FRESH POTATO TRANSPORTATION TO LARGE MARKETS

FROM FIVE MAJOR PRODUCING AREAS

MARKETING ECONOMICS DIVISION · ECONOMIC RESEARCH SERVICE
U. S. DEPARTMENT OF AGRICULTURE

PREFACE

This report describes the extent to which rail and truck transportation factors have contributed to the change in the relative importance of the five major producing areas in California, Idaho, Maine, New York, and North Dakota-Minnesota (combined). It also indicates the movement of fresh potatoes from those areas to principal destinations.

The production data are for the years 1947 through 1963 and unload data are for the years 1958 and 1963.

The Farmer Cooperative Service helped to plan this study and supplied the rail freight rates used in the analysis of freight charges. Truck freight rates were obtained from truck brokers, shippers, and other sources acquainted with transportation in the potato producing areas studied.

CONTENTS

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PRODUCTION AREAS AND MARKETS

Production

California, Idaho, Maine, New York, and North Dakota-Minnesota produced over 60 percent of all potatoes grown in the Nation in recent years.

Maine is no longer the Nation's largest producer of potatoes. It lost that position to Idaho in 1957 and has never recovered it. The switch in position of Maine and Idaho probably was the most striking development in the industry in recent years. The significance of that development depends upon one's point of view. In terms of total production Maine's output in 1963 was only slightly below 1947. Only 7 years in the past 17 have been better ones in terms of production volume. Furthermore, Maine contributed 13.8 percent to the Nation's total output in 1963, a decrease of only 3.0 percentage points from 1947 (table 1).

In terms of Maine's position relative to those of other major potato producing areas, Maine is losing ground rapidly. Idaho's output has more than tripled in the past 17 years. That State's share of the Nation's total output grew from 7.4 percent in 1947 to its dominant position of 19.7 percent in 1963. More important than that, however, is the fact that Idaho has recorded a consistent upward output trend.

California's production fluctuates from year to year but shows no distinct trend. In 1963 it was the third ranking source of production, a position it has consistently held since 1950.

Production in the North Dakota-Minnesota area appears to be growing, whereas production in New York has remained relatively stable since 1960.

Markets

In 1960 over 40 percent of the Nation's population was located in States generally within a radius of 500 miles of Wayland, N.Y., one of the two major potato producing areas of that State.[1] Another 20 percent of the Nation's population was located beyond 500 miles from Wayland, N.Y., but within 800

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[1] The entire population of a State was included if most of the State's area fell within the radius.

miles. Despite this proximity of production to population, New York State pro-
duced only 7.4 percent of the Nation's potatoes in 1963. These statistics
cannot be reconciled simply in terms of potential market. Factors other than
transportation have strongly influenced this State's share of national
production (table 2).

In contrast, Idaho had less than 3 percent of the Nation's population
within 500 miles of its potato producing area and less than 15 percent between
500 miles and 800 miles from the area. Of the Nation's total population less
than 17 percent live within 800 miles of Idaho's potato production area.
Nevertheless, Idaho produced more potatoes than any of the other four producing
areas and almost 20 percent of the Nation's output in 1963.

Maine had almost 30 percent of the Nation's population within 800 miles of
its potato producing areas. About half of that percentage was within 500 miles
and the other half between 500 and 800 miles. Yet, that State produced less
than 14 percent of the Nation's output in 1963.

California had slightly more than 10 percent of the Nation's population
within 500 miles of its potato producing areas and produced almost 11 percent
of the Nation's output in 1963. Additional markets for California potatoes
were distant ones.

The North Dakota-Minnesota area had about 25 percent of the Nation's popu-
lation within 800 miles and produced 10.1 percent of the Nation's output in
1963.

Table 2 also contains estimates of U.S. population in 1965 and in 1970.
These figures show that Maine, New York, and the North Dakota-Minnesota area
will have slightly smaller shares of the Nation's population near potato pro-
ducing areas as time passes, whereas California and Idaho will have larger ones,
with California having the advantage over Idaho in nearby markets.

Figure 1 indicates the areas falling within the 500 and 800 mile zones and
the extent to which some areas fall within delivery potentials from two or more
of the five larger producing centers.

TRANSPORTATION BY HIGHWAY AND RAILWAY

Railroads delivered more fresh potatoes than trucks did in 21 of 37 U.S.
cities, according to 1963 unload statistics (table 4).[2] In 1958 rails predom-
inated at 26 points. They showed a distinct lead over trucks for origins in
California, Idaho, Maine, and the North Dakota-Minnesota area. Only New York
potatoes generally arrived at more of the 37 markets in greater volume by truck
than by rail. Potatoes shipped from that State in 1963 reached destinations
almost exclusively by truck, except for Baltimore, Cincinnati, Philadelphia,
Pittsburgh, and Washington, D.C. The use of rail for shipments to these points
appears to be a new development. According to the 1958 unload statistics none
arrived in those cities in that year by rail from New York.

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[2] Unload statistics include only fresh potatoes. Processed potatoes are
not included. Data obtained from annual "Fresh Fruit and Vegetable Unloads,"
Market News Branch, Fruit and Veg. Div., U.S. Agr. Mktg. Serv.
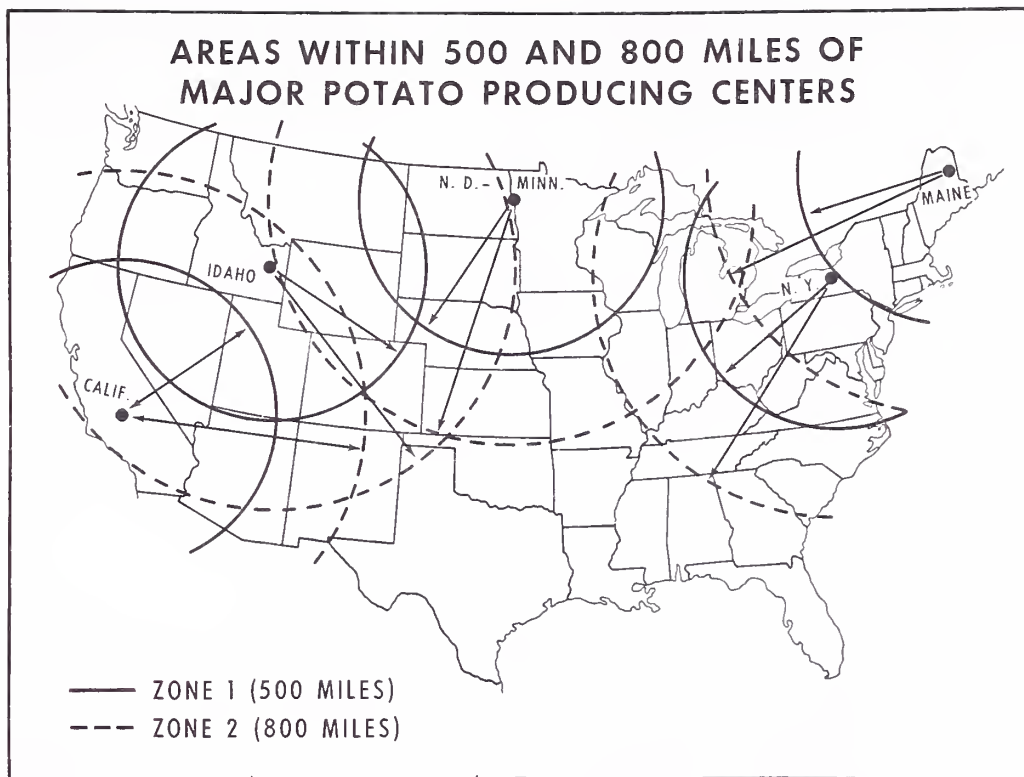
AREAS WITHIN 500 AND 800 MILES OF
MAJOR POTATO PRODUCING CENTERS

——— ZONE 1 (500 MILES)
- - - ZONE 2 (800 MILES)

Figure 1

Potatoes sometimes move from origin points to ultimate destinations by a combination of rail and truck service; that is, they move part way by rail and part way by truck. Maine is a good example of the use of both services. Although some Maine potatoes go all the way from storage point to market by rail, and others go all this way by truck, substantial quantities leave the storage point by rail, and at Boston or Providence are transferred to trucks. Sometimes the trucks carry them considerable distances. The extent of the use of rail for part of a haul and truck for the remainder is not known but the amounts are believed to be substantial.

Table 4 shows the share of total unloads at 37 destinations arriving by truck and rail from California, Idaho, Maine, New York, and the North Dakota-Minnesota area. It shows them as ratios of total unloads for the years 1958 and 1963. The numerator of the fraction indicates the truck share of total unloads; and the denominator, the rail share. Twenty-six cities received a larger share of fresh potatoes in 1963 by truck than they did in 1958, whereas 11 cities received a larger proportion by rail. Even though rails dominate the transportation of potatoes, 1958 and 1963 statistics indicate that trucks are making significant inroads on the rails' position.

Although big metropolitan centers tend to draw their potatoes from various production centers, the bulk comes from nearby production areas. The closer the source of potatoes to the destination, the more likely it is that the destination will be served by truck. Rail unload points often draw potato supplies from quite distant sources. When this happens, such destinations tend

3

to be very large metropolitan areas. Tables 5 through 9 highlight these and additional facts. Interpretations of unload statistics are complicated by the fact, noted above, that potatoes may move to a transfer point such as Boston by one type of carrier and then on to their destination by another type.

California

The principal destination of California fresh potatoes has been Los Angeles. The next most important destination has been San Francisco. The deliveries to Los Angeles have been more than four times those for San Francisco. The third most important market has been Chicago. But the volume unloaded there in 1963 was only about one-sixth the volume unloaded in Los Angeles and about two-thirds the volume unloaded in San Francisco. Other major destinations have been New York City and Houston, Tex. Arrivals at Houston were mostly by truck in 1958 and mostly by rail in 1963. Unloads at Chicago and New York have been almost entirely by rail.

Idaho

Idaho potatoes arrive at major markets mostly by rail. The five major markets (truck and rail combined) in order of importance in 1963 were: Chicago, Los Angeles, New York City, Detroit, and St. Louis. The major truck unload points were Salt Lake City, San Francisco, Denver, Minneapolis, Los Angeles, and Dallas. Even though Minneapolis and Los Angeles were important truck unload points, these two cities received more potatoes by rail than by truck in 1963. Only Salt Lake City, which is the largest truck unload point, received more Idaho potatoes by truck than by rail by a substantial margin.

Maine

New York and Boston were the chief markets for Maine potatoes. By far the greatest share of arrivals at New York reached there by rail. Arrivals at Boston were more by truck than rail though both modes of transportation moved large volumes. Other important destinations were Philadelphia and Baltimore. Deliveries to these points were more by rail than by truck. Many Maine potatoes leave Maine by rail and are transferred at Boston or other major metropolitan centers to truck for hauls to final destinations.

New York

New York has two major production areas. One is near the center of the State and one is on Long Island. The major market for that State's products has been New York City. Unloads there have been four times or more those at the next most important unload points of Philadelphia and Baltimore. Trucks move virtually all of the potatoes to these markets.

North Dakota-Minnesota

Chicago, Minneapolis, and St. Louis are the three most important unload points for Red River Valley potatoes. Chicago and St. Louis received potatoes almost exclusively by rail in 1958 and 1963, whereas Minneapolis received almost all its potatoes from this production area by truck. Kansas City was

the fourth largest unload point, but unloads there were less than one-half as large as those in Chicago.

UNLOAD VOLUME RELATED TO SIZE AND LOCATION OF MARKETS

Table 3 shows that the larger the destination areas--in terms of population--the bigger the actual fresh potato unloads. According to 1963 statistics, a particular production center is likely to sell more fresh potatoes at nearby markets than at those located farther away (tables 5-9).

More important findings for this analysis, however, are that large metropolitan areas do draw supplies from very long distances, usually by rail. These movements are predominantly east and south, not west.

Market Size and Location

New York City is the largest market for Maine potatoes. It is also the largest market for New York potatoes, the third largest market for Idaho potatoes, and the fourth largest market for potatoes from California. The key transportation question for eastern potato producers is why California and Idaho potatoes move eastward across the country to New York City and the Atlantic Coast markets while potatoes grown in Maine, New York, and North Dakota-Minnesota seldom move very far west and almost never to Los Angeles and San Francisco. A partial explanation of the longer eastbound flow is that rail freight rates for long distance eastbound hauls are notably lower than for westbound ones of equal length. The most distant of the 15 markets served by Maine is Miami, Fla. The only distant market of significance served with New York State potatoes is Atlanta, Ga. North Dakota-Minnesota potatoes move somewhat longer distances to reach Chicago and St. Louis. Distant markets served by Maine, New York State, and the North Dakota-Minnesota areas are not west--usually they are south.

Distances from potato-producing areas in California, Idaho, Maine, New York, and the North Dakota-Minnesota area to the 15 most important destinations for potatoes are compared in figure 2. This figure highlights the fact that New York, North Dakota-Minnesota, and Maine potatoes move much shorter distances than either Idaho or California potatoes. Eleven of 15 Maine markets were less than 1,200 miles away; only 2 were more than 1,400 miles. Fourteen of New York's markets were less than 1,200 miles away. Except for the larger west coast markets of Los Angeles and San Francisco served by California and Idaho, those two States move their potatoes two or three times as far to reach their outlets. In fact, in 1963 California potatoes moved more than 1,400 miles to 10 of 15 major markets. Idaho potatoes also traveled 1,400 miles or more to 11 of 15 markets. Only 3 of the 15 principal markets are closer than 1,000 miles.

New York State potatoes generally are hauled much shorter distances than those produced in California and Idaho. Eleven of the 15 major markets in 1963 were less than 500 miles from production areas and only 1 was over 1,000 miles.

North Dakota-Minnesota potatoes move somewhat longer distances than Maine potatoes. In 1963, 8 of 15 markets were over 1,000 miles away and only 1 was less than 500 miles away.

5

POTATO UNLOADS RELATED TO DISTANCE
FROM MAJOR PRODUCING CENTERS

15 Destinations Ranked in Order of Unload Volume, 1963

HIGHWAY MILES TO DESTINATION

California
Idaho
Maine
N. D.-Minn.
N. Y.

DESTINATIONS

COMBINED TRUCK AND RAIL UNLOADS.

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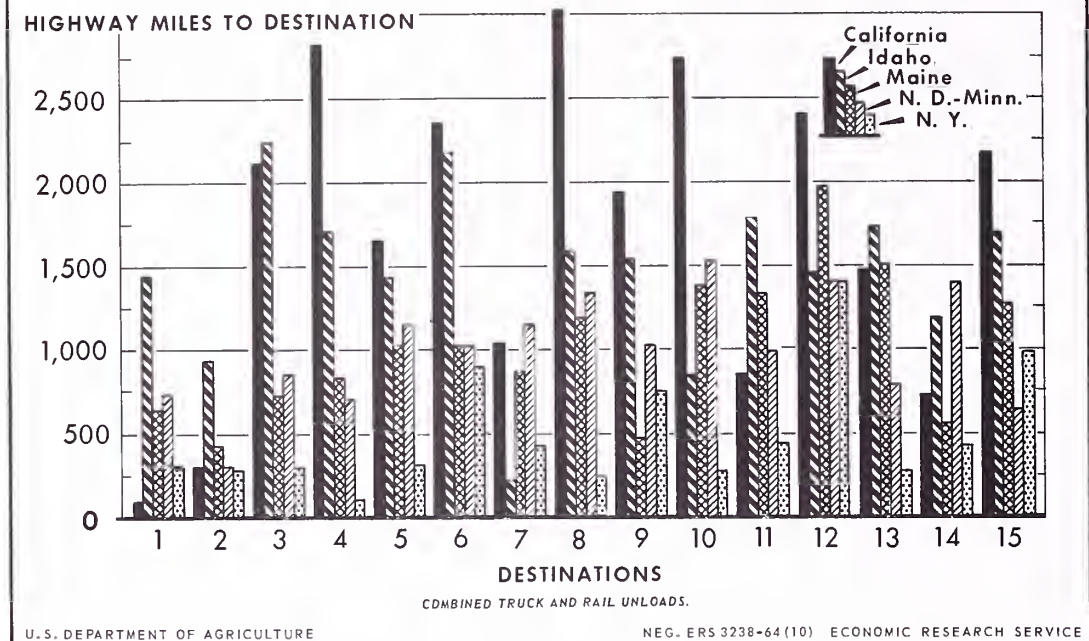
Figure 2

Truck Versus Rail Hauls

Although there are many exceptions, the principal truck unload points for any given potato production area tend to be nearby and the rail unload points tend to be farther away. For example, the two most important truck unload points for California potatoes are customarily Los Angeles and San Francisco, both less than 300 miles from the Bakersfield production area. The three major rail unload points for California potatoes, on the other hand, are over 2,000 miles from the production area. These are Chicago, New York City, and Detroit. Also, the rail unloads of California potatoes at Chicago have been over three-fourths as large as the quantities unloaded from trucks at San Francisco. Chicago is the center of a much larger metropolitan area than San Francisco, but even so, these statistics do highlight the fact that large amounts of California potatoes do move very long distances to market (table 5 and fig. 3).

Thirteen of 15 rail destinations for California potatoes in 1963 were over 800 miles distant. Contrasted with this, the important truck markets were nearby (fig. 3). Idaho potatoes also tend to reach nearby markets by truck and distant markets by rail (fig. 4).

Transportation of Maine potatoes does not follow the pattern indicated for California and Idaho. Potatoes originating there move about the same distances by truck as they do by rail to reach markets of comparable rank. The minimum distances to major markets by rail and truck in 1963 exceeded 400 miles and the maximum distance for any of the 15 major rail unload points was less than 1,500

6

POTATO UNLOADS BY RAIL AND TRUCK FROM BAKERSFIELD, CALIFORNIA

15 Destinations, Ranked in Order of Unload Volume, 1963

MILES TO DESTINATION

Truck

Railroad
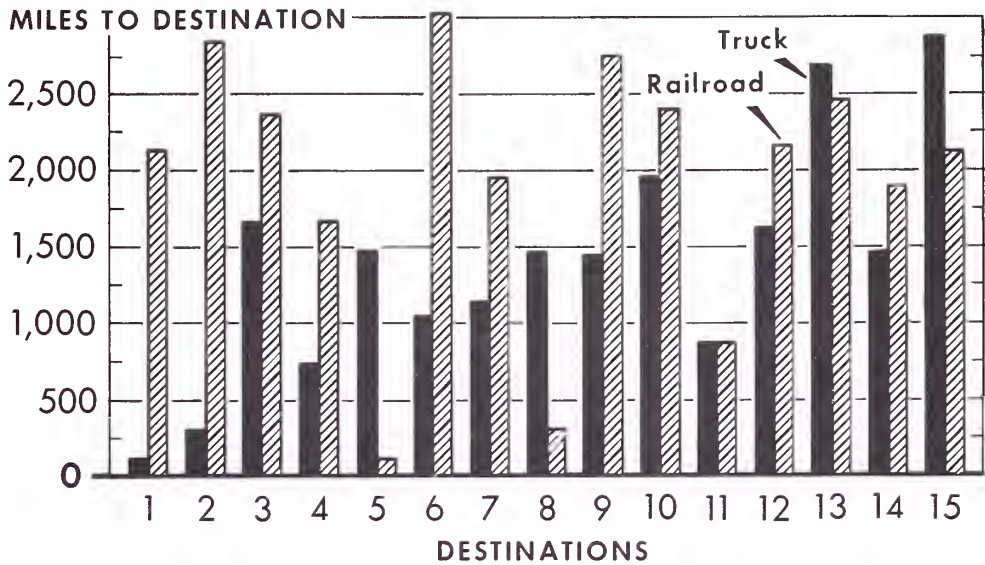
DESTINATIONS

U.S. DEPARTMENT OF AGRICULTURE   NEG. ERS 3239-64 (10)   ECONOMIC RESEARCH SERVICE

Figure 3

POTATO UNLOADS BY RAIL AND TRUCK FROM IDAHO FALLS, IDAHO

15 Destinations, Ranked in Order of Unload Volume, 1963

MILES TO DESTINATION

Railroad

Truck

DESTINATIONS

U.S. DEPARTMENT OF AGRICULTURE   NEG. ERS 3240-64 (10)   ECONOMIC RESEARCH SERVICE

Figure 4

miles. For trucks the same maximum distances applied to all markets except two. These were Miami, Fla., and Atlanta, Ga. (fig. 5).

No clear-cut unload patterns are evident for shipments of New York and North Dakota-Minnesota potatoes to markets. In general, however, rail and truck distances tend to be within the same general range depending on the importance of the market (figs. 6 and 7).

Perhaps the most surprising fact shown by these unload statistics is that Maine potatoes do not move to Chicago in any notable volume even though Chicago is less than 1,400 miles. Neither do they move to St. Louis, a distance of less than 1,700 miles. Maine potatoes would need to move 3,500 miles to arrive at Los Angeles or San Francisco, or some 700 miles more than California potatoes need to move to reach New York, Philadelphia, and other Atlantic Coast markets.

To summarize, potatoes produced in the west dominate the fresh markets there and also move east in substantial volume as far as the Atlantic Coast. Potatoes produced in eastern areas are the principal sources of supply for the fresh market there. Substantial quantities raised in Maine, New York, and the North Dakota-Minnesota area are delivered to the southern and South Central portions of the Nation. These eastern production centers do not have important markets to the west and are facing growing competition from California and Idaho potatoes in major markets close to home. As explained later, transportation does not seem to be the only factor influencing this trend.

POTATO UNLOADS BY RAIL AND TRUCK
FROM CARIBOU, MAINE

15 Destinations, Ranked in Order of Unload Volume, 1963

MILES TO DESTINATION

Truck

Railroad

DESTINATIONS
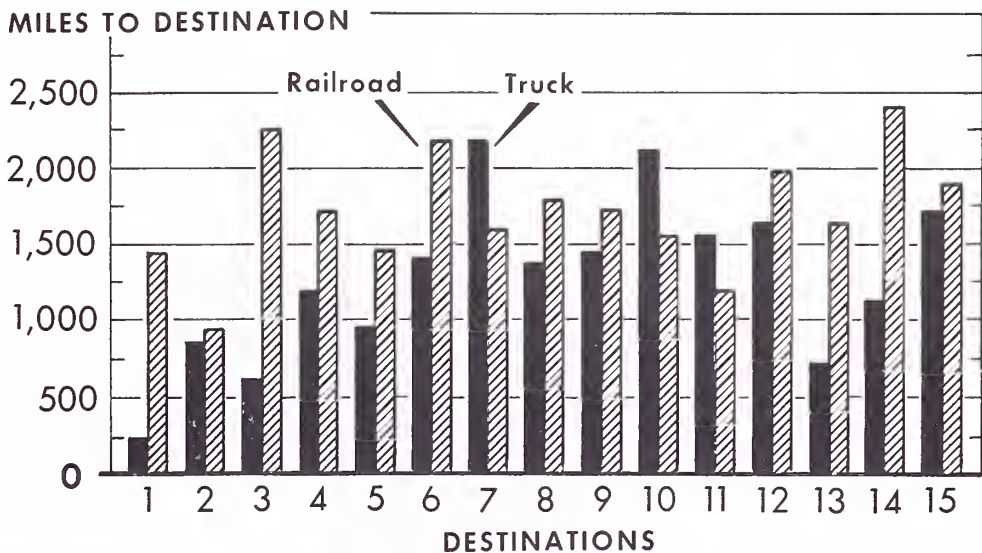
U. S. DEPARTMENT OF AGRICULTURE   NEG. ERS 3241-64 (10)   ECONOMIC RESEARCH SERVICE

Figure 5

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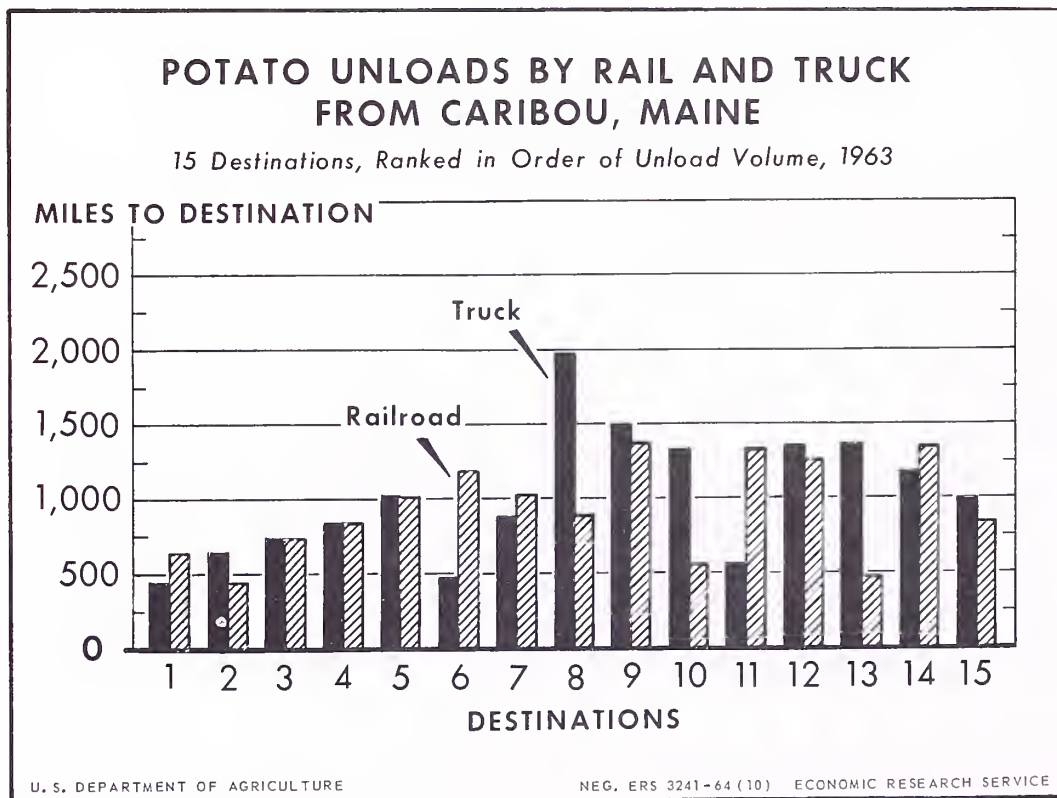
POTATO UNLOADS BY RAIL AND TRUCK FROM WAYLAND, NEW YORK

15 Destinations, Ranked in Order of Unload Volume, 1963
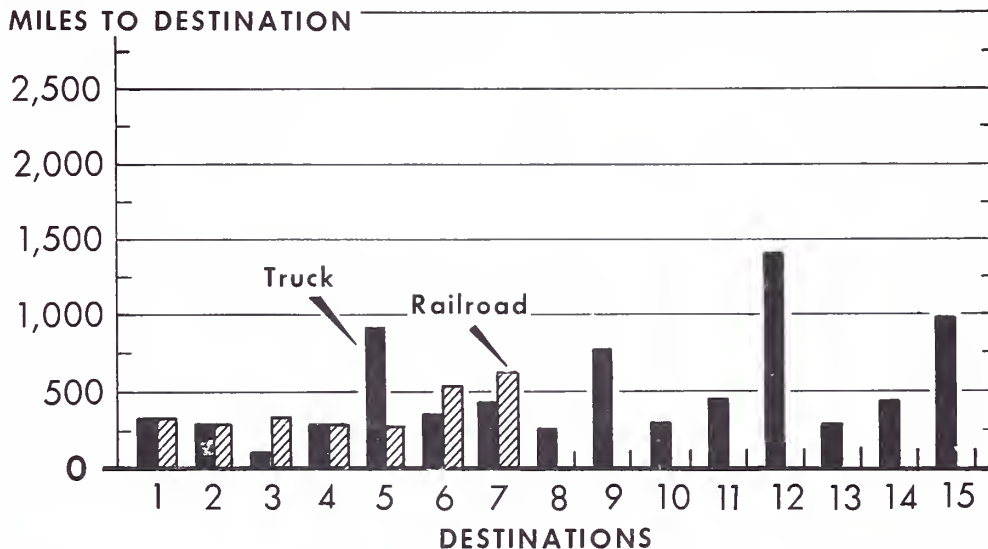
Figure 6

POTATO UNLOADS BY RAIL AND TRUCK FROM E. GRAND FORKS, NORTH DAKOTA-MINNESOTA

15 Destinations, Ranked in Order of Unload Volume, 1963
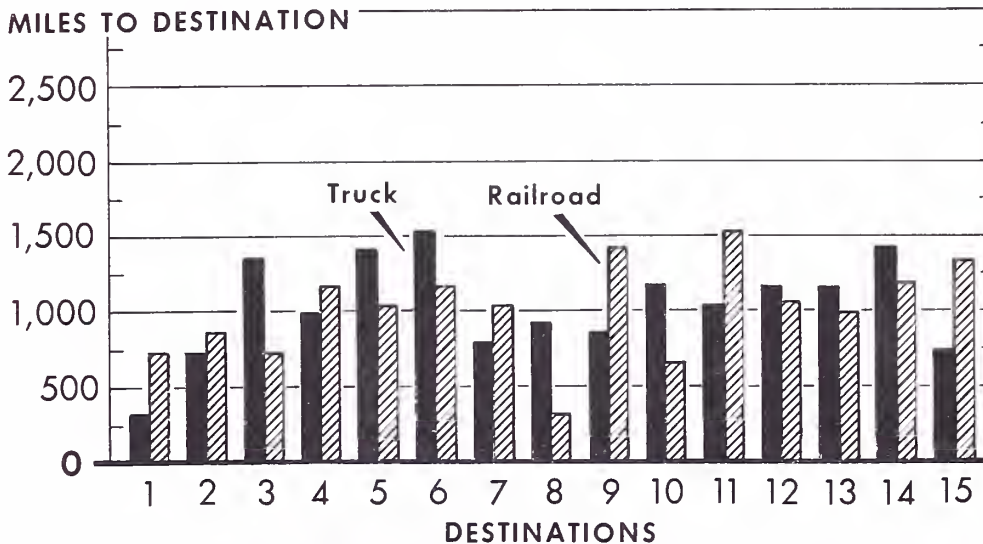
Figure 7

Statistics of potato shipments for 1959 through 1963 show that almost 85 percent of each year's total rail shipments from California usually occur in May, June, and July. No other month accounts for more than 3 percent of a year's total. Truck shipments from that State follow a similar though less pronounced seasonal pattern with about 55 percent of each year's total concentrated in May, June, July, and August. On the average truck shipments of any other month never equal 10 percent of any year's total truck shipments, and never fall below about 4 percent (table 10 and figs. 8 and 9).

California's seasonal pattern differs markedly from those in other States. In general, deliveries from Idaho, Maine, New York, and the North Dakota-Minnesota area are small or nonexistent during the summer period and are somewhat more evenly spread over the fall, winter, and spring months.

Peak shipments from Idaho by truck and rail occur in March, and the smallest shipments by both means of transportation are in July. Total shipments beginning in January and ending in April are larger than for any other similar period of time during the year.

Almost three-fourths of all rail shipments from Maine occur during January, February, March, and April. Few potatoes are moved from Maine from July through October.
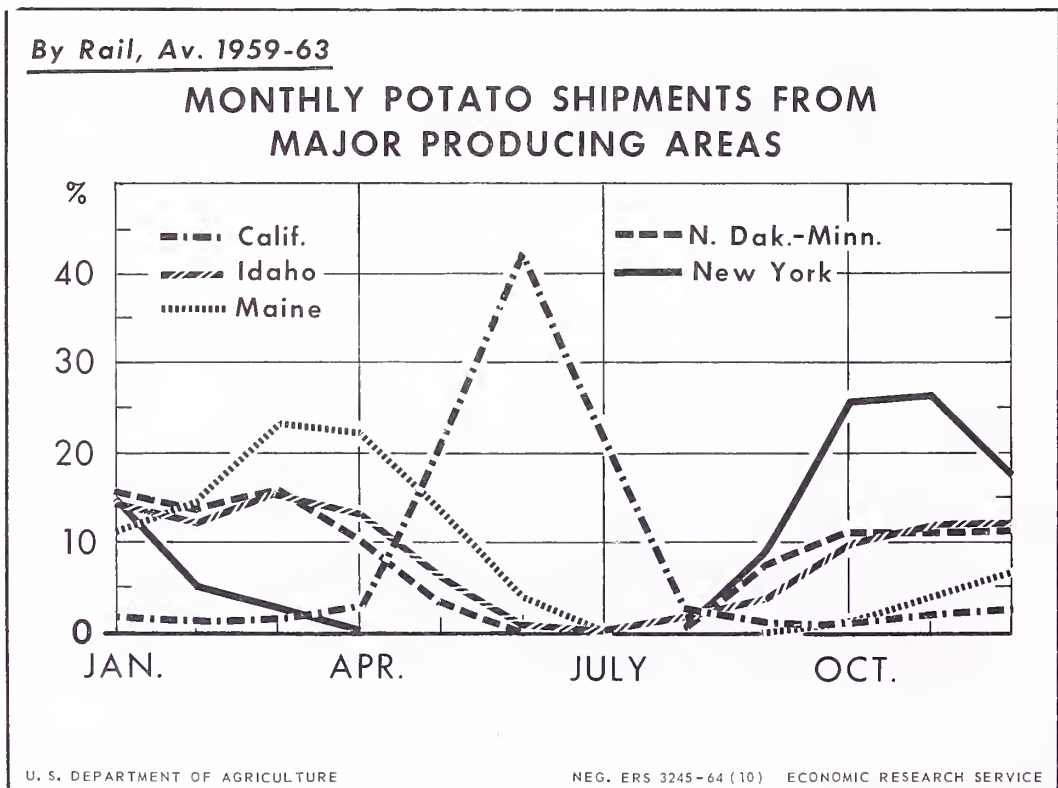
Figure 8

**MONTHLY POTATO SHIPMENTS FROM
MAJOR PRODUCING AREAS**
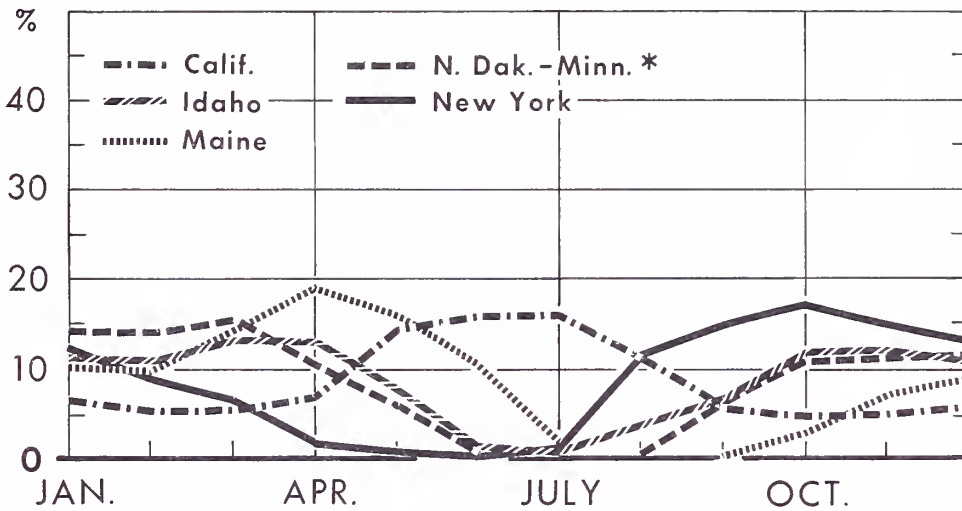
TRUCK SHIPMENTS - 1963, - WERE NOT REPORTED; USED 1958 - 62 AVERAGE.

U. S. DEPARTMENT OF AGRICULTURE   NEG. ERS 3244-64 (10)   ECONOMIC RESEARCH SERVICE

Figure 9

New York's rail shipping pattern is somewhat different with October and November far exceeding other months and accounting for over 50 percent of each year's total shipments from that State. Truck movements in each of the months of August through January vary from about 10 to 15 percent of the year's New York production. Rail and truck shipments virtually cease during the period beginning in April and ending in August.

Shipments from the North Dakota-Minnesota area are small for May, June, July, and August, but during the other months movements vary less than they do for Idaho, Maine, and New York. The smallest percentage of potatoes moved annually in any one month by either rail or truck, outside the four summer months, is 6.4 percent (September) and the maximum is 15.6 percent (March).

Data are based on averages for the 5-year period 1959 through 1963 except for the North Dakota-Minnesota area where the period 1958 through 1962 was used because 1963 statistics were not available. Except for New York State, where the share of total annual movements during September, October, and November has varied considerably from one year to another, the month-to-month patterns for each of the major areas have not changed notably.

California is unique in that the bulk of fresh potato shipments from that State are made in May, June, July, and August. The heavy shipments in those months reflect late spring and early summer crops and the fact that some of that production is not suitable for extended storage. Those potatoes must be moved to market promptly. In any event, these crops help to provide year

around traffic, and it makes potato traffic attractive to both the trucks and the railroads.

If States producing potatoes that can be stored for long periods could reduce month-to-month fluctuations in their shipments, their traffic would become more attractive to the carriers. Reduced seasonal variations in shipments might lead to lower rates, better service, or both.

FREIGHT RATES AND CHARGES

Rail Freight Rates

Rail shipping charges per hundredweight for moving fresh potatoes usually increase as distances increase. However, this is not always the case. Sometimes railroads attract transcontinental traffic by adjusting rates to meet those of other railroads hauling traffic shorter distances to market (table 11 and fig. 10 show regression equations and calculated rates).

Mile for mile, rates for moving Maine potatoes are higher than they are for moving North Dakota-Minnesota, California, and Idaho potatoes. Furthermore, Maine potato rates rise more rapidly as distances increase than rates for the other three areas, except for hauls over 1,000 miles. For those long hauls the progression rate is not as high as for shorter ones.

Railroads hauling Idaho potatoes recognize the need for lower rates for long hauls. Consequently, the charge rates that rise less rapidly for each

Figure 10

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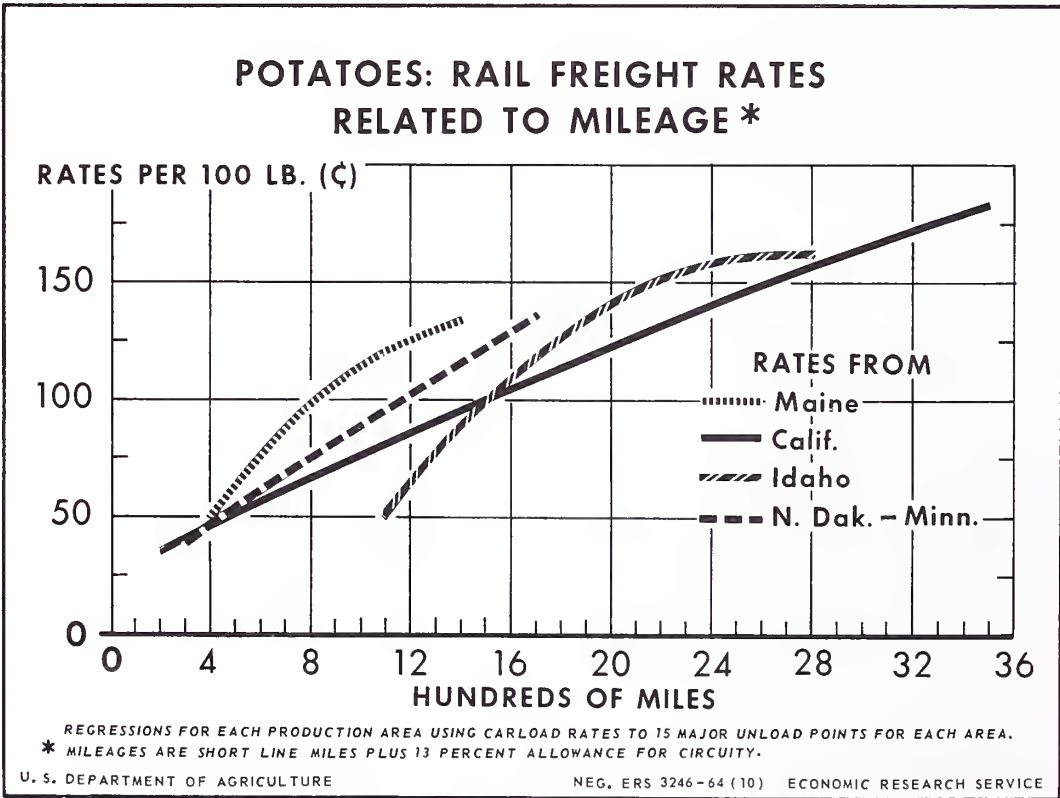
additional mile for the longer hauls than for the shorter ones. In contrast, rates on North Dakota-Minnesota and California potatoes tend to rise by a constant amount for each increment of distance for both short and long hauls. North Dakota-Minnesota rates rise faster as distances increase than do California rates.

Figure 10 shows the differences in level and progression of rail rates. It highlights the fact that except for very short hauls, Maine shippers generally pay high rates on potatoes and are at a competitive disadvantage. This means that North Dakota-Minnesota, Idaho, and California potatoes can move much longer distances for a given amount of money than Maine potatoes.

Rail rates applicable to New York potatoes originating in the Wayland area are even higher than those for other areas. They are not shown in figure 10 because almost all New York potatoes are moved by truck, principally to markets within 500 miles.

Three specific examples of the relation of actual current rail rates to destination are:

(1) Maine potatoes move 430 shortline rail miles[3]/ to Boston for 53½ cents per hundredweight (50,000 pound minimum) whereas Idaho potatoes move to Los Angeles, a distance of 997 miles, for 57½ cents per hundredweight (45,000 pound minimum per car).

(2) Idaho potatoes move 1,492 miles to St. Louis for $1.15 per hundredweight (40,000 pound minimum) whereas Maine potatoes that move to Louisville, Ky., a distance of 1,445 miles, must bear a rate of $1.33 per hundred-weight (50,000 pound minimum).

(3) California potatoes moving 2,154 miles to Chicago are charged $1.42 per hundredweight (40,000 pound minimum) whereas California potatoes moving to Minneapolis-St. Paul, a distance of 2,172 miles, may go for $1.10 per hundredweight (40,000 pound minimum per car).

The above rates do not include charges shippers may have paid for pro-tection against cold and heat which are generally higher for Maine potatoes than for Idaho potatoes.

It is difficult to compare rail freight rates for moving potatoes from one area to a particular market with those for potatoes moving from other origins to the same market because distances from two or more of the five production areas to any given important metropolitan center usually are different. One reasonably good comparison may be made of the rates from Maine and Idaho to Chicago. The distance from Maine to Chicago is 1,366 miles, and the distance from Idaho is 1,577 miles. The rail freight rate on Maine potatoes is $1.31 per hundredweight (50,000 pound minimum with a standard protective service charge of $32.41 per carload) while the rate from Idaho to Chicago is $1.27 per hundredweight (40,000 pound minimum with standard protective service charge of

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3/ Shortest possible route but not necessarily the actual route potatoes traveled.

13

$19.84 per carload). In 1963 the railroads moved 2,539 carlots of Idaho potatoes to Chicago. In the same year the railroads moved only 53 cars of Maine potatoes to Chicago and trucks moved 7.

Truck Freight Rates

Truck rates for hauling California, Idaho, Maine, and North Dakota-Minnesota potatoes to market are shown in table 11 and figure 11. Table 11 gives regression equations and calculated rates and figure 11 shows that the levels of these rates differ widely from one part of the country to another.

In general, rates for moving Maine potatoes direct from production areas or nearby storage to major markets as far away as 2,000 miles are higher than those for moving Idaho or North Dakota-Minnesota potatoes equal distances from production areas. Not many trucks go to Maine with loads and for that reason there is a limited number seeking payloads southbound. Transportation charges paid by shippers or receivers of California potatoes depend on distances and on markets involved.

Truckers loading Maine potatoes at Boston for hauls to major unload points tend to charge lower rates than do truckers hauling potatoes equal distances from any production area. Maine shippers take advantage of the lower truck rates from Boston by utilizing the rail service from Maine to Boston and then transferring potatoes to trucks for movements on to final unload points.[4]/

The most outstanding case where Maine potatoes move long distances mostly by truck is to Miami, Fla., a distance of 1,975 miles. In 1963 Miami was Maine's 12th largest market and much farther away than any other major market. Most potatoes delivered there arrived by truck. Data are not available to indicate what portion of all Maine potatoes moved all the way from Maine to Miami by truck--even though stored perhaps along the way--and what portion moved from Maine to Boston by rail and then were transferred to trucks for final destinations. Many shipments involved the use of both railroads and trucks. Inasmuch as the "usual" truck rate from Maine to Miami is about $1.50 per hundredweight there is considerable incentive for shippers to save on transportation by using a combination of rail and truck service. The combined rail and truck rate is about $1.25 per hundredweight. The lower combination rate includes the rail rate to Boston of 50 cents per hundredweight and the truck rate from Boston to Miami of 75 cents per hundredweight. This sum does not include any allowance for the cost of transferring the potatoes from one conveyance to another at some point between origin and destination and possible damage.

The relation between freight rates and distances for different sections of the country are shown by the lines of figures 10 and 11. These lines do not adequately highlight the wide dispersion in rates for moving potatoes from several different origins to one unload point. In the discussion of rail rates it was pointed out that over 2,500 carloads of Idaho potatoes reached Chicago

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4/ Transfer charges are reported to range from 6 cents to 10 cents per 100 pounds with 8 cents the "usual" charge. Although some damage may be done to the potatoes in the process of transferring them, the amount of damage is unknown.
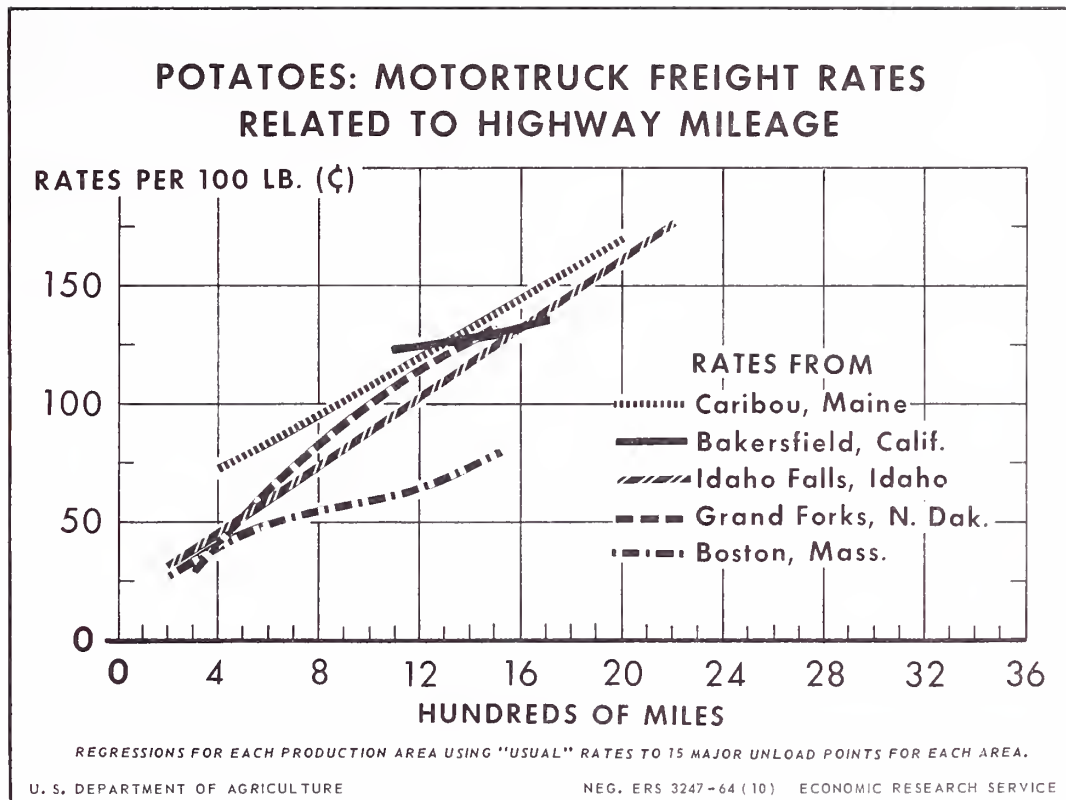
Figure 11

and that most of them arrived by rail. The applicable rail rate was $1.27 per hundredweight (40,000 pound minimum). The combination cost indicated by the figures of rail and truck service from Maine to Chicago amounts to $1.06 per hundredweight, not including the cost of transferring from rail cars to trucks at Boston. It would seem that the difference between the Idaho transportation cost and the Maine transportation cost would enable more Maine potatoes to move to Chicago than do move there. Perhaps the failure may be explained by the fact that trucks are not usually available to move potatoes from Boston to Chicago. They may have more remunerative traffic available to them. These rates for fresh potatoes as well as other unmanufactured farm products are not subject to regulation by the Interstate Commerce Commission. In many sections of the country motortruckers who haul predominantly manufactured goods that are subject to regulation by the ICC do engage quite regularly in hauling exempt commodities when other traffic is not available. In many instances the volume of "regulated" traffic tends to be much heavier in one direction than in another, and in those instances carriers of that traffic often haul "exempt" traffic in the direction where regulated traffic is scarce.

If transportation charges paid by shippers or receivers were the dominant factor in fresh potato marketing, it would seem that Maine potatoes would have a stronger competitive position in many markets than they do. The movement of potatoes from California and Idaho to New Orleans and from Maine to New Orleans cannot be explained in terms of transportation alone. Substantial quantities of potatoes moved from California and Idaho to that city in both 1958 and 1963. Very few moved there from Maine.

Assuming the use of the 50-cent rail rate from Maine to Boston and the truck rate from Boston indicated by the trend lines, it would seem that more Maine potatoes would have been sold in New Orleans than were. The combination rail-truck rate would be $1.30 per hundredweight, plus transfer costs, as contrasted with $1.55 per hundredweight for Idaho potatoes, and probably at least that much for California potatoes. Viewed in terms of transportation alone, the tentative hypothesis must be that Maine potatoes do not move to many distant markets as do potatoes from California and Idaho because trucks serving the Boston area do not want that traffic or do not go there in sufficient number to make the supply of them equal to the need for them. It is not attractive to them either as an outbound payload or as a backhaul. Another hypothesis is that truckers going to New Orleans from California and Idaho seek potatoes as a payload for the eastbound segment of their round trip operations.

Truck Rates Versus Rail Rates

For equal distances truck rates exceeded rail rates in California, Idaho, and the North Dakota-Minnesota area. California truck rates for hauls to the five unload points for which information was available were about 20 percent or more higher than rail rates. Although truck rates for moving North Dakota-Minnesota potatoes were higher for distances over 500 miles, the differentials were much smaller than they were for California and Idaho. For distances under 500 miles truck rates for moving North Dakota-Minnesota potatoes were lower than rail rates.

The principal exception to the pattern of higher truck rates than rail rates occurred in Maine. For hauls out of Maine rail rates exceeded truck rates for distances from about 800 to 1,400 miles. For less than 800 miles rail rates tended to be lower than truck.

For truck movements of potatoes originating at Boston the rates were much lower than rail rates and lower than for similar distances anywhere else in the four production areas. As pointed out earlier, these lower truck rates from Boston when utilized in connection with the rail rate from Maine to Boston would seem to give the Maine potatoes an opportunity to move to distant markets. However, Maine potatoes do not go very far west and only in a few instances do they move far south. One explanation is that potatoes must be moved part way by rail and part way by truck to keep transportation charges on a competitive basis mile for mile with other areas. This involves the physical transfer of the potatoes at some intermediate point and perhaps storage there as well. Furthermore, the differences indicated on table 11 and figure 12 between truck rates and rail rates are somewhat exaggerated since truck rates include protective services, if any are needed, whereas rail rates do not.

In addition, rail rates shown on table 11 and on figures 10, 11, and 12 are rates indicated by the regression equations and are not necessarily actual rates. Particular rates for movement from one point to another may depart from the rates indicated here and alter the competitive relationship of carriers and transportation users. Available statistics indicate, however, that truck rates generally are higher than rail rates for movements of equal distances. Presumably, trucks are preferred for many hauls because they can stop at several points to make up a full load or stop to drop off part of their contents. Findings of another Department study show that reduced time in-transit and

By Motortruck and Rail

FREIGHT RATES RELATED TO MILEAGE
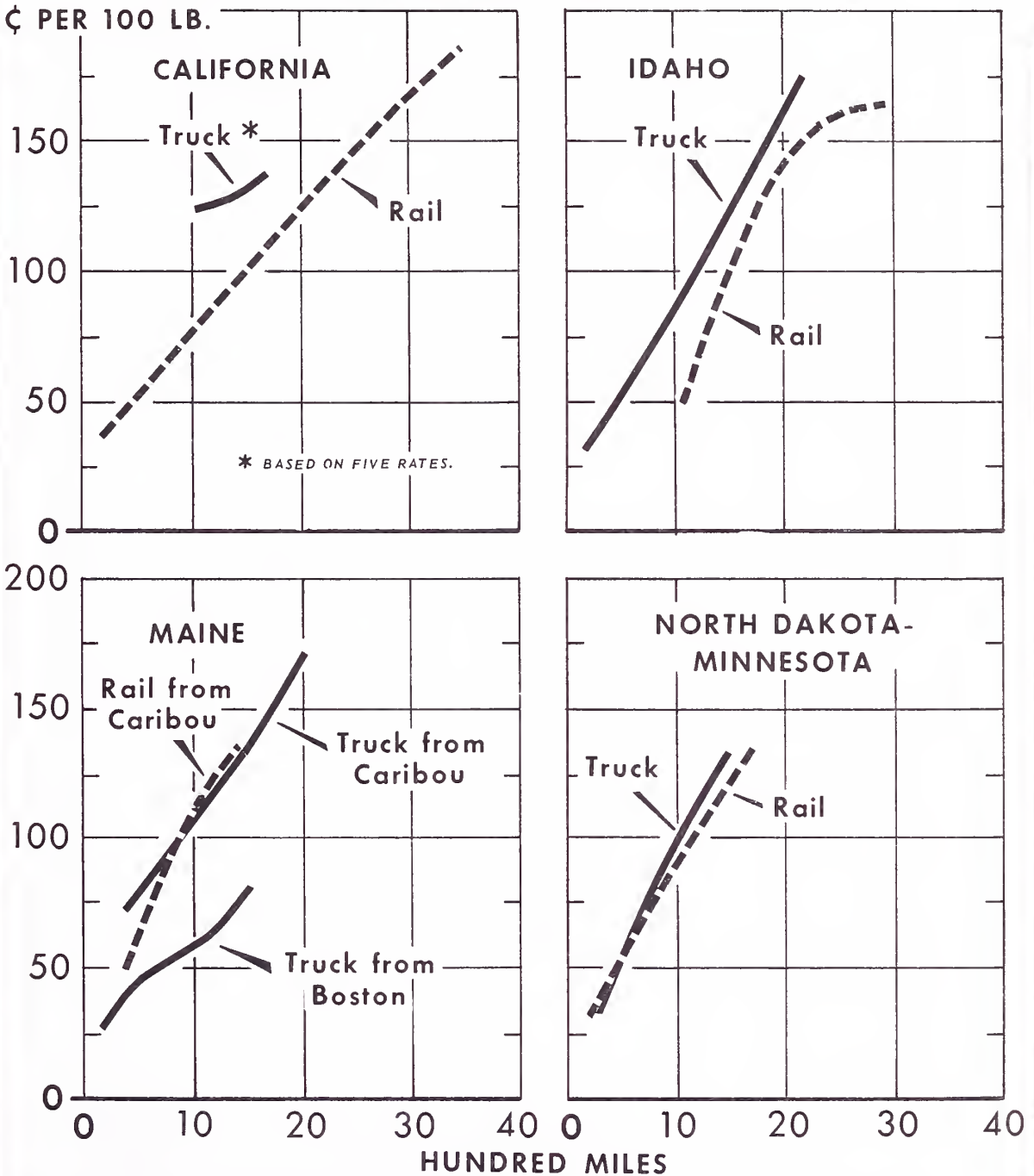
Figure 12

dependable delivery schedules are important factors in moving perishables.[5]
These factors may also be important for the movement of potatoes, particularly
those that have rather limited store shelf life.

CONCLUSIONS

Some of the findings in this preliminary analysis were unexpected and some
were not. One unexpected finding was that potato shippers tend to pay more for
truck service than they do for the nearest comparable rail service. This is
true even after adjustment for the fact that truck charges make the truckers
responsible for protection of potatoes against heat and cold whereas the rail
charges do not.

Another unexpected finding was that rail rates for moving potatoes from
the western production areas of California and Idaho to the eastern metropolitan
centers tend to be notably lower for given distances than rail rates for moving
eastern potatoes grown in Maine and the Red River Valley for the same distances
to western or southern markets. Another fact learned about truck rates was
that Maine potatoes move from Boston, after arrival there in part by rail, for
notably lower rates for distances up to 1,500 miles than California, Idaho, and
Red River Valley potatoes move comparable distances.

One expected finding was that any potato producing area near population
centers has a distinct transportation advantage over those located farther
away. However, the importance of this factor is somewhat obscured because the
unload statistics used in this survey include traffic unloaded at nearby points
that may be reloaded for shipment elsewhere. One outstanding example of this
is Boston. Many Maine potatoes move to that point by rail and are transferred
to truck for destinations beyond. The extent of and reasons for this need to
be studied for each area. This would seem to be an uneconomic practice.

Another expected finding was that markets near production areas are usually
served by truck while those farther away are served by rail. This tendency is
subject to many exceptions, particularly for intermediate distances. One
reason for the exceptions is the imbalance in the volume of traffic moved in
the opposite direction to potatoes. These unbalanced traffic flows result in
the need for backhauls by the carriers involved. While this backhaul factor is
probably a more influential force in the establishment of truck rates for
moving fresh potatoes, the same influence may be at work on some railroads.
This explains why carriers minimize rates to attract traffic that would not
otherwise move. The effect on freight rates of the presence or absence of
backhauls should be studied.

For example, potatoes move from Maine to Miami mostly by truck, a distance
of almost 2,000 miles. This can probably be attributed to the fact that motor-
trucks move north from Florida with fruits and vegetables for delivery in
Atlantic Coast metropolitan centers. It may also indicate faster or more con-
venient service provided by trucks. Unload statistics used in this survey do

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[5] Bennett, R. M. Interstate Hauling of California-Arizona Fresh Fruits
and Vegetables by Rail and Truck. Mktg. Res. Rpt. No. 673, U.S. Dept. Agr.,
Aug. 1964.

not tell the full story of this movement because potatoes are sometimes trans-ferred from one type of carrier to another between origin and destination.

It is likely that the relatively attractive rail freight rates for fresh potatoes moving from California and Idaho to eastern markets are established to attract additional traffic for cars that might otherwise move east empty after being used for a westbound load. The western railroads' efforts to expand potato traffic for eastern markets is indicated by the lower increment in rates for the longer distances. It appears that eastern railroads either are unable --perhaps because of their operating costs--or are unwilling to make comparable concessions to attract long-haul westbound payloads.

The availability of transportation facilities--particularly trucks--is still another factor in the type of transportation to be used. For example, trucks may not move fresh potatoes between two specified points because they do not want the type of load available. Perhaps packaging practices could be modified to make them easier to handle or easier for truckload deliveries. Also, potato producing areas may be away from the usual stream of traffic or trucks do not move during the potato shipping season in large numbers. One example is the inadequacy of truck service from the Maine potato area to important midwestern markets. Maine is too far beyond a large metropolitan center for truckers to travel to pick up a return payload. Furthermore, Maine potatoes move in the early spring months when the roads are more hazardous because of fog, ice, and snow. These are only a few of the possible explana-tions of the potato traffic flows. These and others need to be explored in more detail.

Perhaps the problems needing immediate attention are those concerning the level and progression of freight rates both in terms of distances involved and in terms of differentials between truck and rail charges. Why do transportation users pay more for truck service than for rail service? Could potato shipments be regularized to the point where more markets would be available to the pro-ducing centers, perhaps through more attractive freight rates, better service, or both?

There are several specific instances in which charges for moving potatoes from western producing areas and from eastern producing areas to a particular midwestern market are about equal but, despite this, the aggregate volume of deliveries from each of the origins differs widely. This indicates that trans-portation services and charges are not solely responsible for large sales volume.

Geographical differences in population growth indicate that California producers are likely to gain most from the Nation's growth pattern in the long-run. Idaho producers will also benefit, but to a lesser degree. Despite this expected rapid population growth, Maine and New York have, and will continue to have, an advantage over California and Idaho in terms of nearness to population centers.

In the long-run the different rates of population growth may tend to even out the flow of industrial traffic from west to east and east to west. This may mean that ultimately carriers may not be seeking traffic to avoid empty backhauls and freight rates will tend to be equal for equal hauls. Changes in

traffic patterns for movement of traffic from the south, such as Florida, to the north and west are less clear. This is another area in which more research needs to be done.

One way producers might be able to take the initiative in minimizing shipping costs would be through stabilizing month-by-month shipments from storage points to destinations. Increased regularity of shipments would tend to make fresh potato traffic more attractive to carriers and might induce them to reduce rates or improve services, or to do both. Also, the carriers' needs for an even flow of traffic to minimize service costs merit consideration.

This study only applies, of course, to transportation of fresh potatoes in recent years. The shift by consumers to the more convenient processed potato may change the flow patterns described here.

This report has not taken into account the impact on national potato production and consumption of the activities of producers located in other important producing sections of the country. Thirty-eight percent of the Nation's total potato production in 1963 was in areas other than the five dealt with in this preliminary study.

Table 1.--Potato production: Five important producing areas and total United States

Areas	1947	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963
Production of:							Million hundredweight										
California	22.8	28.0	25.9	26.3	21.8	24.3	27.6	23.3	29.2	25.7	31.3	29.5	27.7	28.8	34.6	28.2	29.6
Idaho	17.2	27.4	21.8	30.5	23.1	26.9	30.7	26.6	33.1	33.7	39.0	45.6	42.4	43.1	57.7	46.3	53.5
Maine	39.1	45.0	42.2	38.0	27.0	32.0	34.8	29.0	35.0	41.7	37.8	36.6	34.3	33.7	37.0	39.0	37.6
New York	20.2	23.9	18.6	20.7	16.8	18.5	18.6	19.4	19.2	19.9	19.0	21.5	18.0	20.3	21.2	20.9	20.0
North Dakota and Minn. (combined)	21.8	21.9	21.9	22.6	15.3	16.3	18.3	23.3	15.1	24.0	17.9	26.0	24.0	27.7	28.1	27.1	27.5
All other	112.3	123.8	110.6	121.0	91.8	93.1	101.7	97.9	96.1	100.8	97.5	107.7	99.4	104.1	64.4	105.2	103.5
Total U.S.	233.4	270.0	241.0	259.1	195.8	211.1	231.7	219.5	227.7	245.8	242.5	266.9	245.8	257.7	243.0	266.7	271.7
Distribution:							Percent of U.S. total										
California	9.8	10.4	10.8	10.1	11.1	11.5	11.9	10.6	12.8	10.4	12.9	11.1	11.3	11.2	14.2	10.6	10.9
Idaho	7.4	10.1	9.0	11.8	11.8	12.7	13.3	12.1	14.6	13.7	16.1	17.1	17.2	16.7	23.8	17.4	19.7
Maine	16.8	16.7	17.5	14.7	13.8	15.2	15.0	13.2	15.4	17.0	15.6	13.7	14.0	13.1	15.2	14.6	13.8
New York	8.7	8.9	7.7	8.0	8.6	8.8	8.0	8.9	8.4	8.1	7.8	8.1	7.3	7.9	8.7	7.8	7.4
North Dakota and Minn. (combined)	9.3	8.0	9.1	8.7	7.8	7.7	7.9	10.6	6.6	9.8	7.4	9.7	9.8	10.7	11.6	10.2	10.1
All other	48.0	45.9	45.9	46.7	46.9	44.1	43.9	44.6	42.2	41.0	40.2	40.3	40.4	40.4	26.5	39.4	38.1
Total U.S.	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Indexes:							Percent of 1947										
California	100	123	114	115	96	107	121	102	128	113	137	129	122	126	152	124	130
Idaho	100	159	127	177	134	156	178	155	192	196	227	265	247	251	336	269	311
Maine	100	115	108	97	69	82	89	74	90	107	97	94	88	86	95	100	96
New York	100	118	92	102	83	92	92	96	95	99	94	106	89	100	105	103	99
North Dakota and Minn. (combined)	100	100	100	104	70	75	84	107	69	110	82	119	110	127	129	124	126
All other	100	110	98	108	82	83	91	87	86	90	87	96	89	93	57	94	92
Total U.S.	100	116	103	111	84	90	99	94	98	105	104	114	105	110	104	114	116
Rank:																	
California	2	2	2	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Idaho	5	3	4	2	2	2	2	2	2	2	1	1	1	1	1	1	1
Maine	1	1	1	1	1	1	1	1	1	1	2	2	2	2	2	2	2
New York	4	4	5	5	4	4	4	5	4	5	4	5	5	5	5	5	5
North Dakota and Minn. (combined)	3	5	3	4	5	5	5	4	5	4	5	4	4	4	4	4	4

Table 2.--Potato production: Percentage of U.S. population within 500 and 800 miles of major production areas 1/

Production areas	1963 production (percentage of U.S. total)	1960 U.S. population, percent--			Estimated 1965 U.S. population, percent--			Estimated 1970 U.S. population, percent--		
		Within 500 miles	Between 500 & 800 miles	Within 800 miles	Within 500 miles	Between 500 & 800 miles	Within 800 miles	Within 500 miles	Between 500 & 800 miles	Within 800 miles
California	10.9	10.2	1.9	12.1	11.2	1.9	13.1	12.1	1.9	14.0
Idaho	19.7	2.6	14.2	16.7	2.6	15.0	17.6	2.7	15.8	18.4
Maine	13.8	15.2	14.3	29.5	14.8	14.2	29.1	14.5	14.3	28.8
New York	7.4	40.3	20.2	60.5	39.7	19.8	59.6	39.2	19.4	58.6
North Dakota and Minn. (combined)	10.1	7.2	17.7	24.9	6.9	17.5	24.5	6.7	17.4	24.1
All other	38.1									
Total U.S.	100.0									

1/ The entire population of a State was included if most of the State's area fell within the radius.

22

Table 3.--Potatoes: Total truck and rail unloads at certain cities (markets) originating from the five major producing areas of California, Idaho, Maine, New York, and North Dakota-Minnesota area for 1958 and 1963 1/

Markets	California unloads		Idaho unloads		Maine unloads		New York unloads		North Dakota-Minnesota unloads		Total	
	1958	1963	1958	1963	1958	1963	1958	1963	1958	1963	1958	1963
Albany, New York	143	155	72	66	520	347	358	248	---	2	1,093	818
Atlanta, Georgia	114	202	550	447	398	383	637	1,082	58	268	1,757	2,382
Baltimore, Maryland	131	121	237	173	1,676	1,729	875	1,419	15	37	2,934	3,479
Birmingham, Alabama	96	162	541	330	88	23	42	67	240	452	1,007	1,034
Boston, Massachusetts ...	679	721	346	422	6,681	8,911	1,108	940	---	---	8,814	10,994
Buffalo, New York	329	201	138	116	286	102	692	1,381	5	27	1,450	1,827
Chicago, Illinois	2,032	2,201	3,592	2,606	81	60	11	29	3,023	3,863	8,739	8,759
Cincinnati, Ohio	173	146	591	484	417	166	251	59	615	643	2,047	1,498
Cleveland, Ohio	514	424	706	522	1,134	1,153	488	395	101	154	2,943	2,648
Columbia, South Carolina	51	62	150	65	134	157	600	532	25	15	960	831
Dallas, Texas	493	261	1,343	450	2	2	---	---	276	590	2,114	1,303
Denver, Colorado	438	238	542	246	---	---	---	---	2	28	982	512
Detroit, Michigan	841	992	1,390	1,089	846	711	19	391	102	351	3,198	3,534
Ft. Worth, Texas	280	180	361	227	1	---	---	---	106	147	748	554
Houston, Texas	1,663	1,395	568	474	---	---	1	---	49	290	2,281	2,159
Indianapolis, Indiana ...	240	302	783	725	475	409	42	1	282	153	1,822	1,590
Kansas City, Missouri ...	295	300	793	489	3	---	---	---	762	1,706	1,853	2,495
Los Angeles, California .	11,394	12,240	2,726	2,424	1	---	---	---	---	16	14,121	14,680
Louisville, Kentucky	143	127	397	389	457	445	15	57	115	364	1,127	1,382
Memphis, Tennessee	57	56	183	161	8	1	16	29	461	828	725	1,075
Miami, Florida	101	42	299	221	218	397	239	335	2	17	859	1,012
Milwaukee, Wisconsin	406	367	791	497	59	10	---	---	98	232	1,354	1,106
Minneapolis, Minnesota ..	680	699	336	436	---	---	---	---	2,058	2,753	3,074	3,888
Nashville, Tennessee	48	100	632	491	66	17	15	1	79	50	840	659
New Orleans, Louisiana ..	170	196	637	394	41	13	32	6	59	353	939	962
New York, New York	1,371	1,444	2,557	2,243	9,554	9,791	6,283	6,296	1	37	19,766	19,811
Philadelphia, Pennsylvania	472	584	1,047	868	2,776	2,589	1,000	1,714	25	105	5,320	5,860
Pittsburgh, Pennsylvania	481	348	543	371	1,213	893	718	765	126	118	3,081	2,495
Portland, Oregon	396	476	72	44	---	---	---	---	3	25	471	545
Providence, Rhode Island	81	74	46	55	837	705	128	81	---	---	1,092	915
St. Louis, Missouri	352	311	1,084	963	67	2	---	1	1,206	1,984	2,709	3,261
Salt Lake City, Utah	249	404	619	734	---	---	---	---	1	7	869	1,145
San Antonio, Texas	590	420	623	532	---	1	---	---	75	123	1,289	1,076
San Francisco, California	2,971	3,087	673	528	1	---	---	---	8	28	3,645	3,643
Seattle, Washington	318	773	151	216	915	761	555	1,182	1	63	1,762	1,052
Washington, D. C.	56	91	235	214	---	---	555	1,182	---	17	1,762	2,265
Wichita, Kansas	104	121	421	201	---	761	---	---	70	269	595	591
Total	28,952	30,023	26,775	20,913	28,956	29,778	14,125	17,011	10,050	16,115	108,858	113,840

1/ Basic statistics have been expanded, where necessary, and adjusted to reflect total unloads in terms of 43,000-pound rail carlots and truck equivalents.

Source: Fresh Fruit and Vegetable Carlot Unloads (AMS-25), U.S. Department of Agriculture.

Table 4.--Potatoes: Ratio of truck to rail unloads at certain cities (markets) originating from the five major producing areas of California, Idaho, Maine, New York, and North Dakota-Minnesota areas for 1958 and 1963

Ratio of truck to rail unloads

Destination	California		Idaho		Maine		New York		N. Dakota-Minnesota		Total	
	1958	1963	1958	1963	1958	1963	1958	1963	1958	1963	1958	1963
Albany, New York	2/98	22/78	0/100	11/89	30/70	51/49	100/0	100/0	---	0/100	47/53	51/43
Atlanta, Georgia	10/90	8/92	1/99	2/98	88/12	94/6	99/1	100/0	55/45	30/70	59/41	65/35
Baltimore, Maryland	18/82	48/52	17/83	36/64	18/82	46/54	100/0	92/8	0/100	0/100	42/58	64/36
Birmingham, Alabama	16/84	8/92	2/98	8/92	99/1	100/0	100/0	100/0	75/25	75/25	34/66	45/55
Boston, Massachusetts	0/100	1/100	0/100	0/100	65/35	61/39	100/0	100/0	---	---	62/38	58/42
Buffalo, New York	0/100	0/100	0/100	0/100	40/60	65/35	100/0	100/0	0/100	0/100	56/44	79/21
Chicago, Illinois	1/100	0/100	1/100	3/97	1/99	12/88	100/0	100/0	7/93	2/98	3/97	2/98
Cincinnati, Ohio	1/99	1/99	0/100	1/100	19/81	37/63	100/0	64/36	2/98	3/97	17/83	81/92
Cleveland, Ohio	1/99	1/99	1/100	6/100	40/60	64/36	100/0	100/0	3/97	7/93	32/68	43/57
Columbia, S. Carolina	6/94	0/100	11/89	25/75	98/2	100/0	100/0	100/0	56/44	73/28	78/22	85/15
Dallas, Texas	32/68	41/59	86/14	71/29	0/100	0/100	---	---	18/82	23/77	17/83	27/73
Denver, Colorado	81/19	50/50	1/99	2/98	---	16/84	95/5	100/0	0/100	0/100	83/17	57/43
Detroit, Michigan	1/99	1/99	25/75	35/65	0/100	---	100/0	---	18/82	62/38	2/98	21/79
Ft. Worth, Texas	42/58	56/44	15/85	9/91	0/100	---	100/0	---	23/7	85/15	41/59	55/45
Houston, Texas	59/41	34/66	1/99	4/96	---	65/35	100/0	---	17/86	74/26	47/53	34/66
Indianapolis, Indiana	0/100	9/91	1/100	1/99	38/62	---	---	---	95/5	92/8	21/73	29/71
Kansas City, Missouri	3/97	26/74	28/72	5/95	0/100	---	---	---	43/57	56/44	18/82	42/58
Los Angeles, California	96/4	93/7	2/98	1/99	0/100	---	100/0	98/2	---	81/19	82/18	78/22
Louisville, Kentucky	1/99	0/100	0/100	1/99	35/65	27/73	100/0	100/0	34/66	37/63	20/80	23/77
Memphis, Tennessee	19/81	12/88	1/99	0/100	12/88	0/100	100/0	100/0	29/71	13/87	21/78	13/87
Miami, Florida	2/98	2/98	1/99	0/100	99/1	96/4	100/0	100/0	100/0	47/53	54/56	71/29
Milwaukee, Wisconsin	0/100	2/98	1/99	1/99	3/97	0/100	---	---	5/95	22/78	1/99	6/94
Minneapolis, Minnesota	5/95	12/88	33/67	30/70	---	---	100/0	92/8	86/14	92/8	62/38	71/29
Nashville, Tennessee	2/98	1/99	0/100	0/100	54/46	53/47	100/0	100/0	61/39	36/64	12/88	4/96
New Orleans, Louisiana	3/97	11/89	1/100	0/100	88/12	18/82	96/4	98/2	51/49	56/44	11/89	24/76
New York, New York	1/99	1/100	1/99	1/100	7/93	17/83	100/0	95/5	0/100	3/97	34/66	40/60
Philadelphia, Pennsylvania	7/93	3/97	7/93	11/89	39/61	47/53	100/0	95/5	0/100	1/99	41/59	51/49
Pittsburgh, Pennsylvania	0/100	0/100	0/100	0/100	7/93	12/88	99/1	100/0	1/99	3/97	26/74	34/66
Portland, Oregon	30/70	17/83	18/82	73/27	---	---	---	100/0	0/100	16/84	28/72	21/79
Providence, Rhode Island	0/100	1/99	0/100	0/100	63/37	88/12	---	100/0	14/86	7/93	60/40	76/24
St. Louis, Missouri	5/95	1/99	1/100	1/100	10/90	0/100	---	---	14/86	7/93	7/93	4/96
Salt Lake City, Utah	88/12	63/37	97/3	95/5	---	0/100	---	---	0/100	100/0	95/5	84/16
San Antonio, Texas	70/30	54/46	14/86	9/91	0/100	0/100	---	---	25/75	54/46	49/60	32/68
San Francisco, California	79/21	81/19	65/35	79/21	---	---	---	---	0/100	100/0	76/24	81/19
Seattle, Washington	0/100	23/77	0/100	8/92	---	---	---	---	0/100	---	0/100	19/81
Washington, D. C.	0/100	3/97	1/99	1/99	0/100	55/45	100/0	91/9	0/100	3/97	55/45	67/33
Wichita, Kansas	29/71	33/67	13/87	14/86	44/56	55/45	---	---	57/44	66/34	21/79	42/58

1/ Less than .5 percent.

NOTE: Numerator of the ratio indicates truck portion of total unloads; denominator indicates rail portion.

Table 5.--California potatoes: Truck and rail unloads at major cities (markets) and highway mileage to these cities, 1958 and 1963

Cities (markets)	Highway mileage from Bakersfield, California	Total truck and rail unloads				Total truck unloads				Total rail unloads			
		Number 1958	Number 1963	Rank (top fifteen) 1958	Rank (top fifteen) 1963	Number 1958	Number 1963	Rank (top fifteen) 1958	Rank (top fifteen) 1963	Number 1958	Number 1963	Rank (top fifteen) 1958	Rank (top fifteen) 1963
Albany, New York	2,867	143	155	--	--	3	34	--	15	140	121	--	--
Atlanta, Georgia	2,230	114	202	--	--	12	16	15	--	102	186	--	--
Baltimore, Maryland	2,670	131	121	--	--	24	58	12	13	107	63	--	--
Birmingham, Alabama	2,100	96	162	--	--	15	13	14	--	81	149	--	--
Boston, Massachusetts	3,028	679	721	8	8	--	3	--	--	679	718	1/4	6
Buffalo, New York	2,590	329	201	--	--	--	--	--	--	329	201	13	--
Chicago, Illinois	2,123	2,032	2,201	3	3	3	--	--	--	2,029	2,201	1	1
Cincinnati, Ohio	2,212	117	146	--	--	1	1	--	--	116	145	--	--
Cleveland, Ohio	2,401	514	424	10	12	3	2	--	--	511	422	1/7	10
Columbia, South Carolina	2,445	51	62	--	--	3	--	--	--	48	62	--	--
Dallas, Texas	1,473	493	261	11	--	160	107	7	8	333	154	12	--
Denver, Colorado	1,129	438	238	14	--	354	118	5	7	84	120	--	--
Detroit, Michigan	2,369	841	992	6	6	8	7	--	--	833	985	3	3
Ft. Worth, Texas	1,441	280	180	--	--	117	101	9	9	163	79	--	--
Houston, Texas	1,661	1,663	1,395	4	5	984	475	3	3	679	920	1/4	4
Indianapolis, Indiana	2,106	240	302	--	--	--	27	--	--	240	275	--	15
Kansas City, Missouri	1,624	295	300	--	--	9	77	--	12	286	223	15	15
Los Angeles, California	113	11,394	12,240	1	1	10,883	11,371	1	1	511	869	1/7	5
Louisville, Kentucky	2,138	143	127	--	--	11	--	--	--	132	127	--	--
Memphis, Tennessee	1,864	57	56	--	--	11	7	--	--	46	49	--	--
Miami, Florida	2,782	101	42	--	--	2	1	--	--	99	41	--	--
Milwaukee, Wisconsin	2,152	406	367	15	15	--	6	--	--	406	361	10	11
Minneapolis, Minnesota	1,941	680	699	7	9	34	85	1/10	10	646	614	5	7
Nashville, Tennessee	2,086	48	100	--	--	1	1	--	--	47	99	--	--
New Orleans, Louisiana	1,971	170	196	--	--	5	22	--	--	165	174	--	--
New York, New York	2,824	1,371	1,444	5	4	8	1	--	--	1,363	1,443	2	2
Philadelphia, Pennsylvania	2,742	472	584	13	10	34	19	1/10	11	438	565	9	9
Pittsburgh, Pennsylvania	2,460	481	348	12	--	--	--	--	--	481	348	8	12
Portland, Oregon	863	396	476	--	11	120	81	8	11	276	395	--	--
Providence, Rhode Island	2,989	81	74	--	--	--	1	--	--	81	73	--	--
St. Louis, Missouri	1,874	352	311	--	--	18	3	13	--	334	308	11	13
Salt Lake City, Utah	729	249	404	--	14	220	255	6	4	29	149	--	--
San Antonio, Texas	1,475	590	420	9	13	413	227	4	5	177	193	--	--
San Francisco, California	291	2,971	3,087	2	2	2,348	2,491	2	2	623	596	6	1/8
Seattle, Washington	1,038	318	773	--	7	--	177	--	6	318	596	14	1/8
Washington, D. C.	2,670	56	91	--	--	--	3	--	--	56	88	--	--
Wichita, Kansas	1,430	104	121	--	--	30	40	11	14	74	81	--	--
Totals		28,952	30,023			15,824	15,830			13,128	14,193		

1/ Indicates two cities had the same number of unloads.

Source: Fresh Fruit and Vegetable Carlot Unloads (AMS-25), U.S. Department of Agriculture.

NOTE: Basic statistics have been expanded, where necessary, and adjusted to reflect total unloads in terms of 43,000-pound rail carlots and truckload equivalents.

Table 6.--Idaho potatoes: Truck and rail unloads at major cities (markets) and highway mileage to these cities, 1958 and 1963

Cities (markets)	Highway mileage from Idaho Falls, Idaho	Total truck and rail unloads — Number 1958	Number 1963	Rank (top fifteen) 1958	Rank 1963	Total truck unloads — Number 1958	Number 1963	Rank (top fifteen) 1958	Rank 1963	Total rail unloads — Number 1958	Number 1963	Rank (top fifteen) 1958	Rank 1963
Albany, New York	1,798	72	66	--	--	--	7	--	--	72	59	--	--
Atlanta, Georgia	1,988	550	447	--	--	7	10	--	--	543	437	1/15	14
Baltimore, Maryland	2,106	237	173	--	--	41	62	12	10	196	111	--	--
Birmingham, Alabama	1,886	541	330	--	--	13	28	1/15	1/15	528	302	--	--
Boston, Massachusetts	2,409	346	422	--	--	--	--	--	--	346	422	--	--
Buffalo, New York	1,969	138	116	--	--	--	--	--	--	138	116	--	--
Chicago, Illinois	1,443	3,592	2,606	1	1	9	67	--	9	3,583	2,539	1	1
Cincinnati, Ohio	1,697	706	484	11	15	3	2	--	--	703	482	11	1/12
Cleveland, Ohio	1,780	591	522	--	11	--	--	--	--	591	522	14	8
Columbia, South Carolina	2,179	150	65	--	--	3	4	--	--	147	61	--	--
Dallas, Texas	1,396	1,343	450	5	--	146	111	5	6	1,197	339	5	--
Denver, Colorado	612	542	246	--	--	464	174	3	3	78	72	--	--
Detroit, Michigan	1,707	1,390	1,089	4	4	14	20	14	--	1,376	1,069	4	4
Ft. Worth, Texas	1,373	361	227	--	--	91	79	7	8	270	148	--	--
Houston, Texas	1,589	568	474	--	--	83	41	9	12	485	433	--	15
Indianapolis, Indiana	1,160	783	725	10	8	8	32	--	1/13	775	693	10	7
Kansas City, Missouri	949	793	489	8	14	3	7	--	--	790	482	8	1/12
Los Angeles, California	849	2,726	2,424	2	2	761	113	1	5	1,965	2,311	3	2
Louisville, Kentucky	1,694	397	389	--	--	6	2	--	--	391	387	--	--
Memphis, Tennessee	1,639	183	161	--	--	--	--	--	--	183	161	--	--
Miami, Florida	2,650	299	221	--	--	3	--	--	--	296	221	--	--
Milwaukee, Wisconsin	1,452	791	497	9	12	10	6	--	--	781	491	9	1/9
Minneapolis, Minnesota	1,174	336	436	--	--	110	132	6	4	226	304	--	--
Nashville, Tennessee	1,732	632	491	14	13	2	--	--	--	630	491	12	1/9
New Orleans, Louisiana	1,894	637	394	13	--	13	--	1/15	--	624	394	13	--
New York, New York	2,260	2,557	2,243	3	3	16	1	13	--	2,541	2,242	2	3
Philadelphia, Pennsylvania	2,178	1,047	868	7	6	71	94	10	7	976	774	7	6
Pittsburgh, Pennsylvania	1,887	543	371	--	--	--	--	--	--	543	371	1/15	--
Portland, Oregon	705	72	44	--	--	--	32	--	1/13	72	12	--	--
Providence, Rhode Island	2,406	46	55	--	--	--	--	--	--	46	55	--	--
St. Louis, Missouri	1,430	1,084	963	6	5	3	1	--	--	1,081	962	6	5
Salt Lake City, Utah	221	619	734	--	7	603	696	2	1	16	38	--	--
San Antonio, Texas	1,535	623	532	15	9	85	46	8	11	538	486	--	11
San Francisco, California	847	673	528	12	10	435	418	4	2	238	110	--	--
Seattle, Washington	774	151	216	--	--	--	18	--	--	151	198	--	--
Washington, D. C.	2,111	235	214	--	--	3	3	--	--	232	211	--	--
Wichita, Kansas	1,118	421	201	--	--	54	28	11	1/15	367	173	--	--
Totals		26,775	20,913			3,060	2,234			23,715	18,679		

1/ Indicates two cities had the same number of unloads.

Source: Fresh Fruit and Vegetable Carlot Unloads (AMS-25), U.S. Department of Agriculture.

NOTE: Basic statistics have been expanded, where necessary, and adjusted to reflect total unloads in terms of 43,000-pound rail carlots and truckload equivalents.

Table 7.--Maine potatoes: Truck and rail unloads at major cities (markets) and highway mileage to these cities, 1958 and 1963

Cities (markets)	Highway mileage from Caribou, Maine	Total truck and rail unloads				Total truck unloads				Total rail unloads			
		Number		Rank (top fifteen)		Number		Rank (top fifteen)		Number		Rank (top fifteen)	
		1958	1963	1958	1963	1958	1963	1958	1963	1958	1963	1958	1963
Albany, New York	562	520	347	10	14	157	176	12	11	363	171	9	10
Atlanta, Georgia	1,500	398	383	14	13	349	361	7	9	49	22	--	--
Baltimore, Maryland	831	1,676	1,729	4	4	305	804	8	4	1,371	924	4	4
Birmingham, Alabama	1,618	88	23	--	--	87	23	--	--	1	--	--	--
Boston, Massachusetts	430	6,681	8,911	2	2	4,349	5,432	1	1	2,332	3,479	2	2
Buffalo, New York	843	286	102	15	--	114	66	14	--	172	36	14	15
Chicago, Illinois	1,363	81	60	--	--	1	7	--	--	80	53	15	14
Cincinnati, Ohio	1,266	417	166	13	15	79	62	--	--	338	104	10	12
Cleveland, Ohio	1,025	1,134	1,153	6	5	452	741	5	5	682	412	7	7
Columbia, South Carolina	1,339	134	157	--	--	132	157	13	12	2	--	--	--
Dallas, Texas	2,202	2	2	--	--	--	--	--	--	2	2	--	--
Denver, Colorado	2,365	--	--	--	--	--	--	--	--	--	--	--	--
Detroit, Michigan	1,191	846	711	8	8	--	117	--	14	846	594	6	6
Ft. Worth, Texas	2,225	1	--	--	--	--	--	--	--	1	--	--	--
Houston, Texas	2,280	--	--	--	--	--	--	--	--	--	--	--	--
Indianapolis, Indiana	1,320	475	409	11	11	180	266	10	10	295	143	13	11
Kansas City, Missouri	1,604	3	--	--	--	--	--	--	--	3	--	--	--
Los Angeles, California	3,425	1	--	--	--	--	--	--	--	1	--	--	--
Louisville, Kentucky	1,376	457	445	12	10	159	119	11	13	298	326	12	9
Memphis, Tennessee	1,745	8	1	--	--	1	--	--	--	7	1	--	--
Miami, Florida	1,975	218	397	--	12	216	379	9	8	2	18	--	--
Milwaukee, Wisconsin	1,452	59	10	--	--	2	--	--	--	57	10	--	--
Minneapolis, Minnesota	1,777	--	--	--	--	--	--	--	--	--	--	--	--
Nashville, Tennessee	1,555	66	17	--	--	36	9	--	--	30	8	--	--
New Orleans, Louisiana	1,973	41	13	--	--	36	2	--	--	5	11	--	--
New York, New York	649	9,554	9,791	1	1	679	1,694	3	2	8,875	8,097	1	1
Philadelphia, Pennsylvania	735	2,776	2,589	3	3	1,079	1,217	2	3	1,697	1,372	3	3
Pittsburgh, Pennsylvania	1,004	1,213	893	5	6	90	108	15	15	1,123	785	5	5
Portland, Oregon	3,500	--	--	--	--	--	--	--	--	--	--	--	--
Providence, Rhode Island	475	837	705	9	9	527	617	4	6	310	88	11	13
St. Louis, Missouri	1,654	67	2	--	--	7	--	--	--	60	2	--	--
Salt Lake City, Utah	2,786	--	--	--	--	--	--	--	--	--	--	--	--
San Antonio, Texas	2,451	1	1	--	--	--	--	--	--	1	1	--	--
San Francisco, California	3,536	--	--	--	--	--	--	--	--	--	--	--	--
Seattle, Washington	3,415	1	--	--	--	--	--	--	--	1	--	--	--
Washington, D. C.	870	915	761	7	7	402	418	6	7	513	343	8	8
Wichita, Kansas	2,000	--	--	--	--	--	--	--	--	--	--	--	--
Totals		28,956	29,778			9,439	12,775			19,517	17,003		

Source: Fresh Fruit and Vegetable Carlot Unloads (AMS-25), U.S. Department of Agriculture.

NOTE: Basic statistics have been expanded, where necessary, and adjusted to reflect total unloads in terms of 43,000-pound rail carlots and truckload equivalents.

27

Table 8.--New York potatoes: Truck and rail unloads at major cities (markets) and highway mileage to these cities, 1958 and 1963

Cities (markets)	Highway mileage from Wayland, New York	Total truck and rail unloads				Total truck unloads				Total rail unloads			
		Number		Rank (top fifteen)		Number		Rank (top fifteen)		Number		Rank (top fifteen)	
		1958	1963	1958	1963	1958	1963	1958	1963	1958	1963	1958	1963
Albany, New York	265	358	248	11	13	358	248	11	13	--	--	--	--
Atlanta, Georgia	907	637	1,082	7	6	631	1,082	7	5	6	--	2	--
Baltimore, Maryland	289	875	1,419	4	3	875	1,306	4	4	--	113	--	2
Birmingham, Alabama	979	42	67	1/15	15	42	67	1/15	15	--	--	--	--
Boston, Massachusetts	428	1,108	940	2	7	1,108	940	2	7	--	--	--	--
Buffalo, New York	109	692	1,381	6	4	692	1,381	6	3	--	--	--	--
Chicago, Illinois	616	11	29	--	--	11	29	--	--	--	--	--	--
Cincinnati, Ohio	507	251	59	12	--	251	38	12	--	--	21	--	6
Cleveland, Ohio	278	488	395	10	10	488	395	10	10	--	--	--	--
Columbia, South Carolina	758	600	532	8	9	600	532	8	9	--	--	--	--
Dallas, Texas	1,450	--	--	--	--	--	--	--	--	--	--	--	--
Denver, Colorado	1,618	--	--	--	--	--	--	--	--	--	--	--	--
Detroit, Michigan	444	19	391	--	11	18	391	--	11	1	--	1/3	--
Ft. Worth, Texas	1,474	--	--	--	--	--	--	--	--	--	--	--	--
Houston, Texas	1,547	1	1	--	--	1	1	--	--	--	--	--	--
Indianapolis, Indiana	569	42	1	1/15	--	42	1	1/15	--	--	--	--	--
Kansas City, Missouri	1,053	--	--	--	--	--	--	--	--	--	--	--	--
Los Angeles, California	2,642	--	--	--	--	--	--	--	--	--	--	--	--
Louisville, Kentucky	617	15	57	--	--	15	56	--	--	--	1	--	7
Memphis, Tennessee	986	16	29	--	--	16	29	--	--	--	--	--	--
Miami, Florida	1,406	239	335	13	12	239	335	13	12	--	--	--	--
Milwaukee, Wisconsin	705	--	--	--	--	--	--	--	--	--	--	--	--
Minneapolis, Minnesota	1,030	15	1	--	--	15	1	--	--	--	--	--	--
Nashville, Tennessee	796	32	6	--	--	32	6	--	--	--	--	--	--
New Orleans, Louisiana	1,326	--	--	--	--	--	--	--	--	--	--	--	--
New York, New York	314	6,283	6,296	1	1	6,053	6,141	1	1	230	155	1	1
Philadelphia, Pennsylvania	289	1,000	1,714	3	2	1,000	1,633	3	2	--	81	--	4
Pittsburgh, Pennsylvania	245	718	765	5	8	718	728	5	8	--	37	--	5
Portland, Oregon	2,739	128	81	14	14	127	81	14	14	1	--	1/3	--
Providence, Rhode Island	425	--	1	--	--	--	1	--	--	--	--	--	--
St. Louis, Missouri	806	--	--	--	--	--	--	--	--	--	--	--	--
Salt Lake City, Utah	2,039	--	--	--	--	--	--	--	--	--	--	--	--
San Antonio, Texas	1,694	--	--	--	--	--	--	--	--	--	--	--	--
San Francisco, California	2,789	--	--	--	--	--	--	--	--	--	--	--	--
Seattle, Washington	2,668	--	--	--	--	--	--	--	--	--	--	--	--
Washington, D. C.	326	555	1,182	9	5	555	1,078	9	6	--	104	--	3
Wichita, Kansas	1,249	--	--	--	--	--	--	--	--	--	--	--	--
Totals		14,125	17,011			13,887	16,499			238	512		

1/ Indicates two cities had the same number of unloads.

Source: Fresh Fruit and Vegetable Carlot Unloads (AMS-25), U.S. Department of Agriculture.

NOTE: Basic statistics have been expanded, where necessary, and adjusted to reflect total unloads in terms of 43,000-pound rail carlots and truckload equivalents.

Table 9.--North Dakota and Minnesota potatoes: Truck and rail unloads at major cities (markets) and highway mileage to these cities, 1958 and 1963

Cities (markets)	Highway mileage from Grand Forks, North Dakota 1958	Total truck and rail unloads				Total truck unloads				Total rail unloads			
		Number		Rank (top fifteen)		Number		Rank (top fifteen)		Number		Rank (top fifteen)	
		1958	1963	1958	1963	1958	1963	1958	1963	1958	1963	1958	1963
Albany, New York	1,531	---	2	---	---	---	---	---	---	---	2	---	---
Atlanta, Georgia	1,404	58	268	---	14	32	80	12	14	26	188	---	9
Baltimore, Maryland	1,394	15	37	---	---	---	---	---	---	15	37	---	---
Birmingham, Alabama	1,338	240	452	9	8	181	339	5	3	59	113	13	15
Boston, Massachusetts	1,694	5	27	---	---	---	---	---	---	5	27	---	---
Buffalo, New York	1,254	---	---	---	---	---	---	---	---	---	---	---	---
Chicago, Illinois	727	3,023	3,863	1	1	212	75	4	15	2,811	3,788	1	1
Cincinnati, Ohio	1,019	615	643	5	6	13	21	---	---	602	622	3	5
Cleveland, Ohio	1,065	101	154	14	---	3	11	---	---	98	143	9	12
Columbia, South Carolina	1,512	25	15	---	---	14	11	---	---	11	4	---	---
Dallas, Texas	1,164	276	590	8	7	49	136	9	10	227	454	7	6
Denver, Colorado	925	2	28	---	---	---	---	---	---	2	28	---	---
Detroit, Michigan	983	102	351	13	11	18	217	15	4	84	134	11	13
Ft. Worth, Texas	1,162	106	147	12	12	99	125	8	12	7	22	---	---
Houston, Texas	1,407	49	290	---	---	7	215	---	5	42	75	15	---
Indianapolis, Indiana	911	282	153	7	---	267	141	3	8	15	12	---	---
Kansas City, Missouri	705	762	1,706	4	4	327	960	2	2	435	746	4	3
Los Angeles, California	1,912	---	16	---	---	---	13	---	---	---	3	---	---
Louisville, Kentucky	1,025	115	364	11	9	39	134	1/11	11	76	230	12	7
Memphis, Tennessee	1,151	461	828	6	5	132	109	7	13	329	719	5	4
Miami, Florida	2,069	2	17	---	---	2	8	---	---	---	9	---	---
Milwaukee, Wisconsin	649	98	232	15	15	5	52	---	---	93	180	10	10
Minneapolis, Minnesota	313	2,058	2,753	2	2	1,777	2,532	1	1	281	221	6	8
Nashville, Tennessee	1,148	79	50	---	---	48	18	10	---	31	32	---	---
New Orleans, Louisiana	1,526	59	353	---	10	30	199	13	6	29	154	---	11
New York, New York	1,545	1	37	---	---	---	1	---	---	1	36	---	---
Philadelphia, Pennsylvania	1,466	25	105	---	---	---	1	---	---	25	104	---	---
Pittsburgh, Pennsylvania	1,175	126	118	10	---	1	4	---	---	125	114	8	14
Portland, Oregon	1,500	3	25	---	---	---	4	---	---	3	21	---	---
Providence, Rhode Island	1,691	---	---	---	---	---	---	---	---	---	---	---	---
St. Louis, Missouri	865	1,206	1,984	3	3	165	139	6	9	1,041	1,845	2	2
Salt Lake City, Utah	1,211	1	7	---	---	---	7	---	---	1	---	---	---
San Antonio, Texas	1,415	75	123	---	---	19	66	14	---	56	57	14	---
San Francisco, California	1,876	1	28	---	---	1	28	---	---	---	---	---	---
Seattle, Washington	1,429	8	63	---	---	---	2	---	---	8	61	---	---
Washington, D. C.	1,399	1	17	---	---	---	12	---	---	1	5	---	---
Wichita, Kansas	784	70	269	---	13	39	178	1/11	7	31	91	---	---
Totals		10,050	16,115			3,479	5,838			6,571	10,277		

1/ Indicates two cities had the same number of unloads.

Source: Fresh Fruit and Vegetable Carlot Unloads (AMS-25), U.S. Department of Agriculture.

NOTE: Basic statistics have been expanded, where necessary, and adjusted to reflect total unloads in terms of 43,000-pound rail carlots and truckload equivalents.

Table 10.--Indexes of seasonal variation in fresh potato shipments by truck and by rail from California, Idaho, Maine, New York, and North Dakota-Minnesota areas, based on years 1959-1963

Month	California Truck	Idaho Truck	Maine Truck	New York Truck	North Dakota-Minnesota Truck 1/
January	6.4	11.3	10.1	12.1	14.0
February	5.0	10.4	9.7	8.9	13.7
March	5.3	13.2	13.9	6.2	15.4
April	6.6	12.7	18.9	1.6	10.3
May	14.1	7.7	15.8	.2	5.8
June	15.4	.9	10.4	.1	.4
July	15.6	.3	1.7	.8	---
August	10.9	3.5	---	11.3	.5
September	6.1	6.5	.2	14.4	6.4
October	4.1	11.5	2.8	16.7	11.0
November	4.7	11.6	7.5	14.7	11.2
December	5.8	10.4	9.0	13.0	11.3

Month	California Rail	Idaho Rail	Maine Rail	New York Rail	North Dakota-Minnesota Rail
January	2.1	13.7	11.2	14.5	15.4
February	1.5	11.7	14.6	5.1	14.0
March	1.5	15.7	23.2	2.6	15.6
April	3.0	13.3	21.9	.2	10.2
May	21.2	6.3	13.5	---	3.0
June	41.9	.5	3.9	---	.1
July	21.1	.2	.2	---	---
August	2.5	1.6	---	.2	.5
September	.7	3.5	.1	8.4	7.6
October	.8	9.7	.9	25.2	11.1
November	1.6	11.9	4.0	26.4	11.2
December	2.1	11.9	6.5	17.4	11.3

1/ Based on five years 1958-62; 1963 was not reported.

Source: Fresh Fruit and Vegetable Shipments (AMS-41), U.S. Department of Agriculture.

Table 11.--Truck and rail freight rates (cents per 100 pounds) indicated by regression equations calculated from actual freight rates from each origin territory to 15 major unload points for each origin territory 1/

Miles 1/	California		Idaho		Maine			North Dakota-Minnesota	
	Truck 2/	Rail	Truck	Rail	Truck		Rail	Truck	Rail
					From Caribou	From Boston			
	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents	Cents
100	---	---	---	---	---	---	---	---	---
200	---	36	31	---	---	26	---	---	---
300	---	41	38	---	---	34	---	32	40
400	---	46	45	---	---	41	50	44	47
500	---	51	51	---	---	45	63	54	54
600	---	56	58	---	72	49	76	65	62
700	---	61	65	---	78	51	87	74	69
800	---	66	72	---	83	54	97	83	76
900	---	71	79	---	89	56	106	92	83
1000	---	76	86	50	95	58	113	100	89
1100	123	81	93	64	100	60	120	107	96
1200	124	86	100	77	106	63	125	114	103
1300	125	91	107	89	112	67	129	120	109
1400	127	95	115	100	118	73	132	126	116
1500	129	100	122	110	124	80	---	131	122
1600	132	105	129	119	131	---	---	---	128
1700	136	109	137	127	137	---	---	---	134
1800	---	114	145	135	143	---	---	---	---
1900	---	119	152	141	150	---	---	---	---
2000	---	123	159	147	156	---	---	---	---
2100	---	127	168	152	163	---	---	---	---
2200	---	132	176	155	170	---	---	---	---
2300	---	136	---	158	---	---	---	---	---
2400	---	141	---	161	---	---	---	---	---
2500	---	145	---	162	---	---	---	---	---
2600	---	149	---	162	---	---	---	---	---
2700	---	153	---	161	---	---	---	---	---
2800	---	157	---	160	---	---	---	---	---
2900	---	161	---	---	---	---	---	---	---
3000	---	165	---	---	---	---	---	---	---
3100	---	169	---	---	---	---	---	---	---
3200	---	173	---	---	---	---	---	---	---
3300	---	177	---	---	---	---	---	---	---
3400	---	180	---	---	---	---	---	---	---
3500	---	184	---	---	---	---	---	---	---
3600	---	---	---	---	---	---	---	---	---
3700	---	---	---	---	---	---	---	---	---

1/ Highway miles for truck and shortline rail miles plus 13 percent circuity. Truck rates include protective service; railroads do not. 2/ Regression equation for California truck rates is based on rate to 5 unload points, only 3 of which were among the 15 major truck unload destinations.

Regression equations used: California, truck, $Y_c = 1.484177 - .053030X + .00268^2X^2$, rail, $Y_c = .253062 + .052170X - .000125X^2 - .000002X^3$; Idaho, truck, $Y_c = .186553 + .063223X + .000375X^2$, rail, $Y_c = -1.587333 + .23895X - .004451X^2$; Maine (from Caribou), truck, $Y_c = .514706 + .050314X + .000446X^2$, (from Boston), truck, $Y_c = .040980 + .136551X - .0134226X^2 + .000512X^3$, rail, $Y_c = -.167333 + .189427X - .005928X^2$, North Dakota-Minnesota, truck, $Y_c = -.052000 + .133178X - .002826X^2$, rail, $Y_c = .171676 + .077029X - .000479X^2$.

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