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## Omaha Trade Area Study No. 04: Milk, Grain and Livestock Source Area

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OMAHA TRADE AREA STUDY NO. 4

MILK, GRAIN AND LIVESTOCK SOURCE AREAS

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\* \* \* \* \*

Omaha Urban Area Research Project

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## THE OMAHA MILKSHED

The milk marketing area of Omaha, shown on Figure 1, includes all or parts of 12 Nebraska counties and 20 counties in western Iowa. Normally 80 percent of Omaha's fluid milk needs comes from the region outlined as Omaha's milk marketing area. Southwest of Omaha, the major milk producing counties of Gage, Jefferson and Lancaster are part of the Lincoln milk marketing area. And to the northwest of Omaha are some of the heaviest bulk-milk producers i.e., milk used for manufactural purposes--dry milk products, etc. Therefore, even though Wayne, Pierce, Antelope and Cedar counties are the major milk producers in Nebraska, they are not included in the Omaha milkshed. Likewise, the major milk producing counties in western Iowa are part of the Sioux City milkshed.

Much of the time the Omaha milkshed does not supply enough milk to meet consumer needs of the urban area. When this occurs, milk is then drawn in needed amounts from the Lincoln, Central Nebraska or Sioux City milk marketing areas.

The Omaha milkshed which encompasses over 16,000 square miles contains approximately 1,500 dairy farms. In comparison to all farms in the area, this number is rather inconsequential (see Figure 2). Omaha then, as suggested before, must draw all of its whole milk from a non-dairy area. The distribution of dairy farms within Omaha's milkshed shows a strong majority in Iowa with 56 percent of the farms in the Iowa portion and 44 percent in the Nebraska section of the Omaha milk marketing region.

It should be noted that even though Omaha must obtain most of its milk from the approximately 1,500 dairy farms available in the area, only about 600 farms regularly send milk to the Omaha market. Hence, there is seemingly



# DAIRY FARMS: 1964

## AS A PERCENTAGE OF TOTAL NUMBER OF FARMS PER COUNTY

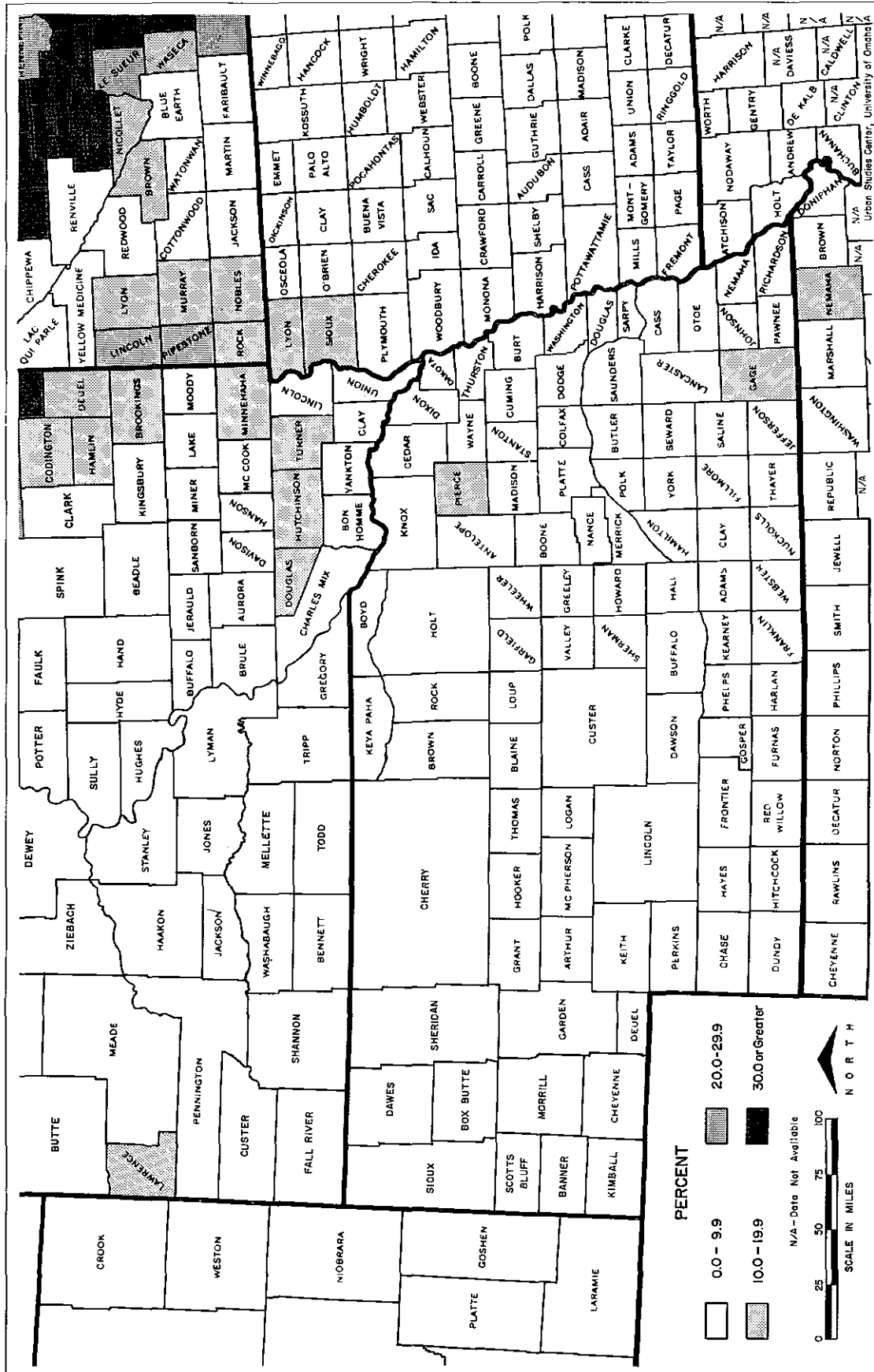


Figure 2

Source: U. S. Census of Agriculture

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some leeway here for sources of milk for Omaha's future needs even with the general decline in the number of farms and dairy cows throughout the milkshed and adjacent areas (see Figure 3). This observation is exemplified by the statistical evidence that during the last year 20 more dairy farms sent their milk to Omaha.

In summary, Omaha's milkshed tends to be a deficit area, usually supplying about 80 percent of the needs of Omaha; the remainder coming from contractual arrangements made with milk marketing regions to the north or southwest. However, even though Omaha's milk drawing region is not a dairy region, not all the dairy farms are sending milk to Omaha, thus allowing some leeway for future marketing demands. The only real dairy area, north and northwest of Omaha, is not in the milkshed and presently is not an area that could be included to meet future market milk needs (see Figure 4).







## THE OMAHA GRAIN SOURCE AREA

In attempting to analyze the source area of grains for Omaha it is important to consider Omaha's geographical situation with respect to areas of production and competing grain centers.

In general, Omaha is located on the northeastern border of the winter wheat area and on the western edge of the Corn Belt. The production of soybeans and milo has spread into eastern Nebraska as government programs have encouraged these two grains and discouraged bumper crops of wheat and corn. The other grains, oats, rye, and barley, serve as rotation crops and are utilized in the production area, although some quantities are shipped through the Omaha Grain Exchange.

The four grain trade areas mapped represented 98 percent of all grain receipts at the Omaha Grain Exchange for the year 1966. The breakdown of grain receipts at the Exchange is indicated in the table below.

Table 1

### RECEIPTS OF GRAIN AT OMAHA DURING 1966 (IN BUSHEL)

	<u>% of Total Receipts</u>	<u>Number of Bushels</u>
Corn	48%	54,044,750
Wheat	30%	33,592,350
Soybeans	6%	7,328,100
Sorghums	14%	16,104,600
Oats, Rye, Barley	2%	2,094,200
Total	<u>100%</u>	<u>113,164,000</u>

Source: Omaha Grain Exchange, Sixty-Third Annual Report 1966, Omaha, Nebraska, 1967.

The competing market structure surrounding Omaha includes such direct interior competitors as Sioux City, St. Joseph, Kansas City, St. Louis, Wichita and Hutchinson. External grain markets engaged in international grain movements that periodically affect Omaha's grain source area are Chicago, Duluth, Milwaukee, Minneapolis and several Gulf of Mexico ports.

In assessing the trade area of grains in the Omaha region, a number of indices appeared. Freight rates, however, seemed to be most important for all of the grains studied. In terms of wheat, freight rates dictated the distance from which grains could be transported profitably to Omaha. For corn, milo and soybeans, the bulkiness of the crop in relation to its market value determined the distance that Omaha could encompass in this aspect of the grain source area.

Market demand and accompanying market price are also integrated into the freight rate structure and into the final determination of the grain drawing area. These two components act to expand or contract the grain supply areas from season to season. Other factors include the relative amounts of production per year, governmental control programs, and readjustments of freight rates from year to year.

In determining the boundaries for the grains in the Omaha grain source area it was discovered that little published data existed for movements of grains into Omaha from outlying areas. As a consequence, the main criteria for the depiction of the Omaha grain trade area are as follows:

1. Consultations with experts in grain trade operations.
2. Review of the railroad grain manifest sheets.

The following maps represent the findings of the investigators through various sources that contributed to the final delimitation of the four major grain trade areas.

CORN

Corn, in terms of the total volume of bushels handled by the Omaha Grain Exchange, represents the largest portion of all the grains, averaging over 50 percent for the past several years. The source area covers 93 counties in a four-state area with the majority of production centered in northeastern Nebraska and northwestern Iowa (see Figure 5). In 1966, railroads accounted for 75 percent of the corn movement in and out of Omaha while trucks moved the remaining 25 percent. Truck movements are generally related to feed lot operations around Omaha and along Interstate 80 to the west.

Several factors entered into the formulation of the boundary. First, since Nebraska is located on the western margins of the Corn Belt, it has been known as a corn deficit area by grain dealers. Also, Omaha's proximity to Iowa naturally results in the eastward extension of the corn supply area into western Iowa. Next, the joint factors of freight rates and market competition exert a dominating pressure for the limitation of the corn supply areas. The northern and eastern boundaries are delimited by these two factors as a result of the direct competition of Omaha with Sioux City, Minneapolis and Chicago. The Omaha market reaches into Iowa until freight rate differences make it uneconomical to ship corn into Omaha. Finally, the general decline in corn production, as wheat gains more importance, forms the southern and western boundaries.



WHEAT

Wheat, the second most important grain in terms of volume at the Omaha Grain Exchange, includes three separate source regions (see Figure 6). These areas comprise a total of 82 counties in four states with the majority of the production centered in Nebraska. In 1966, the movement of wheat into Omaha by rail totaled 75 percent of all wheat shipments, while trucking accounted for the remainder. Over the past several years wheat receipts have averaged about 32 percent of the total grains entering the Omaha Grain Exchange.

The boundaries for the three source regions were constructed from an analysis of the railroad grain manifests by points of origin. The three areas accounted for 81.5 percent of all wheat shipments into Omaha by rail.

The two outlying regions shown on the map are important because of the unusual quality and type of wheat being produced accompanied with the demand for it at the Omaha market. The general shape of the major and contiguous source area is the result of two factors--freight rates and production. The southern and western boundaries reflect freight rate structures between Omaha and points in Kansas, California and ports along the Gulf of Mexico in the southern United States. Generally, the northern and eastern edges are representative of a lack of production--either a result of unsuitable growing conditions or the preeminence in the area of another crop.



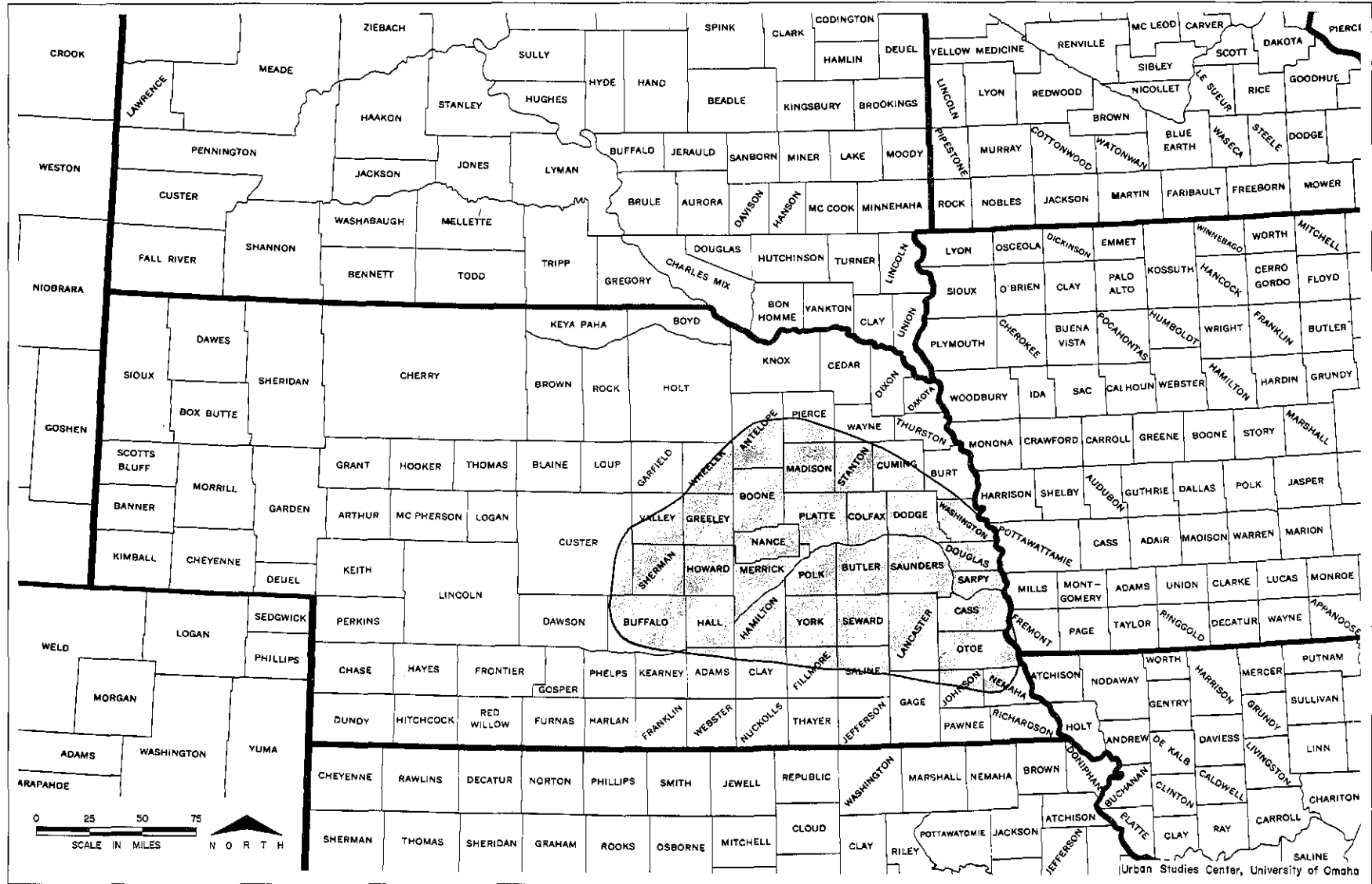


MILO

Milo, the third most important grain by volume at the Omaha Grain Exchange in 1966, has its source region entirely in Nebraska. This includes all or part of 40 counties in a contiguous area to the north, south and west of Douglas County (see Figure 7).

The milo moves into Omaha predominantly by rail and nearly all of the milo grown in Nebraska is shipped to Omaha and then exported out of the state. The general shape of the supply region is a direct result of where milo is produced. The abrupt end of the eastern boundary at the Missouri River is due primarily to the fact that little milo is produced in Iowa.

# OMAHA MILO SOURCE AREA: 1967



Source: Omaha Grain Exchange

Figure 7

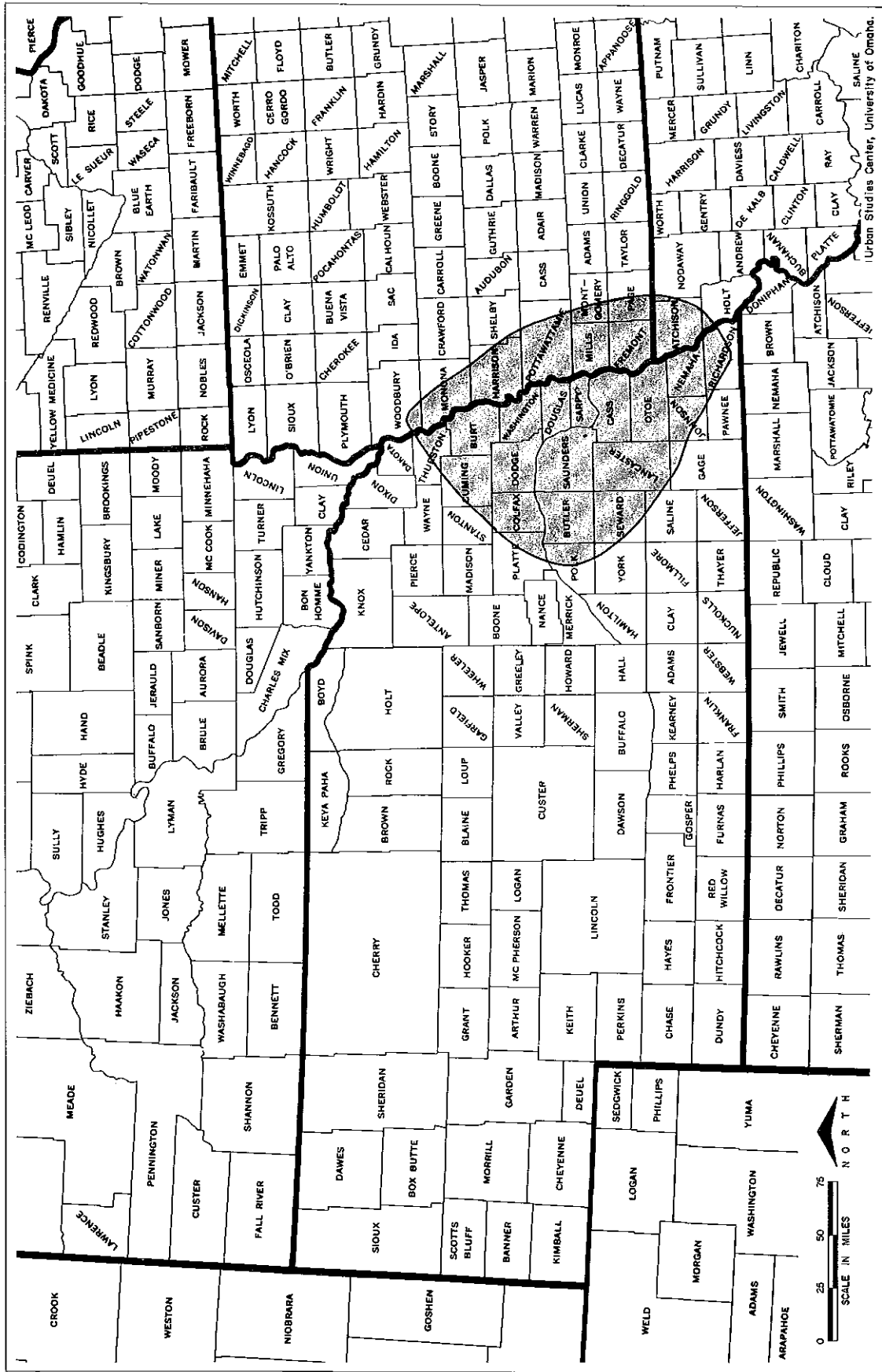
Donald W. Lea

## SOYBEANS

Soybeans, the fourth largest quantity of grain handled, accounted for six percent of the total grain shipments received at the Omaha Grain Exchange in 1966. The source area of soybeans included a total of 32 counties in three states and the region was generally located in eastern Nebraska and adjacent counties in Iowa (see Figure 8). Production of soybeans in Nebraska has been increasing over the past several years, generally because of favorable governmental programs.

The shape of the soybean supply region can be explained by two factors. The boundary in Nebraska represents the western outer limits of soybean production and is merely an extension of the heavier production area in Iowa. The eastern boundary located in western Iowa is a reflection of intense competition among soybean processors. Although Iowa's production is large, the state possesses numerous bean processors. Hence, as a result of this competition by processors, the Omaha soybean source area to the east is very limited.

# OMAHA SOYBEAN SOURCE AREA: 1967



Source: Omaha Grain Exchange

Figure 8

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### COMPOSITE SUMMARY OF GRAIN SOURCE AREAS

It is quite difficult to construct a composite map of the four grain source regions for Omaha. Two major problems create this difficulty: (1) the varying areas covered by the grains, and (2) the wide range in the volume of each of the major grains sent to the Omaha Grain Exchange.

The problem is lessened, however, by the great amount of overlap among the four grain areas, for in essence, the two lesser grains, milo and soybeans, are generally encompassed by the two major grains, corn and wheat (refer to the four grain source maps). The techniques used to construct a composite core grain source map is, then, a matter of deciding the degree of overlap needed to illustrate the four source regions.

The degree of overlap among the four grain regions deemed necessary to depict the grain source region of focus for Omaha was 75 percent. Also, weight was given to the great volume of corn and wheat shipments. Hence, essentially wherever at least three of the four grain source areas overlapped, the composite line was constructed.

The composite grain area shown by Figure 9 includes all or parts of 53 counties in Nebraska, 11 western counties in Iowa, and 2 counties in northwestern Missouri. The eastern boundary is formed by the overlapping of soybeans, wheat and corn with some spillover influence of milo. This eastern boundary was weighted to a strong degree by corn shipments. The northern boundary is composed of the influence of all four major grain drawing regions.

The western composite limits of grain shipments were naturally defined by the Sandhills and decreasing production of corn and milo westward along the Platte Valley and in the Loess Plain. Additional weight was credited to the ever-increasing volume of wheat production. The southern boundary is similar to the northern boundary in that all four grains exert a strong overlapping influence.



## OMAHA LIVESTOCK SOURCE REGIONS

### INTRODUCTION

It is well known that Omaha's livestock market is the major market in the world. Also, the meat packing industry is still a major contributor in the basic support of the city, and as stated in the introduction to this report, this industry is extremely significant when comparing it with the nation. Relatively, Omaha, in 1963, had over fourteen times its national share of meat products employees. Hence, livestock shipment receipts are another strong indicator of Omaha's sphere of influence, especially from the point of view of the area that serves the city.

The relative importance of various types of livestock shipped to Omaha is significant for determining the best indicators of the livestock source regions of Omaha. Table 2 shows quite clearly that hog and cattle receipts account for most of the livestock received by the Omaha Stockyards. Analysis of livestock receipts during the 1963-1966 period showed that cattle and hogs represented 90 percent of the total receipts during the last three years of this period. Sheep and calves receipts have never exceeded 11 percent and numbers have declined more than 200,000 head during the period of study. Therefore, it is felt by the investigators that cattle and hog receipts are more than adequate in the representation of Omaha's livestock source region.

Table 2  
OMAHA LIVESTOCK RECEIPTS

<u>1963</u>	<u>Number</u>	<u>% of Total</u>
Total	<u>6,189,499</u>	<u>100</u>
Cattle	2,028,495	33
Hogs	3,473,768	56
Sheep and Calves	687,236	11
<u>1964</u>	<u>Number</u>	<u>% of Total</u>
Total	<u>6,305,231</u>	<u>100</u>
Cattle	2,192,666	35
Hogs	3,444,642	55
Sheep and Calves	667,923	10
<u>1965</u>	<u>Number</u>	<u>% of Total</u>
Total	<u>5,215,052</u>	<u>100</u>
Cattle	2,082,855	40
Hogs	2,621,603	50
Sheep and Calves	510,594	10
<u>1966</u>	<u>Number</u>	<u>% of Total</u>
Total	<u>4,916,719</u>	<u>100</u>
Cattle	2,019,393	41
Hogs	2,420,583	49
Sheep and Calves	476,743	10

Source: Union Stockyards Company of Omaha (Ltd), Annual Livestock Report, 1963-1966.



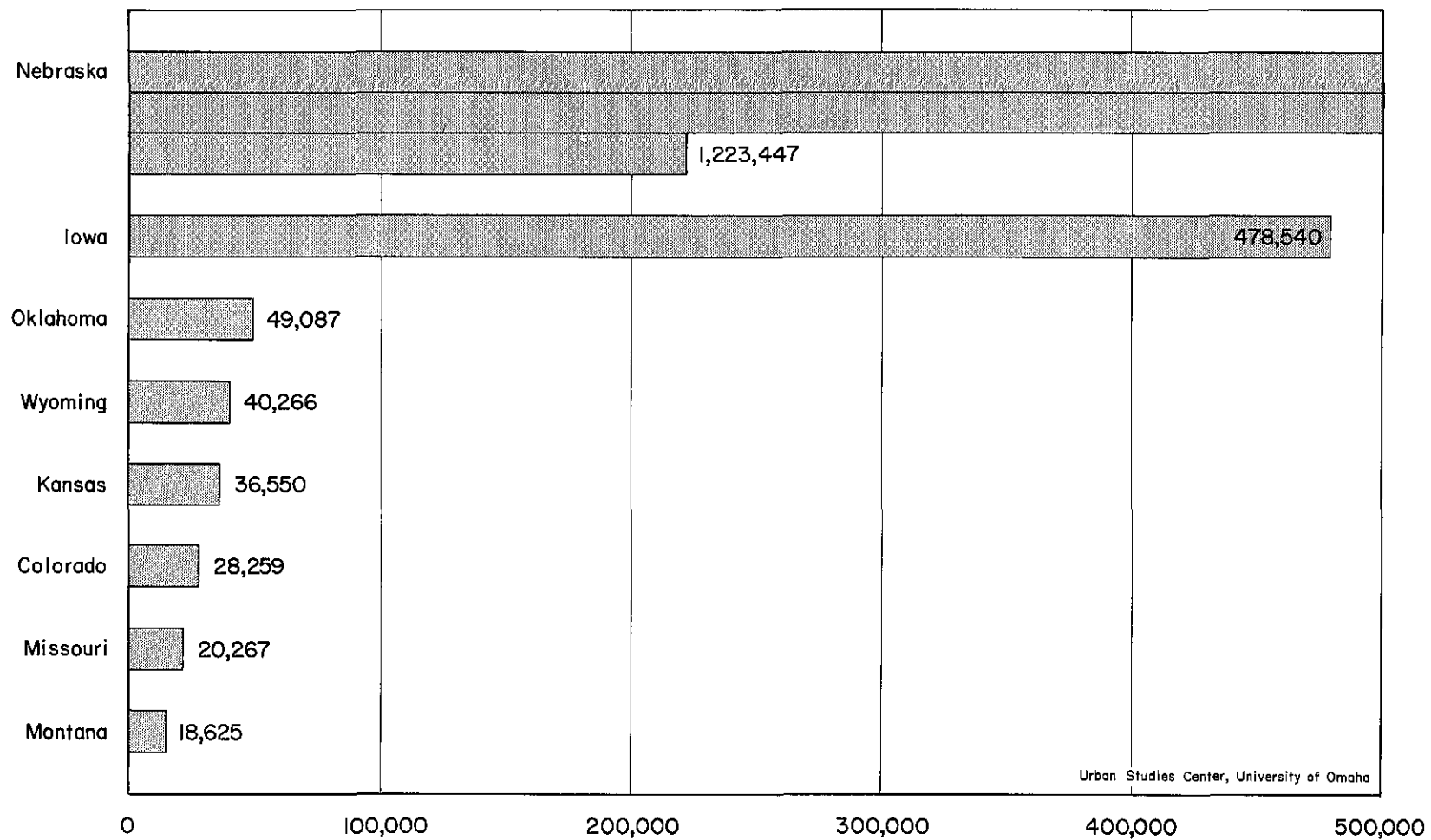
### CATTLE SOURCE AREA

In recent years cattle receipts have accounted for between 33 and 40 percent of all Omaha livestock receipts. Eight states shipping cattle to Omaha contributed approximately 97 percent of all cattle shipments (see Figure 10). The location of the states shipping cattle to the Omaha market, as shown in Figure 10, indicates a regional area surrounding Omaha. However, most interesting is the rank of the top eight states. As expected, Iowa and Nebraska are the leading shippers, but Oklahoma, Wyoming and Colorado rank third, fourth and sixth respectively and are indicative of states which send feeder livestock to the Omaha market.

The role of this portion of the study is to attempt to show slaughter cattle shipments that are focused on Omaha. Thus, states like Oklahoma which send predominantly feeder stock would not be included. Figure 11 represents the core area that ships slaughter livestock to Omaha and, in turn, best shows the area that most directly influences Omaha.

The boundaries of the area represent a multitude of different limiting criteria. It is felt by the authors that the varying levels of competition and the distribution of the major packing centers result in the necessity to consider different factors in delimiting the Omaha cattle source area. For instance, to the north of Omaha is Sioux City, a single, major competitor which is a short distance from Omaha. The northern boundary is a 50 percent line of shipments between Omaha and Sioux City. However, to the east the major competitor, Chicago, is some distance away. Cattle shipping varies with market price and distance. Thus, since transport costs and market price are limiting factors of Omaha's eastern cattle source boundary, the line represents a minimum of 80 percent of the cattle shipped to Omaha. The southern

# CATTLE AND CALVES RECEIPTS BY STATE OF ORIGIN: 1967



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boundary is more complex. This occurs mainly because of three major competitors, St. Joseph, Kansas City and St. Louis. The boundary was drawn on the basis of a ratio of the number of cattle shipped to Omaha and limited information from the competitors.

To the west, unlike the other boundaries, Denver does not strongly compete with Omaha as a packing center. A comparison of Denver with Omaha would then be rather meaningless. Consequently, the western core boundary was constructed on the basis of major feeder cattle densities and general market shipment patterns.

Therefore, the area shown on Figure 11 of Omaha's prime cattle source area represents receipts from a five-state region, most of which originate in Nebraska and southwestern Iowa. The greater share of the cattle shipped to Omaha from the Nebraska portion of the area is from eastern Nebraska, and, in turn, over 88 percent of the cattle from Iowa is represented in the Iowa section. Most of the remainder of the slaughter cattle originate in the Kansas portion of the source region. In fact, at least 40 percent of the cattle from Kansas is included within the area on the map.

### HOG SOURCE AREA

Hog receipts to Omaha are very significant; in fact, swine shipments still represent nearly 50 percent of the total receipts. The source area, however, represents a somewhat less complex problem than cattle sources because most swine shipments originate in Iowa and Nebraska. Unlike cattle shipments, Iowa leads in sending over 50 percent of the total; Nebraska contributes nearly 45 percent of the total hogs received by the Omaha market and Kansas slightly over 3 percent.<sup>3</sup>

The map (Figure 12) shows two areas--the major source area and the core area. The core area represents at least 90 percent of all hogs shipped from Iowa and Nebraska to the Omaha stockyards. The northern boundary is a 50 percent line with Sioux City, whereas the eastern boundary represents at least 90 percent of the swine from Iowa. The remaining boundary areas were determined by direct county-by-county shipments. For instance, most of the swine sent from Missouri to Omaha are shipped from sale barns in Atchison County, Missouri.

Iowa counties are by far the leading contributors; this is best exemplified in the observation that the top eight counties in hog shipments are in adjacent counties in western Iowa. Most of Nebraska, except the central and northeastern tier of counties, is included in the hog source area of Omaha. However, as the map illustrates, very few swine in proportion are sent from central and western Nebraska. Ninety percent of the swine received in Omaha from Nebraska derive their origin from eastern Nebraska counties. Thus, the core area is the most significant area in assessing Omaha's swine source region.

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<sup>3</sup>84th Annual Livestock Report, Union Stock Yards Company, Omaha, 1967.



SUMMARY (CATTLE AND HOG RECEIPTS)

The brief analysis of cattle and swine source areas clearly indicates that the major cores of shipments are in the region immediately surrounding Omaha. In the interpretation of livestock receipt data for the past several years, 1964 represents the peak year in Omaha with a steady decline in total numbers received through 1967. With competition from smaller packers outside the major packing centers, this trend is common to most of the major packing points in the nation.

In the Omaha market, hogs have shown the greatest decline over the years, whereas cattle receipts have remained rather steady in showing a slow decline since 1964 (see Table 2). Cattle receipts, however, have increased markedly in their proportion of total receipts from 33 percent to over 40 percent of the total receipts in 1966. With the closing of major packers in Omaha, especially Armour and Company, a larger decline in the hog kill will be noted, thus potentially increasing the significance of cattle in total market receipts. It is felt by the authors that even with the decline in total receipts, the cattle and swine core source regions will remain nearly the same with some peripheral constriction in terms of location for the next few years.

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