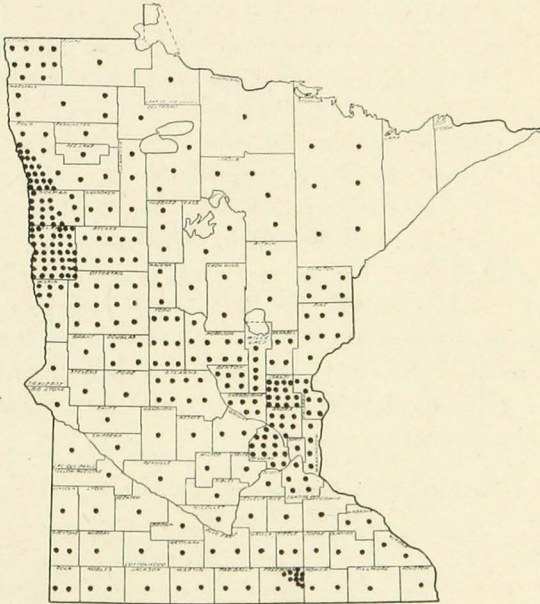


UNIVERSITY OF MINNESOTA
AGRICULTURAL EXPERIMENT STATION

A STUDY OF THE DEMAND FOR POTATOES IN THE TWIN CITIES

L. F. GAREY
DIVISION OF AGRICULTURAL ECONOMICS



Acreage of Potatoes in Minnesota in 1934
(One dot = 1,000 Acres.)

Note the concentration areas in the east central and northwestern parts of the state and in the northeastern part of Freeborn County in the southern part of the state.

UNIVERSITY FARM, ST. PAUL

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A STUDY OF THE DEMAND FOR POTATOES IN THE TWIN CITIES

L. F. GAREY¹

PRODUCTION

Minnesota is classified as a late potato-producing state. Its potato acreage constitutes about 14 per cent of the total acreage of the 30 late potato states and about 11 per cent of the total potato acreage of the United States. The potato acreage in the state reached a record peak of 486,000 acres in 1922. Since that time, the acreage has been somewhat less and has varied from year to year.

The peak in production did not come, however, until 1924 and then only because of a large yield per acre. Years of high production since 1910 have on the average occurred every fourth or fifth year. These large crops have been due to high yields per acre more than to large acreages.

The average yield per acre in Minnesota for the 10-year period 1921 to 1930 was 93 bushels; for the 30 late potato states, 115, and for the United States, 111. The comparatively low yield in Minnesota was due to general lack of moisture in the important potato areas in the north-western part of the state. The average yield per acre for the five-year period 1910-14 was 110 bushels; for 1925-29, 97 bushels, and for 1930-34, 74 bushels. The extremely low yield in the last period was due to the drouth which reduced the yield each year far below the average since 1910. Table 1 gives the production of potatoes in the state for three five-year periods.

Table 1.—Production of Potatoes in Minnesota by Five-Year
Periods Since 1920

Five-year period	Acres	Yield	Production
		per acre	
		bushels	bushels
1920-24	394,800	97.8	38,629,800
1925-29	317,200	98.4	31,202,000
1930-34	343,000	73.8	25,303,200

The quantity sold reached a maximum in 1923, when 22,587,000 bushels were sold by farmers. After staying close to this level for two or three years, the amounts disposed of through sales declined; in 1933 only 12,400,000 bushels were sold, practically the same quantity as was sold in 1916 and in 1930. While years of high production have resulted

¹ Acknowledgment is made to Dr. W. C. Waite for his suggestions.

in the sale of larger quantities, the quantities sold have not been directly proportional to the production. For instance in 1924, with the largest crop in 25 years, a smaller amount was sold than in 1923, a year when there was a smaller crop. Similarly, in 1917 fewer bushels of potatoes were sold than in 1916, even tho the crop was twice as large. Apparently the quantity sold depends to some extent on the amount produced in other states which compete with Minnesota on the various markets.

Distribution of production.—There are several important areas of potato production in the state. The oldest section is in the east central part, including the counties of Anoka, Chisago, and Isanti. The next oldest section is in the northwestern part of the state, in Clay and Norman counties. The production in these two counties began to develop about 1900, when their acreage constituted only three per cent of the acreage in the state. In 1934 their acreage constituted 17 per cent of the total for the state. A concentration of production is found in the Hollandale area in Freeborn County. While the region is not large, it markets large quantities of potatoes. In the northeastern part of the state, where the total potato acreage is not as large as in some other sections of the state, potatoes occupy a larger part of the cultivated area and furnish a larger share of the farmers' income than in most other sections.

The general region of potato production in the state changed very little between 1919 and 1929. The region included an area extending from the Twin Cities northwestward to the North Dakota boundary, with a concentration in acreage around the Twin Cities and in Clay and Norman counties on the west. Since 1926 the acreage in Freeborn County has increased rapidly and is now recognized as one of the important potato-producing areas of the state. The cover page shows the distribution of the potato acreage in Minnesota for 1934.

Disposal of the potato crop.—The outlets for the Minnesota potato crop are local consumption, sale outside of the state, and seed for the following year. About eight million bushels are consumed in the state annually, but not all of these are grown in Minnesota. No data are available as to just how many are shipped into the state as a whole. An average of about 1,100 cars were shipped into the Twin Cities annually for the five-year period 1930-34. Shipments into the state increase the amount of the surplus shipped out of the state to other markets. Between four and a half and five million bushels are used for seed each year. There is a loss of approximately two and a half million bushels annually, the amount varying in proportion to the size of the crop. The loss owing to shrinkage and waste has been estimated at 10 per cent of the production.

Table 2 gives the potential outlet in this state and the surplus of the Minnesota potato crop for three five-year periods.

Table 2.—Disposal of Minnesota Potatoes and Potatoes Shipped In, by Five-year Periods

Five-year period	Minnesota production	Shipped in from other states*	Used for local consumption	Seed	Loss	To be shipped out
	bushels	bushels	bushels	bushels	bushels	bushels
1920-24	38,630,000	253,000	7,391,000	5,544,000	3,863,000	22,085,000
1925-29	31,202,000	330,000	7,675,000	4,441,000	3,120,000	16,296,000
1930-34	25,303,000	646,000	7,959,000	4,822,000	2,530,000	10,638,000

* Includes only Minneapolis, St. Paul, and Duluth.

The surplus of the potato crop moves in a southeasterly direction. Nearly 90 per cent of the shipments out of Minnesota find their way into 20 markets, the most important of which is Chicago. Other markets in their order of importance are St. Louis, Kansas City, Cincinnati, Peoria, Nashville, and Des Moines. None of the other out-of-state markets received as much as 5 per cent of the shipments from Minnesota for the five-year period 1930-34. Table 3 gives the proportion of Minnesota potatoes received in out-of-state markets.

An average of 7,722 cars of potatoes were shipped annually during the five-year period 1925-29 and 4,690 for the five-year period 1930-34, a decrease of 39 per cent.

Table 3.—Distribution of Carlot Shipments of Minnesota Potatoes, 1925-29 and 1930-34

Cities	1925-29		1930-34	
	Average number of cars per year	Per cent of all Minnesota shipments	Average number of cars per year	Per cent of all Minnesota shipments
Atlanta	112	1.5	51	1.1
Birmingham	186	2.4	90	1.9
Chicago	1,454	18.8	677	14.4
Cincinnati	695	9.0	426	9.1
Cleveland	132	1.7	14	0.3
Columbus	260	3.4	111	2.4
Dayton	125	1.6	69	1.5
Des Moines	156	2.0	234	5.0
Evansville	124	1.6	151	3.2
Indianapolis	305	3.9	209	4.5
Kansas City	755	9.8	451	9.6
Lexington	58	0.7	77	1.6
Louisville	223	2.9	96	2.1
Nashville	108	1.4	248	5.3
Omaha	266	3.4	138	2.9
Peoria	255	3.3	276	5.9
St. Louis	665	8.6	647	13.8
Sioux City	49	0.6	79	1.7
Terre Haute	99	1.3	89	1.9
Toledo	35	0.5	44	0.9
Others	1,660	21.6	513	10.9
Total	7,722	100.0	4,690	100.0

THE DEMAND FOR POTATOES IN THE TWIN CITIES

Approximately 2,235,000 bushels of potatoes are consumed annually in the Twin Cities. About 30 per cent of these potatoes are shipped in by rail from other states. Some may come in by truck, but it is likely that the consumption of out-of-state potatoes in the Twin Cities does not constitute more than one-third of the total consumption.

This raises a pertinent question to the potato producers of this state. Here we are in a great surplus-producing area, yet consumers buy potatoes raised in other states to the extent of approximately one-third of their total consumption. What are the reasons?

To find some explanation for the above situation, a study of the demand for potatoes in the Twin Cities was made during March and April 1935.² Enumerators called at 1,356 retail stores, 20 hotels, 128 restaurants and cafeterias, and 21 hospitals in the Twin Cities and obtained information on potatoes. No information was obtained from stores in the loop district, nor municipal markets of either city, and none directly from consumers. The information was of such character as to portray the demand for potatoes in the Twin Cities. Because of the different purposes served by the sources of information mentioned, the data from each source are analyzed separately.

The quantity of potatoes included in this study was 959,410 bushels, or about 43 per cent of the consumption in the Twin Cities. The remaining 57 per cent reached the consumers through retail stores in the loop districts, the municipal markets of the Twin Cities, direct purchase from farmers by the resident consumers, and through eating places not included in the study.

The prices quoted are those which were paid at the time the enumerators made their calls and do not represent the price for the year. The quantities listed cover a year, the estimates being based on the year 1934.

DEMAND IN RETAIL STORES

Kind and quantity of potatoes sold.—Thirteen specified kinds of potatoes were handled by the 1,356 retail stores in this study. Six of these varieties were russets from different states. More Minnesota Russets were sold than any other kind. The Green Mountain was second and Washington Russets third (see Table 4). All out-of-state russets amounted to 225,914 bushels, or 26.8 per cent of all potatoes handled. When the Minnesota Russets are included, the quantity of russets amounted to 400,792 bushels, or 47.5 per cent of all potatoes handled. The total quantity sold in 1934 was 842,172 bushels, approximately two-thirds of which were grown in Minnesota.

² This part of the study was made possible through F.E.R.A. funds, Project No. 200-F2-41.

Table 4.—Kinds and Quantities of Potatoes Sold by 1,356 Retail Stores in the Twin Cities

Kind	Quantity sold, bushels	Per cent of total sales	Average retail price per peck in March and April, cents	Number retailers handling
Russets				
Minnesota	177,588	21.1	26.2	547
Washington	167,119	19.8	34.2	639
Montana	19,187	2.3	35.7	76
Idaho	15,792	1.9	36.2	67
California	1,760	0.2	34.5	2
Other western	22,056	2.6	35.9	83
Other				
Green Mountain	168,380	20.0	21.5	651
Round White*	99,734	11.9	20.6	381
Cobblers	74,433	8.9	19.1	345
Southern	15,670	1.8	101.1	327
Early Ohio	9,786	1.2	23.4	60
Carmen	3,745	0.4	19.9	25
Rurals	3,714	0.4	21.1	9
Round Red†	1,940	0.4	20.8	27
Mixed‡	61,809	7.3	23.4	53
Total or average	842,172	100.0	33.3	.....

* Trade name including, for the most part, Green Mountain, Cobbler, and Rural varieties.

† Trade name.

‡ Origin not definitely known.

The average retail price received for the potatoes sold by these retailers at the time of the survey was 33.3 cents per peck. It ranged from 19.1 cents for cobblers to \$1.01 for the southern potatoes. The prices for the southern potatoes were high. These potatoes were from the new crop of the early potato states and met a limited demand for new potatoes. The average price for russets shipped in from the western states was 34.5 cents per peck, as compared with 26.3 cents for Minnesota russets. Other Minnesota potatoes were lower in price, averaging from 19.1 cents to 21.5, except for a few early Ohio's which averaged 23.4 cents.

Type of organization.—The demand for potatoes as indicated by retail stores is analyzed on the basis of type of store organization and method of sale. There was considerable variation in the proportion of Minnesota potatoes handled by stores of different types of organization and a variation in the price of potatoes sold by the different methods.

The five types of stores studied from the standpoint of organization were the independent, local chain, national chain, cooperative,³ and local branch.⁴ There were 1,024 independent stores, 17 local chain, 83 national chain, 194 cooperative, and 38 local branch.

The independent stores sold 61 per cent of all the potatoes included

³ Stores that buy cooperatively certain goods under their own brand.

⁴ Stores that are branches of a large store locally owned.

in the study; the cooperative, 19 per cent; the national chain, 11 per cent; the local branch, 6 per cent, and the local chain, 3 per cent.

Table 5.—Proportion of Different Potatoes Handled by Different Types of Stores

Kind of potatoes	Type of store				
	Independent	Coopera- tive	National chain	Local branch	Local chain
	per cent	per cent	per cent	per cent	per cent
Western Russets	23	38	32	32	7
Minnesota Russets	20	22	8	29	68
Other Minnesota	44	37	54	34	23
Southern	2	2	2	4	2
Mixed	11	1	4	1	.....
Total	100	100	100	100	100

One important observation in Table 5 is the relatively large proportion of Minnesota Russet potatoes sold by the local chain stores. The principal reason for this is that one local chain organization maintains a potato warehouse in the northern part of the state and supplies its stores with russet potatoes grown only in Minnesota. On the other hand, a relatively small proportion of the potatoes handled by the national chain stores were Minnesota Russets, owing probably to the large purchases of potatoes which they make for their stores throughout the country. There was not much variation in the proportion of different kinds of potatoes handled by the other stores. Twenty-four per cent of the potatoes sold by the independent, 40 per cent by the cooperative, 34 per cent by the national chain, 36 per cent by the local branch, and 8 per cent by the local chain stores were raised outside of Minnesota.

The average price per peck was 31.8 cents for independent stores, 34.5 cents for the local chain stores, 35.6 cents for the national chain stores, 38.2 cents for the cooperative stores, and 38.3 cents for the local branch stores. The percentage of high-priced potatoes, which consist of out-of-state russets and southern potatoes, was highest for the cooperative and local branch stores, 39.7 per cent and 31.8 per cent, respectively. It was lowest for the independent and local chain stores, 24.4 per cent and 8.4 per cent, respectively. This accounts for a large part of the price differential among these stores.

Method of sale.—The retail stores were classified according to method of sale; that is, cash and carry, credit and carry, cash and delivery, and credit and delivery.

Forty-five per cent of all the potatoes sold by the retail stores in this study were sold by 621 cash and carry stores, 42.6 per cent by 458 credit and delivery stores, 7.0 per cent by 44 credit and carry stores, and 5.4 per cent by 233 cash and delivery stores.

Table 6.—Prices Paid per Peck by Consumers, According to Method of Sale and Kind of Potatoes Sold

Method of sale	Kind of potatoes					Average
	Western russets	Minnesota Russets	Other Minnesota	Mixed*	Southern	
	cents	cents	cents	cents	cents	cents
Cash and carry	34.0	25.5	20.7	25.3	90.9	31.8
Credit and carry	34.6	26.8	21.0	19.7	96.8	29.9
Cash and delivery	34.1	24.5	19.3	23.3	98.5	31.4
Credit and delivery	34.7	26.6	21.0	22.5	104.0	37.5
Average	34.4	26.0	20.8	22.7	98.5	33.3

* Origin not definitely known.

There was little variation in the price of the same kind of potatoes sold by the different types of stores indicated in Table 6. The greatest variation was for mixed potatoes, with a range of 5.6 cents per peck. The least variation was for western russets, with a variation of only 0.7 cents per peck. This indicates that the range in the price of a variety of potatoes between stores was small. On the other hand, the range in the price between varieties in the same type of store was wide.

The average price of potatoes handled by the credit and delivery stores was 7.6 cents per peck higher than the credit and carry, 6.1 cents higher than the cash and delivery, and 5.7 cents higher than the cash and carry stores. One reason for the higher price received by the credit and delivery stores was that a larger proportion of the potatoes sold by them consisted of western russets and southern potatoes than was true of the other stores. They also handled a smaller proportion of Minnesota potatoes, except russets, than the other stores.

Size of store and low-priced potatoes.—All stores did not handle the same proportion of high- and low-priced potatoes. The proportion varied to some extent with the size of the store as measured by the number of clerks. The number of clerks is used as an indication of the volume of business, and hence the number of different families served by a store. Potatoes that sold for less than \$0.25 a peck were classed as low-priced potatoes.

The small stores handled a larger proportion of low-priced potatoes than the larger stores. This proportion declined as the size of the store increased until the number of clerks reached four, but in stores larger than this there was no significant difference in the percentage of low-priced potatoes handled. The quantity of potatoes handled per store averaged 621 bushels, of which 298 bushels sold for less than \$0.25 a peck. While there was an increase in the quantity of low-priced potatoes sold as the size of the store increased, there was a greater increase in the quantity of other potatoes sold.

Table 7.—Proportion of Low-priced Potatoes and Total Quantity of Potatoes Sold by 1,356 Retail Stores in the Twin Cities Annually, According to Size of Store

Number of clerks	Number of stores	Bushels of potatoes	Average number bushels per store	Bushels of low-priced potatoes	Average number bushels per store	Per cent that was low-priced
1	431	97,248	226	54,897	127	56.4
2	595	303,671	510	160,607	270	52.9
3	202	172,565	854	79,651	389	46.2
4	78	117,640	1,508	48,033	616	40.8
5	22	37,519	1,705	15,930	724	42.2
6 or more	28	113,529	4,054	45,866	1,674	40.8
Total or average	1,356	842,172	621	403,515	298	47.9

Unit of sale.—Sixty-seven per cent of all the potatoes were sold by the peck. Each type of store—the independent, cooperative, national chain, local chain, and local branch—sold about the same proportion of their potatoes on the peck basis. About the same proportion of all varieties were sold on the peck basis, except the southern potatoes which were the highest-priced. Eleven per cent of the potatoes were sold by the half peck. Twenty per cent of the potatoes were sold by the pound and in 5- or 10-pound quantities. About 85 per cent of all southern potatoes were sold by the pound. Only two per cent of the potatoes were sold by the bushel.

Sources of purchases of potatoes.—There were four distinct sources from which potatoes were purchased by the retailer. Purchases direct from farmers amounted to 36.6 per cent; from commission firms, 33.1 per cent; from warehouses, 14.1 per cent; from truckers, 4.8 per cent, and from other sources, 11.4 per cent.

Practically all of the western russets were purchased either from commission firms or warehouses by the retailers. On the other hand, only 25.6 per cent of Minnesota Russets were purchased from these sources. Farmers supplied the retailers with 58.4 per cent of Minnesota Russets and 2.5 per cent of the other potatoes grown in Minnesota. Most of the southern potatoes were supplied by either commission firms or warehouses. About one-third of the mixed potatoes were supplied by commission firms, farmers, and warehouses.

Frequency of purchase.—Thirty-eight per cent of the retailers purchased their potatoes weekly, and 44 per cent as needed. Some stores, during certain seasons of the year, had standing orders with dealers for a truck load of potatoes each week. This was particularly true for graded Minnesota Russets for which there was a steady demand. Seven per cent of the retailers purchased their potatoes every two weeks, and 8.0 per cent monthly.

Only a few indicated that they purchased when there appeared to be a price advantage. Many indicated that if they took advantage of the price, it meant purchasing large quantities, some of which would be in their cellars for several weeks. The carrying charge and the shrinkage would more than offset any price advantage. Another reason was that many of the small stores did not have the space for storing large quantities of potatoes. With the competition among the various agencies selling potatoes, it was believed that the service rendered under these conditions was better than if purchases were made in large quantities.

Grade and inspection of potatoes.—Potatoes were purchased as U. S. No. 1, U. S. No. 2, Combination of U. S. No. 1 and U. S. No. 2, and unclassified. Fifty-three per cent of all potatoes purchased by these retailers were unclassified, 26.3 per cent were U. S. No. 1, 1.5 per cent were U. S. No. 2, and 19.2 per cent were a combination of U. S. No. 1 and No. 2. Those stores which purchased potatoes at regular intervals and in the same quantities usually purchased U. S. No. 1 or 2, as they believed the quality would be more uniform than that of ungraded potatoes.

Out of 221,669 bushels of U. S. No. 1 potatoes handled by the retail stores studied, 138,872 bushels were western russets, 41,039 bushels were Minnesota Russets, 26,097 bushels were other Minnesota potatoes, and 15,661 bushels were southern potatoes.

Out of 12,202 bushels of U. S. No. 2 potatoes, 8,941 bushels were western russets, 1,000 bushels were Minnesota Russets, 2,203 bushels were other Minnesota potatoes, and 58 bushels were southern potatoes.

Out of 161,494 bushels of a combination of U. S. Nos. 1 and 2, 71,960 bushels were western russets, 25,860 bushels were Minnesota Russets, 62,990 bushels were other Minnesota potatoes, and 684 bushels were southern potatoes.

Out of 15,669 bushels of southern potatoes, all but 1,257 bushels graded U. S. No. 1, and out of 61,809 bushels of mixed potatoes all but 1,251 were ungraded.

“Inspection,” as used in this study, means inspected by the retailer before purchasing. About three-fourths of the retailers inspected their potatoes before purchasing them, and these retailers sold 88 per cent of all the potatoes. Ninety-three per cent of Minnesota Russets, 92 per cent of all other Minnesota potatoes, 76 per cent of western russets, and 59 per cent of southern potatoes were inspected by the retailers before purchasing them. Over 99 per cent of the mixed potatoes were inspected.

RELATION OF INCOME TO KIND OF POTATOES USED AND PRICES PAID

Persons with high incomes tended to purchase potatoes of high quality. This is indicated in Table 8, which gives the percentages of different kinds of potatoes purchased by consumers according to their incomes.

Table 8.—Relation of the Income of Consumers to Kind of Potatoes Purchased from 1,356 Retail Stores in the Twin Cities

Per capita income	Proportion of all potatoes purchased					Total
	Western russet	Minnesota Russet	Other Minnesota	Southern	Mixed	
	St. Paul*					
	per cent	per cent	per cent	per cent	per cent	per cent
Under \$300	11.8	20.9	62.5	0.9	3.9	100.0
\$300-\$599	14.7	15.6	66.2	2.3	1.2	100.0
600- 899	36.0	14.7	46.3	3.0	.....	100.0
900 and over	26.0	27.4	24.8	6.1	15.7	100.0
Average	22.0	18.2	53.3	2.9	3.6	100.0
	Minneapolis†					
Under \$300	30.0	26.0	41.1	0.6	2.3	100.0
\$300-\$599	34.7	18.2	42.6	2.4	2.1	100.0
600- 899	34.3	14.2	46.9	4.6	.....	100.0
900 and over	51.2	0.4	44.6	3.8	.....	100.0
Average	32.5	22.1	42.2	1.5	1.7	100.0
Average for both cities	26.8	21.9	43.1	1.8	7.3	100.0

* Income areas established by the author.

† Income areas established by Waite and Cox, Minn. Agr. Expt. Sta. Bul. 311.

In general, as incomes increased, the proportion of sales of western russets and southern potatoes increased (see Table 8). This was true for both St. Paul and Minneapolis. In Minneapolis the data indicate that as incomes increased, people shifted from Minnesota Russets to western russets, while in St. Paul the shift was from other Minnesota potatoes to western russets. It is noticeable that a larger proportion of southern-grown potatoes was purchased by the higher-income groups. The quantity of mixed and southern potatoes sold was too small to be particularly significant. The mixed potato sales in St. Paul to the income group of \$900 and over are due to a few good stores in that income area selling a good grade of mixed potatoes and amounted to only one half of one per cent of the total sales in the study.

The proportion of other Minnesota potatoes tended to increase slightly in Minneapolis with increases in the incomes of consumers, while in St. Paul the tendency was for a decided decrease.

In both St. Paul and Minneapolis the prices received for potatoes by the retailers increased as the incomes of purchasers increased, indicating that the higher-income groups demand a higher quality of potato

than the low-income groups. This tendency was the same in both Minneapolis and St. Paul for the russet potatoes grown in Minnesota and the western states. The russet potato is probably the best indicator of quality of any of the varieties sold. The price for western russets in St. Paul averaged 2.6 cents per peck higher than in Minneapolis, and for Minnesota Russets, 1.1 cents higher. The price for other Minnesota potatoes averaged 0.8 cent per peck less in St. Paul than in Minneapolis. The price for southern potatoes averaged 5.1 cents per peck higher in St. Paul. The average price for mixed potatoes was 4.2 cents per peck lower in St. Paul.

Table 9.—Relation of Income of Consumers to Prices Paid per Peck for Potatoes in the Twin Cities

Per capita income	Prices per peck					Average
	Western russet	Minnesota Russet	Other Minnesota	Southern	Mixed	
	St. Paul*					
	cents	cents	cents	cents	cents	cents
Under \$300	35.5	25.8	20.2	102.7	17.5	27.4
\$300-\$599	35.6	26.6	20.6	104.7	19.0	32.0
600- 899	36.8	27.8	19.9	96.7	.....	38.5
900 and over	36.3	28.0	21.8	111.5	21.3	52.0
Average	36.2	27.0	20.3	101.8	20.2	35.1
	Minneapolis†					
Under \$300	33.3	25.7	21.0	94.4	22.9	28.2
\$300-\$599	33.7	25.9	21.2	97.1	27.0	33.6
600- 899	34.9	28.7	21.1	97.9	.....	39.8
900 and over	35.8	30.0	21.8	99.4	.....	43.3
Average	33.6	25.9	21.1	96.7	24.4	31.1
Average for both cities	34.2	26.2	20.8	99.1	22.5	33.3

* Income areas established by author.

† Income areas established by Waite and Cox, Minn. Agr. Expt. Sta. Bull. 311.

DEMAND IN EATING PLACES

The consumption of potatoes in hotels, restaurants and cafeterias, and hospitals amounted to 12 per cent of all the potatoes included in the study. There are some differences in the types of demand in these places that should be noted. Hotels, particularly those with a high-class trade, have a demand for potatoes that is quite rigid. Their trade demands a potato that is uniform in both size and quality, and this demand does not vary much throughout the year. The demand in restaurants and cafeterias is less rigid than that in hotels because of a wider range in the class of trade served. This means that a wider range in the size and quality of potatoes can be used. However, there are certain eating places in this classification that have as rigid a demand for potatoes as do hotels. In hospitals the patients have little opportunity to express their demand for a particular kind of potato or the way in which it is to be

cooked, consequently the demand is the least rigid from the standpoint of the trade of any of the three kinds of eating places. The manner in which potatoes in hospitals are to be cooked is prescribed largely by dietitians and is limited almost entirely to baking and boiling. As 71 per cent of the potatoes consumed in hospitals were boiled, a wider range in both size and quality is possible than in hotels, restaurants, and cafeterias.

HOTELS

Kind and quantity of potatoes used.—Information was obtained from 20 hotels in the Twin Cities relative to varieties and quantities of potatoes used in these hotels, as well as the prices paid for the different varieties.

Table 10.—Kind, Quantity, and Price of Potatoes Consumed in 20 Hotels in the Twin Cities

Kind	Quantity, lb.	Per cent of total	Average price paid per cwt.
Russets			
Minnesota	127,440	8.6	\$1.026
Washington	570,430	38.6	1.692
Idaho	128,000	8.7	1.750
Montana	15,000	1.0	1.400
Other western	242,500	16.4	1.300
Other			
Green Mountain	57,000	3.9	1.183
Cobblers	23,800	1.6	0.875
Round white*	38,440	2.6	0.915
Mixed†	274,500	18.6	1.125
Total or average	1,477,110	100.0	\$1.341

* Trade name including, for the most part, Green Mountain, Cobbler, and Rural varieties.

† Origin not definitely known.

It is evident that hotels depend on russets to supply about three-fourths of their trade. The two principal reasons given for using so many russets were their good cooking quality and their uniformity in size. They said the western russets were more dependable in these respects than the other varieties. The usual practice is to serve one baked potato per serving, so uniformity of size is important. Because of the necessity of cooking large quantities at a time, good keeping quality after cooking is greatly desired.

The number of meals served daily was used as a measure of the size of the hotels. It is significant that 64.7 per cent of all potatoes used by the hotels in this study were western russets and that only 8.6 per cent were Minnesota Russets. Only 8.1 per cent consisted of other potatoes grown in Minnesota. The mixed potatoes included southern potatoes and those of unknown origin, some of which were doubtless grown in Minnesota.

Table 11.—Kinds and Proportions of Potatoes Used by 20 Hotels of Different Sizes in the Twin Cities

Number meals served daily	Proportion of all potatoes				Total
	Western russets	Minnesota Russets	Other Minnesota	Mixed*	
	per cent	per cent	per cent	per cent	per cent
Under 500	49.9	14.3	35.8	.....	100.0
500-999	94.3	4.8	0.9	.....	100.0
1,000 and over	57.6	8.9	5.6	27.9	100.0
Average	64.7	8.6	8.1	18.6	100.0

* Origin not definitely known.

Prices paid.—The prices paid for russets by the hotels ranged from \$1.75 per hundredweight for Idaho Russets to \$1.03 for Minnesota Russets. The prices paid for other Minnesota-grown potatoes varied from \$0.88 per hundredweight for cobbles to \$1.18 for Green Mountains. Apparently Washington and Idaho Russets came the nearest to satisfying the demand of hotels.

The average price paid by the larger hotels is more than that paid by the smaller ones. The price paid by hotels serving fewer than 500 meals daily averaged \$1.25 per hundredweight; by those serving 500 to 999 meals daily, \$1.47, and by those serving 1,000 or more meals daily, \$1.39. For the hotels serving from 500 to 999 meals daily, the western russets constituted the largest proportion of potatoes served; those serving 500 to 999 meals, the next largest, and those serving under 500 meals, the smallest. This is the principal reason for the differences in prices paid by these hotels.

Size preference.—Potatoes were classified as large, medium, and small. Fifty per cent of the hotels preferred large potatoes. All but one of these hotels were classed as large, or those serving more than 500 meals daily. A larger proportion of the potatoes in the large hotels were served as baked potatoes than in small hotels, which makes a definite size a more important factor in the large hotels.

Forty per cent of the hotels preferred medium-sized potatoes, most of these hotels serving from 100 to 500 meals daily. Five per cent preferred a long potato, and 5 per cent had no particular preference. It was noticeable that the hotels that charged the highest prices for their meals required potatoes of good quality and uniformity in size.

Cooking.—As the size of the hotel increased, there was an increase in the proportion of potatoes served baked and scalloped. There was no definite tendency in the proportion of either fried or boiled potatoes served as the size of the hotel increased. For all hotels, 23.0 per cent of the potatoes served were baked; 3.4 per cent, scalloped; 21.9

per cent, fried, and 51.7 per cent, boiled.⁵ A large portion of the fried potatoes were French-fried, which requires some uniformity in shape.

Table 12.—Proportion of Potatoes Cooked in Different Ways by 20 Hotels in the Twin Cities

Number meals served daily	Proportion of potatoes served—				Total
	Baked	Scalloped	Fried	Boiled	
	per cent	per cent	per cent	per cent	per cent
Under 500	15.6	2.2	24.4	57.8	100.0
500-999	16.4	3.3	41.8	38.5	100.0
1,000 and over	26.3	3.7	15.0	55.0	100.0
Average	23.0	3.4	21.9	51.7	100.0

Sources of purchase.—Hotels gave three distinct sources from which they obtained their potatoes. The most important one was commission firms; the second, farmers, and the third, potato jockeys.

Table 13.—Proportion of Potatoes Purchased from Different Sources by 20 Hotels in the Twin Cities

Number meals served daily	Proportion purchased from—				Total
	Commission firms	Farmers	Potato jockeys	Other	
	per cent	per cent	per cent	per cent	per cent
Under 500	50.0	35.8	.....	14.2	100.0
500-999	95.2	.....	.....	4.8	100.0
1,000 and over	57.8	15.8	1.9	24.5	100.0
Average	65.1	10.5	1.2	23.2	100.0

It will be observed from Table 13 that 65.1 per cent of all potatoes purchased by the 20 hotels included in this study were purchased from commission firms, 10.5 per cent from farmers, 1.2 per cent from jockeys, and 23.2 per cent from other sources. One hotel raised its own potatoes on a farm in Sherburne County. Most of the largest hotels have cafes in addition to their main dining rooms. In these cafes many lunches are served without potatoes, but the lunches are included in the number of meals served daily. This helps to explain the smaller proportion of high-quality potatoes used in these hotels than in the hotels which serve only 500 to 999 meals daily, most of which serve meals only in their main dining rooms. Hotels depend mainly on commission firms to supply them with western potatoes. As these potatoes are graded, there is less variation in quality.

⁵ These proportions check quite closely with the findings of consumer preference for potatoes in Milwaukee and Chicago, as reported in Wis. Agr. Expt. Sta. Bull. 124, Consumer Preferences for Potatoes.

RESTAURANTS AND CAFETERIAS

Kind and quantity of potatoes used.—Information on potatoes was obtained from 128 restaurants and cafeterias in the Twin Cities. Table 14 gives the variety, quantity, and price of potatoes used by these eating places.

Table 14.—Kind, Quantity, and Price of Potatoes Consumed in 128 Restaurants and Cafeterias in the Twin Cities

Kind	Quantity, lb.	Per cent of total	Average price paid per cwt.
Russets			
Minnesota	605,590	14.2	\$1.199
Washington	1,102,160	25.9	1.568
Montana	157,125	3.7	1.583
Idaho	74,650	1.8	2.413
Other western	360,970	8.5	1.564
Other			
Green Mountain	257,060	6.0	1.110
Cobbler	74,800	1.8	.893
Early Ohio	127,500	3.0	1.150
Round white*	260,565	6.1	1.025
Mixed†	1,236,820	29.0	.991
Total or average	4,257,240	100.0	\$1.220

* Trade name including, for the most part, Green Mountain, Cobbler, and Rural varieties.

† Origin not definitely known.

Over half, 54.1 per cent, of all potatoes consumed in 128 restaurants and cafeterias in the Twin Cities were russets. Other Minnesota potatoes constituted 16.9 per cent, and mixed, 29.0 per cent. Of the russets consumed, 47.9 per cent were from the state of Washington, 25.9 per cent from other western states, and 26.2 per cent from Minnesota. A smaller proportion of russets came from western states and a larger proportion from Minnesota than was true for the hotels studied. Of the other potatoes grown in Minnesota, the round white and Green Mountains were the most popular. The former consisted of 6.1 per cent of the total consumed, and the latter, 6.0 per cent.

Table 15.—Kinds and Proportions of Potatoes Used by 128 Restaurants and Cafeterias in the Twin Cities

Number meals served daily	Proportion of all potatoes				Total
	Western russets	Minnesota Russets	Other Minnesota	Mixed*	
	per cent	per cent	per cent	per cent	per cent
Under 100	11.5	33.9	36.0	18.6	100.0
100-499	19.8	10.3	24.8	45.1	100.0
500-899	54.6	23.1	9.5	12.8	100.0
900 and over	54.6	9.7	10.9	24.8	100.0
Total or average	39.9	14.2	16.9	29.0	100.0

* Includes potatoes of unknown origin and southern potatoes.

Like the hotels, the large restaurants and cafeterias bought a larger proportion of russets than other potatoes. Table 15 gives the distribution of potatoes used by restaurants and cafeterias, according to their size, measured by the number of meals served daily.

Approximately 40 per cent of all potatoes used in restaurants and cafeterias were western russets, as compared with 64.7 per cent in hotels; 14.2 per cent were Minnesota Russets, as compared with 8.6 per cent in hotels; 16.9 per cent were other Minnesota potatoes, as compared with 8.1 per cent in hotels, and 29.0 per cent were mixed, as compared with 18.6 per cent in hotels.

It appears from data in Table 15 that the large restaurants and cafeterias, those serving 500 or more meals daily, have a more rigid demand for russet potatoes than the smaller ones which depend more on other varieties of potatoes grown in Minnesota. The demand for a potato of a definite size and quality was not as distinct as in hotels. Apparently the russets shipped in from the western states came the nearest to satisfying the demands of more than half of the large restaurant and cafeteria trade (see Table 15).

Prices paid.—The prices paid by the 128 restaurants and cafeterias studied varied from \$2.42 per hundredweight for Idaho Russets⁶ to \$0.89 for cobbles grown in Minnesota. The highest price paid for other Minnesota potatoes, excluding the russets, was \$1.15 for Early Ohio's.

The large restaurants and cafeterias paid more for their potatoes on the average than the small ones. This was because a larger proportion of russet potatoes was used by the large restaurants. The restaurants that served more than 500 meals daily paid an average price of \$1.36 per hundredweight, and those which served less than 500 meals daily paid an average price of \$1.18 per hundredweight.

Size preference.—Sixty-six per cent of all the restaurants and cafeterias preferred medium-sized potatoes weighing about 12 ounces and measuring about two and one-half to three inches in diameter. Twenty-six per cent preferred large-sized potatoes. Those which preferred a large-sized potato served a smaller proportion of their potatoes baked than did those which preferred the medium size. Six per cent indicated a preference for mixed sizes, and two per cent preferred a long potato for serving as French fries. The preference for medium-sized potatoes did not vary much among the restaurants and cafeterias that served over 100 meals daily.

Cooking.—The number of meals served daily was used as a measure of the size of the restaurants and cafeterias. Table 16 gives the

⁶ This unusually high price for Idaho potatoes was paid by certain eating places which specialize in high quality of food.

proportion of potatoes cooked in different ways, according to the size of the eating place.

Table 16.—Proportion of Potatoes Cooked in Different Ways by 128 Restaurants and Cafeterias in the Twin Cities

Number meals served daily	Proportion of potatoes served—				
	Baked	Scalloped	Fried	Boiled	Total
	per cent	per cent	per cent	per cent	per cent
Under 100	4.3	4.9	17.2	73.6	100.0
100-499	5.4	1.7	28.6	64.3	100.0
500-899	4.9	0.9	35.9	58.3	100.0
900 and over	4.4	1.3	45.1	49.2	100.0
Average	4.9	1.5	35.6	58.0	100.0

As the size of the restaurants and cafeterias increased, there was a continuous decline in the proportion of potatoes served boiled and a continuous increase in the proportion served fried. The larger restaurants and cafeterias serve a larger proportion of potatoes French fried, which accounts principally for the increase in the proportion of all fried potatoes.

Fifty-eight per cent of all potatoes served in the restaurants and cafeterias studied were boiled, as compared with 51.7 per cent served in hotels; 35.6 per cent were fried, as compared with 21.9 per cent in hotels; 1.5 per cent were scalloped, as compared with 3.4 per cent in hotels, and 4.9 per cent were baked, as compared with 23.0 per cent in hotels. It is evident from the above that the demand for potatoes in restaurants and cafeterias was not as rigid as that in hotels, and for this reason a wider range in both quality and size of potatoes could be used.

Sources of purchase.—The four distinct sources from which restaurants and cafeterias purchased their potatoes were commission firms, retailers, farmers, and potato jockeys. Table 17 gives the relative importance of each of these sources.

The restaurants and cafeterias purchased 63.2 per cent of their potatoes from commission firms, 28.3 per cent from farmers, 1.8 per cent from retailers, 1.5 per cent from potato jockeys, and 5.2 per cent from other sources. It is significant that as the size of these eating places increases, the larger is the proportion of potatoes obtained from commission firms and smaller the proportion from farmers and other sources, indicating that in potatoes furnished by commission firms there are certain qualities that are in greater demand by the larger restaurants and cafeterias than the smaller ones (see Table 17). The smallest places bought 35.2 per cent of their potatoes from commission firms, while the largest bought 80.2 per cent from them. The proportion of potatoes the

smaller establishments bought from farmers was approximately two and one half times greater than the proportion purchased by the larger establishments.

Table 17.—Proportion of Potatoes Purchased from Different Sources by 128 Restaurants and Cafeterias in the Twin Cities

Number meals served daily	Proportion purchased from—					Total
	Commission firms	Farmers	Retailers	Potato jockeys	Other	
	per cent	per cent	per cent	per cent	per cent	
Under 100	35.2	50.0	11.5	3.3	0.0	100.0
100-499	48.9	34.9	3.2	3.7	9.3	100.0
500-899	65.1	26.4	0.0	0.0	8.5	100.0
900 and over	80.2	19.8	0.0	0.0	0.0	100.0
Average	63.2	28.3	1.8	1.5	5.2	100.0

Eighty-two per cent of the potatoes purchased by these eating places from commission firms were russets, of which over four-fifths were shipped in from western states. These were graded potatoes and were more uniform than those purchased from the other sources indicated, many of which were ungraded.

HOSPITALS

Kind and quantity of potatoes used.—Information was obtained from 21 hospitals in the Twin Cities relative to varieties and quantities of potatoes used, and the prices paid for the different varieties.

Table 18.—Kind, Quantity, and Price of Potatoes Consumed in 21 Hospitals in the Twin Cities

Kind	Quantity, lb.	Per cent of total	Average price paid per cwt.
Russets			
Minnesota	44,400	3.1	\$0.767
Montana	74,000	5.2	1.578
Washington	35,000	2.4	1.450
Idaho	9,000	0.6	1.700
Other western	139,200	9.8	1.678
Other			
Green Mountain	146,540	10.3	1.010
Cobblers	59,000	4.1	0.800
Early Ohio	30,000	2.1	1.100
Round White*	60,000	4.2	0.900
Mixed†	833,900	58.2	0.975
Total or average	1,431,040	100.0	\$1.210

* Trade name including, for the most part, Green Mountain, Cobbler, and Rural varieties.
 † Origin not definitely known.

There is a striking difference in the proportion of certain kinds of potatoes used in hospitals and those used in hotels or restaurants and cafeterias. For example, only 2.4 per cent of all the potatoes used in

hospitals studied were Washington Russets, 0.6 per cent Idaho Russets, 5.2 per cent Montana Russets, and 9.8 per cent russets from other western states. Eighteen per cent of all the potatoes used were western russets, as compared with 64.7 per cent for hotels and 39.9 per cent for restaurants and cafeterias. Minnesota Russets comprised 3.1 per cent, as compared with 8.6 per cent for hotels and 14.2 per cent for restaurants and cafeterias. A larger proportion of Minnesota potatoes, other than russets, was used in hospitals than in either of the other two types of eating places.

Hospitals used more mixed potatoes than all the other potatoes combined. They constituted 58.2 per cent of all potatoes used, as compared with 18.6 per cent in hotels and 29.0 per cent in restaurants and cafeterias.

Table 19.—Kind and Proportion of Potatoes Used by 21 Hospitals in the Twin Cities

Number meals served daily	Proportion of all potatoes				Total
	Western russets	Minnesota Russets	Other Minnesota potatoes	Mixed*	
	per cent	per cent	per cent	per cent	per cent
100-499	33.9	20.9	39.6	5.6	100.0
500-899	41.2	2.5	21.0	35.3	100.0
900 and over.....	1.8	1.3	16.8	80.1	100.0
Total or average.....	18.0	3.1	20.7	58.2	100.0

* Includes potatoes of unknown origin and southern potatoes.

There was a rapid increase in the proportion of mixed potatoes used as the size of the hospital increased (see Table 19). This change was more marked than in the hotels or in restaurants and cafeterias. There was a decrease in the proportion of other Minnesota potatoes used, altho it should be remembered that some of the mixed potatoes were doubtless of Minnesota origin. Russet potatoes were more popular in the small hospitals than in the large ones. The large hospitals include the city hospitals whose patients are not as closely selected as is the case in the smaller hospitals.

Prices paid.—The average price paid for potatoes by hospitals was less than that paid by hotels or restaurants and cafeterias. It ranged from \$0.77 per hundredweight for Minnesota Russets to \$1.70 for Idaho Russets. Seventy per cent of all the potatoes bought by the hospitals cost less than \$1.00 per hundredweight, while only 42 per cent of those purchased by hotels and 47 per cent of those purchased by restaurants and cafeterias cost less than \$1.00 per hundredweight.

Size preference.—Eighteen of the 21 hospitals preferred a medium-sized potato, but only one indicated that this preference was

strong enough to warrant the payment of a premium for a special-sized potato. The indications were that hospitals would buy mixed sizes and select the size desired for special purposes rather than pay a premium for a particular size.

Cooking.—Only two methods of cooking potatoes were important in the hospitals studied—baking and boiling. Of all the potatoes consumed in the hospitals 71.2 per cent were boiled, 23.6 per cent were baked, 3.6 per cent were fried, and 1.6 per cent were scalloped. Table 20 gives the importance of the different methods of cooking.

Table 20.—Proportion of Potatoes Cooked in Different Ways by 21 Hospitals of Various Sizes in the Twin Cities

Number meals served daily	Proportion of potatoes served—				Total
	Baked	Scalloped	Fried	Boiled	
	per cent	per cent	per cent	per cent	
100-499	15.4	0.7	0.5	83.4	100.0
500-899	27.1	2.5	5.1	65.3	100.0
900 and over	23.4	1.2	3.5	71.8	100.0
Average	23.6	1.6	3.6	71.2	100.0

Hospitals that served more than 500 meals daily served a larger proportion of their potatoes baked than did those serving fewer meals. They, on the other hand, served a smaller proportion boiled (see Table 20). It is apparent that fried and scalloped potatoes have little place in hospital diets.

Sources of purchase.—Hospitals purchased their potatoes from two sources chiefly, farmers and commission firms. The most important source was the farmer, who supplied the hospitals with 60.0 per cent of their potatoes. The commission firms furnished 32.3 per cent; retailers, 3.4 per cent, and other sources, 4.3 per cent (see Table 21). The small hospitals depended more on commission firms than on any other source for their potatoes, and the large hospitals, the least. The large hospitals obtained 81.4 per cent of their total supply from farmers. Two of the largest hospitals in this study obtained their entire supply from farmers.

Table 21.—Proportion of Potatoes Purchased from Different Sources by 21 Hospitals in the Twin Cities

Number meals served daily	Proportion purchased from—				Total
	Commission firms	Farmers	Retailers	Other	
	per cent	per cent	per cent	per cent	
100-499	54.1	45.9	0.0	0.0	100.0
500-899	44.9	34.6	9.0	11.5	100.0
900 and over	18.6	81.4	0.0	0.0	100.0
Average	32.3	60.0	3.4	4.3	100.0

OBJECTIONS TO MINNESOTA POTATOES

The objections to Minnesota-grown potatoes as given by 1,356 retail stores, 20 hotels, 128 restaurants and cafeterias, and 21 hospitals have been grouped under six heads: (1) Poor cooking and baking quality and turning black after cooking. Turning black was the one most frequently mentioned. It was especially common in large hotels, restaurants, and cafeterias, where it is necessary to cook large quantities of potatoes at a time and where they may have to stand as long as three hours after cooking. (2) Disease, including scab and both hollow and dry rot. Hollow rot was frequently mentioned. (3) Poor quality, including softness, starchiness, wateriness, and general lack of quality. (4) Lack of uniformity in size, color, and roughness; not graded. (5) Wastefulness, including waste of all kinds in preparation for cooking. (6) Poor keeping quality before cooking.

It will be observed from Table 22 that poor cooking quality accounted for 36.6 per cent of all the objections to Minnesota potatoes given by eating places and 41.9 per cent given by retail stores. This objection was more important in hotels, restaurants, and cafeterias than in hospitals. Diseased potatoes constituted 20.7 per cent of all the objections in eating places, the largest proportion of which came from hospitals, and 15.5 per cent in retail stores. Some hospitals stated that sometimes it was necessary to take potatoes in payment of bills, and in such cases the potatoes were frequently of low grade. Objections to poor quality were of about equal importance in hotels and hospitals, the former because of a rather rigid demand for quality and the latter because of the generally poor quality they were frequently compelled to buy. Poor quality was less objectionable in retail stores than in the eating places. Lack of uniformity accounted for 15.2 per cent of the objections in eating places and was most frequent in hospitals and restaurants and cafeterias. Objections to lack of uniformity were more frequent in retail stores than in eating places. With the exception of hospitals, retail stores purchased a larger proportion of their potatoes from sources with no facilities for grading. Objections to waste accounted for 6.3 per cent and poor keeping quality for 3.7 per cent in eating places, and 2.0 per cent and 8.8 per cent, respectively, in retail stores.

Some favorable comments were obtained on Minnesota potatoes. The comments most frequently mentioned were quality, particularly in the northern-grown potato, and flavor. Where comment on cooking was obtained, boiling was the method recommended. Some favorable comment was obtained from certain retail stores on the cheapness of Minnesota potatoes.

Table 22.—Importance of Objections to Minnesota Potatoes as Reported by 160 Hotels, Restaurants, Cafeterias, and Hospitals, and 1,356 Retail Stores in the Twin Cities

	Objections indicated						Total
	Poor cooking quality	Disease	Poor quality	Lack of uniformity	Waste-fulness	Poor keeping quality	
	per cent	per cent	per cent	per cent	per cent	per cent	per cent
Hotels	34.6	15.4	26.9	15.4	7.7	0.0	100.0
Restaurants and cafeterias	39.2	20.0	12.8	16.8	6.4	4.8	100.0
Hospitals	30.0	27.5	25.0	10.0	5.0	2.5	100.0
Average of eating places	36.6	20.9	17.3	15.2	6.3	3.7	100.0
Retail stores	41.9	15.5	10.6	21.2	2.0	8.8	100.0

If Twin City hotels and other public eating places could depend on Minnesota potatoes for uniformity in size and satisfactory cooking quality from one year to the next, they would buy more Minnesota potatoes. It must be recognized that these places have a particular demand for potatoes, and unless that demand is met at all times, their business suffers. A load of poor potatoes is likely to prejudice them against that variety or brand of potato for some time and results in their turning to sources that are more dependable.

CULLS

Because of the method of purchase used by hotels, restaurants, cafeterias, and hospitals, there were not many culls. Most of the purchases were in quantities that would last for only short periods. This was particularly true of the small public eating places and most of the hospitals. These places usually have very meager storage facilities and hence can lay in only a limited supply. A few of the large hotels and restaurants occasionally buy in large quantities, and in such cases there are always some culls. The best of the culls were boiled, and the remainder thrown out.

CONCLUSIONS

This study shows that in metropolitan centers there is a considerable demand for the very best quality of potatoes. This is especially true of hotels, restaurants, and other commercial eating establishments, and the higher-income groups of consumers. The two outstanding requirements are satisfactory cooking quality and uniformity in size. Premiums are paid for potatoes possessing these qualities, and the higher prices attract potatoes of high quality from western states. Because of the large proportion of western russets used, it appears that Minnesota-grown potatoes do not possess all the qualities required by this rather select trade.

About 30 per cent of the potatoes used in the Twin Cities are grown in states other than Minnesota. The objections to the use of Minnesota potatoes, reported by the hotels, restaurants, and retail stores, indicate that a large part of this outlet could be secured for Minnesota potatoes through improvement in quality and more careful grading.

About 50 per cent of the objections mentioned were on the grounds of disease, poor quality, and lack of uniformity. Certainly some of the objection to diseased tubers and poor quality can be overcome through more careful cultural practices, such as treatment of the seed and more careful selection of the soil in which potatoes are grown. If a soil is infected, treatment of seed alone is insufficient. Greater uniformity can be secured by more rigid grading. Uniformity has a strong appeal to certain consumers, and they are willing to pay more for a uniform, reliable product than for one about which there is some doubt. There is evidently a considerable market in the Twin Cities alone that will pay premiums for potatoes of high quality and uniformity, but in order to secure the advantages of this market Minnesota growers must offer the type of potatoes demanded by this trade.

Ninety per cent of the potatoes shipped out of Minnesota go to 20 cities, largely toward the southeast. These potatoes must compete with Wisconsin and Michigan potatoes, and because of our greater distance from these markets we are at some disadvantage. This disadvantage can, however, be offset by marketing a better product. It is evident from this study that Minnesota potato growers can increase their returns from this crop by producing and marketing potatoes of higher quality and greater uniformity.