,116	19,048,742	21,321,081	26,938,658	28,421,067	32,956,150	30,362,126
March	39,998,802	35,922,618	20,301,442	21,219,736	24,564,010	25,819,472	32,469,198	37,951,428	32,812,071
April	35,468,609	30,165,357	15,514,249	16,940,599	21,119,648	21,544,165	28,354,815	31,785,675	28,348,410
May	37,014,844	32,864,921	16,376,183	22,096,642	21,362,624	20,606,473	27,203,755	30,311,620	29,574,587
June	36,580,812	32,793,790	18,828,371	23,599,057	20,799,705	21,817,726	30,439,142	31,580,246	28,724,250
July	32,960,069	27,967,536	15,628,313	19,487,075	18,059,473	22,504,758	26,852,446	29,593,896	24,249,956
August	36,556,881	27,544,232	21,640,869	20,028,312	23,248,034	27,233,100	36,096,523	28,136,223	26,704,741
September	39,064,616	34,441,957	21,694,181	21,231,611	27,586,724	36,839,443	37,799,346	30,742,185	32,973,174
October	41,851,992	36,715,099	24,729,836	24,042,766	27,545,523	43,973,355	36,461,049	38,066,696	36,576,704
November	34,134,588	27,490,260	16,291,503	22,154,927	24,567,227	32,460,820	33,023,993	32,822,925	29,838,818
December	38,761,122	22,815,617	16,585,845	28,034,632	26,222,650	36,557,377	41,062,958	37,206,200	30,644,243
Total	\$437,552,586	\$379,230,509	\$229,308,384	\$256,402,446	\$286,589,477	\$342,026,061	\$395,217,696	\$397,611,900	\$365,777,310

* Cash income from sales of the following products; wheat, corn, oats, barley, rye, flax, hay, potatoes, hogs, cattle, calves, lambs-sheep, chickens, eggs, butter-fat, and milk,

Table 4

Annual Gross Cash Income from the Sales of Principal Products by the Farmers of Minnesota, 1910-1927

	1910	1911	1912	1913	1914	1915	1916	1917	1918
Wheat	\$ 57,847,277	\$ 43,555,757	\$ 43,093,415	\$ 46,720,610	\$ 44,059,073	\$ 53,967,169	\$ 46,587,912	\$ 78,288,759	\$132,476,411
Corn	8,007,245	6,451,533	5,423,597	9,670,870	13,496,855	7,478,267	4,202,198	10,853,329	21,869,461
Oats	9,292,624	4,646,278	7,980,297	12,218,785	9,949,074	12,589,708	13,395,735	11,467,479	26,637,875
Barley	7,848,530	10,919,406	9,652,349	7,883,977	8,044,683	9,265,094	11,235,525	16,191,227	14,843,963
Rye	2,400,520	3,451,473	2,967,951	2,711,759	3,681,305	4,893,655	5,475,360	8,066,988	10,765,755
Flax	6,729,516	4,984,930	4,802,753	4,718,627	3,910,244	4,107,154	4,951,390	4,409,505	8,561,923
Hay	1,926,021	1,706,538	2,125,359	1,786,236	2,146,670	2,682,525	2,859,118	3,467,622	4,341,893
Potatoes	5,242,000	7,601,250	8,469,840	6,834,670	7,673,320	5,768,940	10,532,360	14,389,670	12,880,010
Hogs	20,103,041	17,213,080	21,025,147	28,782,931	29,103,560	28,215,687	44,208,343	53,695,616	81,857,709
Cattle	9,817,987	11,098,886	13,383,134	15,241,038	18,586,414	27,211,556	30,317,185	39,450,344	52,027,233
Calves	1,279,726	1,007,564	1,260,834	1,510,437	1,813,196	2,013,005	2,565,068	3,789,337	4,952,962
Lambs-Sheep	863,193	782,996	981,966	803,098	1,045,979	858,031	915,937	1,198,339	1,948,503
Chickens	2,062,242	1,965,644	2,812,854	2,370,174	2,388,978	2,357,543	3,038,540	3,734,041	4,800,060
Eggs	5,399,933	4,623,404	5,657,089	5,735,251	6,055,104	6,102,191	7,317,956	11,306,036	12,671,693
Butterfat	22,829,491	20,331,723	28,299,279	39,554,947	27,607,331	28,890,305	34,305,107	39,857,921	50,446,206
Milk	4,211,261	3,772,498	4,604,822	4,855,669	4,825,454	4,966,563	5,815,223	8,074,262	9,787,159
Total	\$165,866,607	\$144,712,960	\$162,630,686	\$182,399,079	\$184,387,240	\$201,367,393	\$227,722,957	\$308,264,475	\$450,868,816

	1919	1920	1921	1922	1923	1924	1925	1926	1927
Wheat	\$ 90,133,153	\$ 54,962,938	\$ 26,931,043	\$ 23,746,514	\$ 21,448,023	\$ 34,918,877	\$ 42,060,061	\$ 35,430,564	\$ 21,617,831
Corn	19,445,481	23,334,825	14,143,687	15,078,331	17,283,139	23,314,958	17,481,396	12,987,292	7,475,441
Oats	15,902,438	18,384,619	8,328,958	9,493,783	13,370,711	25,454,718	22,491,710	11,104,204	7,904,469
Barley	18,814,493	12,696,554	3,284,160	3,622,786	4,321,467	7,236,122	8,802,227	5,373,925	6,911,305
Rye	10,619,884	12,164,516	8,496,485	10,185,228	9,846,830	12,736,304	6,488,352	3,405,634	5,270,189
Flax	11,979,396	8,613,637	4,692,997	5,580,937	11,650,074	14,246,329	18,025,064	15,069,724	13,604,432
Hay	6,075,140	7,482,065	4,869,155	4,744,935	5,043,124	5,190,308	5,625,437	4,973,986	5,359,657
Potatoes	21,375,710	23,382,770	16,920,160	11,916,470	10,538,380	10,229,410	14,507,460	22,783,250	18,564,579
Hogs	93,908,373	73,555,446	45,416,265	63,691,054	63,377,109	69,819,251	100,447,084	113,497,681	94,984,139
Cattle	44,200,782	38,841,294	20,454,793	25,158,705	23,647,832	25,618,131	32,175,165	40,413,097	40,754,756
Calves	4,873,952	5,118,025	2,995,369	4,266,826	4,561,291	4,782,595	6,666,531	8,035,386	8,240,875
Lambs-Sheep	2,826,797	2,471,456	1,543,685	2,020,420	1,698,043	2,128,434	2,708,796	3,817,776	4,017,739
Chickens	5,085,347	5,942,294	4,836,725	4,441,715	3,900,266	5,161,893	5,378,411	7,066,165	6,375,239
Eggs	14,309,183	15,971,276	10,212,922	9,877,759	10,767,048	10,823,695	13,655,787	13,919,674	12,086,867
Butterfat	65,318,812	64,715,344	47,432,369	54,295,530	73,926,212	79,709,404	85,481,420	87,184,276	99,489,164
Milk	12,683,645	11,593,450	8,749,611	8,281,444	11,209,928	10,655,632	12,235,795	12,549,266	12,880,628
Total	\$437,552,586	\$379,230,509	\$229,308,384	\$256,402,446	\$286,589,477	\$342,026,061	\$395,217,696	\$397,611,900	\$365,777,310

A diagram showing the comparison of total annual cash incomes is presented in Figure 6, where the annual amounts are represented by the height of the bars. After 1911 the gross income increased gradually until 1917. In 1917 and 1918 the increase was marked. A slight decline came in 1919, a further decline in 1920, and in 1921 it struck the lowest figure in the post-war period. In 1922 it began to rise again and the rise continued through 1926, altho the increase of 1926 over 1925 was slight. The total income for 1927 was noticeably less than that for 1926. Computations which have been made for 1928 indicate that the gross cash income will show an increase of only about a million dollars over the total for 1927.

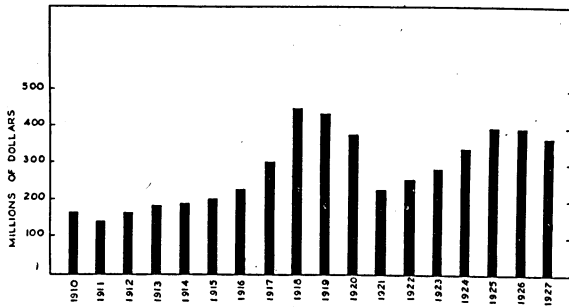
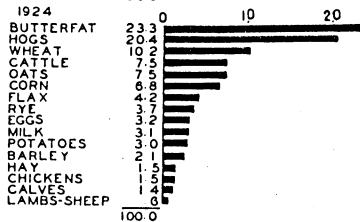
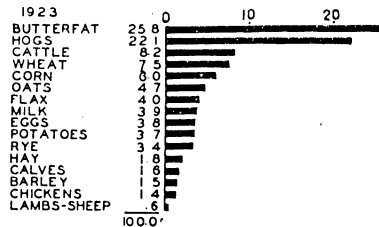
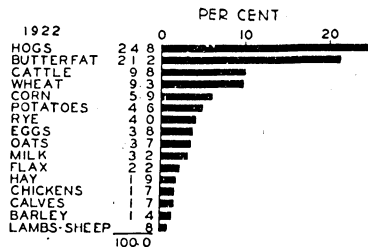
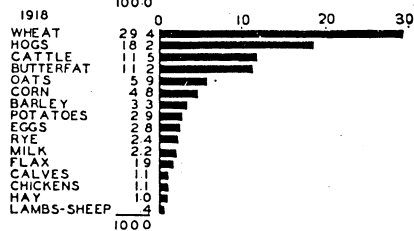
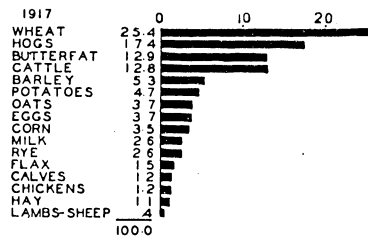
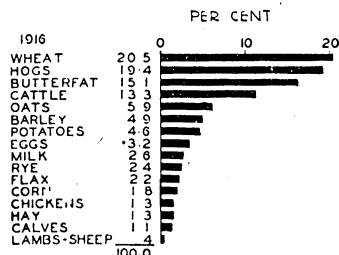
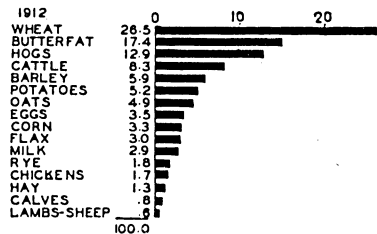
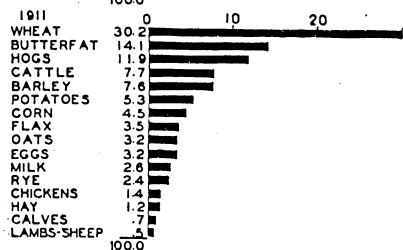
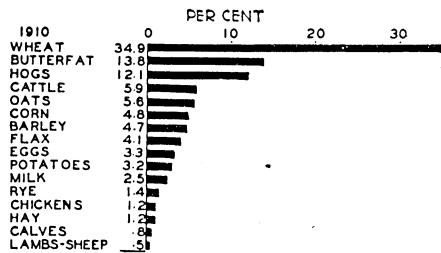


Fig. 6. Gross Cash Income of Minnesota Farmers, 1910-1927

The amounts which each of the sixteen products contributed to the annual gross receipts are shown in Table 4, and a comparison of the relative importance of the various products in the gross income for each year can be had by an examination of Table 5 which shows the percentage which the cash receipts from each crop formed of the gross cash income for the calendar year.

The facts of Table 5 are more clearly brought out in the series of bar diagrams for the years 1910 to 1927, shown in Figure 7. Wheat constituted the largest single percentage of the yearly receipts for each year from 1910 to 1918, inclusive, after which hogs took first position in the years 1919, 1920, 1922, 1925, and 1926, and butterfat in 1921, 1923, 1924, and 1927. Wheat dropped as low as fourth position in the years 1922, 1923, 1926, and 1927 when its contributions to the cash income were 9.3, 7.5, 8.9, and 5.9 per cent, respectively.

Other interesting facts in the make-up of each year's gross income and changes from year to year may be noted from the graphs. The decided predominance of a single crop in the earlier years, such as approximately 35 per cent of the 1910 income from wheat, has been replaced largely by contributions to the year's income of two or three



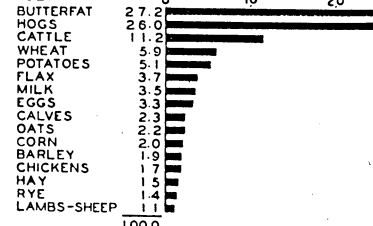
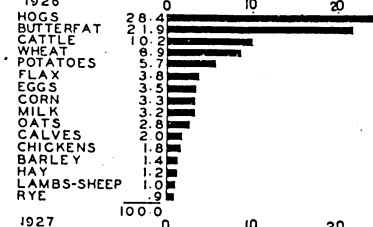
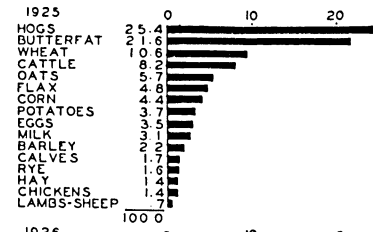
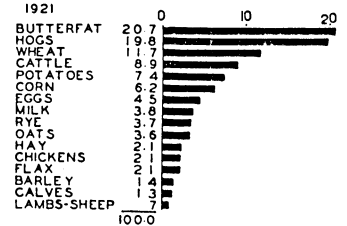
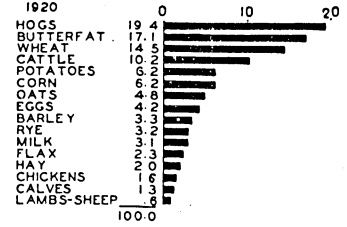
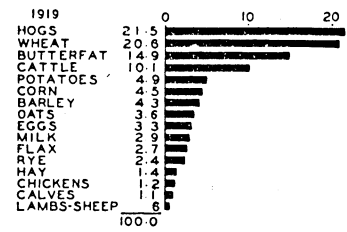
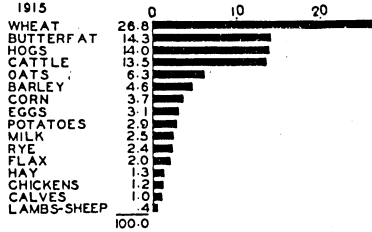
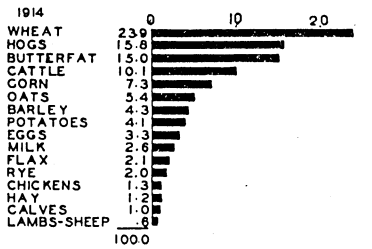
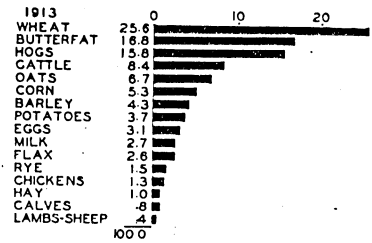


Fig. 7. Percentage of Total Annual Cash Income of Minnesota Farmers Received from Sales of Each of the Principal Products, 1910-1927

SOURCES OF PRICE AND QUANTITY DATA AND METHODS OF ESTIMATING AMOUNTS MARKETED

The following section is a detailed account of the data used, the sources from which they were taken, and the methods used for estimating the data in those instances in which they were inadequate for the purposes of the index series.

Wheat

The figures for the amount of wheat sold by the farmers of Minnesota have been derived by taking the official estimates of the annual production in the state, made by the United States Department of Agriculture, and deducting from this the amount necessary to plant the acreage of the following season. A seed requirement of one and one-half bushels per acre has been assumed. There should be some further deduction because of the amount wasted or fed to livestock. The Food Research Institute has estimated the amount of wheat wasted and fed at four-tenths of a bushel per capita.¹² On the basis of a population of 115,000,000 this would amount to 46,000,000 bushels for the entire United States, or approximately 6 per cent of a 750,000,000 bushel crop. A deduction on this account would reduce the estimates probably not more than 5 per cent. Because, however, a considerable portion of the waste occurs elsewhere than on the farm, and the amount fed includes purchases for feed after the producer has sold it, it seems incorrect to deduct from the marketings of farmers the entire amount of the waste and feed, and there is no basis for determining what portion of such a deduction properly belongs to the period when the wheat is in the hands of the farmer. No deduction on this account has therefore been made. Another source of error in the estimates of the amounts sold lies in the failure to allow for difference in carry-over from one crop year to the next. The carry-over varies from year to year and is dependent chiefly upon the size and quality of the preceding crop, the price at which it might be sold, and the prospect for the new crop. Absence of adequate data prevents adjustments from being made. A greater error might easily be introduced by attempting to adjust marketings for variations in the size of the carry-over than by assuming that a constant carry-over exists, as has been done in this study.

The production, amount necessary for planting in the following year, and total annual sales of wheat by the farmers of Minnesota, estimated as above outlined, for the crop years from 1910 to 1927, are given in Table 6.

¹² Wheat Studies of the Food Research Institute, Vol. II, No. 7, June, 1926, p. 246.

Table 6

Production of Wheat, Seed Requirement, and Amount Sold by the Farmers of Minnesota, 1910-1927
(Bushels)

Crop year (August to July)	Production*	Seed requirement	Amount sold†
1910-11	64,000,000	6,525,000	57,475,000
1911-12	43,935,000	6,487,000	37,448,000
1912-13	67,038,000	6,300,000	60,738,000
1913-14	68,040,000	6,070,000	61,970,000
1914-15	42,975,000	6,240,000	36,735,000
1915-16	70,870,000	5,197,500	65,672,500
1916-17	26,410,000	4,420,500	21,989,500
1917-18	51,611,000	5,428,500	46,182,500
1918-19	75,792,000	5,797,500	69,994,500
1919-20	35,731,000	4,501,500	31,229,500
1920-21	28,168,000	3,556,500	24,611,500
1921-22	22,938,000	2,983,500	19,954,500
1922-23	27,276,000	2,760,000	24,516,000
1923-24	20,785,000	2,574,000	18,211,000
1924-25	37,863,000	3,394,500	34,468,500
1925-26	30,269,000	3,231,000	27,038,000
1926-27	24,811,000	2,716,500	22,094,500
1927-28	20,925,000	2,601,000	18,324,000

* U. S. Dept. of Agr. Yearbooks.

† For calendar year totals, see Table 8.

These annual amounts were sold ordinarily during the twelve months following the harvest, from August to July of the following year. As a guide to the monthly sales of these amounts by the farmers, percentage distributions by months, based on total receipts at the Minneapolis market during each twelve-month period from August to July, have been computed. These distributions were adopted rather than the estimated monthly percentage marketings published by the United States Department of Agriculture, which constitute an average for the entire United States. Altho receipts on the Minneapolis market include much wheat not raised in Minnesota, and altho some wheat raised in Minnesota is marketed elsewhere, the receipts at the Minneapolis market are doubtless a much better indicator of the monthly tendencies of Minnesota farmers to market their crops than a series for the United States as a whole.

The percentage distribution by months from 1910 to 1927, based on the total receipts at Minneapolis for each crop year period from August to July, inclusive, are shown in Table 7. The percentages shown for January to July, 1910, are based on receipts for the twelve months from August, 1909, to July, 1910.

Table 7
 Monthly Percentage Marketings of Wheat, Based on Total Annual Receipts
 at Minneapolis for year August to July, 1910-1927*

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	10.6	8.8	8.6	8.0	8.4	8.5	5.4	6.6	7.1
February	9.6	5.0	8.0	6.5	8.4	6.0	7.1	5.3	4.3
March	9.4	6.9	7.3	7.9	8.4	3.8	7.5	9.2	4.0
April	4.8	5.1	4.2	5.0	5.4	3.1	4.6	8.2	4.7
May	4.6	5.5	3.9	4.0	3.4	5.2	4.5	6.5	6.2
June	5.4	5.7	3.6	4.7	3.1	4.9	4.9	4.4	6.4
July	4.7	5.7	3.0	3.3	4.2	4.5	5.1	2.3	3.2
August	10.3	7.0	6.9	6.5	7.8	3.3	7.9	7.7	12.5
September	14.3	14.6	10.8	15.7	18.6	11.6	13.2	14.1	15.7
October	12.8	14.5	14.2	12.9	15.9	14.1	13.6	17.8	17.9
November	8.9	13.5	14.0	11.9	10.6	14.7	13.6	15.0	7.9
December	11.0	11.8	14.7	11.7	11.1	17.2	9.2	9.5	15.1

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	3.5	8.4	7.6	7.0	11.0	5.3	8.7	7.0	5.9
February	4.8	5.4	6.2	6.4	4.7	7.0	4.9	5.7	6.2
March	7.0	5.3	6.2	6.3	7.7	7.0	5.4	5.2	6.1
April	4.6	4.7	6.2	4.3	5.1	3.3	3.1	4.4	4.4
May	4.2	5.1	5.5	5.0	3.8	4.6	3.2	4.0	5.4
June	3.3	5.0	8.1	5.1	4.6	5.6	4.9	4.2	6.0
July	3.5	5.7	6.7	5.4	3.7	5.1	5.2	7.5	5.6
August	11.2	6.8	13.6	8.3	10.2	8.0	11.6	13.3	10.3
September	12.8	11.8	15.1	14.7	15.3	18.9	18.0	17.4	21.5
October	15.1	13.8	16.3	12.3	13.7	17.4	10.6	13.9	17.1
November	9.9	12.2	7.8	10.4	13.6	11.4	10.0	8.5	7.5
December	11.4	8.9	7.7	13.7	9.3	8.9	11.8	7.3	6.3

* Computed from reports of the Minneapolis Chamber of Commerce and from an unpublished manuscript by Hutzler Metzger.

These percentage distributions for months were applied to the annual crop year amounts sold by Minnesota farmers (Table 6), to secure the actual amounts marketed in each month.¹³ For example, the wheat sold from the 1925-26 crop, 27,038,000 bushels, was estimated to have been marketed during the period August, 1925, to July, 1926, according to the percentage distribution shown for each month in this period—11.6 per cent in August and 18 per cent in September, 1925, and finally 7.5 per cent in July, 1926. The amounts sold in the months from January to July, 1910, are percentages of the 1909-10 crop, the total of which is not shown.

¹³ At the time the Minnesota index number was constructed, in the spring of 1927, the total receipts of the various grains at Minneapolis for the year August, 1926, to July, 1927, were not available. Total marketings were, therefore, estimated on the basis of the receipts up to that time, and a preliminary percentage distribution computed on that basis for the months from August to December, 1926, in order that the approximate amounts sold could be determined for inclusion in the base period. The percentage distributions shown in the various tables for this period have been revised, but the difference was not sufficiently large to justify the work of changing the estimated number of bushels sold as used in the base period computations.

Table 8
Amount of Wheat Sold Monthly by the Farmers of Minnesota, 1910-1927 (Bushels)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	5,287,068	5,057,800	3,220,528	4,859,040	5,205,480	3,122,475	3,546,315	1,451,307	3,278,958
February	4,783,288	2,873,750	2,995,840	3,947,970	5,205,480	2,204,100	4,662,748	1,165,444	1,985,847
March	4,688,532	3,965,775	2,733,704	4,798,302	5,205,480	1,395,930	4,925,437	2,023,034	1,847,300
April	2,394,144	2,931,225	1,572,816	3,036,900	3,346,380	1,138,785	3,020,935	1,803,139	2,170,578
May	2,294,388	3,161,125	1,460,472	2,429,520	2,106,980	1,910,220	2,955,263	1,429,317	2,863,315
June	2,693,412	3,276,075	1,348,128	2,854,686	1,921,070	1,800,015	3,217,952	967,538	2,955,680
July	2,344,266	3,276,075	1,123,440	2,004,354	2,602,740	1,653,075	3,349,298	505,758	1,477,840
August	5,919,925	2,621,360	4,190,922	4,028,050	2,865,330	2,167,192	1,737,170	3,556,052	8,749,312
September	8,218,925	5,467,408	6,559,704	9,729,290	6,832,710	7,618,010	2,902,614	6,511,733	10,989,137
October	7,356,800	5,429,960	8,624,796	7,994,130	5,840,865	9,259,822	2,990,572	8,220,485	12,529,015
November	5,115,275	5,055,480	8,503,320	7,374,430	3,893,910	9,653,858	2,990,572	6,927,375	5,529,565
December	6,322,250	4,418,864	8,928,486	7,250,490	4,077,585	11,295,670	2,023,034	4,387,338	10,569,170
Total	57,423,273	47,534,897	51,262,156	60,307,162	49,104,010	53,219,092	38,321,910	38,948,520	64,945,717

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	2,449,808	2,623,278	1,870,474	1,396,815	2,696,760	965,183	2,998,760	1,892,660	961,808
February	3,359,736	1,686,393	1,525,913	1,277,088	1,152,252	1,274,770	1,688,957	1,541,166	1,013,448
March	4,899,615	1,655,164	1,525,913	1,257,134	1,887,732	1,274,770	1,861,299	1,405,976	994,083
April	3,219,747	1,467,786	1,525,913	858,044	1,250,316	600,963	1,068,524	1,189,672	716,514
May	2,939,769	1,592,705	1,353,633	997,725	931,608	837,706	1,102,992	1,081,520	877,892
June	2,309,819	1,561,475	1,993,531	1,017,680	1,127,736	1,019,816	1,688,957	1,135,596	981,173
July	2,449,808	1,780,081	1,648,971	1,077,543	907,092	928,761	1,792,362	2,027,850	910,167
August	3,497,704	1,673,582	2,713,812	2,034,828	1,857,522	2,757,480	3,136,408	3,448,060*	1,887,372
September	3,997,376	2,904,157	3,013,130	3,603,852	2,786,283	6,514,547	4,866,840	4,531,736	3,939,660
October	4,715,654	3,396,387	3,252,584	3,015,468	2,494,907	5,997,519	2,866,028	3,620,463	3,133,404
November	3,091,721	3,002,603	1,556,451	2,549,664	2,476,696	3,929,409	2,703,800	2,216,610	1,374,300
December	3,560,163	2,190,424	1,536,497	3,358,692	1,693,623	3,067,697	3,190,484	1,822,546	1,154,412
Total	40,490,920	25,534,035	23,516,822	22,444,533	21,262,527	29,168,576	28,965,411	25,913,855	17,944,233

* Explanation in Note 13 applies to August to December, 1926.

Sales of wheat computed by this method for each month in the period 1910-1927 are given in Table 8, which also shows the total for the calendar year.

The prices of wheat used in this study are the monthly farm prices for the 15th of the month reported by the United States Department of Agriculture. These are shown in Table 9.

Table 9
Monthly Farm Prices for Wheat Received by Producers in Minnesota,*
1910-1927
(Fifteenth of the month)
(Per bushel)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$1.02	\$0.94	\$0.94	\$0.74	\$0.77	\$1.16	\$1.15	\$1.55	\$2.04
February	1.04	.91	0.94	.78	0.80	1.27	1.14	1.60	2.04
March	1.04	.86	0.96	.78	0.83	1.30	1.04	1.70	2.02
April	1.02	.87	1.00	.78	0.83	1.40	1.06	2.06	2.01
May	0.98	.88	1.04	.81	0.84	1.43	1.08	2.30	2.01
June	1.00	.88	1.04	.82	0.81	1.26	1.02	2.16	1.98
July	1.06	.88	0.98	.81	0.81	1.20	1.06	2.21	2.00
August	1.07	.90	0.90	.80	0.93	1.12	1.27	2.20	2.04
September	1.02	.94	0.82	.78	1.00	0.93	1.41	2.02	2.04
October	0.98	.97	0.80	.76	0.98	0.86	1.52	2.02	2.06
November	0.95	.95	0.76	.76	1.01	0.88	1.62	2.02	2.05
December	0.94	0.93	0.73	0.76	1.03	0.99	1.56	2.04	2.05

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$2.06	\$2.50	\$1.38	\$1.02	\$1.04	\$0.99	\$1.55	\$1.55	\$1.26
February	2.06	2.38	1.36	1.18	1.04	1.00	1.64	1.49	1.26
March	2.08	2.34	1.32	1.28	1.06	1.01	1.60	1.42	1.24
April	2.26	2.57	1.16	1.31	1.07	0.98	1.34	1.40	1.19
May	2.37	2.70	1.12	1.32	1.07	1.00	1.45	1.41	1.27
June	2.30	2.59	1.18	1.25	1.00	1.04	1.50	1.45	1.33
July	2.33	2.40	1.13	1.15	0.92	1.15	1.40	1.49	1.31
August	2.22	2.23	1.08	1.02	0.94	1.22	1.51	1.40	1.29
September	2.10	2.14	1.10	0.93	1.00	1.11	1.38	1.26	1.19
October	2.19	1.95	1.08	0.94	1.02	1.28	1.29	1.28	1.13
November	2.38	1.54	0.98	0.98	0.98	1.32	1.34	1.29	1.09
December	2.49	1.34	0.96	1.04	0.97	1.43	1.51	1.27	1.10

* Prices 1910-25, U.S. Dept. of Agr. Statistical Bull. 15.

Prices 1926-27, current numbers of Crops and Markets.

Corn

The data include under this item only the amounts of corn which farmers sold for cash. To include the total crop at current market prices and also the livestock crop at current prices would result in serious duplication in the income and erroneous weighting in the indexes. Consequently only cash sales of corn are considered. The estimated amount of corn sold by the farmers of Minnesota is based on the total production for the state reported by the United States Department of Agriculture, and the percentage of the crop shipped out of the county where grown. These percentages were obtained for the most part from

the series of publications of the United States Department of Agriculture—the present Crops and Markets and the publications which it superseded.¹⁴ The amounts shipped out of the county do not represent wholly the total amounts marketed, because local cash sales are not included. In the aggregate, such local sales assume considerable importance, and the estimated amount of corn sold is, therefore, somewhat too small. No data are available with which to make the proper adjustment, and the figure derived from the percentage shipped out of the county where grown is, therefore, accepted as the approximate amount sold. These percentages vary considerably from year to year. Table 10 shows the total production, the percentage shipped out of county where grown, and the estimate on this basis of the amount of corn sold by the farmers of Minnesota in each crop year.

Table 10
Production of Corn, Percentage of Crop Shipped from County Where Grown,
and Amount Sold by the Farmers of Minnesota, 1910-1927

Crop year (August to July)	Production*	Shipped	
		from county†	Amount sold‡
	bu.	per cent	bu.
1910-11	66,708,000	25	16,677,000
1911-12	74,140,000	14	10,379,600
1912-13	78,177,000	15	11,726,550
1913-14	96,000,000	25	24,000,000
1914-15	91,000,000	26	23,660,000
1915-16	64,400,000	2	1,288,000
1916-17	87,100,000	12	10,452,000
1917-18	91,800,000	13	11,934,000
1918-19	111,200,000	14	15,568,000
1919-20	119,920,000	16	19,187,200
1920-21	123,300,000	22	27,126,000
1921-22	156,620,000	22	34,456,400
1922-23	131,307,000	18	23,635,260
1923-24	154,692,000	24	37,126,080
1924-25	124,065,000	17	21,091,050
1925-26	148,896,000	18	26,801,280
1926-27	147,662,000	10	14,766,200
1927-28	127,246,000	8	10,179,680

* Yearbooks U.S. Dept. of Agr.

† See Note 14.

‡ For calendar year totals, see Table 12.

The percentage distributions for the marketing of corn by months were derived from records of receipts of corn on the Chicago market, which were thought to be more representative than receipts at Minneapolis. Table 11 shows the percentage which the receipts of each month

¹⁴ These percentages figures were available for the most part from records of the United States Department of Agriculture. If not, they were estimated by interpolation or other available information. In the most recent periods, preliminary estimates of this percentage figure made by the United States Department of Agriculture were used, and it is possible that slight revision may have occurred subsequently.

at Chicago were of the total receipts for the period from August to July, inclusive, of each crop year.

Table 11
Monthly Percentage Marketings of Corn, Based on Total Annual Receipts at Chicago for Year August to July, 1910-1927*

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	9.2	9.6	9.8	14.3	12.6	20.8	11.3	10.6	6.9
February	13.6	9.4	14.4	15.8	9.8	8.0	14.8	9.0	12.6
March	9.2	7.2	11.4	11.9	8.5	3.8	7.8	8.9	16.8
April	5.3	5.4	2.4	2.5	2.5	2.5	5.5	4.9	10.1
May	2.9	6.2	5.2	4.2	3.3	4.7	6.6	5.0	7.0
June	8.8	12.9	12.7	12.0	10.8	3.6	3.2	10.3	9.1
July	8.0	5.8	5.1	4.7	5.4	6.0	11.0	5.7	11.9
August	5.4	4.2	5.2	5.7	8.8	5.8	6.5	4.5	6.9
September	10.7	12.6	9.0	16.5	6.8	6.8	11.7	4.2	12.6
October	8.5	6.0	5.4	7.0	5.7	10.3	5.7	3.4	15.2
November	6.0	6.3	6.0	4.2	9.4	6.6	8.2	4.8	8.1
December	12.9	9.8	8.9	13.8	20.0	10.3	13.5	8.7	7.2
Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	10.5	10.7	16.2	14.2	11.4	9.7	13.8	12.7	8.8
February	4.9	10.3	10.2	15.5	10.8	15.0	7.2	12.4	10.6
March	5.0	11.2	11.8	6.2	8.1	9.4	9.2	8.8	9.9
April	8.1	3.0	3.6	2.7	3.8	4.2	4.4	4.3	3.7
May	4.4	4.1	7.1	4.8	2.0	5.1	4.0	3.4	3.3
June	10.6	11.7	16.0	7.0	2.5	6.0	7.0	9.9	9.4
July	6.4	12.0	6.7	6.0	4.6	5.0	3.2	4.5	5.8
August	4.4	2.8	8.4	7.2	9.5	8.6	8.7	2.9	5.3
September	10.0	9.0	11.6	14.6	8.0	11.8	6.6	5.0	8.7
October	6.3	8.9	10.6	12.7	7.4	10.3	5.1	16.1	7.0
November	6.4	2.9	3.8	7.4	8.2	7.0	8.2	14.7	6.7
December	9.9	4.7	9.1	14.8	12.3	13.3	15.5	9.8	8.2

* Computed from records of the Chicago Board of Trade and from current reports of receipts as published in The Northwestern Miller.

These monthly percentage distributions were applied to the total crop year amounts estimated to have been sold by the farmers of Minnesota. The monthly sales of corn, computed on this basis, and totals for calendar years are given in Table 12.

Table 12
Amount of Corn Sold Monthly by the Farmers of Minnesota, 1910-1927 (Bushels)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	1,436,700	1,600,992	1,017,201	1,676,897	3,024,000	4,921,280	145,544	1,107,912	823,446
February	2,123,818	1,567,638	1,494,662	1,852,795	2,352,000	1,892,800	190,624	940,680	1,503,684
March	1,436,700	1,200,744	1,183,274	1,395,459	2,040,000	899,080	100,464	930,228	2,004,912
April	827,664	900,558	249,110	293,164	600,000	591,500	70,840	512,148	1,205,334
May	452,873	1,033,974	539,739	492,515	792,000	1,112,020	85,008	522,600	835,380
June	1,374,235	2,151,333	1,318,209	1,407,186	2,592,000	851,760	41,216	1,076,556	1,085,994
July	1,249,305	967,266	529,360	551,148	1,296,000	1,419,600	141,680	595,764	1,420,146
August	900,558	433,943	609,781	1,368,000	2,082,080	74,704	679,380	537,030	1,074,192
September	1,784,439	1,307,830	1,055,390	3,960,000	1,608,880	87,584	1,222,884	501,228	1,961,568
October	1,417,545	622,776	632,234	1,680,000	1,348,620	132,664	595,764	405,756	2,366,336
November	1,000,620	653,915	703,593	1,008,000	2,224,040	85,008	857,064	572,832	1,261,008
December	2,151,333	1,017,201	1,043,663	3,312,000	4,732,000	132,664	1,411,020	1,038,258	1,120,896
Total	16,155,790	13,460,170	10,377,216	18,997,164	24,691,620	12,200,664	5,541,488	8,740,992	16,662,896

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	1,634,640	2,053,030	4,394,412	4,892,809	2,694,420	3,601,230	2,910,565	3,403,763	1,239,784
February	762,832	1,976,282	2,766,852	5,340,742	2,552,608	5,568,912	1,518,556	3,323,359	1,493,542
March	778,400	2,148,966	3,200,868	2,136,297	1,914,456	3,489,852	1,940,377	2,358,513	1,392,039
April	1,261,008	575,616	976,536	930,323	898,140	1,559,295	928,006	1,152,455	522,015
May	684,992	786,675	1,925,946	1,653,907	472,705	1,893,430	843,642	911,244	464,013
June	1,650,208	2,244,902	4,340,160	2,411,948	590,881	2,227,565	1,476,374	2,653,327	1,319,537
July	996,352	2,302,464	1,817,442	2,067,384	1,087,222	1,856,304	674,914	1,206,058	819,273
August	844,237	759,528	2,894,338	1,701,739	3,526,978	1,813,830	2,331,711	457,752*	539,523
September	1,918,720	2,441,340	3,996,942	3,450,748	2,970,086	2,488,744	1,768,884	767,842	885,632
October	1,208,794	2,414,214	3,652,378	3,001,678	2,747,330	2,172,378	1,366,865	2,495,488	712,578
November	1,227,981	786,654	1,309,343	1,749,009	3,044,339	1,476,374	2,197,705	2,273,995	682,039
December	1,899,533	1,274,922	3,135,532	3,498,018	4,566,508	2,805,110	4,154,198	1,520,919	834,734
Total	14,867,697	19,764,593	34,410,749	32,834,602	27,065,673	30,953,024	22,111,797	22,524,715	10,904,709

* Explanation in Note 13 applies also to receipts at Chicago, August to December, 1926.

The prices of corn used in this study are the monthly farm prices for the 15th of the month, reported by the United States Department of Agriculture. These are shown in Table 13.

Table 13
Monthly Farm Prices for Corn Received by Producers in Minnesota,*
1910-1927
(Fifteenth of the month)
(Per bushel)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$.51	\$.42	\$.51	\$.36	\$.50	\$.58	\$.61	\$.82	\$1.21
February	.52	.42	.50	.38	.50	.62	.60	0.88	1.29
March	.53	.42	.52	.40	.51	.62	.64	0.98	1.38
April	.49	.44	.58	.43	.53	.63	.70	1.20	1.40
May	.47	.46	.60	.47	.54	.64	.71	1.38	1.36
June	.49	.48	.59	.50	.56	.64	.73	1.47	1.33
July	.52	.53	.60	.51	.57	.66	.74	1.66	1.39
August	.54	.57	.60	.58	.63	.69	.76	1.70	1.40
September	.52	.56	.58	.62	.64	.66	.76	1.64	1.39
October	.47	.54	.52	.57	.58	.63	.75	1.57	1.26
November	.44	.54	.42	.53	.54	.62	.78	1.26	1.12
December	0.44	0.52	0.36	0.52	0.53	0.61	0.80	1.16	1.16

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$1.15	\$1.22	\$.48	\$.34	\$.56	\$.59	\$.94	\$.57	\$.58
February	1.10	1.24	.46	.40	.57	0.62	.92	.55	.59
March	1.18	1.30	.44	.44	.59	0.62	.85	.53	.56
April	1.34	1.44	.42	.46	.63	0.63	.80	.52	.55
May	1.43	1.54	.43	.48	.68	0.61	.84	.54	.65
June	1.46	1.56	.45	.48	.68	0.66	.94	.57	.78
July	1.57	1.40	.47	.49	.70	0.86	.93	.63	.83
August	1.62	1.28	.44	.50	.70	0.98	.95	.73	.90
September	1.40	1.13	.38	.49	.69	1.02	.85	.68	.85
October	1.18	0.82	.31	.50	.69	1.00	.65	.66	.76
November	1.16	0.60	.29	.54	.65	0.90	.61	.55	.66
December	1.19	0.50	0.32	0.56	0.58	0.91	0.55	0.56	0.68

* Prices 1910-25, U.S. Dept. of Agr. Statistical Bull. 15.
Prices 1926-27, current numbers of Crops and Markets.

Oats

The totals for the amounts of oats sold by the farmers of Minnesota were derived by the same general method and from the same sources as those used for corn. The production for each year, the percentage shipped out of the county where grown, and the actual amounts represented by these percentages, which are taken as the approximate crop year sales, are shown in Table 14.

The percentage distributions for the marketing of oats by months were based on the records of receipts on the Minneapolis market. Table 15 shows the percentage which the receipts of each month were of the total receipts for the crop year period from August to July, inclusive.

Table 14

Production of Oats, Percentage of Crop Shipped from County Where Grown, and Amount Sold by Farmers of Minnesota, 1910-1927

Crop year (August to July)	Production*	Shipped from county†	Amount sold‡
	bu.	per cent	bu.
1910-11	85,440,000	23	19,651,200
1911-12	67,214,000	20	13,442,800
1912-13	122,932,000	27	33,191,640
1913-14	124,644,000	28	34,900,320
1914-15	85,120,000	30	25,536,000
1915-16	138,675,000	35	48,536,250
1916-17	88,112,000	20	17,622,400
1917-18	120,250,000	26	31,265,000
1918-19	134,562,000	28	37,677,360
1919-20	98,728,000	20	19,745,600
1920-21	138,825,000	29	40,259,250
1921-22	99,480,000	23	22,880,400
1922-23	142,746,000	28	39,968,880
1923-24	153,254,000	27	41,378,580
1924-25	197,241,000	34	67,061,940
1925-26	200,340,000	31	62,105,400
1926-27	129,162,000	18	23,249,160
1927-28	116,580,000	18	20,984,400

* U.S. Dept. of Agr. Yearbook.

‡ For calendar year totals, see Table 16.

† See Note 14.

Table 15

Monthly Percentage Marketings of Oats, Based on Total Annual Receipts at Minneapolis for Year August to July, 1910-1927*

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	6.9	5.2	9.0	8.6	6.2	6.3	5.4	4.9	9.4
February	7.2	5.7	13.8	6.7	4.7	7.1	7.5	4.4	8.6
March	8.3	6.6	9.2	7.0	5.0	8.9	7.4	7.6	15.8
April	4.3	4.2	6.3	6.0	3.7	3.8	6.3	4.7	7.2
May	3.9	3.9	5.1	3.1	4.1	2.8	4.8	3.0	3.0
June	4.7	5.7	4.9	6.1	3.8	2.9	5.7	2.2	4.3
July	4.8	3.6	4.1	8.4	3.8	2.9	7.1	2.1	3.3
August	12.4	7.9	7.2	14.8	10.8	3.0	16.1	4.6	10.3
September	21.4	10.6	10.8	16.4	16.0	9.1	22.0	13.6	15.6
October	13.2	8.0	13.3	14.3	17.8	15.6	15.3	13.0	11.3
November	6.9	10.2	9.5	10.0	10.2	14.9	12.2	10.3	9.7
December	11.2	10.8	13.2	13.2	10.4	13.1	5.4	6.9	13.6
January	8.7	7.0	8.0	6.1	9.3	6.8	7.4	6.0	4.6
February	5.1	7.1	4.9	6.3	5.9	8.3	4.1	4.0	6.0
March	4.9	6.2	5.6	6.6	7.4	6.3	4.7	4.7	5.2
April	4.3	5.9	2.3	3.6	4.7	4.9	2.7	5.9	3.0
May	4.4	5.5	2.7	5.9	2.8	2.7	3.1	3.7	4.0
June	5.9	4.1	7.8	4.9	3.7	4.0	4.8	2.5	4.1
July	6.3	5.4	9.6	4.7	2.5	3.4	3.5	1.7	2.8
August	16.2	10.5	22.0	16.2	13.0	9.7	29.4	25.7	21.3
September	14.1	18.0	12.8	14.9	15.7	23.3	17.5	15.6	17.9
October	13.8	15.2	14.2	13.1	14.8	20.9	8.8	14.2	9.4
November	8.0	8.0	5.8	9.0	8.6	8.9	5.7	6.8	5.6
December	6.8	7.4	7.1	10.4	11.5	6.9	9.9	8.0	5.7

* Computed from records of the Minneapolis Chamber of Commerce.

Table 16
Amount of Oats Sold Monthly by the Farmers of Minnesota, 1910-1927 (Bushels)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	2,202,847	1,021,862	1,209,852	2,854,481	2,163,820	1,608,768	2,620,958	863,498	2,938,910
February	2,298,623	1,120,118	1,855,106	2,223,840	1,640,315	1,813,056	3,640,219	775,386	2,688,790
March	2,649,802	1,296,979	1,236,738	2,323,415	1,745,016	2,272,704	3,591,683	1,339,302	4,939,870
April	1,372,789	825,350	846,896	1,991,498	1,291,312	970,368	3,057,784	828,253	2,251,080
May	1,245,087	766,397	685,583	1,028,941	1,430,913	715,008	2,329,740	528,672	937,950
June	1,500,490	1,120,118	658,697	2,024,690	1,326,212	740,544	2,766,566	387,693	1,344,395
July	1,532,415	707,443	551,155	2,788,098	1,326,212	740,544	3,446,074	370,070	1,031,745
August	2,436,749	1,061,981	2,389,798	5,165,247	2,757,888	1,456,088	2,837,206	1,438,190	3,880,768
September	4,205,357	1,424,937	3,584,697	5,723,652	4,085,760	4,416,799	3,876,928	4,252,040	5,877,668
October	2,593,958	1,075,424	4,414,488	4,990,746	4,545,408	7,571,655	2,696,227	4,064,450	4,257,542
November	1,355,933	1,371,166	3,153,206	3,490,032	2,604,672	7,231,901	2,149,933	3,220,295	3,654,704
December	2,200,934	1,451,822	4,381,296	4,606,842	2,655,744	6,358,249	951,610	2,157,285	5,124,121
Total	23,594,984	13,243,597	24,967,509	39,211,482	27,573,272	35,895,684	33,964,928	20,225,134	38,927,543

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	3,277,930	1,382,192	3,220,740	1,395,704	3,717,106	2,813,743	4,962,584	3,726,324	1,138,744
February	1,921,545	1,401,938	1,972,703	1,441,465	2,358,164	3,434,422	2,749,540	2,484,216	1,484,040
March	1,846,191	1,224,227	2,254,518	1,510,106	2,957,697	2,606,851	3,151,911	2,918,954	1,285,679
April	1,620,126	1,164,990	925,963	823,694	1,878,537	2,027,550	1,810,672	3,664,219	742,020
May	1,657,804	1,086,008	1,087,000	1,349,944	1,119,129	1,117,222	2,078,920	2,297,900	991,809
June	2,222,964	809,570	3,140,221	1,121,140	1,478,849	1,655,143	3,218,973	1,552,635	1,013,849
July	2,373,674	1,066,262	3,864,888	1,075,379	999,222	1,406,872	2,347,168	1,055,792	690,593
August	3,198,787	4,227,221	5,033,688	6,474,959	5,379,215	6,505,008	18,258,988	5,812,290*	4,469,677
September	2,784,130	7,246,665	2,928,691	5,955,363	6,496,437	15,625,432	10,868,445	3,510,623	3,756,208
October	2,724,893	6,119,406	3,249,017	5,235,923	6,124,030	14,015,945	5,465,275	3,231,633	1,972,534
November	1,579,648	3,220,740	1,327,063	3,597,199	3,558,558	5,968,513	3,540,008	1,534,445	1,175,126
December	1,342,701	2,979,185	1,624,508	4,156,764	4,758,537	4,627,274	6,148,435	1,813,434	1,196,111
Total	26,550,393	31,928,404	30,629,000	34,137,660	40,825,481	61,803,975	64,600,919	33,602,465	19,916,390

* Explanation in Note 13 applies to August to December, 1926.

These monthly percentages applied to the total crop year amounts estimated to have been sold by the farmers of Minnesota result in the monthly sales of oats and the calendar year totals shown in Table 16.

The prices of oats used in this study are the 15th of the month prices paid to producers, reported by the United States Department of Agriculture. These are shown in Table 17.

Table 17
Monthly Farm Prices for Oats Received by Producers in Minnesota,*
1910-1927
(Fifteenth of the month)
(Per bushel)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$0.38	\$0.30	\$0.42	\$0.26	\$0.32	\$0.44	\$0.40	\$0.48	\$0.72
February	.40	.30	.44	.26	.32	.48	.40	.50	.80
March	.40	.29	.46	.26	.32	.49	.37	.54	.84
April	.38	.30	.48	.27	.32	.50	.38	.62	.82
May	.36	.30	.49	.29	.32	.48	.38	.65	.74
June	.36	.33	.47	.32	.32	.46	.37	.64	.69
July	.39	.37	.42	.33	.32	.44	.37	.66	.68
August	.39	.38	.32	.34	.34	.40	.39	.60	.64
September	.35	.39	.26	.34	.39	.31	.40	.52	.62
October	.32	.40	.26	.32	.40	.28	.42	.54	.60
November	.32	.40	.26	.32	.40	.30	.46	.59	.60
December	0.31	0.40	0.26	0.32	0.40	0.34	0.46	0.66	0.62

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$0.56	\$0.74	\$0.34	\$0.25	\$0.34	\$0.36	\$0.47	\$0.33	\$0.39
February	.52	.75	.32	.28	.34	.39	.45	.31	.39
March	.54	.78	.32	.29	.34	.38	.40	.31	.39
April	.60	.86	.28	.30	.36	.39	.35	.33	.38
May	.62	.92	.28	.30	.36	.39	.36	.33	.41
June	.60	.95	.29	.30	.34	.40	.42	.33	.43
July	.64	.84	.29	.27	.32	.45	.38	.33	.42
August	.64	.64	.25	.24	.30	.43	.33	.34	.41
September	.60	.53	.22	.24	.30	.40	.31	.31	.38
October	.59	.46	.22	.29	.32	.43	.29	.34	.39
November	.62	.39	.21	.32	.34	.40	.29	.35	.40
December	0.68	0.36	0.24	0.33	0.35	0.46	0.33	0.37	0.44

* Prices 1910-25, U.S. Dept. Agr. Statistical Bull. 15.

Prices 1926-27, current numbers of Crops and Markets.

Barley

The marketings of barley by Minnesota farmers were arrived at in the same general manner as those of corn and the other feed crops. The production of barley, the percentages shipped out of county where grown, and the actual amounts represented by these percentages, which are taken as the approximate crop year sales, are shown in Table 18.

Table 18

Production of Barley, Percentage of Crop Shipped from County Where Grown, and Amount Sold by Farmers of Minnesota, 1910-1927

Crop year (August to July)	Production*	Shipped from county†	Amount sold‡
	bu.	per cent	bu.
1910-11	26,985,000	..	13,398,000
1911-12	28,025,000	..	12,331,000
1912-13	42,018,000	..	18,487,920
1913-14	34,800,000	..	15,312,000
1914-15	31,694,000	56	17,748,640
1915-16	38,125,000	45	17,156,250
1916-17	26,125,000	49	12,801,250
1917-18	34,425,000	51	17,556,750
1918-19	31,694,000	45	14,262,300
1919-20	38,125,000	44	16,775,000
1920-21	22,378,000	40	8,951,200
1921-22	18,700,000	38	7,106,000
1922-23	24,062,000	38	9,143,560
1923-24	24,050,000	35	8,417,500
1924-25	29,280,000	45	13,176,000
1925-26	32,940,000	42	13,834,800
1926-27	32,675,000	30	9,802,500
1927-28	43,800,000	29	12,702,000

* U.S. Dept. of Agr. Yearbooks. † See Note 14. ‡ For calendar year totals, see Table 20.

Table 19

Monthly Percentage Marketings of Barley, Based on Combined Annual Receipts at Minneapolis and Milwaukee, for Year August to July, 1915-1926*

Month	1915	1916	1917	1918	1919	1920	1921
January	7.6	7.8	8.6	7.0	7.5	8.1	8.1
February	7.7	3.9	9.6	5.4	4.8	4.5	4.5
March	8.1	5.6	12.3	12.0	6.2	6.8	6.8
April	4.4	5.3	3.4	9.1	5.8	4.6	4.6
May	4.9	4.0	3.0	9.1	6.3	5.4	5.4
June	6.1	3.5	2.7	11.9	6.1	9.0	9.0
July	5.5	2.0	0.8	9.0	5.2	6.4	6.4
August	2.9	7.3	7.1	4.6	16.4	6.5	16.8
September	11.9	18.9	16.0	8.7	13.0	15.2	10.8
October	11.8	17.4	14.6	7.0	10.8	10.9	11.2
November	12.7	14.9	9.9	7.3	8.9	11.5	5.5
December	16.5	9.4	12.0	8.9	9.0	11.2	5.9

Month	1922	1923	1924	1925	1926	Average†
January	5.8	10.2	6.3	10.0	6.3	7.7
February	5.2	6.6	7.8	7.5	5.0	6.2
March	9.6	9.0	7.5	6.4	6.2	8.2
April	5.6	5.4	6.0	3.8	4.9	5.3
May	8.3	4.8	5.3	4.5	5.7	5.6
June	9.2	6.2	4.2	3.9	5.4	6.2
July	6.0	5.8	3.1	3.7	2.3	4.5
August	8.8	11.5	5.8	18.4	12.3	9.6
September	10.3	14.7	17.2	18.5	13.9	14.1
October	11.3	12.5	16.5	9.7	13.2	12.2
November	9.7	9.5	10.7	9.0	9.6	10.0
December	11.9	11.5	10.0	8.5	8.7	10.4

* Computed from records of the Minneapolis Chamber of Commerce and reports of receipts published in The Northwestern Miller.

† Average for 11 crop years, 1915-1926; August to December, 1926, not included.

Table 20
Amount of Barley Sold Monthly by the Farmers of Minnesota, 1910-1927 (Bushels)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	1,183,869	1,031,646	949,487	1,423,570	1,179,024	1,366,645	1,303,875	998,498	1,509,880
February	953,245	830,676	764,522	1,146,251	949,344	1,100,416	1,321,031	499,249	1,685,448
March	1,260,743	1,098,636	1,011,142	1,516,009	1,255,584	1,455,388	1,389,656	716,870	2,159,480
April	814,871	710,094	653,543	979,860	811,536	940,678	754,875	678,466	596,930
May	860,996	750,288	690,536	1,035,324	857,472	993,924	840,656	512,050	526,702
June	953,245	830,676	764,522	1,146,251	949,344	1,100,416	1,046,531	448,044	474,032
July	691,871	602,910	554,895	831,956	689,040	798,689	943,594	256,025	140,454
August	1,286,208	1,183,776	1,774,840	1,469,952	1,703,869	497,531	934,491	1,246,529	656,066
September	1,889,118	1,738,671	2,606,797	2,158,992	2,502,558	2,041,594	2,419,436	2,809,080	1,240,820
October	1,634,556	1,504,382	2,255,526	1,868,064	2,165,334	2,024,438	2,227,418	2,563,285	998,361
November	1,339,800	1,233,100	1,848,792	1,531,200	1,774,864	2,178,844	1,907,286	1,738,118	1,041,148
December	1,393,392	1,282,424	1,922,744	1,592,448	1,845,859	2,830,781	1,203,317	2,106,810	1,269,345
Total	14,261,914	12,797,279	15,797,346	16,699,877	16,683,828	17,329,344	16,292,266	14,573,024	12,298,666

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	998,361	1,258,125	725,047	412,148	932,643	530,302	1,317,600	871,592	879,049
February	770,164	805,200	402,804	369,512	603,475	656,565	988,200	691,740	700,751
March	1,711,476	1,040,050	608,682	682,176	822,920	631,312	843,264	857,758	688,311
April	1,297,869	972,950	411,755	397,936	493,752	505,050	500,688	677,905	501,721
May	1,297,869	1,056,825	483,365	589,798	438,891	446,128	592,920	788,584	443,671
June	1,697,214	1,023,275	805,608	653,752	566,901	353,535	513,864	747,079	733,923
July	1,283,607	872,300	572,877	426,360	530,326	260,942	487,512	318,200	199,030
August	2,751,100	581,828	1,193,808	804,633	968,013	764,208	2,545,603	1,205,708*	1,575,048
September	2,180,750	1,360,582	767,448	941,787	1,237,372	2,266,272	2,559,438	1,362,548	2,133,936
October	1,811,700	975,681	795,872	1,033,222	1,052,188	2,174,040	1,341,976	1,293,930	1,282,902
November	1,492,975	1,029,388	390,830	886,925	799,662	1,409,832	1,245,132	941,040	863,736
December	1,509,750	1,002,534	419,254	1,088,084	968,012	1,317,600	1,175,958	852,818	978,054
Total	18,802,835	11,978,738	7,577,350	8,286,333	9,414,155	11,315,786	14,112,155	10,608,902	10,980,132

* Explanation in Note 13 applies to August to December, 1926.

The percentage distributions for the marketing of barley by months were based on the combined receipts of barley at the Minneapolis and Milwaukee markets. Table 19 shows the percentage which the combined receipts for each month at the two markets constituted of the combined total receipts for the crop years from August to July, inclusive. The data on which to base these distributions were not available for the early years included in the index. An average of the percentage distributions for 1915 to 1926 has been substituted in these instances.

These percentage distributions, applied to the annual crop year marketings, result in monthly sales of barley and calendar year totals as shown in Table 20.

The prices of barley used in this study are the 15th of the month prices received by producers in Minnesota as reported by the United States Department of Agriculture. These prices are shown in Table 21.

Table 21
Monthly Farm Prices for Barley Received by Producers in Minnesota,*
1910-1927
(Fifteenth of the month)
(Per bushel)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$.53	\$.70	\$.96	\$.44	\$.46	\$.56	\$.58	\$.89	\$1.34
February	.54	.72	0.98	.44	.47	.62	.60	0.94	1.55
March	.54	.78	0.98	.43	.46	.62	.56	0.99	1.73
April	.50	.88	1.00	.42	.44	.62	.58	1.13	1.62
May	.48	.86	0.99	.44	.44	.62	.60	1.20	1.32
June	.50	.81	0.87	.46	.42	.60	.60	1.10	1.04
July	.52	.80	0.67	.44	.41	.60	.59	1.14	0.96
August	.55	.82	0.49	.48	.48	.56	.66	1.16	0.89
September	.57	.88	0.43	.54	.52	.46	.74	1.10	0.82
October	.56	.94	0.45	.52	.49	.44	.78	1.14	0.78
November	.58	.96	0.44	.50	.52	.47	.84	1.11	0.78
December	0.64	0.95	0.42	0.46	0.52	0.51	0.86	1.22	0.78

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$.76	\$1.28	\$.53	\$.38	\$.47	\$.49	\$.77	\$.52	\$.56
February	0.75	1.24	.48	.42	.47	.51	.76	.50	.57
March	0.80	1.26	.48	.44	.47	.54	.75	.49	.58
April	0.91	1.36	.46	.46	.48	.55	.70	.49	.60
May	0.98	1.42	.44	.47	.48	.58	.71	.51	.66
June	0.98	1.34	.45	.46	.43	.58	.71	.51	.75
July	1.03	1.14	.46	.44	.46	.62	.72	.52	.66
August	1.08	0.91	.42	.40	.44	.64	.62	.52	.62
September	1.04	0.79	.40	.40	.44	.63	.55	.48	.62
October	1.05	0.72	.38	.43	.45	.73	.51	.51	.63
November	1.12	0.66	.34	.46	.45	.67	.51	.52	.62
December	1.23	0.60	0.34	0.47	0.48	0.72	0.52	0.52	0.71

* Prices 1910-25, U.S. Dept. of Agr. Statistical Bull. 15.
Prices 1926-27, current numbers of Crops and Markets.

Rye

The amount of rye sold by the farmers of Minnesota was computed according to the methods outlined for wheat. The estimated amounts sold annually were derived by subtracting a seed allowance of one and one half bushels per acre for the acreage planted in the following year, from the annual production figure reported by the United States Department of Agriculture. This figure, when taken to represent annual sales has the same defect as the wheat estimate. In the case of rye the overestimate caused by not making an allowance for the amount fed and wasted, may be as high as 8 or 10 per cent. This estimate of error is higher than for wheat because more of the rye crop is fed on the farm. The production figures, amount necessary for seed, and estimated amount sold in each crop year are shown in Table 22.

Table 22
Production of Rye, Seed Requirement, and Amount Sold by Farmers of
Minnesota, 1910-1927
(Bushels)

Crop year (August to July)	Production*	Seed requirement	Amount sold†
1910-11	4,352,000	360,000	3,992,000
1911-12	4,483,000	393,000	4,095,000
1912-13	6,026,000	450,000	5,576,000
1913-14	5,700,000	418,500	5,281,500
1914-15	5,245,000	450,000	4,795,000
1915-16	6,825,000	502,500	6,322,500
1916-17	5,250,000	615,000	4,635,000
1917-18	6,716,000	652,500	6,063,500
1918-19	8,700,000	783,000	7,917,000
1919-20	8,363,000	720,000	7,643,000
1920-21	8,806,000	960,000	7,846,000
1921-22	11,200,000	1,731,000	9,469,000
1922-23	21,926,000	1,368,000	20,558,000
1923-24	12,312,000	1,048,500	11,263,500
1924-25	14,718,000	672,000	14,046,000
1925-26	5,824,000	550,500	5,273,500
1926-27	5,940,000	613,500	5,326,500
1927-28	7,009,000	670,500	6,338,500

* U.S. Dept. of Agr. Yearbooks.

† For calendar year totals, see Table 24.

Table 23
 Monthly Percentage Marketings of Rye, Based on Total Annual Receipts at
 Minneapolis for Year August to July, 1910-1927*

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	7.8	8.3	5.5	6.7	5.2	7.6	5.9	4.0	8.2
February	6.5	5.0	4.1	5.6	4.7	6.1	6.1	2.4	9.2
March	5.3	8.9	5.1	4.6	5.1	3.3	5.1	5.8	9.2
April	3.9	4.6	3.1	3.9	4.1	1.7	3.6	4.3	5.4
May	2.7	5.2	3.4	2.9	4.8	1.7	2.7	3.3	2.5
June	2.2	2.2	3.6	3.1	4.1	1.5	2.6	2.9	1.8
July	1.8	4.2	2.2	3.4	2.0	1.0	2.3	1.4	0.9
August	10.5	16.0	13.8	12.7	13.0	3.9	4.1	7.2	5.7
September	15.6	14.3	17.8	19.4	20.3	10.6	21.8	15.3	13.8
October	13.0	18.4	16.7	18.6	14.9	20.6	20.9	17.2	5.3
November	10.0	15.7	12.8	10.7	14.2	20.9	19.3	12.6	7.5
December	12.5	8.6	8.7	8.6	14.6	15.9	9.8	10.6	18.5

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	3.9	9.7	10.3	4.6	16.0	5.4	5.9	5.3	7.5
February	2.4	7.9	6.6	5.6	8.1	7.0	2.6	4.4	8.9
March	17.4	8.3	7.5	7.4	5.7	5.2	3.5	5.0	4.3
April	8.7	9.1	3.7	3.2	4.7	2.9	2.3	2.5	3.8
May	6.5	4.2	5.0	5.1	2.7	2.9	2.3	3.7	5.6
June	4.5	4.2	5.5	4.5	4.2	6.7	3.7	3.3	5.7
July	5.6	5.1	7.9	12.0	2.3	5.0	1.4	3.0	3.6
August	12.5	11.6	15.5	11.8	17.4	15.5	12.2	11.6	19.3
September	13.6	12.2	11.4	8.4	16.2	19.4	28.9	16.2	16.0
October	11.4	10.6	17.6	12.5	11.7	29.3	10.6	12.3	12.1
November	6.7	7.3	5.1	8.2	9.2	8.8	9.5	9.1	7.7
December	7.2	11.8	7.9	15.5	10.4	5.3	11.6	11.4	5.5

* Computed from records of the Minneapolis Chamber of Commerce.

The percentage distributions for the marketing of rye were based on receipts at the Minneapolis market. The percentages which the receipts for each month constituted of the total receipts for the crop year August to July are shown in Table 23.

When the percentage distributions are applied to the annual amounts sold in each crop year, monthly sales and calendar year totals of the amounts shown in Table-24-result.

The prices of rye used in this study are the 15th of the month prices paid to producers, reported by the United States Department of Agriculture. These are shown in Table 25.

Table 24
Amount of Rye Sold Monthly by the Farmers of Minnesota, 1910-1927 (Bushels)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	314,855	331,336	225,225	373,592	274,638	364,420	373,028	185,400	497,207
February	262,379	199,600	167,895	312,256	248,231	292,495	385,672	111,240	557,842
March	213,940	355,288	208,845	256,496	269,356	158,235	322,448	268,830	557,842
April	157,427	183,632	126,945	217,464	216,542	31,515	227,610	199,305	327,429
May	108,988	207,584	139,230	161,704	253,512	81,515	170,708	152,955	151,588
June	88,805	87,824	147,420	172,856	216,542	71,925	164,385	134,415	109,143
July	72,659	167,664	90,090	189,584	105,630	47,950	145,417	64,890	54,572
August	419,160	655,200	769,488	670,750	623,350	246,578	190,035	436,572	451,269
September	622,752	585,585	992,528	1,024,611	973,385	670,185	1,010,430	927,715	1,092,546
October	518,960	753,480	931,192	982,359	714,455	1,302,435	968,715	1,042,922	419,601
November	399,200	642,915	713,728	565,121	680,890	1,321,403	894,555	764,001	593,775
December	499,000	352,170	485,112	454,209	700,070	1,005,278	454,230	642,731	1,464,645
Total	3,678,125	4,522,278	4,997,698	5,381,002	5,276,601	5,643,934	5,307,232	4,930,976	6,277,459

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	308,763	741,371	808,138	435,574	3,289,280	608,229	828,714	279,496	469,039
February	190,008	603,797	517,836	530,264	1,665,198	788,445	365,196	232,034	557,910
March	1,377,558	634,369	588,450	700,706	1,171,806	585,702	491,610	263,675	209,080
April	688,779	695,513	290,302	303,008	966,226	326,642	323,058	131,838	236,988
May	514,605	321,006	392,300	482,919	555,066	326,642	323,058	195,120	353,014
June	356,265	321,006	431,530	426,105	863,436	754,654	519,702	174,026	357,951
July	443,352	389,793	619,834	1,136,280	472,834	563,175	196,644	158,205	224,645
August	955,375	910,136	1,467,695	2,425,844	1,959,849	2,177,130	643,367	546,034*	1,223,330
September	1,039,448	957,212	1,079,466	1,726,872	1,824,687	2,724,924	1,524,042	766,209	1,014,160
October	871,302	831,676	1,666,544	2,569,750	1,317,830	4,115,478	558,991	576,859	766,958
November	512,081	572,758	482,919	1,685,756	1,036,242	1,236,048	500,983	431,543	488,064
December	550,296	925,828	748,051	3,186,490	1,171,404	744,438	611,726	537,227	348,617
Total	7,807,832	7,904,465	9,093,065	15,609,568	16,293,858	14,951,507	6,887,091	4,292,266	6,309,756

* Explanation in Note 13 applies to August to December, 1926.

Table 25
 Monthly Farm Prices for Rye Received by Producers in Minnesota,* 1910-1927
 (Fifteenth of the month)
 (Per bushel)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$.65	\$.70	\$.82	\$.48	\$.48	\$1.00	\$.86	\$1.24	\$1.76
February	.66	.70	.81	.50	.48	1.06	0.86	1.28	1.98
March	.66	.72	.80	.50	.50	1.04	0.82	1.36	2.38
April	.65	.74	.80	.50	.50	1.02	0.81	1.56	2.51
May	.64	.78	.80	.52	.50	1.03	0.82	1.88	2.12
June	.64	.79	.76	.51	.50	1.01	0.84	1.98	1.74
July	.66	.75	.68	.50	.50	0.96	0.83	1.84	1.62
August	.66	.74	.58	.52	.62	0.88	0.92	1.65	1.58
September	.66	.77	.54	.53	.76	0.82	1.05	1.63	1.52
October	.64	.80	.54	.50	.78	0.82	1.12	1.68	1.47
November	.64	.80	.52	.48	.84	0.84	1.22	1.66	1.48
December	0.66	0.79	0.49	0.48	0.92	0.82	1.24	1.69	1.48

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$.1.42	\$1.52	\$1.27	\$.67	\$.70	\$.56	\$1.32	\$.88	\$.82
February	1.32	1.44	1.27	.76	.68	0.58	1.34	.80	.87
March	1.36	1.46	1.20	.84	.67	0.54	1.26	.71	.86
April	1.50	1.69	1.12	.86	.68	0.51	0.97	.71	.84
May	1.45	1.78	1.10	.87	.66	0.52	1.02	.69	.91
June	1.32	1.82	1.08	.80	.56	0.55	1.02	.75	.96
July	1.36	1.74	0.98	.68	.50	0.63	0.86	.84	.91
August	1.38	1.65	0.90	.58	.51	0.77	0.91	.85	.79
September	1.31	1.64	0.85	.54	.53	0.77	0.75	.79	.80
October	1.26	1.52	0.75	.58	.55	1.09	0.65	.80	.79
November	1.26	1.34	0.64	.64	.54	1.12	0.65	.80	.84
December	1.42	1.22	0.64	0.69	0.54	1.17	0.86	0.78	0.88

* Prices 1910-25, U.S. Dept. of Agr. Statistical Bull. 15.
 Prices 1926-27, current numbers of Crops and Markets.

Flax

The quantity of flax sold has been estimated from the annual production reported for the state by the United States Department of Agriculture, minus a seed allowance of one-half bushel per acre for the acreage planted in the following year. The assumption that sales of flax equal the total production less the seed requirement is valid in this case, because no flax is used on farms for feeding purposes. The figures for production, seed allowance, and sales by crop years are shown in Table 26.

The monthly percentage distributions for flax computed on the basis of the receipts at Minneapolis for the crop year August to July, are shown in Table 27.

The estimated amounts sold by months and the calendar year totals which result when these percentages are applied to the annual crop year marketings are shown in Table 28.

Table 26
 Production of Flax, Seed Requirement, and Amount Sold by the Farmers of
 Minnesota, 1910-1927
 (Bushels)

Crop year (August to July)	Production*	Seed requirement	Amount sold†
1910-11	2,828,000	200,000	2,628,000
1911-12	3,200,000	202,000	2,998,000
1912-13	4,121,000	175,000	3,946,000
1913-14	3,150,000	157,500	2,992,500
1914-15	2,930,000	150,000	2,780,000
1915-16	3,150,000	137,500	3,012,500
1916-17	1,700,000	110,000	1,590,000
1917-18	2,090,000	150,000	1,940,000
1918-19	3,536,000	160,000	3,376,000
1919-20	2,304,000	160,000	2,144,000
1920-21	3,040,000	157,000	2,883,000
1921-22	2,983,000	155,000	2,828,000
1922-23	3,100,000	263,500	2,836,500
1923-24	5,270,000	356,000	4,914,000
1924-25	8,117,000	370,000	7,747,000
1925-26	7,400,000	455,000	6,945,000
1926-27	7,652,000	378,500	7,273,500
1927-28	7,343,000	363,000	6,980,000

* U.S. Dept. of Agr. Yearbooks.

† For calendar year totals, see Table 28.

Table 27
 Monthly Percentage Marketings of Flax, Based on Total Annual Receipts at
 Minneapolis for Year August to July, 1910-1927*

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	9.7	4.2	6.2	11.8	8.9	8.3	4.3	6.3	8.6
February	6.7	5.4	5.3	10.2	6.0	6.2	5.4	5.1	9.0
March	8.3	4.1	4.6	8.6	7.4	5.3	11.0	5.1	8.5
April	4.4	2.0	5.4	6.1	3.4	2.0	6.6	4.5	4.6
May	2.2	2.1	6.6	4.2	1.7	1.1	6.0	3.0	5.7
June	1.6	2.2	5.1	4.2	2.1	2.0	5.0	6.6	10.5
July	1.2	2.4	5.7	3.5	2.9	3.3	6.0	3.8	3.4
August	2.4	2.2	1.3	3.5	1.6	1.6	2.3	1.5	1.3
September	15.2	6.6	5.7	9.5	12.5	4.7	3.7	4.3	7.1
October	27.3	14.1	13.5	21.2	26.2	14.1	27.7	15.9	12.2
November	23.1	18.2	12.4	18.9	17.3	20.4	19.7	18.0	11.4
December	9.5	19.9	18.3	14.3	14.1	15.1	12.2	10.0	10.5
Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	7.4	6.5	4.1	6.8	7.1	3.7	8.7	3.3	4.7
February	6.3	6.9	3.9	4.6	4.0	2.6	5.2	2.4	3.6
March	11.0	8.1	6.2	5.8	5.1	2.4	4.7	2.8	3.1
April	5.8	3.1	6.4	4.7	7.6	2.2	2.6	3.2	1.9
May	5.8	5.9	8.5	6.7	6.4	3.0	2.8	3.8	2.9
June	12.5	9.9	7.8	4.9	7.6	3.0	3.1	2.3	3.1
July	8.6	10.5	5.0	3.5	5.7	2.7	2.0	2.6	1.6
August	3.7	4.4	7.2	5.0	10.5	1.9	9.7	9.3	3.3
September	14.3	9.6	12.4	15.0	27.3	15.8	29.4	17.3	33.3
October	10.9	21.8	27.0	17.0	20.1	24.2	24.3	32.6	29.1
November	10.8	11.9	8.7	9.5	13.5	19.4	9.8	12.4	8.0
December	9.4	10.5	7.9	10.0	9.0	9.6	6.4	7.5	3.7

* Computed from records of the Minneapolis Chamber of Commerce.

Table 28
Amount of Flax Sold Monthly by the Farmers of Minnesota, 1910-1927 (Bushels)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	299,585	110,376	185,876	465,628	266,333	230,740	129,538	100,170	166,840
February	206,930	141,912	158,894	402,492	179,550	172,360	162,675	81,090	174,600
March	256,346	107,748	137,908	339,356	221,445	147,340	331,375	81,090	164,900
April	135,894	52,560	161,892	240,706	101,745	55,600	198,825	71,550	89,240
May	67,947	55,188	197,868	165,732	50,873	30,580	180,750	104,940	110,580
June	49,416	57,816	152,898	165,732	62,843	55,600	150,625	104,940	203,700
July	37,062	63,072	170,886	138,110	86,782	91,740	180,750	60,420	65,960
August	63,072	65,956	51,298	104,737	44,480	48,200	36,570	29,100	43,888
September	399,456	197,868	224,922	284,288	347,500	141,587	58,830	83,420	239,696
October	717,444	422,718	532,710	634,410	728,360	424,763	440,430	308,460	411,872
November	607,068	545,636	489,304	565,583	480,940	614,550	313,230	349,200	384,864
December	249,660	596,602	722,118	427,927	391,980	454,886	193,980	194,000	354,480
Total	3,089,880	2,417,452	3,186,574	3,934,701	2,962,831	2,467,946	2,377,578	1,511,140	2,410,620

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	249,824	139,360	118,203	192,304	201,391	181,818	673,989	229,185	326,322
February	212,688	147,936	112,437	130,088	113,460	127,764	402,844	166,680	249,455
March	371,360	173,664	178,746	164,024	144,662	117,936	364,109	194,460	214,647
April	195,808	66,464	184,512	132,916	215,574	108,108	201,422	222,240	131,979
May	195,808	126,496	245,055	189,476	181,536	147,420	216,916	263,910	201,594
June	422,000	212,256	224,874	138,572	215,574	147,420	240,157	159,735	214,647
July	290,336	225,120	144,150	98,980	161,681	132,678	154,940	180,570	111,674
August	79,328	126,852	203,616	141,825	515,970	147,193	673,665	688,415*	230,340
September	306,592	276,768	350,672	425,475	1,341,522	1,224,026	2,041,830	1,271,543	2,324,340
October	233,696	628,494	763,560	482,205	987,714	1,874,774	1,687,635	2,397,304	2,031,180
November	231,552	343,077	246,036	269,468	663,390	1,502,918	680,610	915,187	558,400
December	201,536	302,715	223,412	283,650	442,260	743,712	444,480	550,732	258,260
Total	2,990,526	2,769,202	2,995,273	2,648,983	5,184,734	6,455,766	7,782,597	7,239,961	6,852,838

* Explanation in Note 13 applies to August to December, 1926.

The prices of flax used in this study are the 15th of the month prices paid to producers, reported by the United States Department of Agriculture. These are shown in Table 29.

Table 29
Monthly Farm Prices for Flax Received by Producers in Minnesota,*
1910-1927
(Fifteenth of the month)
(Per bushel)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$1.82	\$2.30	\$1.93	\$1.11	\$1.31	\$1.54	\$2.00	\$2.55	\$3.24
February	1.92	2.40	1.89	1.16	1.34	1.66	2.12	2.56	3.43
March	1.92	2.38	1.88	1.16	1.36	1.66	2.10	2.60	3.66
April	2.04	2.38	1.94	1.14	1.37	1.70	1.99	2.83	3.82
May	2.07	2.34	1.99	1.15	1.38	1.74	1.84	3.01	3.73
June	1.94	2.13	1.98	1.15	1.40	1.66	1.72	2.92	3.52
July	2.04	1.95	1.82	1.18	1.48	1.53	1.74	2.82	3.83
August	2.21	1.97	1.68	1.25	1.50	1.50	1.87	2.91	4.05
September	2.32	2.08	1.58	1.28	1.38	1.50	1.94	3.08	3.87
October	2.34	2.12	1.43	1.25	1.25	1.58	2.15	3.06	3.62
November	2.30	1.98	1.28	1.23	1.24	1.72	2.36	2.96	3.40
December	2.26	1.87	1.14	1.26	1.34	1.82	2.48	3.06	3.36

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$3.19	\$4.56	\$1.64	\$1.74	\$2.35	\$2.20	\$2.80	\$2.29	\$1.97
February	3.18	4.71	1.58	2.02	2.51	2.30	2.80	2.22	2.00
March	3.39	4.64	1.52	2.24	2.65	2.25	2.70	2.08	1.97
April	3.56	4.48	1.40	2.32	2.85	2.20	2.55	2.11	1.99
May	3.76	4.28	1.44	2.42	2.80	2.30	2.60	2.11	2.09
June	4.18	3.82	1.54	2.38	2.50	2.20	2.52	2.08	2.08
July	4.89	3.17	1.54	2.22	2.30	2.20	2.32	2.13	2.02
August	5.18	2.87	1.68	1.99	2.15	2.16	2.30	2.20	2.08
September	4.62	2.90	1.69	1.89	2.13	2.00	2.30	2.18	2.01
Oct.	4.04	2.68	1.60	2.06	2.16	2.14	2.37	2.01	1.96
November	4.18	2.14	1.50	2.18	2.14	2.30	2.33	1.99	1.90
December	4.42	1.74	1.58	2.23	2.27	2.50	2.37	2.00	1.90

* Prices 1910-25, U.S. Dept. of Agr. Statistical Bull. 15.
Prices 1926-27, current numbers of Crops and Markets.

Hay

The amount of hay sold by the farmers of Minnesota has been based on the percentage of the crop sold, as reported by the census for 1909 and 1919. For these years 4.6 and 6.1 per cent, respectively, were reported. In order to estimate the amount of the crop sold in the intervening years, straight-line interpolation has been applied to these percentages. For the years 1922, 1923, and 1924, the United States Department of Agriculture has reported that 8 per cent of the hay crop was shipped out of the county where grown. No estimate has been made since 1924 and an amount of 8 per cent has, therefore, been used for the years 1920 to 1927. The total production and the amount of sales estimated in this way are given in Table 30.

Table 30
Production of Hay, Percentage and Amount of Crop Sold by the Farmers of
Minnesota, 1910-1927

Crop year (August to July)	Production*	Percentage sold	Amount sold†
	Tons		Tons
1909-10	4.6‡
1910-11	3,189,000	4.8	153,072
1911-12	2,974,000	4.9	145,726
1912-13	4,707,000	5.1	240,006
1913-14	4,613,000	5.2	239,876
1914-15	6,073,000	5.4	327,942
1915-16	5,812,000	5.5	319,660
1916-17	6,384,000	5.7	563,888
1917-18	5,192,000	5.8	301,136
1918-19	4,685,000	6.0	281,100
1919-20	6,746,000	6.1‡	411,505
1920-21	5,884,000	8.0	470,720
1921-22	5,639,000	8.0	451,120
1922-23	5,639,000	8.0§	451,120
1923-24	4,869,000	8.0	389,520
1924-25	6,319,000	8.0	505,520
1925-26	6,227,000	8.0	498,160
1926-27	4,233,000	8.0	338,640
1927-28	7,906,000	8.0	632,480

* U.S. Dept. of Agr. Yearbooks.

† For calendar year totals, see Table 32.

‡ 14th Census—Agriculture, vol. V, p. 722.

§ Percentage shipped from county where grown, reported in Crops and Markets.

The distribution of sales of hay by months has been based on the percentage which the receipts for each month at Minneapolis constituted of the total receipts of the crop year from August to July. These percentage distributions are shown in Table 31.

These distributions were applied to the annual crop year sales, and the amounts found for each month together with calendar year totals are shown in Table 32.

The United States Department of Agriculture has reported the 15th-of-the-month price for five classes of hay, namely, alfalfa, timothy, clover, prairie, and loose, since October, 1914. For this period an unweighted average of all five quotations for a given month has been taken as the general price of hay received by Minneapolis producers. For the period prior to October, 1914, the department reported the price of loose hay only. For the period before October, 1914, monthly prices for hay of all kinds were estimated as follows: The ratio between the quotations for loose hay and the monthly average of the prices of the five classes of hay was computed for each month in the period 1915 to 1917. The average of these ratios for each calendar month was calculated and applied to the monthly quotations for loose hay from 1910 to October, 1914, in order to obtain monthly quotations

for this period, which would correspond to the general hay quotations computed for subsequent years. The hay prices derived by these methods are shown in Table 33.

Table 31
Monthly Percentage Marketings of Hay, Based on Total Annual Receipts at
Minneapolis for Year August to July, 1910-1927*

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	6.7	6.6	11.0	10.1	8.8	8.9	4.5	7.2	12.2
February	8.5	14.4	14.7	9.3	7.2	6.7	8.5	8.8	9.9
March	8.5	11.2	14.0	8.1	10.0	9.2	9.9	10.2	13.7
April	6.5	7.9	9.8	5.2	5.2	8.0	5.4	6.9	5.0
May	7.2	7.7	7.0	5.0	5.3	8.6	8.7	5.4	4.9
June	6.3	3.9	5.4	7.0	6.4	7.3	9.2	8.2	5.4
July	11.0	3.8	2.9	5.1	8.9	2.5	4.6	5.7	5.2
August	9.3	4.8	9.2	5.8	8.2	10.9	5.2	4.9	6.8
September	7.0	4.8	10.2	5.2	8.2	6.5	8.8	6.2	7.8
October	9.3	6.7	11.1	12.3	11.8	8.3	12.2	10.9	8.0
November	6.4	7.8	11.0	12.7	10.0	11.5	12.6	11.3	6.9
December	12.4	11.1	8.6	12.2	10.7	12.0	8.7	10.4	10.6
Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	10.2	10.7	13.2	9.8	10.6	8.7	11.5	10.8	15.8
February	13.0	11.0	9.0	9.4	8.4	10.0	9.5	8.9	12.1
March	10.1	8.5	10.2	10.9	12.3	13.2	10.4	8.0	14.6
April	5.8	6.0	7.6	8.2	5.9	7.3	7.8	6.3	6.2
May	10.0	9.3	5.8	6.4	6.7	5.4	5.8	7.9	7.9
June	4.9	5.3	5.3	4.9	5.9	6.5	5.0	7.2	3.5
July	6.0	6.5	4.0	9.3	9.0	6.8	7.4	6.2	1.9
August	5.6	8.2	8.1	7.5	6.0	6.2	7.9	5.5	5.2
September	10.4	6.0	6.3	7.9	6.1	5.8	4.6	5.6	3.5
October	10.6	9.2	11.0	8.6	9.6	12.5	8.2	9.2	11.1
November	6.9	9.6	6.7	8.0	9.2	8.6	12.9	8.7	7.7
December	9.2	12.0	9.1	9.1	11.1	9.6	11.1	9.0	7.2

* Computed from records of the Minneapolis Chamber of Commerce.

Table 32

Amount of Hay Sold Monthly by the Farmers of Minnesota, 1910-1927 (Tons)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	17,355	10,103	16,030	24,246	21,109	29,187	14,385	26,200	36,739
February	22,017	22,042	21,422	22,325	17,271	21,972	27,171	32,022	29,812
March	22,017	17,144	20,402	19,445	23,988	30,171	31,646	37,117	41,256
April	16,837	12,093	14,281	12,483	12,474	26,235	17,262	25,108	15,057
May	18,650	11,787	10,201	12,003	12,713	28,203	27,810	19,650	14,756
June	16,319	5,970	7,869	16,804	15,352	23,940	29,409	29,839	16,261
July	28,493	5,817	4,226	12,243	21,349	8,199	14,704	20,742	15,659
August	14,236	6,995	22,085	13,913	26,891	34,843	18,922	14,756	19,115
September	10,715	6,995	24,486	12,474	26,891	20,778	32,022	18,670	21,926
October	14,236	9,764	26,646	29,505	38,697	26,532	44,394	32,824	22,488
November	9,797	11,367	26,406	30,464	32,794	36,761	45,850	34,028	19,396
December	18,981	16,176	20,645	29,265	35,090	38,359	31,658	31,318	29,797
Total	209,653	136,253	214,699	235,170	284,619	325,180	335,233	322,274	282,262
Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	28,672	44,031	62,135	44,210	47,819	33,888	58,135	53,801	53,971
February	36,543	45,266	42,364	42,405	37,894	38,952	48,024	44,336	41,272
March	28,391	34,978	48,013	49,172	55,488	51,417	52,574	39,853	49,738
April	16,304	24,690	35,775	36,992	26,616	28,435	39,431	31,384	21,165
May	23,110	38,270	27,302	28,872	30,225	21,034	29,320	39,355	26,880
June	13,774	21,810	24,948	22,105	26,616	25,319	25,276	35,868	11,852
July	16,866	26,748	18,829	41,954	40,601	26,487	37,408	30,886	6,772
August	23,044	38,599	36,541	33,834	23,371	31,342	39,355	18,625*	32,889
September	42,797	28,243	28,421	35,638	23,761	29,320	22,915	18,625	22,137
October	43,620	43,306	49,623	38,796	37,394	63,190	40,849	30,478	70,205
November	28,394	45,189	30,225	36,090	35,836	43,475	64,263	28,784	48,701
December	37,859	56,486	41,052	41,052	43,237	48,530	55,296	30,478	45,539
Total	344,374	447,616	445,228	451,120	428,858	441,389	512,846	402,473	431,121

* Explanation in Note 13 applies to August to December, 1926.

Table 33
 Monthly Farm Prices for Hay Received by Producers in Minnesota,* 1910-1927
 (Fifteenth of the month)
 (Per ton)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	7.93	\$12.61	\$14.45	\$ 8.06	\$ 7.87	\$ 8.32	\$ 8.48	\$ 8.40	\$16.00
February	7.74	12.30	13.44	7.38	7.74	8.44	8.30	8.74	16.06
March	7.25	11.70	12.29	7.25	7.72	8.40	8.82	9.12	15.72
April	6.61	11.69	12.60	7.41	7.47	8.70	8.92	10.18	14.80
May	6.56	12.08	12.71	7.48	8.11	8.82	9.60	10.74	14.22
June	7.91	12.57	11.92	7.79	8.50	8.72	9.92	10.76	14.06
July	10.74	13.22	9.97	7.61	7.57	8.72	8.51	10.34	13.58
August	12.19	13.28	7.59	7.30	7.68	8.18	7.86	10.08	13.64
September	12.27	13.10	7.20	7.67	7.42	8.16	7.98	11.30	15.54
October	11.84	12.55	7.85	7.74	8.26	8.18	8.12	12.90	15.16
November	10.62	12.60	7.51	7.40	8.06	7.42	8.16	13.20	15.82
December	11.17	13.69	7.66	7.78	8.06	7.80	8.08	13.56	16.90

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$16.78	\$17.58	\$13.06	\$10.10	\$11.14	\$12.46	\$10.94	\$11.18	\$15.48
February	17.58	18.30	11.98	10.56	10.68	12.60	10.86	10.96	16.90
March	17.82	18.10	11.28	10.40	11.06	10.22	11.72	11.34	16.70
April	19.72	18.50	10.76	10.76	11.56	12.00	11.68	11.20	16.70
May	21.64	19.78	11.12	10.96	12.42	11.90	11.28	11.42	17.12
June	22.16	18.58	10.22	10.66	12.16	11.82	11.40	11.52	15.50
July	17.98	17.32	10.42	10.54	11.52	11.84	10.72	12.78	11.90
August	16.74	16.28	10.08	11.08	11.46	11.96	10.56	13.20	10.60
September	16.10	15.86	10.06	9.92	11.70	12.22	10.72	13.24	10.12
October	15.94	15.12	10.06	10.16	12.66	11.58	10.46	14.48	9.48
November	16.32	14.49	10.06	10.42	12.68	12.04	10.40	14.62	8.98
December	17.80	13.78	10.02	10.92	12.58	11.52	11.60	15.46	9.28

* U.S. Dept. of Agr. Statistical Bull. 15 and current numbers of Crops and Markets. Unweighted average based on prices of alfalfa, clover, timothy, prairie, and loose hay, reported by U.S. Dept. of Agr., October, 1914-1927. Price previous to October, 1914, estimated as explained in text.

Potatoes

Data on potatoes consist chiefly of records of annual production and monthly car-load shipments by states. Figures of car-load shipments are available for Minnesota since July, 1917. Sales of potatoes, however, consist of car-load shipments together with the amount hauled by farmers directly to towns and cities. As no data are available on the latter point, a detailed study of the crop years 1920 to 1924 was made in an effort to discover what proportion of the potato crop on the average is trucked into cities directly by farmers. To do this, an estimate of the total urban consumption of potatoes in Minnesota had to be derived. The first step in approximating this amount was the reduction of the population figure to the equivalent adult male basis in order that the annual consumption of potatoes of the average adult male could be applied. The urban population of the state in 1920 was reduced to equivalent adult males by applying weights derived

from those adopted by the United States Bureau of Labor Statistics.¹⁵ As the census classification of the Minnesota population by age groups does not conform in all respects to the classification of ages used by the Bureau of Labor Statistics, the weights had to be adjusted to correspond with the census population.¹⁶ As a result of this calculation, it was found that the urban population of the state in 1920 was equivalent to 882,738 adult males. The ratio of this number of adult males to the total urban population in 1920 was .8394, which was applied to the estimates of urban population for the years 1921, 1922, 1923, and 1924 in order to secure the approximate number of equivalent adult males in Minnesota in each of these years.

According to the cost-of-living survey of the United States Bureau of Labor Statistics in 1918-19, the average annual consumption of potatoes by the equivalent adult male in the north central states was 251.67 pounds or 4.19 bushels.¹⁷ The estimated total urban consumption for Minnesota for each year from 1920 to 1924 was obtained by multiplying this amount by the estimated number of equivalent adult males for each year. This total consumption of potatoes was supplied not alone by amounts trucked in, but also by car-load shipments unloaded within the state, for which data are available. When the amount of car-lot unloads was subtracted from this estimated total consumption, the remainder represented the approximate amount trucked into cities and towns by the farmers. This amount was found to be close to 8 per cent of the total annual production in the years for which the detailed study was made, 1920-24. Consequently, for the years for which records of car-lot shipments are available (beginning with July, 1917), 8 per cent of the annual production has been added to the car-lot shipments to make up the total sales by the farmers. In all of the computations, car-lot shipments have been reduced to bushels on the basis of an average of 600 bushels to the car, which, according to marketing specialists, is considered the typical size of car by potato dealers.

A further observation of the data compiled for the years 1920-24 was that the car-lot shipments, as a whole, amounted to an average of 46.7 per cent of the total production. If 8 per cent of the total annual production is ordinarily hauled into towns and cities by the farmers themselves, then approximately an average of 55 per cent of the total annual crop is marketed. In years before car-lot shipments were recorded, 1910-1917, total sales of potatoes were, therefore, estimated

¹⁵ United States Bureau of Labor Statistics, Bull. 357, p. 70. The weights are as follows: Adult male 1.00; adult female 0.90; child 11 to 14 years 0.90; child 7 to 10 years 0.75; child 4 to 6 years 0.40; child 3 years or under 0.15.

¹⁶ For use in this study, adjustment of weights to conform with census age groups were made as follows: Adult male 1.00; adult female 0.90; child 10 to 14 years 0.85; child 5 to 9 years 0.61; child under 5 years 0.21.

¹⁷ United States Bureau of Labor Statistics, Bull. 357, p. 113.

by taking 55 per cent of the annual production reported by the United States Department of Agriculture.

The total production of potatoes in the state and the total annual sales by farmers, estimated by the methods outlined, are shown in Table 34. These amounts apply to the crop year, as indicated.

Table 34
Production of Potatoes, and Amount Sold by the Farmers of Minnesota,
1910-1927
(Bushels)

Crop year (July to June)	Production*	Amount sold†
1910-11	13,420,000	7,381,000
1911-12	25,875,000	14,231,250
1912-13	33,075,000	18,191,250
1913-14	30,250,000	16,637,500
1914-15	30,780,000	16,929,000
1915-16	30,210,000	16,615,500
1916-17	16,800,000	9,240,000
1917-18	33,600,000	12,564,000
1918-19	32,760,000	16,726,000
1919-20	28,884,000	15,544,000
1920-21	31,581,000	16,848,000
1921-22	32,250,000	20,326,000
1922-23	43,740,000	20,849,000
1923-24	38,304,000	23,223,000
1924-25	44,880,000	22,606,000
1925-26	26,772,000	15,985,000
1926-27	29,800,000	17,273,112
1927-28	33,128,000	22,756,440

* U.S. Dept. of Agr. Yearbooks.

† For calendar year totals, see Table 36.

The monthly distribution of these annual crop year amounts from 1910 to 1916 have been based on an average of the percentages which the car-lot shipments of each month were of the total amount shipped in the crop year July to June, for the years 1917 to 1926. The percentage figures for each year and the average for the nine-year period are shown in Table 35. Since 1917 when car-lot shipments were first reported by months, the only percentage distribution required has been one to apply to the 8 per cent of production which is trucked into towns and cities. For this purpose, the nine-year average percentage has also been employed.

The actual amounts estimated as sold by the methods above outlined during each month of the period 1910-1927, together with calendar year totals, are shown in Table 36.

Prices of potatoes used in this study are the 15th of the month prices paid to producers, reported by the United States Department of Agriculture. These are shown in Table 37.

Table 35
 Monthly Percentage Marketings of Minnesota Potatoes, Based on Amount
 Shipped in Car-Lots, for Year July to June, 1917-1926*

Month	1917	1918	1919	1920	1921	1922
January	...	7.7	7.8	8.5	6.4	6.4
February	...	9.2	5.8	5.3	7.4	4.9
March	...	12.9	10.0	8.6	10.6	15.0
April	...	8.1	6.9	4.7	4.8	8.5
May	...	3.8	4.3	1.2	3.6	3.7
June	...	1.0	1.8	0.5	0.9	0.8
July	...	0.4	0.4	0.3	...	1.8
August	8.0	13.2	11.0	6.0	3.5	5.0
September	11.7	19.5	24.3	12.1	17.0	14.4
October	24.7	19.7	26.4	29.7	30.0	24.4
November	8.8	7.4	6.0	14.3	7.3	8.5
December	4.1	3.2	3.1	3.9	2.9	2.3
Month	1923	1924	1925	1926	Average	
January	6.0	7.6	9.8	6.8	7.4	
February	5.3	11.5	12.1	10.6	8.0	
March	14.6	11.4	13.2	11.8	12.0	
April	11.3	7.2	6.1	7.2	7.2	
May	4.8	3.0	4.3	3.5	3.6	
June	1.6	0.9	1.1	1.2	1.1	
July	...	0.1	2.2	...	0.6	
August	5.2	1.8	11.5	...	7.2	
September	18.3	8.4	15.5	...	15.7	
October	23.5	27.7	20.3	...	25.2	
November	8.1	11.6	6.3	...	8.7	
December	3.3	3.8	3.1	...	3.3	

* Computed from reports published in Crops and Markets.

Table 36

Amount of Potatoes Sold Monthly by the Farmers of Minnesota, 1910-1927 (Bushels)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	1,094,000	546,000	1,053,000	1,346,000	1,231,000	1,253,000	1,230,000	684,000	956,000
February	1,183,000	599,000	1,138,000	1,455,000	1,331,000	1,354,000	1,329,000	739,000	1,121,000
March	1,774,000	886,000	1,708,000	2,183,000	1,997,000	2,031,000	1,994,000	1,109,000	1,594,000
April	1,064,000	531,000	1,025,000	1,310,000	1,198,000	1,219,000	1,196,000	665,000	991,000
May	532,000	266,000	512,000	655,000	599,000	593,000	598,000	333,000	472,000
June	163,000	81,000	157,000	200,000	183,000	203,000	183,000	102,000	137,000
July	44,000	85,000	109,000	100,000	102,000	100,000	55,000	25,000	74,000
August	531,000	1,025,000	1,310,000	1,198,000	1,219,000	1,196,000	665,000	981,000	2,048,000
September	1,159,000	2,234,000	2,856,000	2,612,000	2,658,000	2,609,000	1,451,000	1,573,000	3,155,000
October	1,860,000	3,586,000	4,584,000	4,193,000	4,266,000	4,187,000	2,328,000	3,121,000	3,434,000
November	642,000	1,238,000	1,582,000	1,447,000	1,473,000	1,446,000	804,000	1,101,000	1,268,000
December	244,000	470,000	600,000	549,000	559,000	548,000	305,000	494,000	541,000
Total	10,290,000	11,538,000	16,634,000	17,248,000	16,816,000	16,739,000	12,138,000	10,927,000	15,791,000
Month	1919	1920	1921	1922	1923	1914	1925	1926	1927
January	1,297,000	1,296,000	1,099,000	1,327,000	1,293,000	1,768,000	2,124,000	1,100,000	1,242,616
February	1,025,000	882,000	1,266,000	1,071,000	1,199,000	2,556,000	2,584,000	1,638,000	1,932,520
March	1,734,000	1,417,000	1,822,000	2,976,000	2,949,000	2,661,000	2,937,000	1,884,000	2,525,880
April	1,156,000	782,000	864,000	1,694,000	2,217,000	1,672,000	1,426,000	1,152,000	1,459,248
May	705,000	240,000	600,000	741,000	960,000	717,000	946,000	570,000	834,024
June	289,000	95,000	160,000	177,000	327,000	208,000	252,000	187,000	131,824
July	64,000	54,000	15,000	330,000	27,000	39,000	312,000	14,000	29,101
August	1,629,000	1,038,000	815,000	1,111,000	1,274,000	601,000	1,743,000	752,000	912,617
September	3,578,000	2,136,000	3,421,000	3,049,000	4,175,000	2,159,000	2,488,000	1,891,000	3,256,488
October	4,072,000	4,894,000	5,964,000	5,119,000	5,514,000	6,176,000	3,350,000	4,574,000	6,117,660
November	995,000	2,274,000	1,524,000	1,784,000	1,894,000	2,515,000	1,054,000	1,319,000	2,153,571
December	492,000	642,000	600,000	510,000	758,000	846,000	507,000	597,000	753,458
Total	17,036,000	15,750,000	18,150,000	19,889,000	22,587,000	21,918,000	19,723,000	15,678,000	21,349,007

Table 37
Monthly Farm Prices for Potatoes Received by Producers in Minnesota,*
1910-1927
(Fifteenth of the month)
(Per bushel)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$0.34	\$0.56	\$0.68	\$0.30	\$0.52	\$0.32	\$0.58	\$1.50	\$0.94
February	.34	0.58	0.78	.30	.54	.35	0.66	1.85	.84
March	.32	0.58	0.90	.28	.54	.37	0.71	2.05	.63
April	.26	0.62	1.04	.27	.52	.38	0.72	2.26	.50
May	.23	0.66	1.04	.28	.52	.40	0.70	2.46	.49
June	.24	0.80	0.90	.25	.59	.40	0.72	2.33	.58
July	.44	1.08	0.72	.36	.64	.46	0.73	1.85	.80
August	.80	1.05	0.50	.46	.56	.42	0.90	1.17	.94
September	.90	0.76	0.34	.45	.46	.30	1.00	0.88	.92
October	.76	0.57	0.28	.49	.37	.30	1.11	0.96	.82
November	.65	0.54	0.27	.50	.32	.36	1.28	0.98	.74
December	0.59	0.62	0.29	0.52	0.31	0.44	1.35	0.92	0.75

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$0.78	\$1.98	\$0.74	\$0.90	\$0.34	\$0.50	\$0.37	\$1.96	\$1.14
February	0.72	2.30	0.62	.95	.34	0.49	0.40	1.90	1.10
March	0.69	2.73	0.56	.89	.36	0.55	0.40	1.90	1.00
April	0.80	3.46	0.50	.83	.42	0.56	0.38	2.20	1.00
May	0.84	3.84	0.38	.86	.43	0.56	0.39	1.90	1.20
June	0.80	3.44	0.38	.92	.44	0.70	0.46	1.50	1.65
July	1.33	2.65	1.06	.88	.70	0.93	0.94	1.80	1.80
August	1.72	1.89	1.60	.66	.80	1.04	1.12	1.40	1.40
September	1.50	1.21	1.28	.44	.60	0.57	0.87	1.10	0.85
October	1.50	0.83	1.00	.34	.43	0.35	0.99	1.00	0.65
November	1.53	0.77	0.92	.32	.44	0.32	1.80	1.25	0.60
December	1.62	0.79	0.86	0.34	0.48	0.34	1.82	1.10	0.60

* Prices 1910-25, U.S. Dept. of Agr. Statistical Bull. 15.
 Prices 1926-27, current numbers of Crops and Markets.

Hogs

The actual numbers of hogs sold to packing plants and stockyards each month from Minnesota have been determined by the Division of Agricultural Statistics, Minnesota State Department of Agriculture, in co-operation with the Division of Crop and Livestock Estimates of the United States Bureau of Agricultural Economics, for the years 1920 to 1927, inclusive. These data represent the shipments received at central markets from Minnesota points, together with the number sold by farmers directly to local packers. Hogs sold to buyers at concentration points are also included. Duplication caused by reshipments is offset somewhat by the fact that sales by farmers to retail slaughter houses, local butchers and other similar buyers are not included.

For the years 1910 to 1919 the estimated number of hogs sold by the farmers of Minnesota has been based upon the average ratio which was found to exist, during the years from 1920 to 1926, between the receipts from Minnesota at South St. Paul and the total number of

hogs sold from Minnesota during the same period, as reported by the Minnesota State Department of Agriculture. This ratio was then applied to the receipts from Minnesota at South St. Paul for each year from 1910 to 1919, to obtain the estimated number of hogs sold annually for the entire state. Because of the increasing tendency in recent years for packers to buy livestock outside of central markets, this method would tend to make the estimates high for the earlier years. The average ratio, therefore, was adjusted slightly to offset the inaccuracy.

The hundredweight of hogs sold has been found by applying the average weight of hogs marketed at South St. Paul in each month to the actual number of hogs marketed by the farmers of Minnesota in the corresponding month of the period from 1920 to 1927. For the earlier period, 1910-1919, the average annual weight of hogs marketed at South St. Paul was applied to the estimated annual number sold, to obtain the amount sold in hundredweight.

The number of hogs sold annually by the farmers of Minnesota, and the hundredweight estimate as above outlined for the years 1910-1927, are shown in Table 38.

Table 38

Estimated Number and Hundredweight of Hogs Sold by the Farmers of Minnesota, 1910-1927

Year	Number of hogs	Hundredweight
1910	1,111,598	2,501,096
1911	1,307,854	2,851,122
1912	1,408,112	3,168,252
1913	1,689,328	3,902,348
1914	1,800,032	3,978,071
1915	2,241,012	4,482,024
1916	2,745,722	5,381,615
1917	2,093,158	3,851,411
1918	2,457,649	5,062,757
1919	2,596,320	5,763,830
1920	2,637,261*	5,768,309
1921	2,914,511	6,194,782
1922	3,395,893	7,742,296
1923	4,405,793	9,506,368
1924	4,778,821	9,951,804
1925	4,372,370	9,395,234
1926	4,543,189	9,855,076
1927	4,684,401	10,173,278

* Minnesota Crop Reporter, March 1929. For the years 1920 to 1923, inclusive, final figures were used. For 1924 to 1927, preliminary figures were used which have undergone slight revision subsequently as published in the reference cited. Numbers for 1910-1919 estimated as explained in text.

A monthly percentage distribution is required only for the annual amounts of the years 1910 to 1919, and for this purpose the average percentage of hundredweight sold in each month of the period 1920-1926 has been used. This percentage distribution is shown in Table 39.

Table 39
Monthly Percentage Marketings of Minnesota Hogs, Based on Receipts (in Hundredweight) at Central Markets, 1920-1926

Month	1920	1921	1922	1923	1924	1925	1926	Average
January	12.6	11.8	10.7	11.7	12.9	12.9	11.3	11.9
February	10.1	11.2	8.2	9.3	10.0	10.3	8.5	9.7
March	9.5	8.1	7.2	9.3	9.3	8.0	10.0	8.8
April	6.8	6.7	6.1	6.8	8.4	8.1	7.3	7.2
May	9.7	7.8	8.9	8.1	7.4	6.9	7.3	8.0
June	9.4	7.8	11.1	8.1	7.7	7.1	7.3	8.3
July	6.0	5.6	6.7	6.8	7.8	5.7	8.1	6.7
August	4.0	5.5	5.3	4.7	4.3	3.8	5.2	4.7
September	4.0	4.6	4.4	4.6	3.6	4.7	4.8	4.4
October	7.7	8.3	7.6	8.2	5.8	8.3	6.5	7.5
November	9.7	11.2	10.8	10.4	8.5	10.3	9.5	10.1
December	10.6	11.3	13.0	11.9	14.3	13.8	14.2	12.7

The average percentage distribution was then applied to the annual sales in hundredweight for the years 1910-1919, and the monthly amounts which resulted, together with the data for the years 1920-1927, which were given originally by months, are shown in Table 40.

The prices of hogs used in this study are the monthly farm prices for the 15th of the month, reported by the United States Department of Agriculture. These are shown in Table 41.

Table 40

Hundredweight of Hogs Sold Monthly by the Farmers of Minnesota,* 1910-1927

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	297,630	339,284	377,022	464,379	473,390	533,361	640,412	458,318	602,468
February	242,606	276,559	307,320	378,528	385,873	434,756	522,017	373,587	491,087
March	220,096	250,899	278,806	343,407	350,070	394,418	473,582	338,924	445,523
April	180,078	205,281	228,114	280,969	286,421	322,706	387,476	277,302	364,519
May	200,088	228,090	253,460	312,188	318,246	358,562	430,529	308,113	405,021
June	207,591	236,643	262,965	323,895	330,180	372,008	446,674	319,667	420,209
July	167,573	191,025	212,273	261,457	266,531	300,296	360,568	258,045	339,205
August	117,552	134,003	148,908	183,410	186,969	210,655	252,936	181,016	237,950
September	110,048	125,449	139,403	171,703	175,035	197,209	236,791	169,462	222,761
October	187,582	213,834	237,619	292,676	298,355	336,152	403,621	288,856	379,707
November	252,611	287,963	319,993	394,137	401,785	452,684	543,543	388,993	511,338
December	317,639	362,092	402,368	495,598	505,215	569,217	683,465	489,129	642,970
Total	2,501,094	2,851,122	3,168,251	3,902,347	3,978,070	4,482,024	5,381,614	3,851,412	5,062,758

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	685,896	728,965	731,120	825,542	1,108,987	1,279,436	1,215,332	1,115,025	1,175,279
February	559,092	581,045	697,165	633,263	879,584	997,452	965,029	834,923	762,347
March	507,217	533,982	502,729	554,360	884,607	926,003	752,067	987,295	832,552
April	414,996	392,846	415,596	470,968	642,235	833,699	757,315	719,633	710,561
May	461,106	562,776	484,023	688,307	774,514	737,705	652,345	718,819	768,331
June	478,398	541,133	481,387	857,476	774,572	763,248	670,949	717,891	850,698
July	386,177	349,466	348,748	515,882	649,550	772,979	537,595	800,577	746,526
August	270,900	231,312	339,061	412,805	448,692	423,508	355,833	509,284	502,334
September	253,609	231,244	287,483	344,150	441,456	362,475	442,440	468,912	453,270
October	432,287	442,568	515,949	592,260	780,212	579,444	784,084	645,197	763,861
November	582,147	559,557	691,082	837,903	990,305	849,390	965,423	939,962	1,154,081
December	732,006	613,415	700,439	1,009,380	1,131,654	1,426,465	1,296,822	1,397,558	1,453,438
Total	5,763,831	5,768,309	6,194,782	7,742,296	9,506,368	9,951,804	9,395,234	9,855,076	10,173,278

* Calendar year totals which result from the addition of the 12 months frequently do not agree exactly with the yearly totals originally given, owing to slight deviations above or below 100 of the total percentage distribution for an individual year.

Table 41
 Monthly Farm Prices for Hogs Received by Producers in Minnesota,*
 1910-1927
 (Fifteenth of the month)
 (Per hundredweight)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$7.80	\$ 7.30	\$5.60	\$6.80	\$7.20	\$6.40	\$ 6.10	\$ 9.30	\$15.50
February	8.00	6.80	5.80	7.20	7.70	6.10	7.10	10.80	15.30
March	9.50	6.30	5.90	7.80	7.70	6.10	8.50	13.00	16.00
April	9.40	6.00	6.80	8.10	7.80	6.30	8.40	14.60	16.20
May	8.50	5.40	6.70	7.50	7.70	6.60	8.60	14.70	16.20
June	8.60	5.30	6.70	7.60	7.30	6.70	8.50	14.50	15.70
July	8.10	5.70	6.70	7.90	7.50	6.60	8.60	14.00	15.90
August	7.50	6.40	7.10	7.70	8.00	6.20	8.90	15.00	17.50
September	7.80	6.40	7.50	7.40	7.80	6.40	9.50	16.70	18.30
October	7.80	5.80	7.70	7.40	7.20	7.00	8.60	16.60	17.10
November	7.20	5.60	7.20	7.00	6.70	6.10	8.70	15.30	16.30
December	6.90	5.40	7.00	7.00	6.40	5.60	8.80	16.10	16.10

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$16.20	\$13.30	\$8.40	\$6.50	\$7.60	\$6.20	\$ 9.00	\$11.00	\$10.90
February	16.00	13.40	8.30	8.60	7.40	6.10	9.30	11.70	11.00
March	17.00	13.60	9.00	9.30	7.30	6.30	12.20	11.70	10.90
April	18.70	13.60	7.70	9.10	7.30	6.30	11.90	11.30	10.30
May	19.10	13.60	7.60	9.40	6.90	6.40	10.80	11.80	9.30
June	18.70	13.10	6.80	9.30	6.00	6.20	10.90	12.80	7.90
July	20.10	13.30	7.70	8.90	6.10	6.20	12.00	12.30	8.10
August	19.70	13.40	8.50	8.10	6.50	8.60	12.20	11.10	8.60
September	15.50	13.90	6.50	7.70	7.50	8.30	11.40	11.60	9.40
October	13.50	13.00	6.00	8.00	6.60	9.10	11.00	11.70	10.00
November	13.10	11.60	5.90	7.40	6.10	8.40	10.40	11.20	8.60
December	12.60	9.00	6.00	7.40	5.70	8.00	10.40	10.80	7.80

* Prices 1910-25, U.S. Dept. of Agr. Statistical Bull. 15.
 Prices 1926-27, current numbers of Crops and Markets.

Cattle and Calves

The numbers of cattle and calves sold monthly by Minnesota farmers have been furnished also by the Minnesota State Department of Agriculture, for the period 1920 to 1927. For the years 1911 to 1919, the marketings of each were estimated by applying to the receipts at South St. Paul from Minnesota the average ratio which existed for the period 1920 to 1926 between the total number marketed by Minnesota farmers and the receipts at South St. Paul from Minnesota. Receipts of cattle and calves were not reported separately in 1910. Separation was made by applying to the combined receipts of cattle and calves for 1910, the ratio which existed between receipts of cattle and calves for the period 1911 to 1919. Estimates of the hundredweight sold by months were made by the same methods as those used for hundredweight sales of hogs.

The number of cattle and calves sold by the farmers of Minnesota together with the estimated number of hundredweight are shown in Tables 42 and 43.

Table 42

Estimated Number and Hundredweight of Cattle Sold by the Farmers of Minnesota, 1910-1927

Year	Number of cattle	Hundredweight
1910	303,769	2,411,926
1911	369,744	2,909,885
1912	370,592	2,946,206
1913	344,592	2,729,168
1914	392,695	3,204,391
1915	622,738	5,025,496
1916	643,630	5,142,604
1917	706,372	5,318,981
1918	783,633	6,041,810
1919	651,502	4,970,960
1920	632,642*	5,156,194
1921	507,861	4,188,970
1922	625,962	5,194,497
1923	563,726	4,671,856
1924	567,336	4,904,910
1925	612,456	5,348,937
1926	735,562	6,416,757
1927	655,424	5,758,518

* Minnesota Crop Reporter, March 1929. For the years 1920 to 1925, inclusive, final figures for cattle and calves were used. For 1926 and 1927, preliminary figures were used which have undergone slight revision subsequently. Numbers for 1910-1919 estimated as explained in text.

Table 43

Estimated Number and Hundredweight of Calves Sold by the Farmers of Minnesota, 1910-1927

Year	Number of calves	Hundredweight
1910	135,212	221,748
1911	110,408	188,798
1912	117,478	209,111
1913	99,114	206,157
1914	105,904	241,461
1915	131,199	279,454
1916	164,468	314,134
1917	179,345	365,864
1918	223,590	427,057
1919	266,838	381,578
1920	336,343*	449,479
1921	316,047	432,495
1922	424,456	593,173
1923	453,465	621,510
1924	513,031	642,650
1925	619,925	777,700
1926	690,306	844,977
1927	638,502	798,545

* Minnesota Crop Reporter, March 1929. For the years 1920 to 1925, inclusive, final figures for cattle and calves were used. For 1926 and 1927, preliminary figures were used which have undergone slight revision subsequently. Numbers for 1910-1919 estimated as explained in text.

The percentage distributions used to derive monthly sales for cattle and calves separately for the period 1910-1919 were the averages of the monthly percentages of hundredweight of each sold during 1920-1926, shown in Tables 44 and 45. No percentage distributions were required after 1919, as the data were available by months.

These average monthly percentage distributions were applied to the annual number of hundredweight of cattle and calves estimated as sold in the years 1910 to 1919, to determine the monthly sales of each in these years. The amounts thus derived, hundredweight sales by months from 1920 to 1927, together with calendar year totals, are given in Tables 46 and 47 for cattle and calves, respectively.

The prices for cattle and calves are the 15th of the month prices, reported by the United States Department of Agriculture. These are shown for cattle in Table 48 and for calves in Table 49.

Table 44
Monthly Percentage Marketings of Minnesota Cattle, Based on Receipts (in Hundredweight) at Central Markets, 1920-1926

Month	1920	1921	1922	1923	1924	1925	1926	Average
January	9.6	10.2	7.6	10.5	9.0	9.4	8.5	9.3
February	9.2	7.1	7.7	7.7	8.1	8.5	7.3	7.9
March	10.9	11.2	9.6	8.4	8.9	10.7	9.2	9.8
April	7.3	7.7	7.9	8.0	9.5	9.7	8.0	8.3
May	7.0	8.0	8.5	7.2	8.0	7.9	8.3	7.8
June	5.0	6.8	6.5	5.9	6.0	5.8	8.2	6.3
July	4.9	3.6	7.3	6.5	7.2	5.1	7.6	6.0
August	8.2	8.5	9.2	7.6	5.3	5.0	5.2	7.0
September	10.7	7.3	8.3	9.1	6.7	7.1	7.1	8.0
October	10.3	11.7	10.0	11.2	9.8	10.3	10.1	10.5
November	10.8	10.9	9.4	8.5	10.4	9.3	11.1	10.1
December	5.9	6.9	8.0	9.3	11.2	11.2	9.4	8.9

Table 45
Monthly Percentage Marketings of Minnesota Calves, Based on Receipts (in Hundredweight) at Central Markets, 1920-1926

Month	1920	1921	1922	1923	1924	1925	1926	Average
January	7.6	8.4	7.2	9.2	8.6	7.4	8.1	8.1
February	8.9	8.8	7.4	7.2	8.3	7.8	8.4	8.1
March	12.2	12.1	9.6	8.0	8.6	9.8	9.4	10.1
April	10.4	8.2	8.6	9.3	10.0	10.7	8.8	9.4
May	9.5	10.0	10.1	13.9	10.6	9.8	9.2	10.4
June	11.7	11.3	9.9	9.5	8.3	8.4	8.8	9.7
July	7.1	6.2	8.5	7.3	8.2	6.3	6.8	7.2
August	6.4	6.4	7.6	6.8	5.3	5.0	5.5	6.1
September	5.5	5.8	6.1	5.6	6.3	7.1	6.4	6.1
October	6.5	7.4	9.0	8.5	8.8	8.8	9.0	8.3
November	7.8	8.7	8.7	7.9	7.3	8.4	10.0	8.4
December	6.3	6.6	7.3	6.8	9.8	10.6	9.5	8.1

Table 46

Hundredweight of Cattle Sold Monthly by the Farmers of Minnesota,* 1910-1927

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	224,309	270,619	273,997	253,813	298,008	467,371	478,262	494,665	561,888
February	190,542	229,881	232,750	215,604	253,147	397,014	406,266	420,199	477,303
March	236,369	285,169	288,728	267,458	314,030	492,499	503,975	521,260	592,097
April	200,190	241,520	244,535	226,521	265,964	417,116	426,836	441,475	501,470
May	188,130	226,971	229,804	212,875	249,942	391,989	401,123	414,881	471,261
June	151,951	183,323	185,611	171,938	201,877	316,606	323,984	335,096	380,634
August	144,716	174,593	176,772	163,750	192,263	301,530	308,556	319,139	362,509
September	168,835	203,692	206,234	191,042	224,307	351,785	359,982	372,329	422,927
October	192,954	232,791	235,696	218,333	256,351	402,040	411,408	425,518	483,345
November	253,252	305,538	309,352	286,563	336,461	527,677	539,973	558,493	634,390
December	243,605	293,898	297,567	275,646	323,643	507,575	519,403	537,217	610,223
December	214,661	258,980	262,212	242,896	285,191	447,269	457,692	473,389	537,721
Total	2,409,514	2,906,975	2,943,258	2,726,439	3,201,184	5,020,471	5,137,460	5,313,661	6,035,768

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	462,299	496,274	427,507	392,421	490,580	439,175	503,296	542,230	637,123
February	392,706	476,198	296,040	399,784	357,402	397,920	454,932	468,961	525,176
March	487,154	560,621	469,638	496,448	395,100	435,511	570,284	590,195	533,604
April	412,590	377,797	324,597	409,360	374,329	467,573	519,028	512,904	441,825
May	387,735	361,163	335,449	442,506	340,737	390,195	422,558	530,169	423,738
June	313,170	258,145	284,442	338,657	276,858	293,806	309,987	524,302	403,145
July	298,258	253,892	152,430	380,167	304,464	355,124	273,858	490,122	360,997
August	347,967	424,400	357,903	478,117	355,609	259,902	269,913	332,165	390,715
September	397,677	551,830	306,456	432,525	426,182	327,924	378,832	457,761	435,957
October	521,951	533,316	489,846	520,899	521,522	479,709	549,843	651,814	577,249
November	502,067	557,134	454,304	490,467	398,655	509,976	499,846	710,728	601,817
December	442,415	305,424	290,358	413,146	430,418	548,095	596,560	605,386	427,172
Total	4,965,989	5,156,194	4,182,970	5,194,497	4,671,856	4,904,910	5,348,937	6,416,757	5,758,518

* Calendar year totals which result from the addition of the 12 months frequently do not agree exactly with the yearly totals originally given, owing to slight deviations above or below 100 of the total percentage distribution for an individual year.

Table 47
Hundredweight of Calves Sold Monthly by the Farmers of Minnesota,* 1910-1927

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	17,962	15,293	16,938	16,699	19,558	22,636	25,445	29,635	34,592
February	17,962	15,293	16,938	16,699	19,558	22,636	25,445	29,635	34,592
March	22,397	19,069	21,120	20,822	24,388	28,225	31,728	36,952	43,133
April	20,844	17,747	19,656	19,379	22,697	26,269	29,529	34,391	40,143
May	23,062	19,635	21,748	21,440	25,112	29,063	32,670	38,050	44,414
June	21,510	18,313	20,284	19,997	23,422	27,107	30,471	35,489	41,425
July	15,966	13,593	15,056	14,843	17,385	20,121	22,618	26,342	30,748
August	13,527	11,517	12,756	12,576	14,729	17,047	19,162	22,318	26,050
September	13,527	11,517	12,756	12,576	14,729	17,047	19,162	22,318	26,050
October	18,405	15,670	17,356	17,111	20,041	23,195	26,073	30,367	35,446
November	18,627	15,859	17,565	17,317	20,283	23,474	26,387	30,733	35,873
December	17,962	15,293	16,938	16,699	19,558	22,636	25,445	29,635	34,592
Total	221,751	188,799	209,111	206,158	241,460	279,456	314,135	365,865	427,058

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	30,908	34,287	36,426	42,948	57,249	55,193	57,674	68,540	74,885
February	30,908	39,953	38,204	43,648	44,834	53,211	61,037	71,311	79,976
March	38,539	54,686	52,345	56,845	49,752	55,105	75,890	79,800	79,654
April	35,868	46,921	35,476	51,120	57,996	64,354	83,069	74,569	70,210
May	39,684	42,856	43,241	60,182	86,424	67,878	76,227	77,866	74,092
June	37,013	52,749	48,803	58,474	58,816	53,206	65,284	73,941	63,510
July	27,474	31,889	27,018	50,611	45,564	53,060	48,691	57,287	51,757
August	23,276	28,924	27,672	45,048	42,087	34,043	38,574	46,183	46,002
September	23,276	24,774	24,937	36,295	34,600	40,196	55,010	54,459	51,069
October	31,671	28,936	32,208	53,452	52,561	56,318	68,292	75,792	69,308
November	32,053	35,188	37,734	51,373	49,078	47,125	65,624	84,815	75,356
December	30,908	28,316	28,431	43,177	42,549	62,961	82,328	80,414	62,726
Total	381,578	449,479	432,495	593,173	621,510	642,650	777,700	844,977	798,545

* Calendar year totals which result from the addition of the 12 months frequently do not agree exactly with the yearly totals originally given, owing to slight deviations above or below 100 of the total percentage distribution for an individual year.

Table 48
 Monthly Farm Prices for Cattle Received by Producers in Minnesota,*
 1910-1927
 (Fifteenth of the month)
 (Per hundredweight)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$3.90	\$3.70	\$4.00	\$5.00	\$5.60	\$5.30	\$5.30	\$6.10	\$7.60
February	3.90	4.00	4.10	5.30	6.00	5.30	5.50	6.80	8.20
March	4.50	4.20	4.00	5.80	5.80	5.50	6.00	7.30	8.30
April	5.20	4.00	4.50	5.90	6.00	5.50	6.20	8.20	9.30
May	4.60	3.90	4.80	5.80	6.20	5.90	6.10	8.00	10.10
June	4.50	3.90	4.90	5.80	6.10	5.80	6.70	8.30	9.60
July	4.00	3.60	4.60	5.40	6.00	5.80	6.30	7.70	9.70
August	3.70	3.80	4.60	5.70	6.10	5.50	6.10	7.50	9.00
September	3.70	3.60	4.80	5.70	6.10	5.40	5.90	7.60	8.90
October	3.60	3.60	4.80	5.70	5.60	5.40	5.70	7.50	8.30
November	3.70	3.60	4.80	5.70	5.40	5.00	5.70	7.30	7.90
December	3.80	3.80	4.80	5.30	5.20	5.00	5.80	7.30	7.70

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$ 9.00	\$8.30	\$5.40	\$4.20	\$4.70	\$4.80	\$5.20	\$6.10	\$6.30
February	9.10	8.10	5.20	5.00	5.10	4.80	5.30	6.40	6.50
March	9.90	8.20	6.00	5.00	5.20	5.10	6.00	6.40	6.90
April	10.20	8.40	5.30	5.00	5.30	5.40	6.20	6.60	7.20
May	10.30	8.40	5.50	5.10	5.50	5.60	6.70	6.70	7.20
June	9.80	8.50	4.90	5.50	5.50	5.50	6.40	6.60	7.40
July	9.60	7.90	4.80	5.10	5.40	5.40	6.40	6.60	6.90
August	9.20	7.50	4.80	4.90	5.20	5.70	6.30	6.20	7.20
September	8.10	7.30	4.60	4.80	5.40	5.60	6.10	6.50	6.70
October	7.50	7.40	4.10	4.70	4.90	5.30	6.40	6.10	7.30
November	7.50	5.70	3.90	4.40	4.40	5.40	5.90	5.70	7.60
December	7.70	5.00	4.10	4.50	4.60	4.60	5.80	6.00	8.00

* Prices 1910-25, U.S. Dept. of Agr. Statistical Bull. 15.
 Prices 1926-27, current numbers of Crops and Markets.

Table 49
 Monthly Farm Prices for Calves Received by Producers in Minnesota,*
 1910-1927
 (Fifteenth of the month)
 (Per hundredweight)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$5.80	\$5.70	\$5.90	\$6.70	\$7.80	\$7.20	\$7.20	\$ 9.00	\$11.00
February	5.70	5.70	6.00	6.90	7.60	7.20	7.80	10.00	10.70
March	6.40	5.80	5.70	7.30	7.30	7.10	8.10	9.60	10.80
April	5.70	5.20	5.70	7.40	7.50	7.00	7.90	10.50	11.30
May	6.00	5.10	5.70	7.20	7.40	7.00	7.90	10.30	11.30
June	5.60	5.00	6.00	7.50	7.40	7.30	8.20	10.60	11.60
July	5.70	5.00	6.00	7.70	7.40	7.40	8.50	11.00	12.10
August	5.80	5.10	6.20	7.10	7.90	7.20	8.70	10.50	12.20
September	5.40	5.40	6.00	7.40	7.90	7.40	8.70	11.10	12.80
October	5.70	5.30	6.70	7.40	7.60	7.60	8.40	11.10	12.60
November	5.40	5.40	6.10	7.80	7.40	7.10	8.40	10.10	11.60
December	5.80	5.30	6.60	7.50	7.20	7.10	8.60	10.90	12.00

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$12.50	\$13.30	\$8.10	\$6.40	\$7.30	\$7.60	\$7.50	\$ 9.40	\$ 9.60
February	11.80	13.00	8.00	7.20	7.30	7.60	8.00	9.60	10.70
March	12.70	12.60	7.90	7.20	7.10	7.60	9.20	10.20	10.50
April	12.90	12.00	6.20	6.60	7.00	7.60	8.60	9.20	10.00
May	12.20	10.60	6.70	6.90	7.10	7.30	8.10	8.70	9.60
June	12.45	11.10	6.20	7.50	7.10	7.20	7.80	9.90	9.70
July	13.30	10.50	6.30	7.00	7.60	7.30	8.40	9.60	10.00
August	13.30	11.40	6.40	7.30	7.70	8.00	8.40	9.40	11.00
September	13.60	11.90	7.50	7.90	8.30	8.00	8.90	10.30	11.20
October	13.10	10.40	7.20	7.90	8.20	7.80	9.60	10.30	11.60
November	13.00	10.10	6.00	7.20	7.00	7.00	9.20	9.10	10.10
December	12.90	8.30	6.20	7.30	6.90	6.70	8.80	8.70	10.20

* Prices 1910-25, U.S. Dept. of Agr. Statistical Bull. 15.
 Prices 1926-27, current numbers of Crops and Markets.

Lambs-Sheep

The combined numbers of lambs and sheep sold to packers each month from Minnesota have been compiled by the Minnesota State Department of Agriculture for the years 1920 to 1927. These figures are somewhat high for our use because of the inclusion of shipments from feeding stations, located at points in southwestern Minnesota. These institutions receive sheep from the range, fatten them, and reship to market. Feeding stations are not farms, and it is a mistake to include their product in farm receipts, but it seems impossible to make any separation. At present the business is not large and does not greatly detract from the accuracy of the data. The records of these data are for lambs and sheep combined, and no effort has been made to separate the numbers of each. The average weight per head, as reported for South St. Paul, did not distinguish between lambs and sheep, so that there seemed to be no objection to the application of these weights to the numbers of animals reported. The methods followed in estimating the number of lambs and sheep sold from 1910

to 1919, the number of hundredweight represented by these animals, the percentage distribution by months during 1910-1919, and the number of hundredweight sold during each month from 1910 to 1927, were in all essential respects the same as those outlined for hogs. These data are shown in Tables 50, 51, and 52.

Table 50

Estimated Number and Hundredweight of Lambs-Sheep Sold by the Farmers of Minnesota, 1910-1927

Year	Number of lamb-sheep	Hundredweight
1910	196,765	161,347
1911	200,573	168,481
1912	222,620	189,227
1913	170,481	139,794
1914	208,187	176,959
1915	168,462	136,454
1916	139,922	117,534
1917	115,063	97,804
1918	177,355	148,978
1919	310,994	239,465
1920	308,775*	232,718
1921	315,599	242,461
1922	294,845	220,325
1923	219,737	173,682
1924	261,932	210,966
1925	281,011	227,567
1926	379,167	337,676
1927	406,315	363,294

* Minnesota Crop Reporter, March, 1929. For the years 1920 to 1925, inclusive, final figures were used. For 1926 and 1927, preliminary figures were used which have undergone slight revision subsequently as published in the reference cited. Numbers for 1910-1919 estimated as explained in text.

Table 51

Monthly Percentage Marketings of Minnesota Lambs-Sheep, Based on Receipts (in Hundredweight) at Central Markets, 1920-1926

Month	1920	1921	1922	1923	1924	1925	1926	Average
January	15.2	10.7	12.9	9.5	8.3	7.0	6.7	10.0
February	8.9	6.8	6.5	4.8	4.2	3.4	4.2	5.5
March	1.8	4.5	3.1	1.9	2.1	2.0	2.5	2.7
April	1.7	1.8	1.0	0.8	1.4	1.7	1.1	1.4
May	1.4	2.2	1.4	0.9	1.0	1.0	0.5	1.2
June	1.6	2.9	2.3	1.6	1.4	1.1	1.7	1.8
July	3.5	3.2	5.8	4.4	3.5	3.8	3.2	3.9
August	7.5	12.1	14.6	9.8	9.0	10.4	7.7	10.2
September	13.9	13.6	18.7	20.0	16.7	19.0	16.5	16.9
October	17.3	19.9	14.7	21.6	23.1	21.6	22.0	20.0
November	18.4	13.9	11.8	14.8	16.4	17.5	17.9	15.8
December	8.8	8.3	7.1	10.1	12.9	11.5	15.9	10.6

Table 52
Hundredweight of Lambs-Sheep Sold Monthly by the Farmers of Minnesota,* 1910-1927

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	16,135	16,848	18,923	13,979	17,696	13,645	11,753	9,780	14,898
February	8,874	9,266	10,407	7,689	9,733	7,505	6,404	5,379	8,194
March	4,356	4,549	5,109	3,774	4,778	3,684	3,173	2,641	4,022
April	2,259	2,359	2,649	1,957	2,477	2,358	1,645	1,369	2,086
May	1,936	2,022	2,271	1,678	2,124	1,637	1,410	1,174	1,788
June	2,904	3,033	3,406	2,516	3,185	2,456	2,116	1,760	2,682
July	6,293	6,571	7,380	5,452	6,901	5,322	4,584	3,814	5,810
August	16,457	17,185	19,301	14,259	18,050	13,918	11,988	9,976	15,196
September	27,268	28,473	31,979	23,625	29,906	23,061	19,863	16,529	25,177
October	32,269	33,696	37,845	27,959	35,392	27,291	23,507	19,561	29,796
November	26,620	25,493	29,898	22,087	27,960	21,560	18,570	15,453	23,539
December	17,103	17,859	20,058	14,818	18,758	14,464	12,459	10,367	15,792
Total	161,347	168,481	189,226	139,793	176,960	136,453	117,532	97,803	148,980

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	23,947	35,311	26,034	28,513	16,436	17,538	15,867	22,761	31,038
February	13,171	20,792	16,555	14,287	8,326	8,787	7,654	14,094	23,111
March	6,466	4,084	10,866	6,762	3,252	4,434	4,638	8,431	12,759
April	3,353	3,975	4,452	2,311	1,398	2,955	3,909	3,866	4,187
May	2,874	3,289	5,341	3,015	1,601	2,018	2,232	1,552	2,324
June	4,310	3,856	7,105	5,084	2,808	2,913	2,522	5,814	5,611
July	9,339	8,075	7,811	12,783	7,624	7,469	8,614	10,927	10,904
August	24,425	17,458	29,302	32,268	16,937	19,052	23,759	25,921	36,499
September	40,470	32,359	32,951	41,194	34,612	35,306	43,201	55,828	61,140
October	47,893	40,311	48,300	32,340	37,454	48,661	49,158	74,226	93,253
November	37,835	42,745	33,720	26,076	25,671	34,598	39,781	60,405	57,265
December	25,383	20,463	20,024	15,692	17,563	27,235	26,232	53,851	25,203
Total	239,466	232,718	242,461	220,325	173,682	210,966	227,567	337,676	363,294

* Calendar year totals which result from the addition of the 12 months frequently do not agree exactly with the yearly totals originally given, owing to slight deviations above or below 100 of the total percentage distribution for an individual year.

The United States Department of Agriculture reports the prices paid to producers in Minnesota on the 15th of the month separately for lambs and sheep. The opinion of market specialists is that lambs and sheep are sold in Minnesota in the ratio of approximately 9 lambs to 1 sheep. In accordance with this, a composite price has been constructed for "lambs-sheep," in which the lamb price reported by the United States Department of Agriculture has been given a weighting of 9, and the sheep price a weighting of 1. The resulting composite price is shown in Table 53.

Table 53
Monthly Composite Price for Lambs-Sheep Received by Producers in
Minnesota,* 1910-1927
(Fifteenth of the month)
(Per hundredweight)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$6.05	\$ 4.97	\$4.86	\$ 5.84	\$ 5.74	\$ 5.84	\$ 6.82	\$ 9.64	\$12.74
February	6.05	4.87	5.06	5.84	5.87	6.04	7.11	10.32	12.61
March	7.01	4.50	5.06	6.16	5.56	6.34	7.81	10.66	13.26
April	7.14	4.90	5.39	6.17	5.87	6.47	7.91	11.81	14.23
May	6.37	4.59	6.04	5.78	5.95	6.74	7.84	11.55	14.30
June	6.45	4.86	5.74	5.98	6.23	6.98	8.18	11.60	14.19
July	5.56	5.24	5.54	6.06	6.31	6.70	7.99	11.99	14.11
August	4.89	4.93	5.53	5.65	6.34	6.33	7.89	11.42	13.67
September	5.08	4.50	4.98	5.81	5.94	6.23	7.98	13.05	14.10
October	5.16	4.59	5.07	5.63	5.83	6.34	7.68	13.40	12.67
November	4.98	4.49	5.16	5.65	5.74	6.42	7.89	12.80	12.43
December	5.07	4.29	5.53	5.63	5.93	6.24	8.58	13.02	12.28

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$12.39	\$12.81	\$ 7.45	\$ 7.33	\$10.50	\$ 9.94	\$12.87	\$12.60	\$10.47
February	12.43	13.60	7.18	9.13	10.25	10.45	12.67	11.81	11.04
March	13.95	13.50	7.22	9.94	10.51	10.46	12.88	11.35	11.35
April	14.16	13.88	6.74	10.50	12.61	10.67	11.97	11.48	12.29
May	13.36	13.68	7.30	10.01	10.64	10.78	11.42	12.14	12.18
June	13.03	12.01	6.70	9.60	10.69	10.10	11.30	11.86	12.36
July	12.98	11.02	7.17	9.16	10.70	9.80	11.80	12.01	11.16
August	12.32	10.69	6.43	8.94	9.58	10.16	11.67	11.16	11.10
September	11.36	9.93	5.92	8.98	9.76	9.92	11.34	11.23	10.97
October	11.03	10.64	5.61	9.58	9.36	9.76	11.68	11.43	10.98
November	11.30	8.20	5.70	9.94	9.51	9.86	11.76	10.94	11.29
December	11.68	7.74	6.69	10.58	9.39	11.02	12.82	10.77	10.94

* Prices 1910-25, U.S. Dept. of Agr. Statistical Bull. No. 15.

Prices 1926-27, current numbers of Crops and Markets.

Composite price computed by a weighting of 9 to lamb prices, and 1 to sheep prices.

Chickens

Records of the pounds of chickens received monthly from Minnesota at the Boston, Chicago, New York, and Philadelphia markets, are available from 1922 to 1926. In addition to these amounts, the urban consumption for the state has been estimated on the basis of the number of equivalent adult males in the state during these years. The method

by which the number of equivalent adult males was derived has been explained in other sections. Urban consumption of chickens was taken at 6.85 pounds per adult male, which is the average annual consumption reported by the United States Bureau of Labor Statistics as a result of the cost-of-living survey of 1918-19 in the north central states.¹⁸ This amount of local consumption added to the receipts from Minnesota at the four eastern markets, constituted the estimated sales of the farmers of Minnesota for each of the years 1922 to 1927. For the period 1922-1926, the average ratio was computed between the amount estimated as sold annually and the number of chickens on farms. This number is reported by the Bureau of the Census for 1910, 1920, and 1925, and an estimate by straight-line interpolation was made for other years. This average ratio was then applied to the number of chickens on farms in each year from 1910 to 1922 in order to determine the approximate amount of sales by the farmers of Minnesota in these years. The number of chickens on farms and the amount of estimated sales are shown in Table 54.

Table 54
Number of Chickens on Farms and Pounds Estimated Sold Annually by the Farmers of Minnesota, 1910-1927

Year	Number of chickens	Pounds sold
1910	10,293,849*	22,111,187
1911	10,585,726	22,738,139
1912	10,877,603	23,365,091
1913	11,169,480	23,992,043
1914	11,461,357	24,618,994
1915	11,753,234	25,245,946
1916	12,045,111	25,872,898
1917	12,336,988	26,499,850
1918	12,628,865	27,126,802
1919	12,920,742	27,753,754
1920	13,212,619*	28,380,705
1921	13,851,711	29,753,475
1922	14,490,803	31,126,244
1923	15,129,895	28,211,686
1924	15,768,987	33,267,766
1925	16,408,080*	32,962,817
1926	17,047,173	40,053,549
1927	17,686,265	38,571,726

* U. S. Census of Agriculture, 1910, 1920, 1925.

The monthly marketings, beginning with 1922, were determined on the basis of the percentage which the receipts of each month from Minnesota at the four eastern markets constituted of the yearly state total. The average of these monthly percentages from 1922-26 was taken as the basis for distribution for the years 1910-1921. These percentage distributions are shown in Table 55.

¹⁸ United States Bureau of Labor Statistics. Bull. 357, p. 112.

Table 55

Monthly Percentage Marketings of Chickens Based on Receipts from Minnesota at Four Eastern Markets,* 1922-1926

Month	1922	1923	1924	1925	1926	Average
January	6.7	13.7	10.8	9.9	7.9	9.8
February	3.5	7.8	7.3	5.6	4.9	5.8
March	3.2	3.2	4.4	2.5	4.2	3.5
April	2.2	2.2	2.2	1.8	2.4	2.2
May	2.2	1.7	1.1	1.2	1.9	1.6
June	4.1	1.5	2.7	3.2	3.9	3.1
July	2.5	2.8	4.1	4.7	4.4	3.7
August	2.8	2.7	3.3	5.1	5.1	3.8
September	3.2	3.4	4.7	5.2	6.3	4.6
October	5.0	7.5	8.3	8.7	8.6	7.6
November	21.4	19.5	20.6	21.4	23.5	21.3
December	43.1	33.9	30.5	30.7	26.8	33.0

* New York, Boston, Philadelphia, and Chicago.

Table 56 shows the amounts of estimated sales by months, on the basis of this distribution.

The prices for chickens are for the 15th of the month, reported by the United States Department of Agriculture. These are shown in Table 57.

Table 56
Amounts of Chickens Sold Monthly by the Farmers of Minnesota,* 1910-1927 (Pounds)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	2,166,896	2,228,338	2,289,779	2,351,220	2,412,661	2,474,103	2,535,544	2,596,985	2,658,427
February	1,282,449	1,318,812	1,355,175	1,391,538	1,427,902	1,464,265	1,500,628	1,536,991	1,573,355
March	773,892	795,835	817,778	839,721	861,665	883,608	905,551	927,495	949,438
April	486,446	500,239	514,032	527,825	541,618	555,411	569,204	582,997	596,790
May	353,779	363,810	373,841	383,873	393,904	403,935	413,966	423,998	434,029
June	685,447	704,882	724,318	743,753	763,189	782,624	802,060	821,495	840,930
July	818,114	841,311	864,508	887,706	910,903	934,100	957,297	980,494	1,003,692
August	840,225	864,049	887,873	911,698	935,522	959,346	983,170	1,006,994	1,030,818
September	1,017,115	1,045,954	1,074,794	1,103,634	1,132,474	1,161,314	1,190,153	1,218,993	1,247,833
October	1,680,450	1,728,999	1,775,747	1,823,395	1,871,043	1,918,692	1,966,340	2,013,989	2,061,637
November	4,709,683	4,843,224	4,976,764	5,110,305	5,243,846	5,377,386	5,510,927	5,644,468	5,778,009
December	7,296,692	7,503,586	7,710,480	7,917,374	8,124,268	8,331,162	8,538,056	8,744,951	8,951,845
Total	22,111,188	22,738,139	23,365,089	23,992,042	24,618,995	25,245,946	25,872,896	26,499,850	27,126,803

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	2,719,868	2,781,309	2,915,841	2,085,458	3,865,001	3,592,919	3,263,319	3,164,230	3,352,388
February	1,609,718	1,646,081	1,725,702	1,089,419	2,200,511	2,428,547	1,845,918	1,962,624	1,733,994
March	971,381	993,325	1,041,372	996,040	902,774	1,463,782	824,070	1,682,249	1,194,529
April	610,583	624,375	654,576	684,777	620,657	731,891	593,331	961,285	655,064
May	444,060	454,091	476,056	684,777	479,599	365,945	395,554	761,017	924,797
June	860,366	879,802	922,358	1,276,176	423,175	898,230	1,054,810	1,562,088	1,194,529
July	1,026,889	1,050,086	1,100,879	778,156	789,927	1,363,978	1,549,252	1,762,356	1,040,396
August	1,054,643	1,078,467	1,130,632	871,535	761,716	1,097,836	1,681,104	2,042,731	1,618,394
September	1,276,673	1,305,512	1,368,660	996,040	959,197	1,563,585	1,714,066	2,523,374	2,389,058
October	2,109,285	2,156,934	2,261,264	1,556,312	2,115,876	2,761,225	2,867,765	3,444,605	4,161,585
November	5,911,550	6,045,090	6,337,490	6,661,016	5,501,279	6,853,160	7,054,043	9,412,584	9,710,364
December	9,158,739	9,365,633	9,818,647	13,415,411	9,563,762	10,146,669	10,119,585	10,734,351	10,596,628
Total	27,753,755	28,380,705	29,753,477	31,095,117	28,183,474	33,267,767	32,962,817	40,013,494	38,571,726

* Calendar year totals which result from the addition of the 12 months frequently do not agree exactly with the yearly totals originally given, owing to slight deviations above or below 100 of the total percentage distribution for an individual year.

Table 57
 Monthly Farm Prices for Chickens Received by Producers in Minnesota,*
 1910-1927
 (Fifteenth of the month)
 (Per pound)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$.093	\$.091	\$.085	\$.088	\$.102	\$.091	\$.097	\$.127	\$.155
February	.094	.090	.088	.094	.100	.095	.102	.130	.170
March	.098	.091	.093	.100	.105	.099	.108	.140	.175
April	.100	.095	.096	.102	.112	.104	.123	.152	.185
May	.100	.094	.096	.102	.114	.108	.118	.157	.185
June	.101	.090	.096	.102	.109	.099	.117	.150	.184
July	.102	.094	.094	.114	.107	.101	.120	.150	.195
August	.104	.098	.096	.114	.112	.100	.116	.150	.200
September	.100	.094	.098	.114	.106	.104	.123	.167	.208
October	.094	.088	.096	.103	.106	.098	.125	.154	.198
November	.090	.082	.093	.098	.091	.092	.124	.130	.173
December	0.090	0.082	0.088	0.096	0.089	0.088	0.120	0.143	0.172

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$.184	\$.192	\$.200	\$.160	\$.140	\$.135	\$.158	\$.184	\$.177
February	.183	.216	.200	.170	.140	.147	.170	.189	.175
March	.195	.235	.200	.170	.150	.158	.174	.186	.176
April	.210	.240	.210	.180	.159	.159	.180	.202	.184
May	.230	.248	.190	.180	.157	.174	.183	.200	.175
June	.210	.220	.150	.170	.160	.157	.180	.194	.151
July	.210	.215	.170	.170	.150	.170	.177	.192	.156
August	.220	.232	.190	.160	.160	.178	.180	.185	.163
September	.210	.240	.170	.160	.160	.183	.172	.181	.162
October	.180	.200	.150	.160	.150	.164	.163	.171	.158
November	.160	.210	.140	.130	.136	.156	.150	.165	.159
December	.180	0.200	0.150	0.130	0.127	0.151	0.162	0.171	0.169

* Prices 1910-25, U. S. Dept. of Agr. Statistical Bull. 15.
 Prices 1926-27, current numbers of Crops and Markets.

Eggs

Estimates of total egg production depend primarily upon census data. The census reports production for 1919 and 1924, and production for intercensus years has been estimated by straight-line interpolation. The average ratio between these estimated amounts of annual production and the number of chickens on farms was computed for the period 1919-1924 and applied to the number of chickens on farms for each year from 1910 to 1918, and for 1925, 1926, and 1927. The results were accepted as the production for each year in the period.

Annual sales of eggs were estimated at 65 per cent of total production, which was the most accurate estimate obtainable. This method of estimating production and sales is admittedly faulty. It is substantiated reasonably well, however, for the period 1922 to 1925 by the receipts of eggs from Minnesota at the four principal eastern markets,¹⁹ plus an amount to cover urban consumption within the state estimated

¹⁹ New York, Boston, Philadelphia, and Chicago.

at the rate of 15.86 dozens per equivalent adult male, which is the amount reported by the United States Bureau of Labor Statistics in its 1918-19 cost-of-living survey in the north central states.²⁰ Estimates of sales made in this manner average about 1,000,000 dozen per year less than the estimates made by taking a flat percentage of total production. It is believed that the figure for urban consumption is low, because the equivalent adult male consumption estimate is derived from budgets of working people for whom eggs are more or less a luxury, particularly in the winter months. Neither does this method include the consumption of eggs in towns smaller than 2,500 population, nor receipts of eggs at other than the four principal markets. There must be appreciable amounts shipped from Minnesota to other cities. If such allowances as these could be incorporated, it seems likely that the estimates which have been made would be substantially verified. The figures presented in this section, however, should be considered as rough approximations only. The amounts sold by the farmers of Minnesota, estimated as above outlined, are shown in Table 58.

Table 58
Estimated Amount of Eggs Sold by Farmers of Minnesota, 1910-1927
(Dozens)

Year	Amount	Year	Amount
1910	29,099,166	1919	37,639,899
1911	30,165,084	1920	40,355,962
1912	31,244,283	1921	42,623,099
1913	32,336,762	1922	44,919,316
1914	33,442,520	1923	47,244,610
1915	34,561,559	1924	49,609,020
1916	35,693,880	1925	51,982,438
1917	36,839,479	1926	54,394,972
1918	37,998,360	1927	56,836,581

The percentage distribution on which to base monthly marketings of eggs has also received considerable attention. The percentage which the monthly receipts from Minnesota at the Chicago, New York, Boston, and Philadelphia markets constituted of the annual receipts is available from 1922 to 1926. These figures, together with the average percentage for the five-year period, are shown in Table 59.

²⁰ United States Bureau of Labor Statistics, Bull. 357, p. 112.

Table 59

Monthly Percentage Marketings of Eggs Based on Receipts from Minnesota at Four Eastern Markets,* 1922-1926, and Receipts of Selected Co-operative Associations in Minnesota, 1925

Month	Percentages based on						
	Receipts of four eastern markets from Minnesota						Receipts of co-operative associations, 1925
	1922	1923	1924	1925	1926	Average	
January	2.1	2.0	3.1	1.4	3.5	2.4	2.6
February	2.2	1.9	3.8	3.5	3.5	3.0	5.6
March	3.5	5.4	9.5	8.5	7.7	6.9	13.8
April	15.1	11.8	16.6	17.1	16.7	15.5	19.3
May	23.5	20.2	18.6	16.2	17.9	19.3	15.7
June	17.8	18.3	13.6	15.4	17.2	16.5	13.6
July	11.2	11.4	11.4	10.7	10.0	10.9	10.1
August	9.6	9.3	7.8	9.5	8.9	9.0	8.7
September	8.2	8.4	7.3	8.5	7.7	8.0	6.0
October	4.0	6.2	4.8	4.4	3.6	4.6	2.0
November	1.8	3.0	2.0	2.4	1.6	2.2	0.7
December	1.0	2.1	1.5	2.4	1.7	1.7	1.9

* New York, Boston, Philadelphia, and Chicago.

Additional information for 1925, on the monthly marketings of the farmers who delivered eggs to co-operative associations, was also available. The receipts of nine of the associations which had functioned during the entire 12 months of 1925, resulted in the distribution shown in the last column of Table 59. This distribution confirmed the opinion of those who have followed egg-marketings that in recent years there has been more and more of a tendency for the peak of marketings in the early spring and summer months to flatten out and for marketings in February and especially in March to be larger than formerly. From the information at hand, it was decided to estimate the amounts sold each month by applying the percentage distribution of the last column in Table 59 to the estimated annual sales of eggs for the years 1924, 1925, 1926, 1927, and for the years before 1924, the average percentage of receipts at the four eastern markets.

When the percentage distributions were applied to the estimated annual sales of eggs, monthly sales of the amounts shown in Table 60 resulted.

The prices for eggs used in this study are those reported for the 15th of the month by the United States Department of Agriculture, as shown in Table 61.

Table 60

Amount of Eggs Sold Monthly by the Farmers of Minnesota,* 1910-1927 (Dozens)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	698,380	723,962	749,863	776,082	802,620	829,477	856,653	884,147	911,961
February	872,975	904,953	937,328	970,103	1,003,276	1,036,847	1,070,816	1,105,184	1,139,951
March	2,007,842	2,081,391	2,155,856	2,231,237	2,307,534	2,384,748	2,462,878	2,541,924	2,621,887
April	4,510,371	4,675,588	4,842,864	5,012,198	5,183,591	5,357,042	5,532,551	5,710,119	5,889,746
May	5,616,139	5,821,861	6,030,147	6,240,995	6,454,406	6,670,381	6,888,919	7,110,019	7,333,684
June	4,801,362	4,977,239	5,155,307	5,335,566	5,518,016	5,702,657	5,889,490	6,078,514	6,269,729
July	3,171,809	3,287,994	3,405,627	3,524,707	3,645,235	3,767,210	3,890,633	4,015,503	4,141,821
August	2,618,925	2,714,858	2,811,985	2,910,309	3,009,827	3,110,540	3,212,449	3,315,553	3,419,852
September	2,327,933	2,413,207	2,499,543	2,586,941	2,675,402	2,764,925	2,855,510	2,947,158	3,039,869
October	1,338,562	1,387,594	1,437,237	1,487,491	1,538,356	1,589,832	1,641,918	1,694,616	1,747,925
November	640,182	663,632	687,374	711,409	735,735	760,354	785,265	810,469	835,964
December	494,686	512,806	531,153	549,725	568,523	587,547	606,796	626,271	645,972
Total	29,099,166	30,165,085	31,244,284	32,336,763	33,442,521	34,561,560	35,693,878	36,839,477	37,998,361

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	903,358	968,543	1,022,954	1,078,064	1,133,871	1,289,835	1,351,543	1,414,269	1,477,751
February	1,129,197	1,210,679	1,278,693	1,347,579	1,417,338	2,778,105	2,911,017	3,046,118	3,182,849
March	2,597,153	2,784,561	2,940,994	3,099,433	3,259,878	6,846,045	7,173,576	7,506,506	7,843,448
April	5,834,184	6,255,174	6,606,580	6,962,494	7,322,915	9,574,541	10,032,611	10,498,230	10,969,460
May	7,264,501	7,788,701	8,226,258	8,669,428	9,118,210	7,788,616	8,161,243	8,540,011	8,923,343
June	6,210,583	6,658,734	7,032,811	7,411,687	7,795,361	6,746,827	7,069,612	7,397,716	7,729,775
July	4,102,749	4,398,800	4,645,918	4,896,205	5,149,662	5,010,511	5,250,226	5,493,892	5,740,495
August	3,387,591	3,632,037	3,836,079	4,042,738	4,252,015	4,315,985	4,522,472	4,732,363	4,944,782
September	3,011,192	3,228,477	3,409,848	3,593,545	3,779,569	2,976,541	3,118,946	3,263,698	3,410,195
October	1,731,435	1,856,374	1,960,663	2,066,289	2,173,252	992,180	1,039,649	1,087,899	1,136,732
November	828,078	887,831	937,708	988,225	1,039,381	347,263	363,877	380,765	397,856
December	639,878	686,051	724,593	763,628	803,158	942,571	987,666	1,033,504	1,079,895
Total	37,639,899	40,355,962	42,623,099	44,919,315	47,244,610	49,609,020	51,982,438	54,394,971	56,836,581

* Calendar year totals which result from the addition of the 12 months frequently do not agree exactly with the yearly totals originally given, owing to slight deviations above or below 100 of the total percentage distribution for an individual year.

Table 61
 Monthly Farm Prices for Eggs Received by Producers in Minnesota,*
 1910-1927
 (Fifteenth of the month)
 (Per Dozen)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$.29	\$.26	\$.30	\$.24	\$.28	\$.31	\$.29	\$.35	\$.44
February	.25	.20	.28	.21	.26	.26	.28	.35	.44
March	.20	.15	.22	.18	.21	.18	.18	.27	.31
April	.18	.14	.16	.16	.16	.16	.18	.29	.30
May	.18	.14	.16	.16	.14	.16	.18	.30	.30
June	.17	.13	.16	.16	.16	.15	.18	.30	.31
July	.16	.13	.16	.16	.17	.16	.19	.29	.32
August	.16	.15	.17	.17	.19	.17	.21	.30	.34
September	.18	.17	.19	.20	.21	.18	.23	.34	.36
October	.22	.20	.22	.23	.23	.22	.29	.35	.41
November	.25	.24	.26	.29	.26	.27	.33	.37	.46
December	.28	.28	.26	.30	.30	.31	.37	.41	.56

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$.52	\$.57	\$.51	\$.27	\$.36	\$.30	\$.44	\$.32	\$.34
February	.32	.48	.28	.38	.31	.30	.33	.26	.28
March	.32	.40	.26	.21	.25	.18	.20	.23	.21
April	.36	.36	.21	.21	.21	.17	.24	.25	.20
May	.39	.37	.17	.20	.21	.19	.24	.24	.19
June	.34	.34	.18	.20	.19	.20	.26	.25	.16
July	.35	.34	.24	.19	.18	.21	.27	.24	.19
August	.37	.41	.25	.18	.21	.24	.29	.24	.21
September	.39	.45	.27	.24	.26	.30	.26	.30	.25
October	.48	.50	.38	.31	.30	.36	.34	.35	.31
November	.57	.58	.45	.38	.38	.41	.42	.41	.36
December	.68	.65	.49	.45	.40	.46	.42	.44	.41

* Prices 1910-25, U. S. Dept. of Agr. Statistical Bull. 15.
 Prices 1926-27, current numbers of Crops and Markets.

Butterfat

Estimates of the quantity of butterfat sold were derived from the annual reports of the Minnesota State Department of Agriculture, Dairy and Food. For the most part, the pounds of butterfat received annually by the creameries of the state were available. For 1926, the estimate of the amount of butterfat sold by farmers had to be made before the figures of the Dairy and Food department were compiled, and the increase in receipts of the Land O'Lakes Creameries, Incorporated, in 1926 over their receipts in 1925 was taken as representative of butterfat sales in general and applied to the 1925 figure for the state in order to determine the total estimate for 1926. Such an estimate was essential if 1926 was to be included in the base period. A subsequent check on this procedure showed a difference of only about 2 per cent in the figure thus secured and the one which would have been computed later from the records of the Dairy and Food department. In 1927, the estimate of butterfat was derived from the

total pounds of butter manufactured by Minnesota creameries as reported by the Dairy and Food department. From these annual amounts of butterfat received by Minnesota creameries, the amount estimated to have been resold to farmers, has been deducted. This item varies from 5.04 per cent of creamery receipts of butterfat in 1910 to 5.65 per cent in 1927.²¹ The deduction was made because this amount did not represent a real sale but merely a trade of butterfat for butter, and consequently was not a factor in cash income. Cream retained at home for the production of butter would not be considered, and, from the standpoint of cash income, this "resale" of butter seemed more closely related to the home production of butter than to a sale-and-purchase transaction. The amount remaining after this deduction represented the approximate sales of Minnesota farmers. The method is faulty in assuming that the butter and butterfat reported by Minnesota creameries constituted sales of Minnesota farmers only. No data are available to show how much may have been shipped to Minnesota creameries from farmers outside the state, or how much the farmers of Minnesota may have shipped to creameries outside the state. The

Table 62
Receipts of Butterfat by Minnesota Creameries, Amount Resold to Farmers,
and Amount of Actual Sales by the Farmers of Minnesota, 1910-1927
(Pounds)

Year	Receipts by Minnesota creameries*	Amount resold to farmers	Amount of actual sales
1910	80,637,000	4,066,524	76,570,476
1911	82,342,000	4,182,150	78,159,850
1912	96,679,000	4,944,164	91,734,836
1913	101,647,000	5,234,820	96,412,180
1914	99,397,000	5,154,728	94,242,272
1915	103,237,000	5,390,004	97,847,000
1916	108,383,000	5,697,694	102,685,310
1917	99,672,000	5,275,639	94,396,361
1918	107,902,000	5,749,019	102,152,980
1919	116,117,000	6,228,516	109,888,480
1920	113,066,000	6,105,564	106,960,440
1921	137,734,000	7,487,220	130,246,780
1922	157,322,000	8,607,087	148,714,130
1923	178,073,000	9,806,480	168,266,520
1924	202,612,511	11,228,785	191,383,720
1925	208,895,772	11,652,206	197,243,566
1926	209,731,445	11,774,323	197,957,122
1927	220,309,868	12,447,504	207,862,364

* When available, these amounts have been taken from annual reports of the Minnesota State Department of Agriculture, Dairy and Food. If not available, at the time required, receipts were estimated by the methods outlined in the text.

²¹ Business Practices and Management Problems of Creameries (mimeographed), J. D. Black, Paul L. Miller, B. A. Holt, University of Minnesota, pp. 60-62. In a study of the distribution of 20 million pounds of butter produced by 87 Minnesota creameries in 1919 and 1920, an average of 5.4 per cent was sold to patrons.

assumption that the amounts approximately balance probably leads to no appreciable error.

The amounts of butterfat received by Minnesota creameries, the amount deducted for resales to farmers, and the amounts representing the sales of the farmers of Minnesota are shown in Table 62.

The monthly production of creamery butter in Minnesota from 1921-1925 has been used as a basis for the percentage distributions of annual sales for this period. For 1926 and subsequent years, the percentage distributions have been based on the number of pounds of butter inspected monthly by the Land O'Lakes Creameries, Incorporated. These percentages are shown in Table 63, together with an average for 1921 to 1926, which was applied in the period prior to 1921.

The monthly sales of butterfat, as thus estimated, are shown in Table 64.

Table 63

Monthly Percentage Marketings of Butter Based on Production of Creamery Butter in Minnesota, 1921-1926

Month	1921	1922	1923	1924	1925	1926	Average
January	5.3	6.9	8.6	6.6	7.0	8.3	7.1
February	5.6	6.7	6.5	7.3	6.8	8.7	6.9
March	6.6	7.9	8.1	8.0	7.8	10.5	8.2
April	7.3	7.3	7.8	8.1	8.3	9.9	8.1
May	10.9	11.4	10.1	9.5	10.5	10.9	10.6
June	13.8	13.4	12.3	11.4	12.4	11.6	12.5
July	11.3	12.1	10.9	11.7	11.8	9.7	11.2
August	10.8	9.1	9.4	10.9	9.2	7.6	9.5
September	8.3	7.4	7.4	7.9	7.1	6.0	7.4
October	7.3	6.2	6.6	6.7	6.5	5.1	6.4
November	6.1	5.4	5.8	5.3	5.8	5.0	5.6
December	6.7	6.0	6.5	6.6	6.8	6.7	6.5

Table 64
Amount of Butterfat Sold Monthly by the Farmers of Minnesota,* 1910-1927 (Pounds)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	5,436,504	5,549,349	6,513,173	6,845,265	6,691,201	6,947,137	7,290,657	6,702,142	7,252,862
February	5,283,363	5,393,030	6,329,704	6,652,440	6,502,717	6,751,443	7,085,286	6,513,349	7,048,556
March	6,278,779	6,409,108	7,522,257	7,905,799	7,727,866	8,023,454	8,420,195	7,740,502	8,376,544
April	6,202,209	6,330,948	7,430,522	7,809,387	7,633,624	7,925,607	8,317,510	7,646,105	8,274,391
May	8,116,470	8,284,944	9,723,893	10,219,691	9,989,681	10,371,782	10,884,643	10,006,014	10,828,216
June	9,571,310	9,769,981	11,466,854	12,051,522	11,780,284	12,230,875	12,835,664	11,799,545	12,769,122
July	8,575,893	8,753,903	10,274,302	10,798,164	10,555,134	10,958,864	11,500,755	10,572,392	11,441,134
August	7,274,195	7,425,186	8,714,809	9,159,157	8,953,016	9,295,465	9,755,104	8,967,654	9,704,533
September	5,666,215	5,783,829	6,788,378	7,134,501	6,973,928	7,240,678	7,598,713	6,985,331	7,559,321
October	4,900,510	5,002,230	5,871,030	6,170,380	6,031,505	6,262,208	6,571,860	6,041,367	6,537,791
November	4,287,947	4,376,952	5,137,151	5,399,082	5,277,567	5,479,432	5,750,377	5,286,196	5,720,567
December	4,977,081	5,080,390	5,962,764	6,266,792	6,125,748	6,360,055	6,674,545	6,135,763	6,639,944
Total	76,570,476	78,159,850	91,734,837	96,412,180	94,242,271	97,847,000	102,685,309	94,396,360	102,152,981

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	7,802,082	7,594,191	6,903,079	10,261,275	14,470,921	12,631,326	13,807,050	16,430,441	16,836,852
February	7,582,305	7,386,270	7,293,820	9,963,847	10,937,324	13,971,012	13,412,562	17,222,260	16,213,264
March	9,010,855	8,770,756	8,596,287	11,748,416	13,629,588	15,310,698	15,384,998	20,785,498	17,876,163
April	8,900,967	8,663,796	9,508,015	10,856,131	13,124,789	15,502,081	16,371,216	19,597,755	18,915,475
May	11,648,179	11,337,807	14,196,899	16,953,411	16,994,919	18,181,453	20,710,574	21,577,326	23,488,447
June	13,736,060	13,370,055	17,974,056	19,927,693	20,606,782	21,817,744	24,458,202	22,963,026	25,567,070
July	12,307,510	11,979,569	14,717,886	17,994,410	18,341,051	22,391,895	23,274,741	19,201,841	22,449,135
August	10,439,406	10,161,242	14,066,652	13,532,986	15,817,053	20,860,825	18,146,408	15,044,741	17,668,302
September	8,131,748	7,915,073	10,810,483	11,004,846	12,451,722	15,119,314	14,004,293	11,877,427	12,679,604
October	7,032,863	6,845,468	9,508,015	9,220,276	11,105,590	12,822,709	12,820,832	10,095,813	12,471,742
November	6,153,755	5,989,785	7,945,054	8,030,563	9,759,458	10,143,337	11,440,127	9,897,856	10,393,118
December	7,142,751	6,952,429	8,726,534	8,922,848	10,937,324	12,631,326	13,412,562	13,263,127	13,303,192
Total	109,888,481	106,960,441	130,246,780	148,416,702	168,266,521	191,383,720	197,243,565	197,957,120	207,862,364

* Calendar year totals which result from the addition of the 12 months frequently do not agree exactly with the yearly totals originally given, owing to slight deviations above or below 100 of the total percentage distribution for an individual year.

Since September, 1920, the prices used for butterfat are those of the 15th of the month reported by the United States Department of Agriculture. Previous to September, 1920, the monthly price of butterfat in Minnesota was assumed to be equal to the average price of 92 score butter in New York. This relationship was found to be approximately correct for the period 1920 to 1926, when prices of both Minnesota butterfat and 92 score butter in New York were available for comparison. Table 65 shows the price used for butterfat in Minnesota, which is a combination of the two series mentioned.

Table 65
Estimated Prices for Butterfat Received by Producers in Minnesota,*
1910-1927
(Per pound)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$0.33	\$0.26	\$0.39	\$0.35	\$0.33	\$0.34	\$0.33	\$0.40	\$0.52
February	.30	.26	.32	.36	.29	.32	.34	.44	.50
March	.33	.24	.31	.37	.28	.30	.37	.42	.44
April	.31	.21	.33	.35	.25	.31	.36	.44	.42
May	.28	.22	.30	.29	.26	.29	.31	.40	.42
June	.28	.23	.27	.28	.27	.28	.30	.39	.44
July	.28	.25	.27	.27	.28	.27	.29	.39	.45
August	.29	.26	.27	.28	.30	.26	.31	.41	.46
September	.30	.27	.30	.32	.31	.27	.34	.44	.56
October	.30	.30	.31	.31	.32	.29	.35	.45	.58
November	.31	.34	.34	.34	.35	.31	.39	.46	.63
December	0.30	0.37	0.37	0.36	0.34	0.35	0.40	0.50	0.69

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$0.62	\$0.65	\$0.47	\$0.38	\$0.50	\$0.54	\$0.41	\$0.47	\$0.52
February	.52	.66	.43	.37	.46	.53	.37	.45	.51
March	.62	.67	.43	.36	.47	.49	.43	.45	.51
April	.64	.71	.42	.34	.47	.41	.42	.43	.51
May	.58	.61	.29	.34	.41	.38	.41	.41	.48
June	.52	.57	.28	.34	.38	.37	.42	.42	.44
July	.53	.57	.33	.35	.37	.39	.42	.41	.44
August	.55	.55	.39	.34	.40	.39	.43	.41	.43
September	.59	.57	.39	.35	.43	.38	.44	.43	.45
October	.68	.60	.40	.38	.46	.37	.49	.46	.48
November	.71	.57	.42	.44	.50	.38	.49	.48	.49
December	0.72	0.56	0.41	0.50	0.53	0.43	0.52	0.52	0.52

* January, 1910, to August, 1920, price of New York Extras, 1926 Yearbook of Agriculture. September, 1920, to December, 1925, price received by producers (fifteenth of the month), U. S. Dept. of Agr. Statistical Bull. 15; 1926-27, current numbers of Crops and Markets.

Milk

The amount of fluid milk sold by the farmers of Minnesota was estimated by combining the sales within the Twin City area, the sales in Minnesota cities outside the Twin City area, and the sales to cheese factories. The basic data were such that the separate computation of milk in each of these divisions was feasible. Estimates of urban consumption of milk furnish the basis for the amount of milk sold by Min-

nesota farmers. Urban consumption for the Twin Cities was determined by reducing the population to adult male equivalents, by a method similar to that previously explained, and applying a consumption figure. Several sources were consulted in the effort to determine consumption per equivalent adult male in the Twin Cities. The basis for the estimate finally adopted was the per capita consumption of milk in Minneapolis for the years 1912 and 1923.²² These per capita estimates of consumption were reduced to the basis of consumption per equivalent adult male, and straight line interpolation used for the intervening years. The same annual increment of change was used to extend the figures back to 1910 and forward to 1926. As thus estimated, the consumption of milk per equivalent adult male in the Twin Cities ranged from 325 pounds in 1910 to 349 pounds in 1926.

After the total milk consumed in the Twin City area was estimated in this manner, the amount of milk sold to distributors²³ by the Twin City Milk Producers' Association was subtracted. The difference represented the amount of milk sold in the Twin Cities that was received from sources other than the association. To this difference was added the total milk received by the association. This would include not only the milk that organization sold to distributors within the cities but also milk sold in the area that was disposed of in other ways. This sum, which could be computed for the years 1918 to 1927, represents the total milk sold by farmers in the Twin City area. Before 1918, the first full year of operation of the Twin City Milk Producers' Association, the milk sold in the Twin City area was assumed to equal the total consumption of milk in the Twin Cities, estimated on the basis of population and the consumption per equivalent adult male. The estimate based on this assumption fails to include any surplus taken care of by individual dealers.

Sales of milk for the area outside the Twin Cities were estimated as follows: The total annual population of cities and towns of more than 2,500 population in 1920 was determined for each year by means of interpolation between census years. The annual population was reduced to adult male equivalents and the consumption of milk was derived by applying an annual consumption of 340 pounds per adult male to the total adult male equivalents for each year. Sales were assumed to be equal to consumption.

The annual amount of milk purchased by cheese factories within the state is reported by the State Dairy and Food department, or can be computed approximately by the amount of cheese manufactured.

²² C. M. Jones, *The Milk Supply of Minneapolis*, Bull. 53, State Dairy and Food Commission, p. 5; and 1925 Yearbook, Franklin Co-operative Creamery Association, p. 33.

²³ Twin City Milk Producers' bulletins.

The sum of these three estimates represents the total amount of milk sold annually by the farmers of Minnesota. These amounts are shown later as the totals in Table 67, where they have been distributed according to months.

The reports of the total amounts of milk handled by the Twin City Milk Producers' Association were available by months in their original form. In the case of annual figures, or estimates of consumption which had to be made on an annual basis, it was necessary to apply a monthly percentage distribution before the various figures could be combined to form the total sales of milk. The amount of milk sold in the Twin Cities which was secured from other sources than the Twin City Milk Producers' Association was distributed according to the percentage which the sales to distributors by the association for each month were of the total annual sales. The milk used in cities other than Minneapolis and St. Paul was distributed according to the average of the above percentages for the period 1918-1926. In the case of milk sold for the manufacture of cheese, it was thought advisable to make the monthly distribution on the basis of the average percentage which the amount of milk received each month by the Twin City Milk Producers' Association was of the total annual amount, rather than on the basis of their sales to distributors. The average percentage distributions of the two series are shown in Table 66.

Table 66
Average Monthly Percentage Marketings of Milk, 1918-1926

	Based on T. C. M. P. A. sales to distributors	Based on total amount handled by T. C. M. P. A.
January	7.7	7.9
February	7.2	7.8
March	8.0	8.9
April	8.1	8.5
May	8.6	10.0
June	8.6	10.3
July	9.1	9.1
August	8.7	7.9
September	8.5	7.1
October	8.7	7.2
November	8.5	7.1
December	8.3	8.2

Table 67
Amount of Milk Sold Monthly by the Farmers of Minnesota, 1910-1927 (Hundredweight)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	223,615	220,479	230,470	243,721	252,720	256,274	261,080	267,919	292,218
February	211,117	207,778	217,427	230,255	238,940	242,212	246,717	253,248	277,573
March	235,702	231,778	242,671	257,173	266,976	270,582	275,593	282,928	309,449
April	236,155	232,675	243,325	257,465	267,057	270,772	275,832	283,089	296,208
May	255,488	250,854	262,884	278,933	289,754	293,575	298,976	307,003	343,037
June	256,951	252,028	264,280	280,647	291,666	295,448	300,857	308,983	347,147
July	263,120	259,641	271,274	286,683	297,163	301,394	307,067	315,071	350,288
August	247,653	245,097	255,627	269,510	279,005	283,151	288,551	295,941	322,825
September	238,945	237,043	246,872	259,779	268,651	272,781	278,040	285,054	299,490
October	244,240	242,357	252,370	265,509	274,546	278,780	284,161	291,319	293,085
November	238,945	237,043	246,872	259,779	268,651	272,781	278,040	285,054	284,142
December	239,501	236,424	246,960	260,908	270,403	274,274	279,445	286,712	286,166
Total	2,891,432	2,853,197	2,981,032	3,150,362	3,265,532	3,312,024	3,374,359	3,462,321	3,701,628

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	318,130	305,445	314,422	334,574	366,751	429,311	439,989	495,024	470,013
February	308,629	297,655	310,489	317,605	349,992	420,746	416,893	473,172	450,201
March	352,943	332,052	360,525	360,404	401,239	463,266	471,380	529,482	507,065
April	339,320	326,392	368,290	345,941	397,073	456,060	468,452	510,783	489,847
May	390,405	364,346	420,913	392,558	443,826	500,983	528,979	562,315	552,229
June	394,642	379,527	430,237	389,502	453,523	506,217	540,409	549,695	553,351
July	391,637	365,850	397,732	362,615	428,056	471,581	510,090	506,174	509,690
August	364,628	336,091	366,216	336,545	399,201	418,783	445,033	453,968	440,176
September	333,331	324,521	340,346	321,097	371,893	397,191	402,155	415,455	416,344
October	341,593	330,659	347,236	337,179	381,146	408,142	417,138	424,190	426,615
November	340,817	319,480	336,060	326,669	384,527	396,902	421,905	419,973	417,732
December	365,229	331,233	364,414	348,246	419,272	427,967	463,630	459,852	451,630
Total	4,241,304	4,013,251	4,356,880	4,172,935	4,706,499	5,297,149	5,526,053	5,800,983	5,684,893

The monthly average prices of milk are the weighted average prices paid producers for milk of each of the three divisions, weighted by the amounts of each sold by producers. From April, 1917, to December, 1927, the monthly price of milk in the Twin City area was assumed to be the price paid producers by the Twin City Milk Producers Association. The monthly price of milk outside the Twin City area from April, 1917, to December, 1927, was taken as the average price paid producers in the West North Central States reported in Crops and Markets and previous publications of the United States Department of Agriculture. Prior to these periods the price of milk for both areas was computed according to a formula relating the price of butter to the price of milk.

Table 68

Monthly Weighted Price of Milk Received by Producers in Minnesota,*
1910-1927
(Fifteenth of the month)
(Per hundredweight)

Month	1910	1911	1912	1913	1914	1915	1916	1917	1918
January	\$1.57	\$1.30	\$1.83	\$1.65	\$1.60	\$1.66	\$1.70	\$2.30	\$2.73
February	1.46	1.30	1.57	1.68	1.46	1.58	1.73	2.42	2.64
March	1.56	1.23	1.54	1.71	1.43	1.51	1.82	2.35	2.46
April	1.47	1.10	1.59	1.61	1.29	1.51	1.76	2.24	2.33
May	1.35	1.12	1.46 ¹	1.39	1.30	1.43	1.57	2.03	2.25
June	1.36	1.17	1.36	1.37	1.35	1.41	1.57	1.95	2.28
July	1.38	1.25	1.38	1.35	1.41	1.39	1.54	2.17	2.35
August	1.42	1.30	1.39	1.40	1.49	1.37	1.62	2.30	2.50
September	1.47	1.34	1.51	1.55	1.53	1.42	1.75	2.36	2.77
October	1.48	1.46	1.55	1.52	1.58	1.50	1.79	2.70	3.03
November	1.51	1.61	1.66	1.63	1.68	1.57	1.93	2.58	3.24
December	1.47	1.70	1.76	1.69	1.64	1.70	1.95	2.65	3.39

Month	1919	1920	1921	1922	1923	1924	1925	1926	1927
January	\$3.20	\$3.08	\$2.50	\$1.90	\$2.51	\$2.34	\$2.13	\$2.25	\$2.33
February	2.72	2.96	2.38	1.72	2.37	2.27	2.12	2.17	2.12
March	2.99	2.80	2.28	1.81	2.35	2.12	2.14	2.13	2.32
April	2.85	2.81	2.16	1.78	2.25	1.81	2.10	2.03	2.32
May	2.73	2.65	1.76	1.73	2.17	1.76	2.06	2.01	2.15
June	2.85	2.60	1.55	1.70	2.15	1.80	2.08	2.04	2.09
July	2.93	2.61	1.72	1.85	2.19	1.83	2.09	2.11	2.13
August	3.05	3.04	1.98	1.95	2.50	2.04	2.20	2.15	2.18
September	3.13	3.12	2.07	2.16	2.48	2.05	2.37	2.21	2.25
October	3.09	3.12	2.03	2.30	2.45	2.05	2.45	2.27	2.37
November	3.16	3.07	2.01	2.38	2.39	2.06	2.47	2.33	2.39
December	3.21	2.94	1.94	2.55	2.34	2.13	2.46	2.36	2.42

* Prices include those of Twin City Milk Producers' Association, those reported by Crops and Markets for the west north central section, those of the State Department of Agriculture, Dairy and Food, and others, weighted by amounts of milk sold, as explained in text.

The annual average price paid producers for milk sold to cheese factories is reported by the State Department of Agriculture, Dairy and Food. It was assumed that the monthly price of milk sold to cheese factories varied from the annual average in the same propor-

tion that the price of cheese at New York varied from the average annual price of cheese. Prices of cheese used as a basis for determining these monthly variations in the milk price were obtained from the New York Produce Review. The weighted price of all milk, derived as explained above, is shown in Table 68.

The data of prices and quantities of milk sold as herein estimated are undoubtedly subject to considerable error. However, no more satisfactory method of their determination has been found. Actual reports of sales are not available. Census data of milk sales are doubtless too low, according to statements of the bureau itself. Hence, it was found necessary to devise methods of estimation based upon sources other than the census.

There is some duplication of reported sales, because part of the milk received by the Twin City Milk Producers' Association eventually finds its way into butter or cheese production and is reported there, also. On the other hand, no attempt is made to estimate the amount of milk sold in towns of under 2,500 population. Neither has any attempt been made to include amounts of farm butter, buttermilk, homemade cheese, and other dairy products sold by farmers. These items are small and are continually becoming of less importance. The duplications and omissions in dairy products tend to offset one another. It is probable that omissions more than offset duplications. It was also assumed that the amount of milk and cream shipped into the state would balance that which is shipped out of the state by farmers. No data are available to prove this assumption, but estimates of dairy specialists indicate that the two about offset each other.