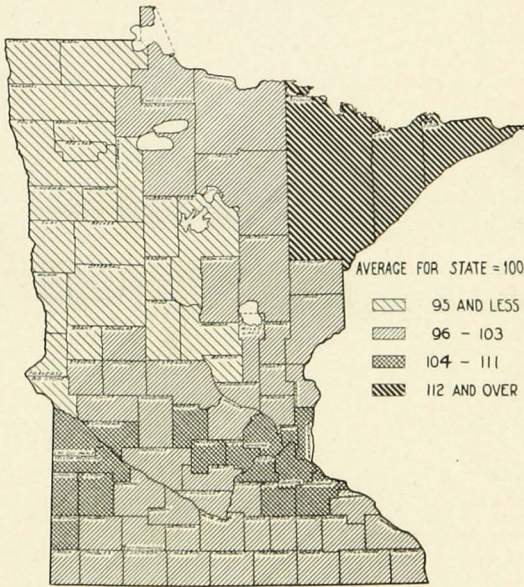


UNIVERSITY OF MINNESOTA
AGRICULTURAL EXPERIMENT STATION

LOCAL PRICES OF LIVESTOCK COMMODITIES IN MINNESOTA

L. F. GAREY
DIVISION OF AGRICULTURAL ECONOMICS



Relative Prices Received by Farmers for Livestock and Livestock Products
in Minnesota, 1925 to 1929

UNIVERSITY FARM, ST. PAUL

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LOCAL PRICES OF LIVESTOCK COMMODITIES IN MINNESOTA¹

L. F. GAREY²

INTRODUCTION

The prices of livestock commodities, like the prices of crops, tend to group themselves into zone-like areas. This indicates that there are certain fundamental factors common to all commodities that account for a part of the variations in the local prices received by farmers. These factors operate in the same manner in all parts of the state.

Three factors common to all commodities in causing variation in local prices are quantity of production in a locality, quality of the product produced, and the distance to market.

Where conditions are most favorable for the production of a commodity, there is usually a surplus production above that needed locally. This has a tendency to lower the price relative to the price in other areas not so suitable for the production of that particular commodity. On the other hand, the product of highest quality is usually found where the conditions for its production are most favorable. Under such conditions, the influence of quality on price tends to offset the effect of a surplus in production, altho it may not always do so. The localities with the most favorable natural conditions for the production of a commodity may be far from market and at a disadvantage from the standpoint of transportation. In some cases, particularly with livestock commodities, quality has enough influence on price to overcome the disadvantages of long distances to market.

The surplus of livestock commodities may be measured in different ways. The number of hogs per 100 acres in farms is used as a measure of hog surpluses; the percentage of all cattle kept for beef production, of beef surpluses; the number of sheep per farm or per person, of sheep surpluses; the number of birds per person, of poultry and egg surpluses; and the butterfat sold per acre or per cow, of butterfat surpluses.

Measurement of quality is difficult, consequently variations in prices resulting from differences in quality are difficult to determine. Differences in quality of livestock commodities are determined to a large

¹ University of Minnesota Agricultural Experiment Station Bulletin 305 is a similar treatise on local prices of crops grown in Minnesota.

² Acknowledgment is made to Dr. W. C. Waite and Dr. O. B. Jesness for suggestions in the development of the manuscript, and to the Minnesota Crop Reporting Service, cooperating with the United States Department of Agriculture, and the Minnesota State Department of Agriculture for assistance.

extent on the basis of intangible factors. For example, in the determination of quality in livestock, seeing and feeling are important, while with butter, taste and smell are used, and with eggs, candling is a factor. The small volume of business in the local market does not permit the development of these skills as accurately as they are developed in the large markets, and for this reason quality in livestock commodities, as determined by local facilities, is not generally accepted in terminal markets.

The facilities for grading eggs, and in many places cream, make it possible to determine quality more accurately at the local shipping point than can be done with livestock. This means that the differences in the prices of livestock commodities, as influenced by quality, are determined in the terminal markets largely on the basis of personal judgments.

Transportation costs, which consist mostly of freight charges, cause differences in local prices. A large part of the livestock commodities produced in Minnesota find their outlet through the Twin Cities, which serve as a receiving, processing, consuming, and shipping center. Small processing plants are found throughout the state, and they have an influence on the price producers receive in their localities. This makes the problem of price comparison with areas that have no processing plants more complex when considering the distance to the central market. The amount of commodities passing through such points is small when compared with that going through the Twin Cities. On the whole, the price received by the producer is low with high freight charges and high with low freight charges.

The average distance by rail from shipping points in a county to Minneapolis and St. Paul has been used to indicate the freight charge from the various localities in the state.

This study deals with the six principal livestock commodities produced in Minnesota for the five-year period 1925 to 1929. A five-year period is used in order that influences causing year-to-year differences may be eliminated, thus leaving the more permanent factors as a basis for the analysis of the price differences in localities.

The prices used are those reported by farmers and others monthly, and represent what farmers received for their commodities on the fifteenth of the month.

THE PRICE OF HOGS

The local price of hogs for the five-year period, November 1925 to October 1930, varied from \$8.82 per 100 pounds in Kittson County to \$11.75 in Cook County, a variation of 33 per cent. In the southern part of the state, where a surplus of hogs is produced, the variation in

price was but 10 per cent between the lowest- and highest-priced counties and less than 10 per cent between adjacent counties.

The price was lowest in the extreme northwestern part of the state where distance to market is a factor. There were three high-priced areas in the state. One was in the extreme northeastern part where

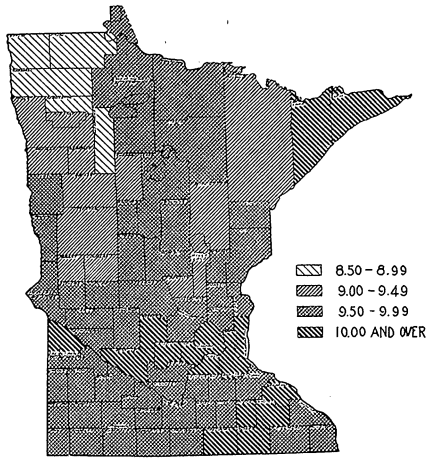


Fig. 1. Price of Hogs per 100 Pounds for the Five-Year Period, November 1925 to October 1930

Note the low price in the northwestern part of the state which is far from market and had little corn as compared with the price in the southeastern part of the state which had good marketing facilities and a surplus of corn.

there is a deficit of hog production; one was in the southeastern part of the state, and one extended from the Twin Cities west to the South Dakota boundary. The price of hogs in Clay, Wilkin, and Traverse counties was undoubtedly influenced some by the nearness to slaughter houses at Fargo and Grand Forks, North Dakota. The high price in the north central and northeastern parts of the state is doubtless the result of deficit hog production, and the price is likely to be determined on an import basis. Figure 1 shows the variation in the price of hogs for the five-year period, November 1925 to October 1930. Prices of hogs are not available by counties for the period 1910-14.

Hog production.—Altho hogs are raised to some extent in all counties in the state, they are of greatest importance in the southern counties where there is an abundance of feed suitable for pork production. In the past, these feeds have been corn, barley, and skimmilk. The greatest number of hogs is in the areas of corn production, with some tendency for expansion where barley is grown. Distance to market is not a particularly significant factor in determining areas of hog production as they are a concentrated product. It is important, however, in determining whether corn will be fed to hogs on the farm or sold. In Table 1 is indicated the relation of acres of corn and barley and number of cows per 100 acres in farms to density in the number of hogs.

In each of the three groups, based on the acres of corn for grain and barley, the number of hog units increased as the number of cows increased. There was some increase in the acreage of corn and barley as the number of cows increased, but the increase in corn and barley acre-

age was not as rapid as the increase in the number of cows. There did not appear to be any tendency for the number of cows per 100 acres in farms to increase after the corn and barley acreage reached about 25 per cent of the farm land. The tendency when the corn and barley acreage exceeded this percentage was for an increase in livestock rather than cows for milking purposes. All counties which had over 25 per cent of their farm land in corn for grain and barley are not considered dairy counties but are heavy producers of beef and pork.

Table 1
Relation of Acres in Corn for Grain and Barley and Number of Cows per 100 Acres in Farms to Number of Hog Units, 1925-29

Per 100 acres in farms		
Acres of corn for grain and barley	No. of cows	No. of hog units*
0.0- 9.9	0-2.9	.34
	3-5.9	.80
	6 and over	1.55
10.0-19.9	0-2.9	.84
	3-5.9	2.65
	6 and over	3.02
20.0-29.9	0-2.9	2.05
	3-5.9	4.26
	6 and over	...
State average 12.75	5.13	2.23

* One hog unit is equal to five head of hogs.

The influence of the acreage of corn for grain and barley on the number of hogs per 100 acres in farms is indicated in Table 2. The major type of production represented by the counties listed in the table is dairy, and each county has approximately the same number of milk cows per 100 acres in farms.

Table 2
Influence of the Acreage of Corn for Grain and Barley on the Number of Hogs per 100 Acres in Farms, with the Number of Cows Constant, 1925-29

County	Per 100 acres in farms		
	No. of cows	No. of acres of corn for grain and barley	No. of hog units
Douglas	6.1	7.3	1.4
Winona	5.9	11.9	2.2
Dakota	6.0	13.5	2.3
Nicollet	6.1	19.4	4.6
Blue Earth	5.9	23.7	5.1

There was an increase in the number of hog units per 100 acres in farms as the acreage of corn and barley increased. The comparatively small number of hogs in Dakota County is due to a part of the county

being in the whole-milk market area of the Twin Cities, limiting the amount of skim milk available for hogs.

There was an increase in the number of hog units as the number of cows per 100 acres in farms increased, with the acres in corn for grain and barley approximately the same in the different counties (see Table 3). The type of production represented by these counties is beef and pork chiefly, but some cows are milked. Many of the cows milked are more of beef breeding than dairy.

Table 3

Influence of the Number of Cows on the Number of Hogs per 100 Acres in Farms, with the Corn for Grain and Barley Acreage Constant, 1925-29

County	Per 100 acres in farms		
	Acres of corn for grain and barley	No. of cows	No. of hog units
Lyon	30.4	3.8	3.5
Cottonwood	29.7	4.2	4.3
Nobles	30.9	4.6	4.4
Jackson	30.0	4.8	5.2
Martin	29.5	5.2	6.2

It is evident from Tables 1, 2, and 3 that the important factors determining the number of hogs a farmer in Minnesota keeps are the amount of corn and barley and the number of cows he has on his farm.

Corn-hog ratio.—In determining the number of hogs to be raised, the farmer considers the price of hogs and the price of corn. He is likely to be influenced first by the price of hogs. That is to say, if the price of hogs is high at breeding time, he will be inclined to breed more sows than if the price of hogs is low. Whether the pigs when farrowed will be fed and the weight to which they will be fattened, or whether they will be sold, will depend on the price of corn as well as the price of hogs during the feeding period. The corn-hog ratio is important in this connection.

By corn-hog ratio is meant the number of bushels of corn necessary to equal in value 100 pounds of hogs. The ratio may be high because hogs are unusually high in price, or corn unusually low, or a combination of both. The ratio may be low because hogs are unusually low in price, or corn unusually high, or a combination of both. If the ratio is high, conditions favor feeding corn to hogs, and if low it may be more profitable to sell both the corn and unfinished hogs. On the average, nine bushels of corn will produce 100 pounds of hogs. Over a period of years, about 11.4 bushels of corn are required to equal the value of 100 pounds of live hogs in the United States and 13.6 bushels in Minnesota. The ratio in Minnesota is higher than for the United States because of lower prices for corn in Minnesota instead of higher prices of hogs.

The corn-hog ratio is important in hog production because it may affect the number of sows bred, it may determine whether some sows should be sold before they farrow, and it may determine the weight to which some hogs are fattened. Thus, this ratio has some relationship to the marketable supply of hogs, which has some influence on the price received for them.

Quality.—Quality of hogs is dependent on feeding and breeding. High finish cannot be attained without suitable feed. As the greatest abundance of such feed is found in the southwestern part of the state, it would be expected that the hogs of highest finish and heaviest weights would come from this area rather than from areas where the feed situation is less favorable.

In general, quality manifests itself in the prices paid under similar conditions of production and transportation. In some areas certain other forces may be strong enough to obscure the influence of quality. For example, the price of hogs in the southeastern part of the state (see Fig. 1) is believed to be influenced by competition of buyers and proximity to packing plants rather than by any superior quality of the hogs raised there. The same would be true in the area surrounding the Twin Cities. In the high-priced area west to the Minnesota-South Dakota boundary, there is probably a larger proportion of the hogs farrowed on the farms where they are fattened than in the more important cattle-feeding area to the south. In the cattle-feeding areas, many hogs are purchased for the cattle-feeding lot and consequently less attention is given to the breeding of the hogs than in sections where the hogs are farrowed and fattened on the same farms. This is believed to be a factor influencing the price in the area west of the Twin Cities, although competition among buyers there is also keen. To the north of this high-priced area, the scarcity of suitable feed tends to lower the quality, and the scarcer the feed the lower the quality is likely to be. The transportation charges from the three extreme northwestern counties to South St. Paul were approximately \$0.30 per hundredweight more than from the three extreme southwestern counties for the period 1925 to 1929. The price of hogs was \$0.80 per hundredweight higher in the southwestern counties. There was a price differential of \$0.50 per hundredweight in favor of the hogs in the southwestern counties after the transportation differential was eliminated. It is reasonable to assume that this difference in the price was largely due to the difference in the quality of the hogs.

Transportation.—Distance to market and supply of hogs are two important factors causing variations in the local price of hogs. There are several packing plants throughout the southern part of the state which no doubt have an influence on the local price of hogs be-

cause of proximity to market. This is particularly true in the southeastern part of the state, with packing plants at Austin, Albert Lea, and Winona. The excellent transportation facilities to the west of the Twin Cities are an advantage to the farmers in that particular territory.

Table 4
Relation of Distance to South St. Paul and Number of Hogs per
100 Acres in Farms to Price of Hogs, 1925-29*

Miles to South St. Paul	No. hog units per 100 acres in farms				
	Under 1.5	1.5-2.9	3.0-4.4	4.5 and over	Average
Under 75	\$9.92	\$9.99	\$10.16	\$10.01
75-149	9.55	9.78	9.92	\$9.74	9.80
150 and over	9.64	9.79	9.52	9.70

* 54 southern counties.

In all of the 54 southern counties, there is a surplus of hogs raised so the price is determined on a surplus basis instead of a deficit basis as is true in most of the counties in the northern part of the state. In the counties that had the same amount of surplus of hogs, as indicated by the number of hog units per 100 acres in farms, there was a decrease in price as the distance to South St. Paul increased. The price decrease up to about 100 miles from South St. Paul was at a faster rate than for distances greater than 100 miles.

All of the important corn-producing areas 150 or more miles distant are in the southeastern and southwestern parts of the state, where the influence of out-of-state markets is felt more than in other parts of the state. The markets at Sioux Falls, Sioux City, and Omaha have some influence on the price of hogs in the extreme southwestern part of the state. A large number of hogs are shipped out of the southeastern part of Minnesota to Chicago and some out of the southwestern part.

Seasonal variation.—The seasonal changes in hog prices are due primarily to the time of farrowing. Most of the spring pigs are farrowed during the months of April and May. It requires from six to ten months to get these pigs ready for market, depending somewhat on the location, so that the heaviest marketing of the spring pig crop occurs during December and January. Approximately 26 per cent of the entire Minnesota pig crop for the five-year period, 1925 to 1929, was sold during these two months and 36 per cent from November to January. The price received by farmers in Minnesota during these three months was lower than for any other month during the year. In the late summer months, the marketings are the least and the price is usually the highest. Figure 2 shows the seasonal marketing and farm price of hogs in Minnesota for the five-year period, November 1925 to October 1930.

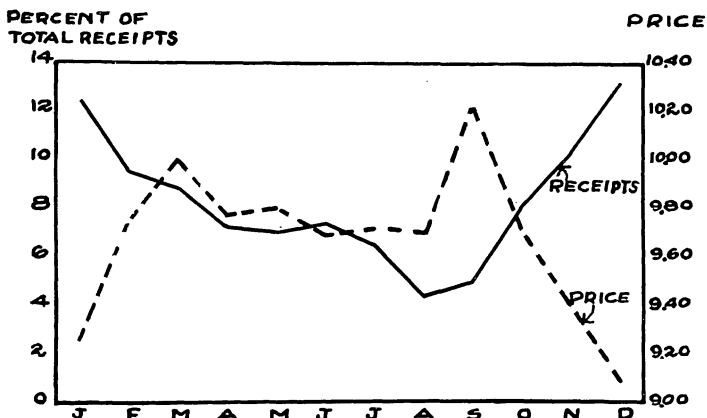


Fig. 2. Percentage of Total Receipts of Hogs Marketed by Minnesota Farmers by Months and the Price Received by Farmers for the Five-Year Period, 1925 to 1929

When the marketings of hogs were large, the price was low, and when small, the price was high. During this five-year period, Minnesota farmers marketed an average of approximately four and one-half million head of hogs annually at an average weight of about 220 pounds.

The seasonal price of hogs received by farmers in surplus-producing counties differs from that in deficit-producing counties or for the state as a whole, and the price fluctuates more. In deficit areas, the price received by farmers is more nearly the retail price than in surplus areas and under such conditions the fluctuation in price is less. The price of hogs received by farmers in five surplus counties in the southwestern part of the state and that in five deficit counties in the northeastern part have been compared and are shown in Figure 3. The seasonal price in

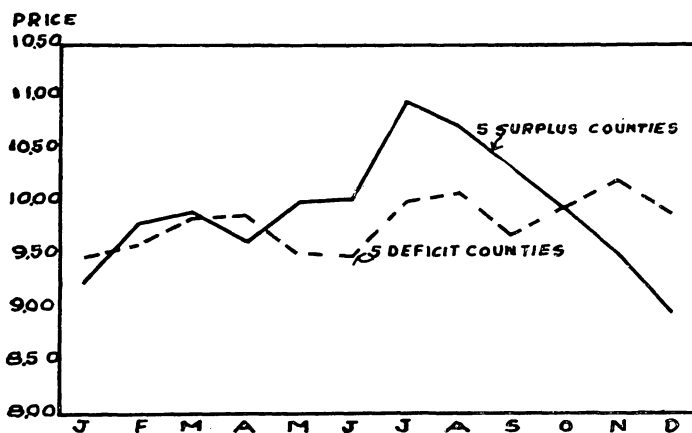


Fig. 3. Monthly Prices Received by Farmers for Hogs in Five Surplus- and Five Deficit-Producing Counties for the Five-Year Period, 1925 to 1929

Notice that the price was higher in the surplus counties than in the deficit counties in months of light marketing and lower in months of heavy marketing.

the five surplus counties for the five-year period, 1925 to 1929, varied 18 per cent; in the five deficit counties, 7 per cent, and for the state, 12 per cent. The highest price in the surplus counties was reached in July and the lowest in December. The highest price in the deficit counties was reached in November and the lowest price in January and June.

THE PRICE OF BEEF CATTLE

The price of beef cattle for the five-year period, September 1925 to August 1930, varied from \$5.16 per 100 pounds in Hubbard County, in the north central part of the state, to \$10.76 in Lac qui Parle County,

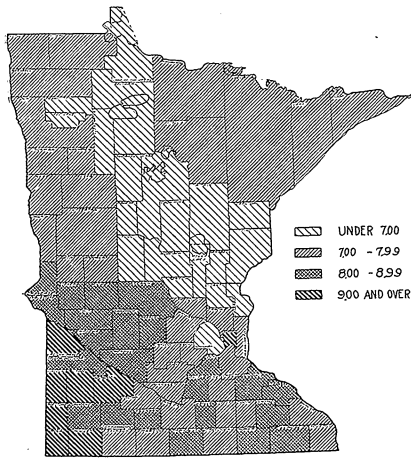


Fig. 4. Price of Beef Cattle per 100 Pounds for the Five-Year Period, September 1925 to August 1929

Note the high-priced area in the southwestern part of the state where there was a surplus of corn. There were very few cattle of beef breeding in the low-priced area in the north central part of the state.

with a concentration in the southwestern part. Corn and legume hay are the principal feeds for finishing beef cattle, and they are available in large quantities in that particular section of the state.

There is a scarcity of beef cattle in the spring-wheat area in northwestern Minnesota and in the dairy sections in the eastern part of the state. Scarcity of suitable feed in the northwest and competition from the dairy industry in the eastern part of the state are the explanations for these conditions.

Beef cattle interfere but little with other farm operations during the busiest season as pasture supplies most of their feed at that time. Dur-

in the southwestern part, a variation of over 100 per cent. There was a moderately high-priced area in the southeastern part of the state. Beef cattle in the south central part of the state and all of the northern part were low or moderately low in price. Figure 4 shows the variation in the price of beef cattle for the five-year period. In general, the price was highest where cattle were most numerous and lowest where they were least numerous, except in the northeastern counties.

Beef production.—The distribution of beef cattle depends largely on the availability of cheap feed and pasture. The distribution is quite general over the southern part of the state,

ing the winter they consume a great deal of roughage for which there is no ready market and may increase the price received for merchantable feed. Because of this, many farmers even outside the beef-cattle belt feed a few cattle each winter, but they are not of high quality when sold.

The variation in the local prices of beef cattle is greater than for most products, because of the wide range in the kind of cattle classed as beef cattle. The cattle classed as beef range from highly finished animals of beef breeding to dairy-bred cows whose usefulness for milk production has ended. There is a wide range in quality even in the beef breeds, when the dual-purpose types are considered, and the range is much wider when the dairy breeds are included. In the dual-purpose and dairy types, the quality of the beef is not such as to command the best prices. The quality in the beef breeds is best where there is a plentiful supply of suitable but cheap feed for fattening.

In the southwestern part of the state, where there is a surplus of feed, the number of beef cattle per 100 acres in farms varies from 6.0 to 8.0, but in the northern part of the state, where there is a deficit of such feed, the number is but 3.0 to 4.0 per 100 acres in farms. In a few counties in the southeastern part of the state, where there is a surplus of corn and barley, the number of beef cattle per 100 acres in farm varies from 6.0 to 8.0, a larger number than in the surrounding territory.

Feed supply.—The principal grains used for fattening beef cattle are corn and barley. Not all of the corn and barley grown in a locality is fed to beef cattle, but as the supply of these feeds increases the price decreases and cattle are fed to a higher finish and bring a higher price. Table 5 gives the relationship between the acres of grain in proportion to beef cattle and the price for the five-year period, 1925 to 1929.

Table 5
Relation of Feed Supply to Price of Beef Cattle, 1925-29

Acres of corn for grain and barley per unit of beef cattle	Price of beef cattle per cwt.	No. hog units per 100 acres in farms	Miles to Twin Cities
0-1.9	\$7.12	1.14	172
2-3.9	7.76	2.16	86
4-5.9	8.18	3.33	164
6 and over	8.88	3.38	153

As the supply of corn for grain and barley increased, the price of beef cattle increased. This indicates that in areas where there is a plentiful supply of suitable feeds for fattening beef cattle, the quality will be better, as revealed in the higher price received by farmers for their cat-

tle. The number of hogs increased with the increase in the proportion of corn and barley to beef cattle, indicating a close relationship between the beef cattle and hog enterprise.

Quality.—Variations in the quality of cattle marketed in various sections of the state obscures the influence of distance to market as a factor in causing variations in local prices of beef cattle. In areas where the conditions for beef-cattle production are essentially the same, the influence of distance to market upon local price can be clearly discerned. For example, throughout the Red River Valley where the conditions for beef production are quite uniform, the prices of beef cattle during the five-year period, 1925-29, were lowest in the extreme northern part and highest in the southern part by approximately the difference in marketing costs to South St. Paul.

In butter- and milk-producing areas, a considerable portion of the stock sold for beef comes from the dairy breeds, with the result that on the whole the quality of the beef tends to be lower than in strictly beef-producing areas. The percentage of all cattle kept for beef production may be taken as a measure of the quality of beef produced in a particular area. As the percentage of beef cattle to total cattle increased, the price increased (see Table 6). There were more hogs as the proportion of beef cattle to all cattle increased. Distance to market was not particularly significant.

Table 6
Relative Importance of Beef Cattle for Fattening and Price of
Beef Animals in Minnesota, 1925-29

Per cent of all cattle kept for beef production	Price per cwt.	No. of hog units per 100 acres in farms	Miles to Twin Cities
16-30	\$7.28	1.8	72
31-45	7.33	1.3	160
46-60	8.24	3.1	146
61-75	8.85	3.9	174

The counties which had 61 per cent and over of all cattle for beef production were in the southwestern part of the state, where the prices were the highest (see Fig. 4). The counties with less than 31 per cent of all cattle kept for beef production were in the east central part of the state. This area of the state on the whole is a low-priced area.

Seasonal variation.—The price of beef cattle is, as a rule, highest in the summer and lowest in the winter. On the other hand, the number of beef cattle sold by farmers is highest in the winter and lowest in the summer.

June is the month of highest prices. This is because most of the winter-fed cattle have been sold before June and because of the demand

for cattle for summer feeding on pasture. Summer feeding is becoming more common in southeastern Minnesota, where pastures are good. By September, the marketings begin to increase, reaching a high point in November. There is a falling-off in marketing in December, probably due to the holiday season, and again in February, due partly to its being a short month. Figure 5 shows the seasonal price and marketing by Minnesota farmers for beef cattle for the five-year period, 1925-29.

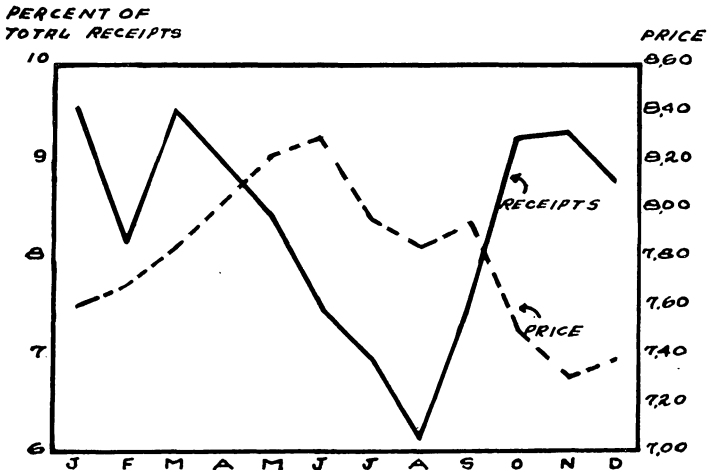


Fig. 5. Percentage of Total Receipts of Beef Cattle Marketed by Minnesota Farmers by Months and Price Received by Farmers for the Five-Year Period, 1925 to 1929

The price tended to be low when the marketings were large and high when the marketings were small. During this five-year period, 641,000 head were marketed annually at an average weight of approximately 880 pounds and 631,000 calves at an average weight of 123 pounds.

There is a noticeable difference in the price of beef cattle in the section of the state where the quality of beef is high and in sections where the quality is low. The average price for the five-year period, 1925-29, in five counties in the southwestern part of the state, a good beef section, was \$2.20 per hundredweight higher than in five counties in the north central part of the state where quality is lower.

There is also some difference in the seasonal variation in the price of beef cattle between the favorable and unfavorable beef-producing areas (see Fig. 6). The low summer price in the poor area was reached in April, while in the good area it was reached in July. The high price in the poor area was reached in September, while in the good area it was reached in October. The widest margin in price between these two areas was in April, a margin of \$2.72 per hundredweight, and the narrowest was in September, a margin of \$1.64.

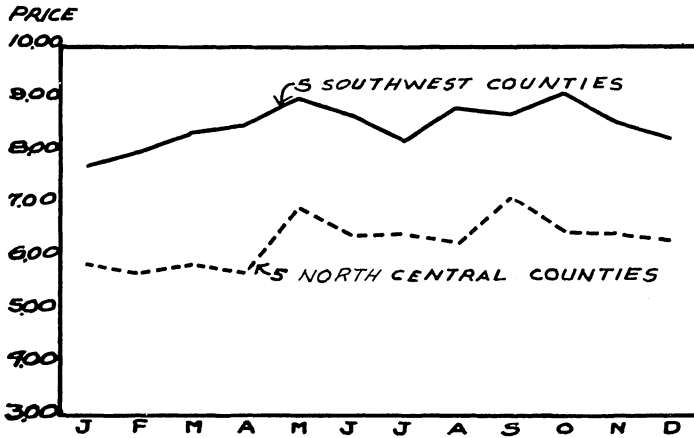


Fig. 6. Monthly Prices Received by Farmers for Beef Cattle in Five Surplus and Five Deficit Counties for the Five-Year Period, 1925 to 1929

The price was higher in the southwestern surplus counties throughout the year. The low-priced counties were in the north central part where there were few cattle of beef breeding.

THE PRICE OF SHEEP

The average price of sheep for the five-year period, May 1925 to April 1930, varied from \$5.30 per 100 pounds in Houston County, in the extreme southeastern part of the state, to \$9.91 in Anoka County,

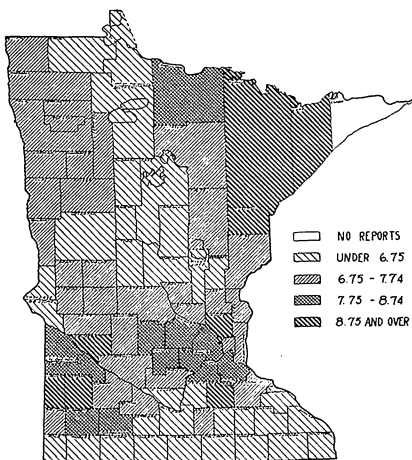


Fig. 7. Price of Sheep per 100 Pounds for the Five-Year Period, May 1925 to April 1930

Note the relatively high-priced areas in the east central and southwestern parts of the state. Low prices were prevalent in the north central part of the state and over nearly all of the southern part.

just north of the Twin Cities, a variation of 87 per cent. There were three areas in the state where sheep were high in price as compared with other areas. One was in the northeastern part of the state, where sheep are relatively few in number; one was in the east central part, and one was in the extreme western part of the state just south of the Minnesota River. The lowest-priced areas were in the southern and north central parts of the state. The northwestern and west central parts of the state were moderately low-priced areas. Figure 7 shows the variation in the price of sheep for the five-year period, May 1925 to April 1930.

Sheep production.—There are two main areas of sheep production in this country, one in eastern Ohio and surrounding territory, and the other in the mountainous sections of the west where over half of the sheep in the United States are raised. In both areas, the topography is too hilly for other livestock to do well. Sheep are most numerous where there is cheap pasture available which will not support dairying or more intensive livestock production. Some sheep are raised on the by-products of the general farm, and, for this reason, a few sheep are found on many farms throughout the United States.

Most of the sheep raising in Minnesota is on a farm-flock basis. Sheep are most numerous in the extreme southeastern, southwestern, and northwestern parts of the state. They do not offer much competition to other farm enterprises unless sheep raising is of major importance. On the farm-flock basis, sheep occupy much the same place in the farm organization as other livestock. Their greatest value is in providing a market for low-valued feeds and in providing an appreciable income with very little cash outlay.

Local supply and transportation.—There are two sources of income from sheep—mutton and wool. In Minnesota, mutton is much more important than wool. The prices of both of these commodities affect the price Minnesota farmers receive for their sheep. As wool is not utilized on the farm in its raw state, the variation in the price of wool on the farm is conditioned largely by the supply and distance to market. The supply is determined by the number of sheep. While some mutton is slaughtered on farms, the per capita consumption is so small that home slaughter can be considered but one of several factors in determining mutton prices. Much the same factors are likely to affect the price of mutton as affect the price of wool, as far as the farmer is concerned. Because of the non-perishable nature and high unit value of wool, distance to market is not highly significant in marketing wool. Because of the relatively small amount of mutton needed to supply local demand, the number of sheep and distance to market are significant influences on the local price of sheep. A satisfactory measure of the supply of mutton and wool in a locality is the number of sheep per farm. Table 7 gives the relationship of the number of sheep and distance to market to the price of sheep in Minnesota.

A larger proportion of the sheep and lambs is slaughtered on farms for home consumption than is true of either hogs or beef cattle. This factor and the distance to market have an important relationship to local prices of sheep in many parts of the state where the surplus of sheep is small.

As the supply of sheep (as measured by the ratio of the number of sheep to human population) increases, the price decreases, when the

distance to market is approximately the same. (See Table 8.) The consumption of mutton is much less per capita than of other meats, but the proportion of the number slaughtered to the total number on farms is much greater.

Table 7

Relation of the Number of Sheep per Farm and Distance to Market to the Price of Sheep Received by Farmers in Minnesota, 1925-29

No. of sheep per farm	Miles to South St. Paul		
	Under 100	100-199	200 and over
0.0 -3.24	\$7.42	\$7.26	\$7.39
3.25-6.49	6.98	7.18	6.78
6.50 and over	6.16	6.34	6.86

Table 8

Relation of Number of Sheep per 100 Population and Distance to Market to Price of Sheep in Minnesota, 1925-29

No. of sheep per 100 persons	Miles to South St. Paul		
	Under 100	100-199	200 and over
Under 25	\$7.75	\$7.87	\$7.70
25-49	6.68	6.89	6.99
50 and over	6.14	6.77	6.88

Seasonal variation.—The lamb crop begins to move to market in April and May, and from then until October there is a continuous increase in the number marketed. After October, the receipts continue to decrease until April or May. From 40 to 50 per cent of the lamb movement in the early fall is to fattening yards in the cornbelt, from which they are marketed a few months later. This movement of lambs to feeding areas serves to adjust the slaughter to a rather uniform rate throughout the year. For the five-year period, 1925-29, the lamb slaughter in October was the highest of any month, 9.5 per cent of the total annual slaughter, and it was lowest in February, 7.4 per cent. This seasonal difference in slaughter, 2.1 per cent, was less than for other kinds of livestock.

The seasonal price of sheep received by farmers in Minnesota varies inversely with the amount of marketings. The price for the five-year period, 1925-29, was highest in April, May, and June, when the receipts were lowest, and lowest in October, when the receipts were highest. Figure 8 shows the relationship between seasonal marketing of sheep by Minnesota farmers and prices received.

The price of wool varies but little throughout the year, time of marketing having little to do with the price obtained. The small amount

of variation is due principally to the non-perishability of the product and the low storage cost in relation to its value. There is a slight tendency for the price to decline in May at shearing time, with rising prices from then until the high point is reached during the winter months.

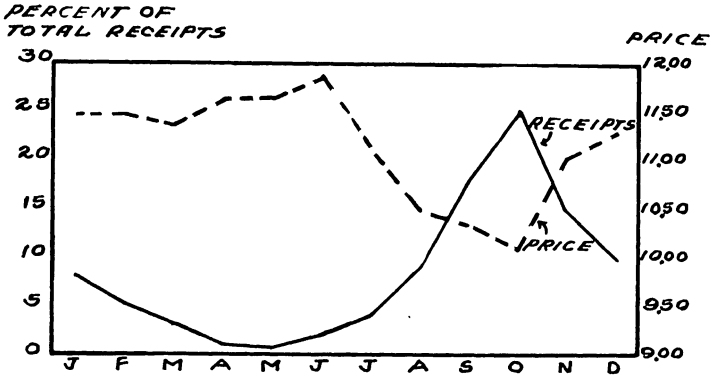


Fig. 8. Percentage of Total Receipts of Sheep Marketed by Minnesota Farmers by Months and Price Received by Farmers for the Five-Year Period, 1925 to 1929

The price was high when the marketings were small and low when the marketings were large. During this period about 395,000 head were marketed annually at an average weight of approximately 89 pounds.

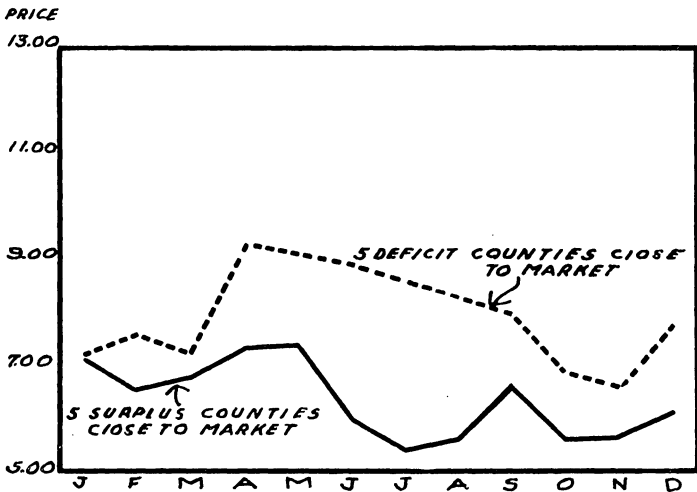


Fig. 9. Monthly Prices Received by Farmers for Sheep in Five Deficit and Five Surplus Counties Close to Market for the Five-Year Period, 1925 to 1929

The price was higher in the deficit area than in the surplus area throughout the year.

The price of sheep for the five-year period, 1925-29, was higher in five deficit-producing counties in southeastern Minnesota than in five surplus-producing counties in the same general location. The deficit

counties are about seventy miles closer to market than the surplus counties, but that distance is not great enough to account for the difference of \$1.59 per 100 pounds in average price for the period. The freight for the difference in distance is approximately \$0.15 per 100 pounds. The difference in price is greatest from June to August and least from January to March (see Fig. 9). The price increased in September in the surplus counties because of the demand in these counties for feeder sheep. There is little demand for feeder sheep in the deficit-producing counties because little feeding is done there as compared with the other counties. The price of sheep in the southeast surplus-producing section of the state increases sharply in September, while in the deficit-producing counties in the same general location, where no appreciable demand for feeder sheep exists, the price declines in September.

THE PRICE OF CHICKENS AND EGGS

The price received for chickens by farmers in Minnesota for the five-year period, May 1925 to April 1930, varied from 15 cents per pound in the northwestern part of the state to 25 cents in the northeastern, a variation of 67 per cent. The price was somewhat higher in the territory near the Twin Cities than in localities 20 to 30 miles out. There was a low-priced area in the east central part of the state, just north of the Twin Cities, and in the northwestern part of the state.

Much the same geographic relationship in the price of chickens existed for the five-year period, May 1910 to April 1915. The price varied from 8 cents per pound in the northwestern part of the state to 14 in the northeastern, a variation of 75 per cent. The price during the earlier period was relatively lower in the southern part of the state than was true during the later five-year period. In the earlier period, the northeastern part of the state was a high-priced area, and the northwestern part, low-priced. The price around the Twin Cities was higher than in the territory to the west or south. Figures 10 and 11 show the variation in the price received by farmers for chickens in Minnesota for the five-year periods, May 1910 to April 1915 and May 1925 to April 1930.

The price of eggs for the five-year period, May 1925 to April 1930, varied from 26 cents per dozen in the northwestern part of the state to 36 cents in the northeastern, a variation of 38 per cent. There was a deficit of production in the northeastern part of the state, which, with the unusual market offered by the mining and lumbering industries, made this a high-priced area. The price was low throughout all of the western part of the state. The price for the five-year period, May 1910 to April 1915, varied from 17 cents per dozen in the southern and western parts of the state to 26 cents in the northeastern part and around

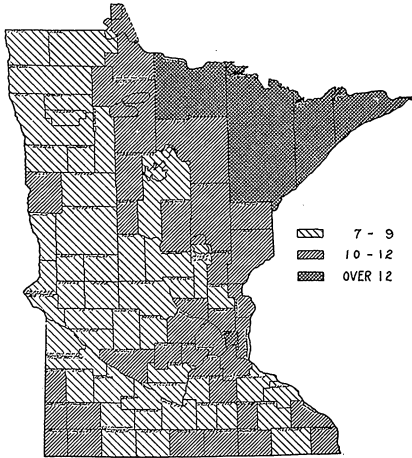


Fig. 10. Price of Chickens per Pound for the Five-Year Period, May 1910 to April 1915

Note the generally low price throughout the western and most of the southern parts of the state. The northeastern part of the state was a deficit area.

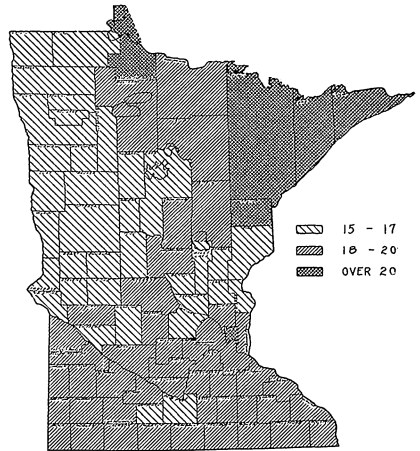


Fig. 11. Price of Chickens per Pound for the Five-Year Period, May 1925 to April 1930

The low-priced area was in the north-western part of the state and most of the southern part of the state was a moderately high-priced area.

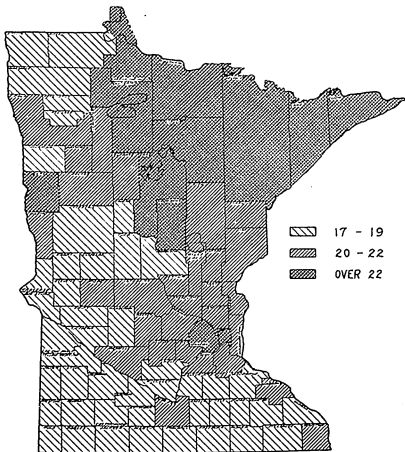


Fig. 12. Price of Eggs per Dozen for the Five-Year Period, May 1910 to April 1915

The price was high around the Twin Cities because of a large consuming center and in the northeastern part because of deficit production. The price was low in most of the southern and western parts of the state.

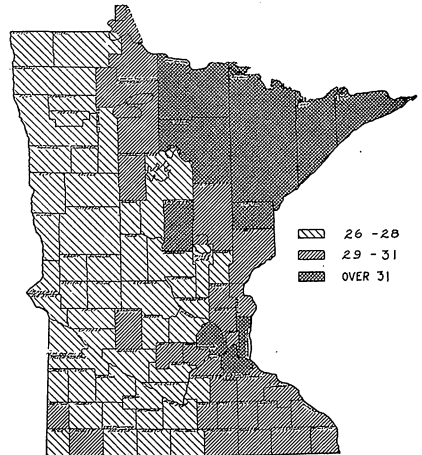


Fig. 13. Price of Eggs per Dozen for the Five-Year Period, May 1925 to April 1930

Note the large low-priced area throughout the western half of the state. The highest prices were around the Twin Cities and in the northeastern part of the state.

the Twin Cities, a variation of 53 per cent. Throughout a large part of the state, the variation in the price of eggs was small. Figures 12 and 13 show the price of eggs for the two periods mentioned above.

Table 9
Changes in the Local Price of Chickens in Different Parts of the State
Between the Five-Year Periods, May 1910 to April 1915 and
May 1925 to April 1930

Five-year period	Location in state			
	North-western	North-eastern	South-western	South-eastern
	cts. per lb.	cts. per lb.	cts. per lb.	cts. per lb.
May 1910-April 1915 ..	9.1	12.6	9.2	9.6
May 1925-April 1930 ..	16.1	21.5	18.2	19.0
Difference	7.0	8.9	9.0	9.4

The greatest actual increase in price occurred in the southeastern part of the state, where it amounted to 9.4 cents per pound, an increase of 98 per cent. The smallest increase was in the northwestern part, where it amounted to 7.0 cents, an increase of 77 per cent. The price during both periods was highest in the northeastern part of the state, which accounts for the smallest percentage increase.

Table 10
Changes in the Local Price of Eggs in Different Parts of the State Between
the Five-Year Periods, May 1910 to April 1915 and May 1925 to April 1930

Five-year period	Location in state			
	North-western	North-eastern	South-western	South-eastern
	cts. per doz.	cts. per doz.	cts. per doz.	cts. per doz.
May 1910-April 1915 ..	19.8	24.4	19.0	18.1
May 1925-April 1930 ..	27.3	33.8	29.5	27.9
Difference	7.5	9.4	10.5	9.8

The greatest actual increase in price occurred in the southwestern part of the state, where it amounted to 10.6 cents per dozen, an increase of 55 per cent. The smallest increase was in the northwestern part of the state, where it amounted to 7.5 cents per dozen, an increase of 38 per cent. The price during both periods was highest in the northeastern part of the state.

Production of chickens and eggs.—There are three essential conditions for the successful production of chickens or eggs: (1) moderately mild winters and cool summers, (2) cheap feed, and (3) a favorable market outlet.

Because southern Minnesota meets the above requirements better than any other part of the state, chickens are most numerous there, with

some tendency for concentration in number southwest of the Twin Cities. Good shipping facilities and cheap feed are unquestionably the main reasons for this concentration. There is very little tendency for concentration in other parts of the state. The favorable market in Duluth and the iron range country offsets the disadvantage of climate and high-priced feed in adjoining areas. As a result, a few small areas have been developed on a commercial scale in the northeastern part of the state.

On many farms chickens little more than take care of the family needs for eggs. Under such conditions, there is little cash outlay as a good part of their living is obtained from materials of little or no commercial value. If only the needs for the family are considered, the housing facilities for poultry may not be expensive. Production on this basis interferes very little with other farm enterprises. When the size of the flock increases much beyond the family needs, it interferes with other productive enterprises and entails considerable cash outlay. Not only this, but more skill is required to keep up the production. With the surplus of chickens and eggs beyond the needs on the farm and the commercial chicken farms already established, there is not much incentive to farmers to expand this enterprise.

Surplus and transportation.—On most farms, chickens are kept for two purposes—to supply food for the persons on the farm and to provide some income with little cash outlay. The surplus over home demand is sold and the price received for it is governed largely by distance to market.

The number of birds per person is a measure of the surplus number of chickens. In general, there was a decrease in the price of chickens as the surplus increased, the rate of decrease in price being less as the surplus increased. This indicates that large surpluses tend to have less influence on the price of chickens than small surpluses. (See Table 11.) The price per pound of chickens declined in counties with the same number of birds per person as the distance to the Twin Cities increased, the rate of decrease in price being greater as the distance increased.

Table 11
Relation of Distance to Market to Price of Chickens
Received by Minnesota Farmers, 1925-29

Birds per person	Miles to Twin Cities		
	Under 100	100-199	200 and over
	cts. per lb.	cts. per lb.	cts. per lb.
0.0- 5.0	20.5	19.0	17.0
5.1-10.0	18.2	17.8	16.0
10.1 and over	18.0	17.7	16.4
Average	18.2	17.8	16.2

There was a small tendency for the egg production per bird to decrease as the number of birds per person increased and as the distance to market increased. A measure of the number of surplus eggs in a locality is the number of eggs produced per person. As the surplus of eggs increased, there was a decrease in the price received per dozen, the rate of decrease in price being less as the surplus increased. (See Table 12.) This indicates that large surpluses tend to have less effect on the price of eggs than small surpluses.

Table 12
Relation of Distance to Market to Price of Eggs
Received by Minnesota Farmers, 1925-29

Dozens of eggs produced per person	Price of eggs per dozen		
	Miles to Twin Cities		
	Under 100	100-199	200 and over
	cents	cents	cents
Less than 30	31.7	31.0	28.0
31-60	29.1	28.2	27.2
61 and over	28.7	27.8	26.7
Average	29.2	28.1	27.2

As the distance to the Twin Cities increased, the price received for eggs by the farmer decreased. The reason for the more rapid decrease in price as the distance increases is doubtless the same as for chickens, namely, more irregular marketing and lower quality of product.

Seasonal variation.—The prices paid to farmers for chickens are highest as a rule in April and May and lowest in November and December. The number of chickens marketed by Minnesota farmers is smallest in April and May, less than 2 per cent of the total annual receipts being marketed in each of these months (see Fig. 14). The receipts are largest in November and December, when over 50 per cent of the total annual marketings occur. These wide fluctuations in receipts are reflected in the wide range in price throughout the year.

The price of chickens in five counties in southeastern Minnesota was 1.5 cents per pound higher than for five counties in southwestern Minnesota for the five-year period, 1925-29. The price ranged from 2.7 cents per pound higher in February to 0.2 cents higher in December. The margin in price was the narrowest from August until the end of the year and widest from January to July (see Fig. 15). There were 18.0 birds per person in the southwestern counties as compared with 9.4 in the southeastern counties. This indicates a larger surplus in the southwestern section, which would depress prices. The heaviest marketings of chickens were from September to the end of the year. The

price declined sharply in both sections of the state from September to November, after which there was an increase because of the demand for chickens during the holiday season. The response to the holiday demand was greater in the southwestern counties, probably because chickens that are more of a meat type are grown there.

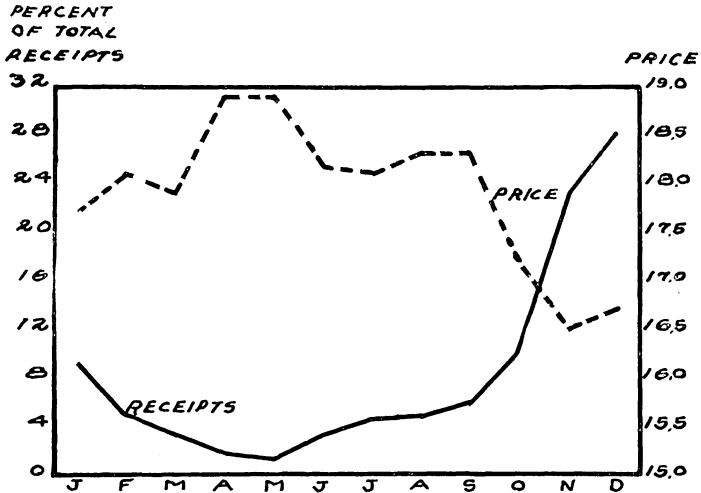


Fig. 14. Percentage of Total Receipts of Chickens Marketed by Minnesota Farmers by Months and Price Received by Farmers for the Five-Year Period, 1925 to 1929

When the marketings of chickens were small, the price was high, and when the marketings were high, the price was low. During this period, there were approximately 16½ million chickens on farms in Minnesota and 36½ million pounds sold annually.

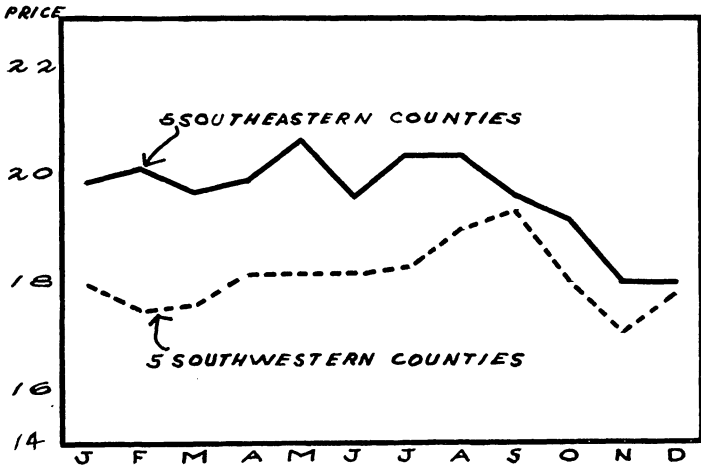


Fig. 15. Monthly Prices Received by Farmers for Chickens in Five Southeastern and Five Southwestern Counties for the Five-Year Period, 1925 to 1929

The price in the southeastern counties was higher throughout the year. The advantage in price held by the southeastern county farmers was greatest from January to August.

The fluctuation in the seasonal price of eggs is quite regular from year to year. The low prices of eggs come in the spring months, from April to June, and the high prices in the fall, from October to December. The seasonal variation in the price of eggs is almost the direct opposite to that of poultry; that is, the price of chickens is highest when eggs are lowest, and vice versa. The seasonal marketing of eggs by Minnesota farmers is almost the direct opposite to that of chickens (see Figs. 14 and 16).

The distribution of egg marketing throughout the year is due to the spring being the natural season for egg production and to the handicaps to production in winter. As a result of these conditions, the egg production per hen is over three times as great in the spring as in the winter.

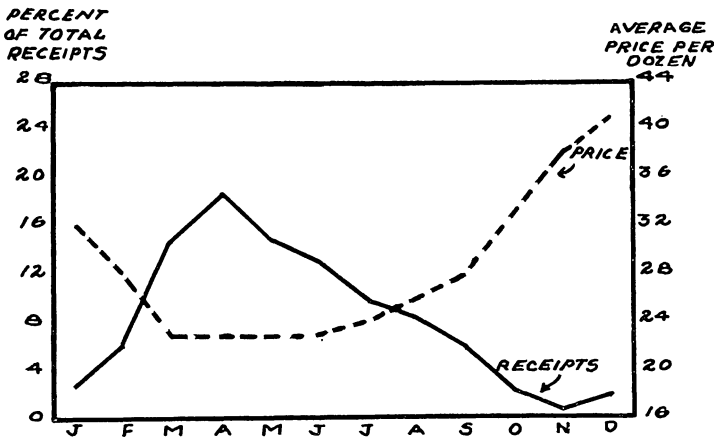


Fig. 16. Percentage of Total Receipts of Eggs Marketed by Minnesota Farmers by Months and Price Received by Farmers for the Five-Year Period, 1925 to 1929

The price tended to be low when the marketings were large and high when the marketings were small. During this five-year period, an average of approximately 66 million dozens of eggs were marketed annually.

To reduce the supply which otherwise would be placed on the market in the spring, cold storage facilities have been developed. Through this means, more eggs are available in the winter months. Cold storage operations have some influence on the seasonal variation in the price of eggs. Holdings of cold-storage eggs are lowest in March, increasing from then until August, after which there is a decline until March.

The average price of eggs in five southeastern counties was 1.8 cents per dozen higher than in five southwestern counties (see Fig. 17). The southwestern counties average 30 miles farther from the Twin Cities, but this distance is not great enough to account for the difference as the freight cost per dozen eggs for a distance of 30 miles would be

less than one-fourth of a cent. A large part of the difference must be accounted for in some other way.

The eggs produced per person, as reported by the Federal Census of 1925 and 1929, averaged 94 dozens for the southwestern counties and 51 for the southeastern. The amount of surplus, as indicated by these figures, is greater in the southwestern counties and so depresses the price more.

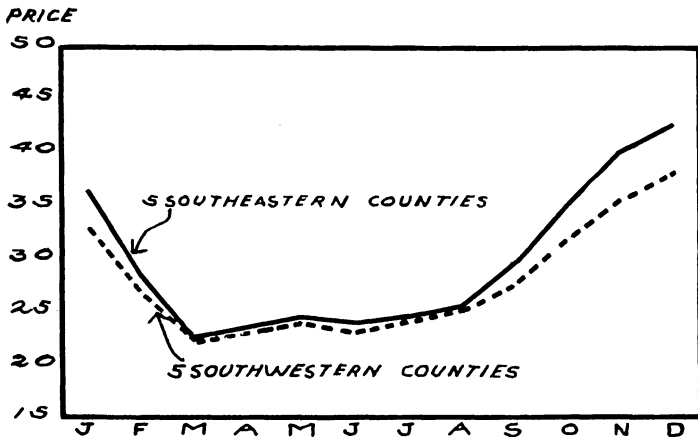


Fig. 17. Monthly Price Received by Farmers for Eggs in Five Southeastern and Five Southwestern Counties for the Five-Year Period, 1925 to 1929

The southeastern counties had the greatest advantage in price from September to February.

The difference in the price of eggs between the two sections of the state varied from 0.1 cent per dozen in March to 4.6 cents in December. The margin in price from March to August was just about equal to the freight differential, but from September to February it was much greater. The farmers in the southeastern part of the state had a greater price advantage during the fall and winter months than during the summer.

THE PRICE OF BUTTERFAT

The price paid to farmers in Minnesota for butterfat for the five-year period, January 1925 to December 1929, varied from 44 cents per pound in the western part of the state to 51 cents in the east central part, a variation of 16 per cent, which was less than the variation for most other farm products. The price was generally highest in the southeastern part of the state, except for the three extreme southeastern counties. It was lowest in the southwestern and northwestern parts of the state.

For the five-year period, January 1910 to December 1914, the price

varied from 22 cents per pound in the western part of the state to 32 in the eastern part, a variation of 45 per cent. The price was highest in the south central and northeastern parts of the state. The low-priced areas were in the southwestern and northwestern parts of the state. Figures 18 and 19 show the price of butterfat for the two periods, 1925 to 1929 and 1910 to 1914.

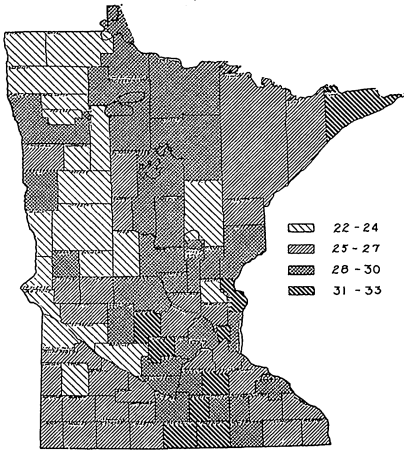


Fig. 18. Price of Butterfat per Pound for the Five-Year Period, January 1910 to December 1914

The high-priced area was in the east central and south central parts of the state. The price was generally low throughout the western part.

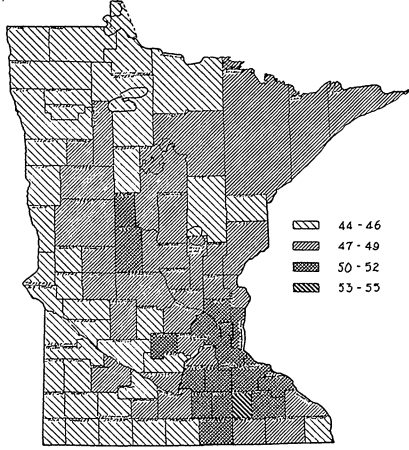


Fig. 19. Price of Butterfat per Pound for the Five-Year Period, January 1925 to December 1929

The high-priced area in the southeastern part of the state is where conditions for producing and marketing dairy products are favorable. The northeastern part of the state is a deficit area.

The price was highest in the northeastern part of the state during the early period and in the southeastern part during the late period (see Table 13). The change in price between the two periods was an increase of 22.3 cents per pound in the southeastern part, which was more cents-per-pound increase than in any other part of the state. The development of the dairy industry and proximity to market were im-

Table 13

Changes in the Local Prices of Butterfat in Different Parts of the State Between the Five-Year Periods, January 1910 to December 1914 and January 1925 to December 1929

Five-year period	Location in state			
	North-eastern	North-western	South-eastern	South-western
	cts. per lb.	cts. per lb.	cts. per lb.	cts. per lb.
January 1910-December 1914	27.7	24.6	27.2	24.1
January 1925-December 1929	46.3	45.6	49.5	45.3
Difference	18.6	21.0	22.3	21.2

portant causes of this increase. The smallest increase occurred in the northwestern part, where dairying was of minor importance.

Butterfat production.—Whole milk is a bulky and perishable product and consequently it is produced near large consuming centers or where transportation facilities to these centers are unusually good. On the other hand, butterfat, being a concentrated product not as perishable as milk, can be shipped long distances and therefore will be produced where the natural conditions for dairying are best. This accounts for the concentrated areas of dairy cows in the United States.

Two factors are paramount in the production of butterfat—climate and cheap feed. The most favorable climate for the production of butterfat is one with cool moist summers, particularly. Such summers are conducive to good pastures from which dairy products are produced most cheaply. Because of the favorable climatic conditions, dairy cattle are numerous in the New England and Great Lakes regions.

Cheap feed is favorable to the production of all livestock products. This factor alone has been responsible for the production of butterfat as a side line on a large number of farms in the middle west. Because of the high unit value of butter and the small deterioration in storage and transit, it is produced outside of the whole-milk market areas.

The production of dairy products fits into the general plan of farm organization very well. The conflict with crop enterprises is limited to the summer and is not serious except in certain months. Its greatest advantages are furnishing a market for otherwise idle labor and the conversion of feed and roughage into one of the highest-priced animal products. It tends to distribute the income throughout the year, which is also important. For best results, unusual skill and care are required on the part of the operator.

Quality.—Most of the butterfat produced in Minnesota is made into butter. There is considerable variation in the quality of butter made, because of the wide range of conditions under which the butterfat is produced and marketed. The quality of butter is indicated by its score. The score for all butter produced in Minnesota is not available. It has been obtained, however, for that manufactured by the Land O'Lakes Creameries Incorporated for the five-year period 1925 to 1929. Table 14 indicates the relationship between the quality as indicated by the score of butter and the prices received by farmers for butterfat for the five-year period 1925 to 1929.

The production of butter indicated in Table 14 represents only about one-third of the production in the state but probably shows the influence of the quality of butter on the price paid for butterfat. In the counties where less than 25 per cent of the total amount of butter manufactured scored 93 or better, the price was lowest, and where more than 75 per cent scored 93 or better, the price was highest.

Table 14
Relation Between the Quality of Butter and the Price Received for Butterfat by Farmers for the Five-Year Period, 1925-29

Per cent of all butter 93 score or better*	Price received by farmers per pound of butterfat†	Pounds of butterfat sold per 100 acres in farms†
Under 25	45.3	336
25-49	46.9	468
50-74	47.7	758
75 and over	49.4	1,038

* Includes only that manufactured by Land O'Lakes Creameries Incorporated.

† Includes all butterfat sold by farmers.

The wide margin in the prices paid for butterfat, as shown in Table 14, is due to several reasons. Differences usually increase as prices increase, and the period 1925 to 1929 was a relatively high-priced period. Some of this difference is doubtless due to the proportion of cream marketed through cream stations. The cream marketed through cream stations in 1929 constituted 22 per cent of all cream sold by farmers in the first group in Table 14, 13 per cent in the second group, 10 per cent in the third group, and 4 per cent in the fourth group. The counties in which over 50 per cent of the production of butter scored 93 or better averaged a shorter distance to the Twin Cities and sold more butterfat per 100 acres in farms than the counties in which the production of high-score butter was less than 50 per cent.

Transportation.—Distance to market is always an important factor affecting the price farmers receive for a product. It is impossible to obtain the exact distance butter and cream are shipped. The principal concentration points for both cream and butter in Minnesota are Duluth and the Twin Cities. Data showing the source of the shipments to these points are not available. Some butter and cream are shipped out of the state without passing through these cities at all. Distance to the Twin Cities is used to show the effect of distance on prices paid to farmers for butterfat. Table 15 indicates the effect of distance on prices paid to farmers for butterfat for the five-year period, 1925 to 1929.

With the same proportions of butterfat sold per cow, the price decreased as the distance to the Twin Cities increased.

The comparatively higher prices in the groups selling 135 pounds or more per cow in counties 101-199 miles and 200 miles and over from the Twin Cities are due to the favorable conditions in these counties. Most of these counties are in the east central and south central parts of the state, where the facilities for handling butterfat and conditions for producing a high grade of cream are unusually good. In these areas, creameries are numerous and there is a demand for sweet cream. The natural conditions are favorable for the production of a high quality

of product and the result is that a good share of the cream sold is of higher grade than in many sections of the state. In some localities, nearly all of the butter manufactured scores 93 or better.

Table 15
Relation of the Amount of Butterfat Sold per Cow and Distance from the Twin Cities to Price per Pound, 1925-29

Miles from Twin Cities	Pounds butterfat sold per cow*			
	Under 100	101-134	135 and over	Average
	cts. per lb.	cts. per lb.	cts. per lb.	cts. per lb.
Under 100	51.0	48.7	48.4	48.9
100-199	46.2	46.5	48.1	46.9
200 and over	45.4	45.5	46.3	45.8

* Federal Census reports.

Seasonal variation.—The prices paid to farmers in the United States for butterfat are lowest in summer and highest in winter. The price varies inversely with the quantity marketed, the heaviest marketings coming in June and the lightest in November. The heavy production in the summer is the result of the general belief of farmers that they can make more money producing butterfat on pasture than they can on dry feed in winter. More cows freshen in the spring than at any other season, which with the good pasture conditions by June make the production heaviest at this time of the year. By fall, with pastures replaced with dry feed and cows well advanced in their lactation period, the production declines until the low point is reached in November. Some farmers, however, believing that greater profits can be made from winter production, have shifted the freshening time of their cows to the fall of the year. This shift is having a tendency to lower the production in the summer and raise it in the winter months and is based on the belief that the advantages of higher prices for butterfat in the winter more than offset the disadvantages of additional costs during that season of the year. Figure 20 shows the seasonal price and marketing of butter for the five-year period, January 1925 to December 1929.

The price of butterfat for the five-year period, 1925 to 1929, in three important dairy counties in southeastern Minnesota varied from five cents a pound higher in October to nine cents higher in February than in three non-dairy counties in the southwestern part of the state. The price for the year averaged seven cents higher. The difference in price between the two areas was greatest from December to the following July. Figure 21 shows the seasonal variation for the two areas. The price in the southeastern counties varied two per cent less than in the southwestern counties. The higher price and smaller variation in price

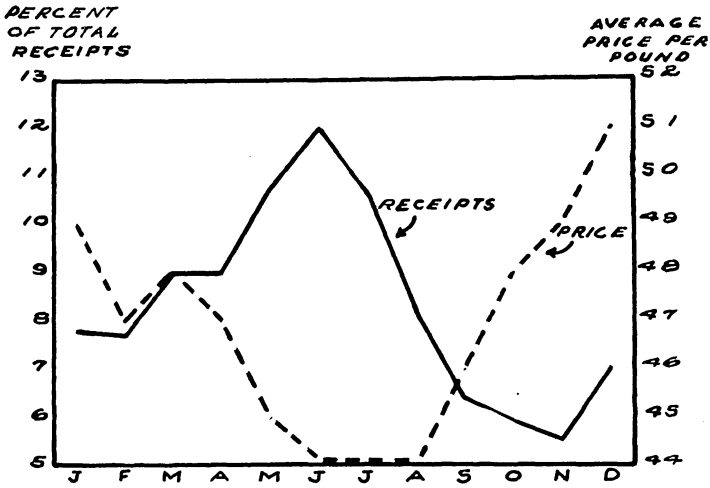


Fig. 20. Percentage of Total Receipts of Butterfat Marketed by Minnesota Farmers by Months and Price Received by Farmers for the Five-Year Period, 1925 to 1929
 In general, the price was low when the marketings were large and high when the marketings were small. During this period an average of approximately 204 million pounds of butterfat were marketed annually.

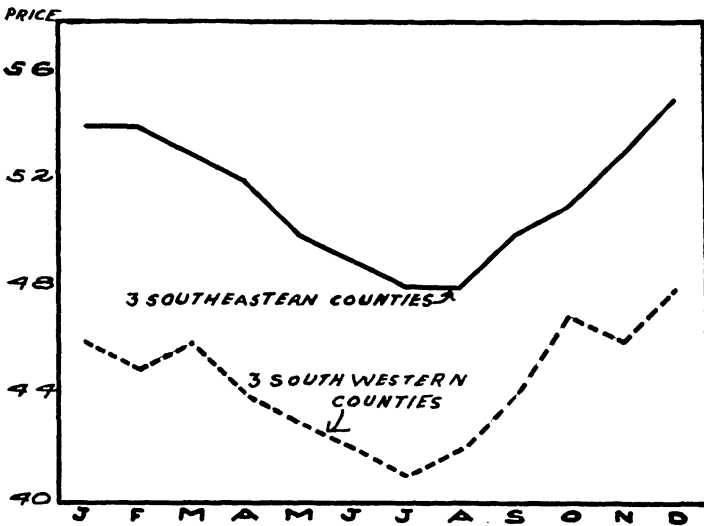


Fig. 21. Monthly Prices Received by Farmers for Butterfat in Five Southeastern and Five Southwestern Counties for the Five-Year Period, 1925 to 1929
 The price averaged from four to nine cents per pound higher in the southeastern counties. In 1929 approximately three per cent of the cream was shipped through cream stations in the southeastern counties and thirty per cent in the southwestern counties.

is due to a better organization for the production of butterfat and better market outlets. The three southeastern counties produced 1,133 pounds of butterfat per 100 acres in farms, and the three southwestern counties, 382 pounds. Fifty-six per cent more butterfat was sold per cow in the southeastern counties. Less than three per cent of the cream was marketed through cream stations in the southeastern counties, while over 29 per cent was marketed through cream stations in the southwestern counties.

The change in the freshening of cows from spring to fall has naturally shifted the production so that a larger proportion of the production comes during the winter months and a smaller proportion in the summer months than formerly. Accompanying these changes in seasonal production has been a seasonal change in the price of butterfat. The change is particularly noticeable in southeastern Minnesota, an area of surplus butterfat production. With an increase in production during the winter months, the price has been relatively lower than in former years, and with a decrease in production during the summer months, the price has been relatively higher (see Figs. 22 and 23). The same changes have occurred in the southwestern part of the state, but to a less degree. The smaller change in that part of the state was undoubtedly due to a smaller surplus of butterfat produced there.

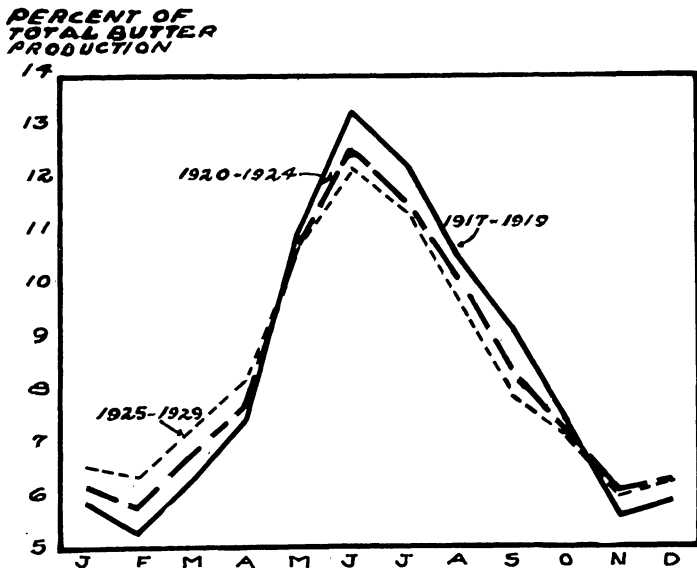


Fig. 22. Seasonal Changes in the Production of Butterfat in the United States

The relative production increased during the winter months in the later periods and decreased during the summer. Change in the time of cows freshening was the principal reason for the shifts in production.

**PERCENT OF
AVERAGE PRICE**

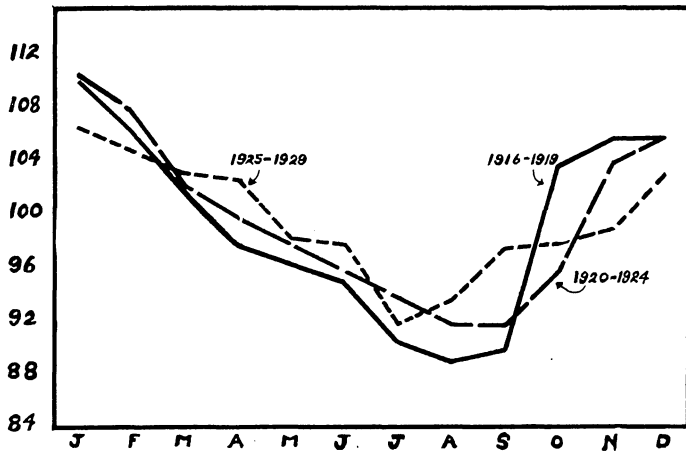


Fig. 23. Relative Price of Butterfat in Three Surplus-Producing Counties in Southeastern Minnesota

The price was lower during the winter months in the later periods and higher during the summer. The shift in the production of butterfat was largely responsible for the change in relative prices.

The average monthly variation in the price of butterfat for three surplus-producing counties in southeastern Minnesota for the period 1916 to 1919 was 7.1 per cent, for the period 1920 to 1924, 6.8 per cent, and for the period 1925 to 1929, 4.6 per cent.

Altho the amount of change in the production during the summers and winters for periods indicated in Table 16 is not great, it is significant to note that the change is continuous. It is important to point out that the rate of increase in cold-storage holdings for May, June, and July was greater than the increase in production during November, December, and January. The increase in production during November, December, and January has more nearly met the current demand for butter during those months and has made it less necessary to draw on cold-storage supplies.

Table 16

Changes in Production and Cold-Storage Holdings of Creamery Butter in the United States for Winter and Summer Months, 1916-29

Years	Per cent of yearly production			Per cent of yearly cold-storage holdings		
	May, June, July	November, December, January		May, June, July	November, December, January	
1916-1919	36.6*	17.3*		12.2	31.5	
1920-1924	35.1	18.5		12.7	30.5	
1925-1929	34.5	18.9		13.4	29.3	

* Three-year period 1917-19.