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CAPACITY OF REFRIGERATED WAREHOUSES

in the United States



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CAPACITY OF REFRIGERATED WAREHOUSES

IN THE UNITED STATES

(As of October 1, 1953)

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INTRODUCTION

Scope and Objectives of the Survey

This report on the capacity of refrigerated warehouses in the United States as of October 1, 1953, is the seventeenth in a series of biennial surveys made by the United States Department of Agriculture beginning with 1921. With the exception of the 1941 survey, which was as of June 16, all surveys have related to October 1.

One important change was made in the 1953 survey. For the first time, freezer space is defined as that refrigerated at 19° Fahrenheit or below, whereas in previous surveys freezer space was that refrigerated at 29° Fahrenheit or below. Cooler space is the refrigerated space above those temperatures. The change was made in accordance with changing trade practice and with recommendations of the industry.

As in previous surveys, as complete a coverage as possible was sought. The Departmental mailing list was checked against trade association listings and other trade media and by State agricultural statisticians. Questionnaires were mailed to all known public, private, and semiprivate refrigerated warehouses; to fruit houses (apple, pear, and grape) having artificially cooled storage space; and to meat packing plants with refrigerated space used for storage purposes. It is believed, therefore, that the refrigerated warehousing industry was adequately covered for this, the seventeenth biennial survey.

Refrigerated facilities included in the survey are those warehouses, artificially cooled to 50° Fahrenheit or lower, in which foodstuffs are generally stored for 30 days or more. Space in facilities maintained by wholesalers, jobbers, or retailers was not included if it was used for holding products less than 30 days. Also excluded was space in locker plants, facilities owned by the armed services, and space in plants operated as part of retail food businesses, hotels, or other establishments where persons are housed or fed.

Each warehouse capacity report was carefully analyzed and checked against similar information received in 1951. In every case where there was a questionable entry, the warehouseman was requested to verify or correct his report. Warehousemen were asked to report all space in their plants, including space leased to others. Meat packers were asked to include in their reports only that portion of their refrigerated space used for storage purposes and to exclude refrigerated working space, that is, cutting, boning, and chill rooms, and sales room coolers. Meat packers were instructed to exclude, also, all space in smoking and curing rooms.

These biennial surveys have a fourfold purpose as follows:

1. To measure the capacity of refrigerated warehouses in the United States to determine whether the storage space expanded, decreased, or remained unchanged since the last survey, and to locate the areas in which changes took place.
2. To provide a benchmark by which to check the accuracy of storage occupancy reports received from warehousemen each month in support of the Cold Storage Report.
3. To provide information on the basis of which an orderly and efficient expansion of facilities can be recommended or by which unneeded plant construction can be discouraged.
4. To aid in locating refrigerated space to facilitate the preservation of perishable foods.

Definitions

The terms used in this report are defined as follows:

Public general cold storage. -- Any artificially cooled warehouse the operator of which is engaged in storing food commodities requiring refrigeration, for others for pay.

Private general cold storage. -- Any artificially cooled warehouse the operator of which conducts a warehousing business to facilitate his main function as a producer, processor, or distributor, but does not store commodities for others for pay.

Semiprivate general cold storage. -- Any artificially cooled warehouse the operator of which uses part of the space to care for the storage of his own commodities and, in addition, stores in his plant various food commodities for others for pay.

Meat-packing establishment. -- Any plant engaged in processing dressed animals and animal products for food. For the purposes of this report and survey, only that space which is used for the storage of products is included. Refrigerated working space, chill rooms, coolers used exclusively for hanging dressed carcasses prior to shipping, and smoking and curing rooms are excluded.

Apple house. -- Any warehouse, public, private, or semiprivate, the operator of which is engaged mainly or exclusively in the storage of apples or pears.

Gross space. -- The space inside refrigerated rooms, measured from wall to wall and floor to ceiling, excluding elevators, stairs, vestibules, and like enclosures.

Net piling space. -- Space for the storage of commodities; that is, space inside rooms measured wall to wall and floor to ceiling, minus the space provided for ventilation (outside of pile), space occupied by coils, aisles, posts, sprinklers, and the like.

Freezer 1/. -- Refrigerated rooms capable of holding a temperature of 19° F. or below.

Cooler 2/. -- Refrigerated rooms capable of holding temperatures only above 19° F.

Geographic regions. -- The regions and States covered in the survey are as follows:

New England: Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, and Connecticut.

Middle Atlantic: New York, New Jersey, and Pennsylvania.

East North Central: Ohio, Indiana, Illinois, Michigan, and Wisconsin.

West North Central: Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas.

South Atlantic: Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, and Florida.

East South Central: Kentucky, Tennessee, Alabama, and Mississippi.

West South Central: Arkansas, Louisiana, Oklahoma, and Texas.

Mountain: Montana, Idaho, Wyoming, Colorado, New Mexico, Arizona, Utah, and Nevada.

Pacific: Washington, Oregon, and California.

1/ Prior to the 1953 survey, freezer temperatures were those of 29° F. or below.

2/ Prior to the 1953 survey, cooler temperatures were those above 29° F.

GROSS REFRIGERATED SPACE

Distribution by Temperature Range and Type of Warehouse

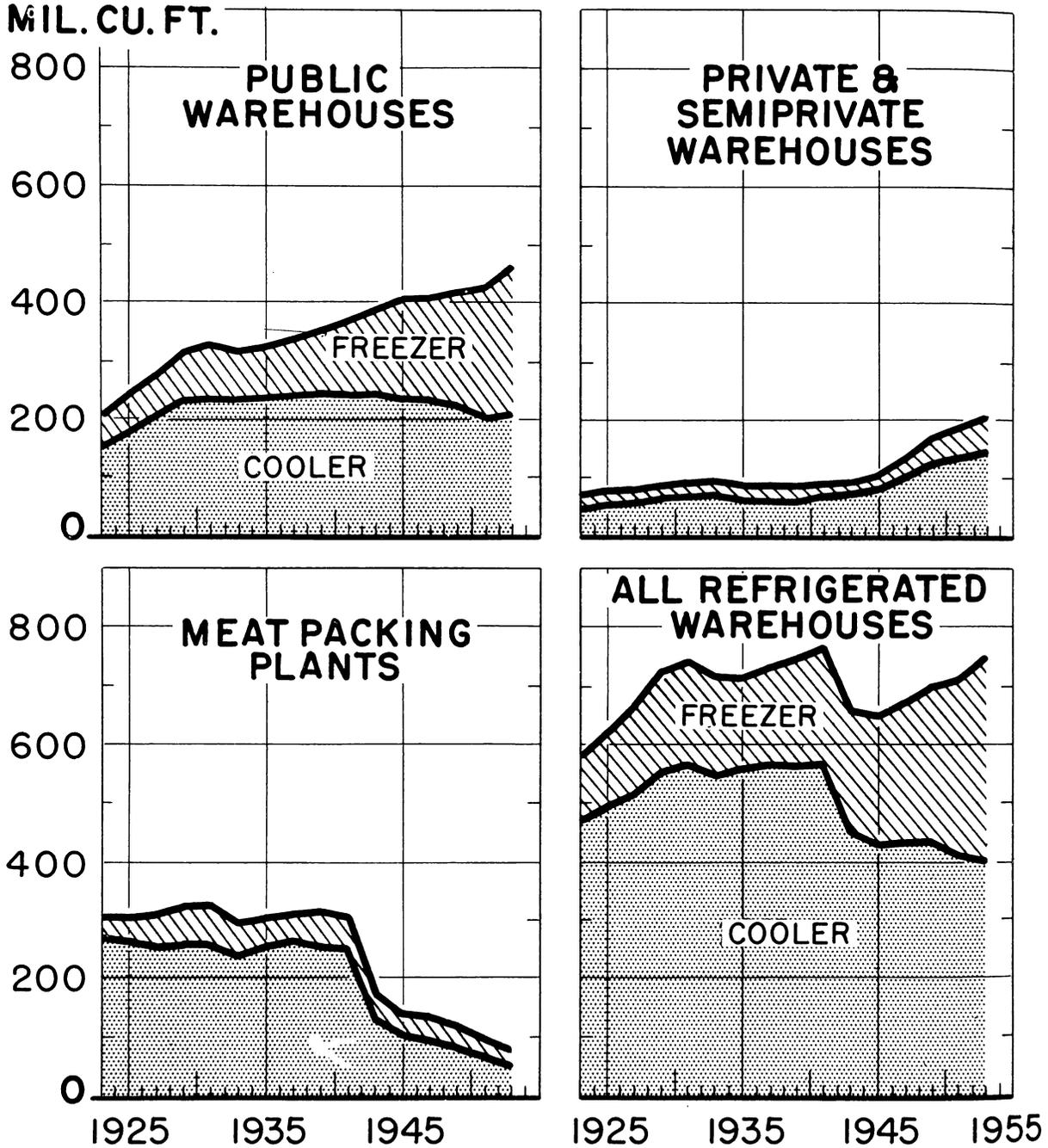


Figure 1.

GROWTH OF REFRIGERATED WAREHOUSE CAPACITY

Gross Capacity

National refrigerated capacity totaled 748,050,000 gross cubic feet on October 1, 1953 (table 1), a net gain of 37,034,000 cubic feet in the 2-year interval since the last previous survey. A decade ago, national warehouse capacity was 651,266,000 cubic feet. During the 1943-53 decade, warehouse capacity was increasing at an average rate of more than 19,000,000 cubic feet every 2 years, the surveys showed, whereas in the previous 10-year period, 1931 to 1941, the average rate of growth was about 5,000,000 cubic feet every 2 years.

Many factors have contributed to the growth of the warehousing industry since the 1930's. These included technological advances and improvements in equipment and transportation facilities, a better knowledge of product handling and storage environment which helped to preserve the quality of foods stored under refrigeration, wider consumer acceptance of cold storage products, increased volume of frozen food production, and an ever-growing variety of foods marketed in a frozen state.

Because of the upward trend in frozen food production, the warehousing industry found it necessary to reappraise its ability to provide adequate space of the right kinds, to facilitate the distribution of the growing volume of frozen foods.

Heretofore, space requirements for apples during the fall and winter and for shell eggs during the spring and summer emphasized the need for cooler space almost to the exclusion of freezer space (fig. 1 and table 2). In 1923, approximately four-fifths of the national refrigerated capacity was in the temperature range of coolers. By 1933, however, cooler space accounted for three-fourths of the national capacity, and in 1943 it was down to seven-tenths of the total. On October 1, 1953, only a little more than half (54 percent) of the national total refrigerated capacity, or 400,722,000 cubic feet was cooler space (table 1).

With a slackening demand for cooler space, especially in concentration and terminal market areas, the warehousing industry, particularly operators of public, private, and semiprivate general warehouses, began to convert all or major portions of their cooler rooms into freezer rooms and to build new facilities in areas closer to points of production.

Expansions, conversions, and new construction brought gross freezer space up to 347,328,000 cubic feet by October 1, 1953 (table 1). By comparison, national freezer capacity was 201,757,000 cubic feet in 1943 and only 169,753,000 cubic feet in 1933. The average annual rate of growth during the 10-year interval from 1943 to 1953 was almost 15,000,000 cubic feet as compared with slightly more than 3,000,000 cubic feet per year in the period from 1933 to 1943.

Public Warehouse Space

Much of the food being held under refrigeration is stored in public warehouses. During 1952, public warehouse facilities held about 80 percent of the frozen poultry stocks in storage, about 85 percent of the butter, about 50 percent

Table 1. — Total refrigerated storage capacity, by type of warehousing operation, United States, October 1, 1953

Type of refrigerated warehouse <u>1/</u>	Plants	Gross space <u>1/</u>			Net piling space <u>1/</u>		
		Freezer	Cooler	Total	Freezer	Cooler	Total
	<u>Number</u>	<u>1,000 cu. ft.</u>	<u>1,000 cu. ft.</u>	<u>1,000 cu. ft.</u>	<u>1,000 cu. ft.</u>	<u>1,000 cu. ft.</u>	<u>1,000 cu. ft.</u>
Public general.....	666	256,751	168,575	425,326	183,561	124,211	307,772
Private and semi-private general.....	499	58,606	42,935	101,541	42,820	32,154	74,974
Meat-packing plant....	198	29,242	49,847	79,089	18,841	34,789	53,630
Apple houses:							
Public.....	107	1,117	40,027	41,144	910	32,931	33,841
Private and semi-private.....	502	1,612	99,338	100,950	1,342	80,617	81,959
Total.....	1,972	347,328	400,722	748,050	247,474	304,702	552,176

1/ For definitions of terms used, see page 2.

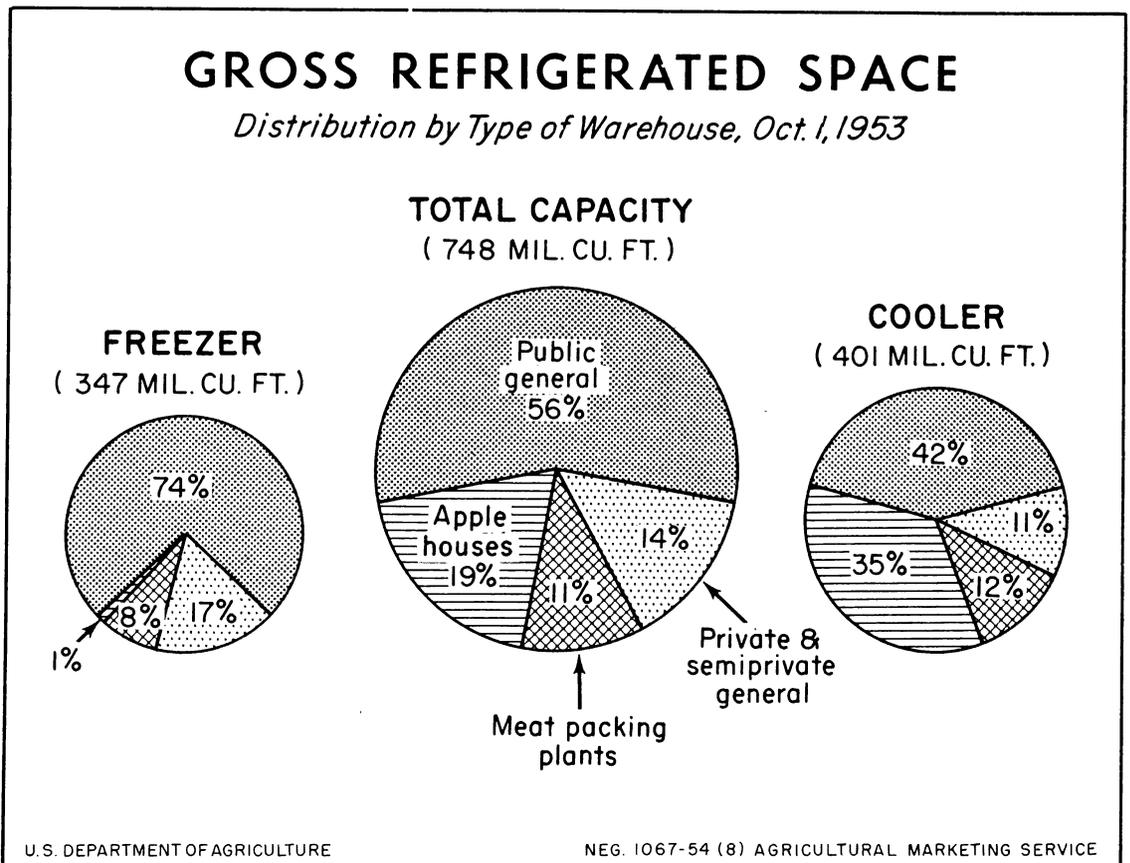


Figure 2.

of the meat and meat products, and about 80 percent of the total frozen fruits, vegetables, and juices.

During the last 7 years the output of frozen foods has more than tripled. The limit of this expansion has not yet been reached. 3/ Whatever the expansion in the future, public warehouses may still be called upon to store the major portion, not only because of their strategic location in intermediate and urban centers but because of their ability to service the frozen food industry adequately by virtue of their number and capacity (fig. 2).

Although growth was not as rapid for public warehouse space as for frozen foods, a trend was evident as successive surveys were completed. In 1921, public warehouse space totaled 194,167,000 gross cubic feet, only slightly more than one-third of the national capacity of all types of warehouses. Table 2 shows the successive changes in capacity during the past 32 years which resulted in a 1953 total of 466,470,000 gross cubic feet. It should be noted, however, that increases may result not only from new construction but also from changes in the type of warehouse business; that is, a private, semiprivate, or meat packing establishment may switch to a public-type operation.

From about one-third of the national capacity in 1921, public warehouse space rose to more than three-fifths of the national total in 1953. The 1951-53 net gain in gross space was more than 41,000,000 cubic feet; the increase from 1949 to 1951 was less than 12,000,000 cubic feet. The average gain during the 10-year period ended 1951 was less than 11,000,000 cubic feet per 2-year period.

The extent to which freezer space was concentrated in public facilities of all types was evidenced by the fact that almost three-fourths of the national freezer capacity was classified as public on October 1, 1953. It amounted to 257,868,000 gross cubic feet, a net gain of more than 37,000,000 cubic feet since 1951. 4/ To reach this volume, the industry's growth was quite consistent during the last 30 years with the sole exception of 1933; at that time a slight reduction occurred. As an example of this growth pattern, freezer space in public facilities in 1953 was almost twice the capacity available in 1943; three times that in 1933; and almost five times that in 1923.

Public warehouse gross space, freezer and cooler, was approximately 2.92 cubic feet per capita as computed from the July 1, 1953, estimate of total population (including armed services abroad) and the October 1, 1953, space survey. Projected estimates of population in 1955, based upon Bureau of the Census reports, indicated a population between 164.4 and 164.8 million persons. 5/ Should the public warehousing industry continue the 1953 per capita relationship into 1955, the eighteenth biennial space survey may show that public warehouse space increased to a total of at least 480,000,000 gross cubic feet, of which 266,000,000 cubic feet would be freezer space.

3/ Bitting, H. W. Purchases of Frozen and Canned Foods by Urban Families as Related to Home Refrigeration Facilities. U. S. Dept. Agr. Mkt. Res. Rpt. 60, p. 1. 1954.

4/ The gain may have been somewhat larger than this, because a part of it may have been concealed by the new basis for reporting freezer space.

5/ United States Bureau of the Census. Current Population Reports, Population Estimates, Ser. P. 25, No. 78, 6 pp. 1953.

Table 2. -- Gross refrigerated space, by type of warehouse and by temperature range, specified years, 1923 - 53

Date	Public warehouses ^{1/}		Private and semiprivate warehouses ^{1/}		Meat packing plants ^{2/}		All refrigerated warehouses	
	Freezer ^{3/}	Cooler	Freezer ^{3/}	Cooler	Freezer ^{3/}	Cooler	Freezer ^{3/}	Cooler
	1,000 cu. ft.	1,000 cu. ft.	1,000 cu. ft.	1,000 cu. ft.	1,000 cu. ft.	1,000 cu. ft.	1,000 cu. ft.	1,000 cu. ft.
October 1								
1923...	55,907	150,029	23,738	46,651	35,253	273,826	114,898	470,506
1925...	61,509	181,056	28,225	52,875	38,403	264,601	128,137	498,532
1927...	68,916	204,981	25,577	56,504	59,592	252,276	154,085	513,761
1929...	81,605	235,205	24,883	64,571	64,078	258,253	170,566	558,029
1931...	89,698	236,005	24,135	69,941	65,217	255,847	179,050	561,793
1933...	85,616	231,595	22,682	74,774	61,455	235,820	169,753	542,189
1935...	86,963	235,488	19,170	65,744	46,461	256,744	152,594	557,976
1937...	92,903	240,931	21,345	65,502	48,061	261,580	162,309	568,013
1939...	107,868	243,500	18,472	64,038	57,166	255,396	183,506	562,934
1941...	129,159	242,612	17,897	74,483	52,067	250,165	199,123	567,260
1943...	142,950	247,042	16,034	75,590	42,773	126,877	201,757	449,509
1945...	166,600	237,232	21,052	86,493	35,035	99,779	222,687	423,504
1947...	175,900	232,332	31,694	104,122	34,228	96,765	241,822	433,219
1949...	191,535	221,721	42,023	129,175	31,162	85,162	264,720	436,058
1951...	220,556	204,558	51,757	135,916	31,917	66,312	304,230	406,786
1953...	257,868	208,602	60,218	142,273	29,242	49,847	347,328	400,722

^{1/} Includes apple houses.

^{2/} Beginning in 1943, refrigerated working space was excluded; in 1953, curing and smoking room space also was excluded.

^{3/} Prior to 1953, freezer temperatures were 29° F. and below; since 1953, they have been 19° F. and below.

Private and Semiprivate Warehouse Space

Ever since 1941 there has been a significant increase in the refrigerated storage capacity of private and semiprivate space, especially in the freezer range. Generally, this type of operation is located close to points of production and, in many instances, the warehouse space is part of a frozen food production plant.

Quality control in the frozen food industry is related in part to the speed with which the product is processed. Consequently, the construction of warehouses near points of production was one of the measures adopted by the industry to maintain the quality of its products. As a result, private and semiprivate warehouse space increased during the past decade at an unequalled rate.

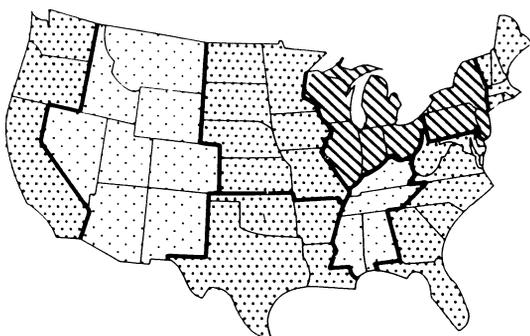
In 1953, gross storage space classified as private and semiprivate totaled 202,491,000 cubic feet as compared with 187,673,000 cubic feet in 1951. It is within the freezer range, however, that this industry's growth may be measured.

From 1943 to 1953, there was a net increase in private and semiprivate freezer space of more than 44,000,000 cubic feet. It was during this 10-year period that this industry almost quadrupled its freezer capacity. Generally, these increases took place in centers of frozen food production; consequently, there was a concentration of private and semiprivate space in the South Atlantic and Pacific regions. Freezer capacity in each of these areas totaled almost 16,000,000 cubic feet. Collectively, the areas accounted for more than half of the freezer space in private and semiprivate facilities. Florida, Washington, and California, because of their many juice and food processing plants, were the chief locations for private and semiprivate warehousing operations in their respective geographic regions.

GROSS REFRIGERATED SPACE

% Distribution of Type of Warehouse Space, by Regions, Oct. 1, 1953

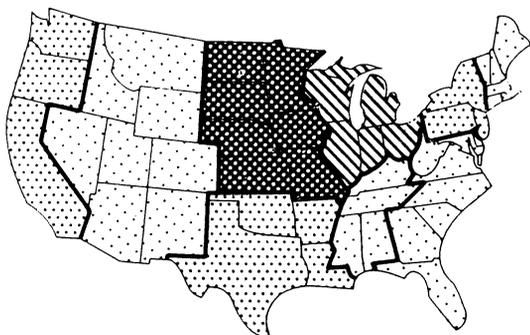
PUBLIC GENERAL



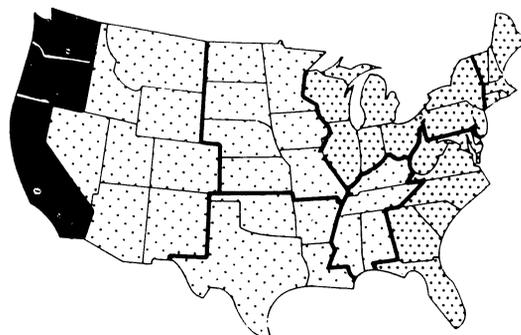
PRIVATE & SEMIPRIVATE GENERAL



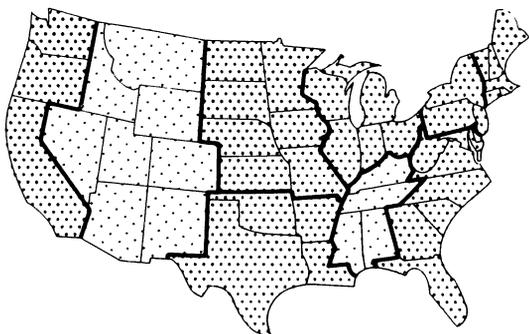
MEAT PACKING PLANTS



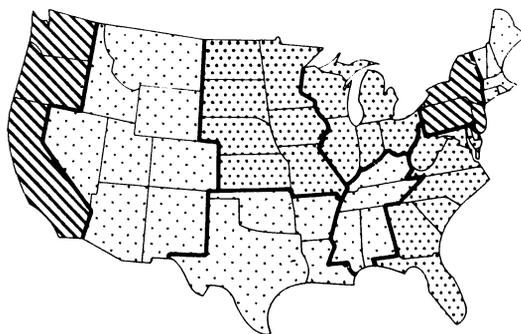
APPLE HOUSES



FREEZER



COOLER



% OF SPACE BY TYPE

Under 5 5-19 20-34 35-49 50 & Over

Figure 3.

REFRIGERATED WAREHOUSE CAPACITY, BY REGIONS

During August and September 1950, a group of 50 experts from 12 countries of Western Europe (representing The Organisation for European Economic Co-operation) visited the United States to study, among many things, the warehousing industry. In their report they stated, "Preservation by refrigeration has become a habit as a result of the much more extensive cold chain linking producer and consumer." 6/

The links in the American "cold chain," or warehouse system, to which this mission referred, extended the length and breadth of this Nation. The "chain" afforded approximately 4.69 cubic feet of storage space per person on the basis of the July 1, 1953, estimate of total population and the October 1, 1953, survey of gross warehouse capacity. The best equipped country in Europe, Netherlands, had only 1.76 cubic feet per person (65 cubic yards per 1,000 inhabitants). 7/

The American refrigerated warehouse system, however, was strongest in the Middle Atlantic, East North Central, and Pacific regions (table 3) because of specialized warehousing in these three areas. The public general warehouses in the Middle Atlantic and East North Central regions and the large number of apple houses and private and semiprivate warehouses on the west coast contributed to the concentration within these three regions of 64 percent of the national refrigerated capacity. In 1951, however, these regions had 66 percent of the national total.

In 1953 as in 1951, the refrigerated warehouse capacity in the Pacific region was the largest of all. The 191,467,000 gross cubic feet compares with 147,334,000 cubic feet reported in the Middle Atlantic region, which ranked second, and 141,464,000 cubic feet in the third ranking region, the East North Central. Next in order was the West North Central, the South Atlantic region, followed by the West South Central, New England, East South Central, and Mountain.

With two exceptions, all regions shared in the national net increase in gross space since 1951. The exceptions were the New England and East North Central regions, where reductions of more than 1,000,000 cubic feet occurred during the 2-year interval since the last survey. Appreciable gains, however, were reported in the South Atlantic region, particularly in Florida; in the Pacific region, mostly in California, and in the West North Central region, notably in Kansas. The largest regional increase of the three was approximately 14,000,000 cubic feet in the South Atlantic. In the Pacific, almost 12,000,000 cubic feet was added as compared with approximately 7,000,000 cubic feet in the West North Central.

The growing importance of western facilities in the national picture was emphasized again by the 1953 survey. Growth patterns evidenced by the warehousing industry showed that storage facilities in the West were slowly narrowing the difference between their gross capacity and that east of the Mississippi River. By 1951, the capacity difference was reduced to 94,000,000 cubic feet; in 1953 this difference was 84,000,000 cubic feet.

6/ The Organisation for European Economic Co-operation. The Cold Chain in the U. S. A. Part II. Technical Survey. p. 151. Paris. 1952.

7/ Ibid., p. 36.

Freezer Space

Figure 3 shows the distribution of freezer space according to geographic regions. Almost equal freezer capacity was available in the Middle Atlantic, East North Central, and Pacific regions. These three areas together controlled over 197,000,000 cubic feet, or almost 57 percent of the national freezer capacity. The next largest freezer capacity was found in the West North Central region. There, as in the three leading areas, a major portion of the freezer capacity was classified as public. In the South Atlantic region, almost twice as much freezer space was found as in the West South Central States, while in the New England area, which ranked next in order of gross freezer space, the capacity was about equal to the combined freezer space found in the East South Central and Mountain regions.

Cooler Space

Space needed for the preservation of fresh fruits, vegetables, and dairy and meat products at points of production and in urban areas gave rise to the distribution pattern of cooler space shown in figure 3. In West Coast facilities particularly, cooler space plays an important role. Almost one-third of the national cooler capacity was in the three Western States and almost two-thirds of this storage area was used for fresh fruits. Apple space and public cooler space in the Middle Atlantic area comprised the next largest concentration of cooler space in the country. The neighboring region to the west, the

Table 3.—Total refrigerated storage capacity of all types of warehouses, by regions, October 1, 1953

Region	Plants	Gross space			Net piling space		
		Freezer	Cooler	Total	Freezer	Cooler	Total
	Number	1,000 cu. ft.					
New England.....	188	17,933	13,356	31,289	11,761	10,002	21,763
Middle Atlantic.....	426	65,136	82,198	147,334	45,305	62,726	108,031
East North Central.....	334	65,529	75,935	141,464	44,152	55,448	99,600
West North Central.....	156	52,357	41,098	93,455	36,625	28,996	65,621
South Atlantic.....	207	40,505	39,807	80,312	30,885	31,704	62,589
East South Central.....	51	9,115	6,515	15,630	6,651	5,019	11,670
West South Central.....	86	21,195	13,037	34,232	15,620	10,181	25,801
Mountain.....	56	8,929	3,938	12,867	6,778	2,927	9,705
Pacific.....	468	66,629	124,838	191,467	49,697	97,699	147,396
United States.....	1,972	347,328	400,722	748,050	247,474	304,702	552,176

East North Central States, had considerable cooler space available, too, for needs of the meat-packing industry and cheese industry, and for public warehousing. More than half of the total refrigerated capacity in that region was in the range of cooler temperatures.

It was significant that, despite the marked national increase in freezer capacity during the past three decades cooler capacity continued to outrank the freezer capacity in the two major storage regions, the Middle Atlantic and East North Central, which are also centers of large urban populations. More than half of the refrigerated space in the Middle Atlantic and East North Central States was in coolers whereas in other areas, except Pacific, it was the reverse.

Public General Warehouses

The largest element in the refrigerated warehouse system is the public general warehouse facility. This type of facility accounted for almost three-fifths of the national refrigerated gross capacity. The number of public general warehouses, however, was only one-third of the total facilities reported in the 1953 survey.

Public facilities, exclusive of public apple houses, reported a gross storage capacity of 425,326,000 cubic feet, of which 256,751,000 cubic feet was in the freezer range (table 4). Their capacity in 1953 was more than 50,000,000 gross cubic feet greater than in 1951 as a result of net gains in all geographic regions. Public space in the West North Central States was increased by almost 14,000,000 cubic feet, and in the East North Central by almost 12,000,000 cubic feet. South Atlantic facilities reported a gain of more than 8,000,000 cubic feet. On the west coast, an additional 6,000,000 cubic feet was made available for the general public, but only 4,000,000 was added in the Middle Atlantic States. In other areas, smaller gains were reported, varying from less than 1,000,000 to slightly more than 2,000,000 cubic feet.

Middle Atlantic and East North Central States were the principal areas for the location of public general warehouse facilities (fig. 3). Between them they accounted for 45 percent of the total public general space in the country. These two regions and Pacific Coast States, combined, controlled 62 percent of the national public general warehouse capacity. In the forefront, however, were the Middle Atlantic States with more than 20 percent of the national public freezer space and more than 25 percent of the public cooler space.

Private and Semiprivate General Warehouses

The geographic distribution of nonpublic warehousing is presented in table 5 and figure 3. Fully one-third of the space maintained by this industry was located on the west coast, largely for the use of the frozen food and grape storage industries. Facilities in the Pacific region accounted for more than two-fifths of the cooler space maintained by the private and semiprivate warehousing industry and about one-fourth of its freezer capacity.

The increase in private and semiprivate capacity in the Pacific region since 1951 was a little more than 5,000,000 gross cubic feet, but this was only about half as great as the net gain reported in the South Atlantic. In the South Atlantic, private and semiprivate space, primarily in orange juice

Table 4.—Refrigerated storage capacity of public general warehouses, by regions, October 1, 1953

Region	Plants	Gross space			Net piling space		
		Freezer	Cooler	Total	Freezer	Cooler	Total
	<u>Number</u>	<u>1,000 cu. ft.</u>					
New England.....	35	15,298	5,439	20,737	9,866	3,640	13,506
Middle Atlantic.....	135	57,980	45,183	103,163	40,283	33,830	74,113
East North Central.....	91	45,232	43,478	88,710	31,571	31,199	62,770
West North Central.....	69	32,685	19,982	52,667	23,694	14,864	38,558
South Atlantic.....	99	24,027	17,056	41,083	18,161	12,798	30,959
East South Central.....	32	8,101	5,210	13,311	5,935	4,064	9,999
West South Central.....	49	17,834	7,833	25,667	12,905	5,932	18,837
Mountain.....	27	6,009	2,004	8,013	4,571	1,556	6,127
Pacific.....	129	49,585	22,390	71,975	36,575	16,328	52,903
United States.....	666	256,751	168,575	425,326	183,561	124,211	307,772

Table 5.—Refrigerated storage capacity of private and semiprivate general warehouses, by regions, October 1, 1953

Region	Plants	Gross space			Net piling space		
		Freezer	Cooler	Total	Freezer	Cooler	Total
	<u>Number</u>	<u>1,000 cu. ft.</u>					
New England.....	27	1,680	806	2,486	1,298	639	1,937
Middle Atlantic.....	94	4,719	5,602	10,321	3,504	4,294	7,798
East North Central.....	114	13,199	11,741	24,940	8,091	8,840	16,931
West North Central.....	37	6,141	2,263	8,404	4,419	1,571	5,990
South Atlantic.....	44	15,209	2,230	17,439	11,778	1,991	13,769
East South Central.....	7	506	201	707	387	119	506
West South Central.....	20	1,123	1,216	2,339	859	869	1,728
Mountain.....	16	1,419	341	1,760	1,143	238	1,381
Pacific.....	140	14,610	18,535	33,145	11,341	13,593	24,934
United States.....	499	58,606	42,935	101,541	42,820	32,154	74,974

concentrating plants, totaled more than 17,000,000 cubic feet. Over 15,000,000 of this capacity was in the freezer range. No other region with private and semiprivate facilities had as much capacity. Yet the South Atlantic area ranked third, because private and semiprivate space in the East North Central States also was substantially larger.

Meat-Packing Plants

Space reported by meat packers, exclusive of smoking and curing rooms, chill space, working space, and similar nonstorage rooms, totaled 79,089,000 gross cubic feet (table 6). About two-fifths of this capacity was in the West North Central region, primarily in Minnesota, Iowa, and Missouri. The East North Central region accounted for an additional one-fourth, because storage space in Illinois is large.

Other regions reporting sizable capacities in meat packing plants were: Middle Atlantic, West South Central, and Pacific.

Apple Houses

Approximately 3 of every 10 refrigerated warehouses in the country were used exclusively for storing apples or pears. This industry's storage capacity of 142,094,000 gross cubic feet (table 7) comprised almost one-fifth of the national total (fig. 2). Nearly all of its capacity, however, was in coolers and it was equivalent to more than one-third of the cooler space in the Nation.

Three regions accounted for most of the apple storage industry--The Pacific, Middle Atlantic, and South Atlantic regions. In the order named, their respective capacities accounted for 57 percent, 18 percent, and 14 percent of the national total. Washington was by far the leading State on the west coast, New York in the Middle Atlantic region, and Virginia in the South Atlantic. Over two-thirds of the total apple house capacity was located in these three States; Washington, alone, having almost half of the national total.

A noticeable trend in the apple storage industry was the shift to nonpublic facilities. Only 10 years ago, public apple storage space exceeded that in private and semiprivate facilities. However, in the decade since the 1943 survey, the capacity of nonpublic facilities increased steadily but public capacity was little changed. By 1953, only about one-fourth of the apple house space was classified as public (table 8). The remainder--over 100,000,000 gross cubic feet--was private and semiprivate. Public apple house space appeared to be located principally in the Middle Atlantic and South Atlantic States, while private and semiprivate warehousing activities prevailed on the west coast.

Table 6.—Refrigerated storage capacity of meat-packing plants, by regions, October 1, 1953

Region	Plants	Gross space			Net piling space		
		Freezer	Cooler	Total	Freezer	Cooler	Total
	<u>Number</u>	<u>1,000 cu. ft.</u>					
New England.....	5	922	110	1,032	574	84	658
Middle Atlantic.....	37	1,763	7,065	8,828	958	4,419	5,377
East North Central.....	45	6,997	13,924	20,921	4,415	10,055	14,470
West North Central.....	43	13,525	17,909	31,434	8,507	11,826	20,333
South Atlantic.....	13	682	1,373	2,055	457	1,016	1,473
East South Central.....	11	508	729	1,237	329	529	858
West South Central.....	15	2,227	3,861	6,088	1,846	3,280	5,126
Mountain.....	11	1,501	1,114	2,615	1,064	764	1,828
Pacific.....	18	1,117	3,762	4,879	691	2,816	3,507
United States.....	198	29,242	49,847	79,089	18,841	34,789	53,630

Table 7.—Refrigerated storage capacity of apple houses, all types, by regions, October 1, 1953

Region	Plants	Gross space			Net piling space		
		Freezer	Cooler	Total	Freezer	Cooler	Total
	<u>Number</u>	<u>1,000 cu. ft.</u>					
New England.....	121	33	7,001	7,034	23	5,639	5,662
Middle Atlantic.....	160	674	24,348	25,022	560	20,183	20,743
East North Central.....	84	101	6,792	6,893	75	5,354	5,429
West North Central.....	7	6	944	950	5	735	740
South Atlantic.....	51	587	19,148	19,735	489	15,899	16,388
East South Central and							
West South Central.....	3	11	502	513	10	407	417
Mountain and Pacific.....	183	1,317	80,630	81,947	1,090	65,331	66,421
United States.....	609	2,729	139,365	142,094	2,252	113,548	115,800

Table 8.—Refrigerated storage capacity of public apple houses, by regions, October 1, 1953

Region	Plants	Gross space			Net piling space		
		Freezer	Cooler	Total	Freezer	Cooler	Total
	<u>Number</u>	<u>1,000 cu. ft.</u>					
New England.....	6	7	982	989	6	764	770
Middle Atlantic.....	35	583	11,111	11,997	480	9,445	9,925
East North Central.....	17	40	2,907	2,947	31	2,275	2,306
West North Central.....	5	2	639	641	2	490	492
South Atlantic.....	18	146	13,432	13,578	121	11,062	11,183
West South Central and Mountain.....	3	11	136	147	10	107	117
Pacific.....	23	328	10,517	10,845	260	8,788	9,048
United States.....	107	1,117	40,027	41,144	910	32,931	33,841

Table 9.—Refrigerated storage capacity of private and semiprivate apple houses, by regions, October 1, 1953

Region	Plants	Gross space			Net piling space		
		Freezer	Cooler	Total	Freezer	Cooler	Total
	<u>Number</u>	<u>1,000 cu. ft.</u>					
New England.....	115	26	6,019	6,045	17	4,875	4,892
Middle Atlantic.....	125	91	12,934	13,025	80	10,738	10,818
East North Central and West North Central.....	69	65	4,190	4,255	47	3,324	3,371
South Atlantic and East South Central.....	34	441	6,091	6,532	368	5,144	5,512
Mountain and Pacific.....	159	989	70,104	71,093	830	56,536	57,366
United States.....	502	1,612	99,338	100,950	1,342	80,617	81,959

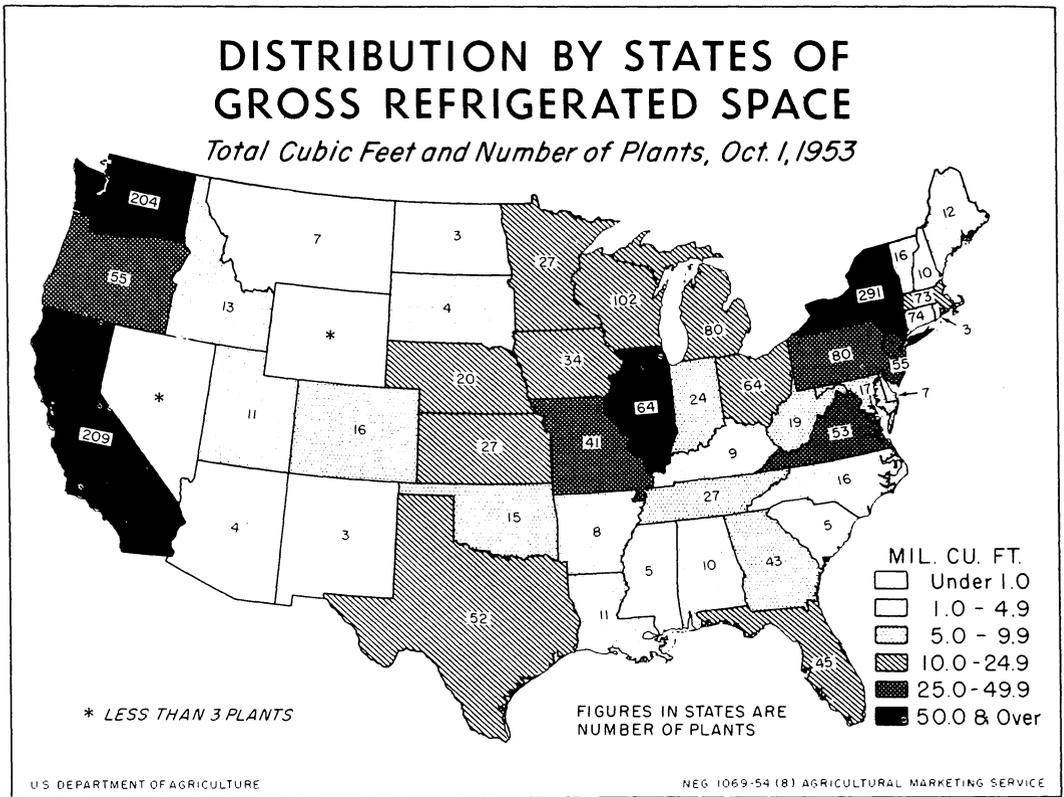


Figure 4.

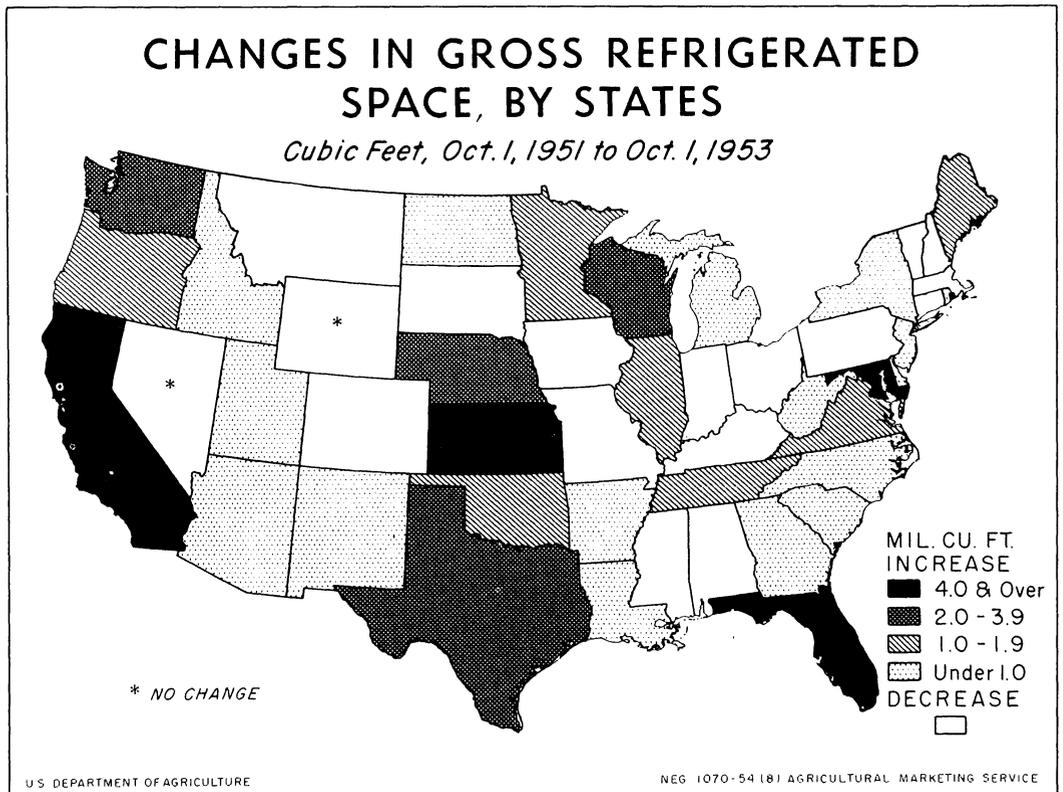


Figure 5.

REFRIGERATED STORAGE CAPACITY, BY STATES

A wide range of tasty and nutritious fruit juices are on the market for use as foods and beverages. They are consumed in such enormous quantities that it has been said that in the United States certain fruits and green vegetables are not eaten but drunk. g/

This observation by Europeans of the American market for frozen foods and juices illustrates the important role played by the refrigerated warehousing industry in sustaining high nutritional levels in this country. Excluding locker plants, refrigerated facilities can be found in every State; collectively, they number almost 2,000. Their distribution, by States, is shown in table 10.

The historical practice of locating facilities in or near areas of large urban population contributed to the preponderance of storage space in States east of the Mississippi River. Gains in cumulative capacity since 1890, the date generally accepted as the beginning of the refrigerated warehousing industry, have sustained the advantage of eastern States over those west of the Mississippi.

It is evident with each biennial survey in recent years, however, that this capacity advantage is dwindling as a result of a more rapid growth of storage space in western States. Indicative of this is the change in the past two surveys. In 1951, the capacity advantage in favor of eastern States was 94,198,000 gross cubic feet, while in 1953 this had diminished to 84,008,000 cubic feet. Thus, in the 2-year interval since the previous survey, the gain in western capacity was at least 10,000,000 cubic feet larger than the gain in the East.

The relative national ranking of States with the greatest capacity remained unchanged during this period. New York, Washington, California, and Illinois, in the order named, continued to be the leaders (fig. 4). But there were some significant changes within this group that foretell a possible new order of national ranking in 1955.

The 1953 difference in capacity between New York and Washington was only 393,000 cubic feet, in contrast to a disparity of almost 2,000,000 cubic feet in 1951. Had it not been for the substantial public general capacity located in New York State, Washington would have surpassed New York in national ranking. The net gain in New York's capacity since 1951 totaled less than 1,000,000 cubic feet, compared with more than 2,000,000 in Washington (fig. 5).

Although California reported the largest total net increase for any State, she could not advance her relative national ranking. As in Washington, substantial gains were reported in public general warehouse space, which accounted for California's rank of second only to New York with respect to this type of warehousing (table 11). However, public general space in Illinois has increased materially, too, since 1951 but it still was slightly less than the capacity in California. The total capacity advantage of California over Illinois, almost 8,000,000 cubic feet, was in the great number of private and semiprivate facilities within her borders. California accounted for more than one-fifth of all

g/ The Organisation for European Economic Co-operation. *op cit.*, p. 311.

Table 10.--Total refrigerated storage capacity of all types of warehouses, by States,
October 1, 1953

State	Plants	Gross space			Net piling space		
		Freezer	Cooler	Total	Freezer	Cooler	Total
	Number	cu. ft.	cu. ft.	cu. ft.	cu. ft.	cu. ft.	cu. ft.
Maine.....	12	1,000	1,000	1,000	1,000	1,000	1,000
New Hampshire.....	10	1,714	696	2,410	1,335	524	1,859
Vermont.....	16	86	427	513	73	364	437
Massachusetts.....	16	379	757	1,136	292	622	914
Rhode Island.....	73	13,808	8,036	21,844	8,720	5,722	14,442
Connecticut.....	3	1,211	435	1,646	815	311	1,126
	74	735	3,005	3,740	526	2,459	2,985
New York.....	291	31,151	56,500	87,651	22,324	43,855	66,179
New Jersey.....	55	19,401	10,125	29,526	12,959	7,090	20,049
Pennsylvania.....	80	14,584	15,573	30,157	10,022	11,781	21,803
Ohio.....	64	11,290	10,687	21,977	8,075	7,746	15,821
Indiana.....	24	3,524	2,960	6,484	2,661	1,935	4,596
Illinois.....	64	35,479	35,309	70,788	21,945	25,266	47,211
Michigan.....	80	9,979	11,700	21,679	7,344	8,855	16,199
Wisconsin.....	102	5,257	15,279	20,536	4,127	11,646	15,773
Minnesota.....	27	10,959	4,011	14,970	7,801	2,759	10,560
Iowa.....	34	9,224	4,415	13,639	6,681	3,042	9,723
Missouri.....	41	13,996	13,133	27,129	9,533	8,325	17,858
North Dakota.....	3	298	255	553	196	243	439
South Dakota.....	4	1,548	2,796	4,344	1,240	2,118	3,358
Nebraska.....	20	10,133	4,333	14,466	6,897	3,110	10,007
Kansas.....	27	6,199	12,155	18,354	4,277	9,399	13,676
Delaware.....	7	1,022	719	1,741	765	578	1,343
Maryland & Dist. of Col.	19	9,282	2,202	11,484	6,678	1,679	8,357
Virginia.....	53	4,308	23,292	27,600	3,418	18,619	22,037
West Virginia.....	19	1,048	5,139	6,187	860	4,379	5,239
North Carolina.....	16	1,129	1,255	2,384	855	987	1,842
South Carolina.....	5	283	124	407	205	101	306
Georgia.....	43	4,274	5,236	9,510	3,435	4,197	7,632
Florida.....	45	19,159	1,840	20,999	14,669	1,164	15,833
Kentucky.....	9	1,585	1,544	3,129	1,104	1,101	2,205
Tennessee.....	27	6,184	3,647	9,831	4,505	2,820	7,325
Alabama.....	10	1,043	856	1,899	805	700	1,505
Mississippi.....	5	303	468	771	237	398	635
Arkansas.....	8	797	508	1,305	558	360	918
Louisiana.....	11	2,566	1,209	3,775	2,045	1,024	3,069
Oklahoma.....	15	2,786	3,083	5,869	2,029	2,495	4,524
Texas.....	52	15,046	8,237	23,283	10,988	6,302	17,290
Montana.....	7	225	240	465	176	208	384
Idaho & Wyoming.....	14	2,081	1,002	3,083	1,591	759	2,350
Colorado.....	16	3,717	1,498	5,215	2,899	1,142	4,041
New Mexico.....	3	145	155	300	107	114	221
Arizona.....	4	577	158	735	355	111	466
Utah & Nevada.....	12	2,184	885	3,069	1,650	593	2,243
Washington.....	204	17,617	69,641	87,258	12,920	56,456	69,376
Oregon.....	55	12,600	13,072	25,672	10,186	9,512	19,698
California.....	209	36,412	42,125	78,537	26,591	31,731	58,322
United States.....	1,972	347,328	400,722	748,050	247,474	304,702	552,176

such space in the Nation and was the leading center for this industry (table 12). Illinois' leadership was in meat packing space (table 13).

Thus, the four leading States were each leaders themselves in a particular phase of warehousing. New York surpassed all others in public general warehousing; Washington excelled in apple storage (tables 14, 15, and 16); California had the most private and semiprivate space; and Illinois had the greatest concentration of meat-packing space.

Significantly, these States represent the eastern, midwestern, and far western sections of our country. Collectively, they accounted for one-third of the Nation's freezer space and two-fifths of the national cooler space. They are States containing large urban populations as well as centers of food production, and this fact accounts for their preeminence in the warehousing field.

Table 11.—Refrigerated storage capacity of public general warehouses, by States, October 1, 1953

State	Plants	Gross space			Net piling space		
		Freezer	Cooler	Total	Freezer	Cooler	Total
	Number	1,000 cu. ft.					
Maine & New Hampshire..	7	1,566	619	2,185	1,221	462	1,683
Massachusetts.....	23	12,105	4,358	16,463	7,539	2,845	10,384
R. I. & Connecticut....	5	1,627	462	2,089	1,106	333	1,439
New York.....	82	27,106	29,839	56,945	19,477	22,852	42,329
New Jersey.....	19	18,117	7,095	25,212	12,138	4,711	16,849
Pennsylvania.....	34	12,757	8,249	21,006	8,668	6,267	14,935
Ohio.....	18	10,081	6,870	16,951	7,309	4,774	12,083
Indiana.....	6	2,426	959	3,385	1,831	644	2,475
Illinois.....	32	23,053	22,208	45,261	15,111	15,671	30,782
Michigan.....	15	7,265	5,726	12,991	5,308	4,096	9,404
Wisconsin.....	20	2,407	7,715	10,122	2,012	6,014	8,026
Minnesota.....	12	6,633	1,588	8,221	5,001	1,085	6,086
Iowa.....	13	4,158	883	5,041	3,296	609	3,905
Missouri & N. D.....	24	12,118	7,252	19,370	8,512	5,165	13,677
Nebraska & S. D.....	7	5,820	969	6,789	3,976	732	4,708
Kansas.....	13	3,956	9,290	13,246	2,909	7,273	10,182
Delaware.....	4	1,007	140	1,147	750	105	855
Maryland & Dist. of Col.	11	8,955	1,091	10,046	6,382	767	7,149
Virginia.....	17	2,957	7,689	10,646	2,362	5,797	8,159
West Virginia.....	3	608	1,355	1,963	496	1,014	1,510
North Carolina & S. C..	10	957	657	1,614	694	482	1,176
Georgia.....	31	2,943	4,329	7,272	2,396	3,504	5,900
Florida.....	23	6,600	1,795	8,395	5,081	1,129	6,210
Kentucky.....	4	1,362	1,223	2,585	953	889	1,842
Tennessee.....	17	5,444	2,670	8,114	3,974	2,081	6,055
Alabama.....	7	998	849	1,847	775	696	1,471
Mississippi.....	4	297	468	765	233	398	631
Arkansas.....	4	700	372	1,072	488	256	744
Louisiana.....	8	1,938	1,151	3,089	1,512	972	2,514
Oklahoma.....	7	1,639	883	2,522	1,120	602	1,722
Texas.....	30	13,557	5,427	18,984	9,755	4,102	13,857
Idaho & Montana.....	8	1,237	382	1,619	868	304	1,172
Colorado.....	8	2,389	928	3,317	1,906	730	2,636
New Mexico & Arizona...	5	624	206	830	392	147	539
Utah & Nevada.....	6	1,759	488	2,247	1,405	375	1,780
Washington.....	30	11,188	3,384	14,572	7,974	2,091	10,065
Oregon.....	18	8,564	2,697	11,261	6,845	2,039	8,884
California.....	81	29,833	16,309	46,142	21,756	12,198	33,954
United States.....	666	256,751	168,575	425,326	183,561	124,211	307,772

Table 12.—Refrigerated storage capacity of private and semiprivate general warehouses, by States, October 1, 1953 ^{1/}

State	Plants Number	Gross space			Net piling space		
		Freezer	Cooler	Total	Freezer	Cooler	Total
		1,000 cu. ft.					
Maine & New Hampshire..	6	234	29	263	187	24	211
Vermont.....	3	371	-	371	285	-	285
Massachusetts.....	15	849	673	1,522	650	545	1,195
Rhode Island & Conn....	3	226	104	330	176	70	246
New York.....	75	2,709	4,054	6,763	1,886	2,993	4,879
New Jersey.....	7	580	363	943	505	292	797
Pennsylvania.....	12	1,430	1,185	2,615	1,113	1,009	2,122
Ohio.....	12	536	261	797	423	222	645
Indiana.....	5	571	497	1,068	518	403	921
Illinois.....	7	9,150	4,123	13,273	4,876	2,934	7,810
Michigan.....	16	2,228	1,823	4,051	1,752	1,461	3,213
Wisconsin.....	74	714	5,037	5,751	522	3,820	4,342
Minnesota.....	9	1,442	128	1,570	1,152	97	1,249
Iowa.....	9	1,112	663	1,775	755	503	1,258
Missouri.....	3	370	413	783	232	305	537
Nebraska & So. Dakota..	10	2,088	695	2,783	1,533	439	1,972
Kansas.....	6	1,129	364	1,493	747	227	974
Maryland & Delaware....	4	302	195	497	272	119	391
Virginia & W. Virginia.	6	1,216	1,514	2,730	940	1,416	2,356
North Carolina.....	4	215	230	445	188	211	399
South Carolina.....	3	215	4	219	159	3	162
Georgia.....	5	702	242	944	631	207	838
Florida.....	22	12,559	45	12,604	9,588	35	9,623
Tennessee.....	3	312	3	315	257	3	260
Oklahoma.....	3	138	136	274	100	103	203
Texas.....	14	299	1,022	1,321	219	714	933
Montana.....	4	83	42	125	69	37	106
Idaho.....	5	947	191	1,138	799	123	922
Colorado.....	3	306	96	402	214	71	285
Utah.....	4	83	12	95	61	7	68
Washington.....	33	5,605	976	6,581	4,348	837	5,185
Oregon.....	21	3,836	1,141	4,977	3,234	820	4,054
California.....	86	5,169	16,418	21,587	3,759	11,936	15,695
Other States.....	7	880	256	1,136	670	168	838
United States.....	499	58,606	42,935	101,541	42,820	32,154	74,974

^{1/} Only those States having 3 or more warehouses are listed.

Table 13.--Refrigerated storage capacity of meat-packing plants, by States, October 1, 1953 ^{1/}

State	Plants Number	Gross space			Net piling space		
		Freezer 1,000 cu. ft.	Cooler 1,000 cu. ft.	Total 1,000 cu. ft.	Freezer 1,000 cu. ft.	Cooler 1,000 cu. ft.	Total 1,000 cu. ft.
Massachusetts.....	3	833	38	871	517	23	540
New York.....	21	838	4,987	5,825	560	3,452	4,012
New Jersey.....	3	661	184	845	281	103	384
Pennsylvania.....	13	264	1,894	2,158	117	864	981
Ohio.....	13	652	2,445	3,097	325	1,853	2,178
Indiana.....	9	527	788	1,315	312	445	757
Illinois.....	13	3,276	6,963	10,239	1,958	5,122	7,080
Michigan.....	3	406	1,227	1,633	227	847	1,074
Wisconsin.....	7	2,136	2,501	4,637	1,593	1,788	3,381
Minnesota.....	6	2,884	2,295	5,179	1,648	1,577	3,225
Iowa.....	12	3,954	2,869	6,823	2,630	1,930	4,560
Missouri & North Dakota	12	1,800	4,923	6,723	980	2,477	3,457
Nebraska & South Dakota	11	3,773	5,465	9,238	2,628	4,057	6,685
Kansas.....	6	1,114	2,357	3,471	621	1,785	2,406
Georgia.....	7	629	665	1,294	408	486	894
Kentucky & Alabama.....	5	80	130	210	55	100	155
Tennessee.....	6	428	599	1,027	274	429	703
Oklahoma.....	5	1,009	2,064	3,073	809	1,790	2,599
Texas.....	8	1,190	1,788	2,978	1,014	1,486	2,500
Colorado.....	5	1,022	474	1,496	779	341	1,120
Washington & Oregon....	9	697	1,698	2,395	446	1,316	1,762
California.....	9	420	2,064	2,484	245	1,500	1,745
Other States.....	12	649	1,429	2,078	414	1,018	1,432
United States.....	198	29,242	49,847	79,089	18,841	34,789	53,630

^{1/} Only those States having 3 or more warehouses are listed.

Table 14.—Refrigerated storage capacity of apple houses, all types, by States, October 1, 1953 ^{1/}

State	Plants	Gross space			Net piling space		
		Freezer	Cooler	Total	Freezer	Cooler	Total
	<u>Number</u>	<u>1,000 cu. ft.</u>					
New Hampshire.....	8	-	403	403	-	341	341
Vermont.....	13	8	757	765	7	622	629
Massachusetts.....	32	21	2,967	2,988	14	2,309	2,323
Connecticut.....	68	4	2,874	2,878	2	2,367	2,369
New York.....	113	498	17,620	18,118	401	14,558	14,959
New Jersey.....	26	43	2,483	2,526	35	1,984	2,019
Pennsylvania.....	21	133	4,245	4,378	124	3,641	3,765
Ohio.....	21	21	1,111	1,132	18	897	915
Indiana.....	4	-	716	716	-	443	443
Illinois.....	12	-	2,015	2,015	-	1,539	1,539
Michigan & Wisconsin..	47	80	2,950	3,030	57	2,475	2,532
Missouri.....	5	6	800	806	5	621	626
Delaware & Maryland...	5	-	1,166	1,166	-	986	986
Virginia.....	30	146	13,912	14,058	121	11,317	11,438
West Virginia.....	13	429	3,661	4,090	359	3,270	3,629
North Carolina.....	3	12	409	421	9	326	335
Washington.....	134	327	63,801	64,128	259	52,376	52,635
Oregon.....	14	-	9,016	9,016	-	6,489	6,489
California.....	33	990	7,334	8,324	831	6,097	6,928
Other States.....	7	11	1,125	1,136	10	890	900
United States.....	609	2,729	139,365	142,094	2,252	113,548	115,800

^{1/} Only those States having 3 or more warehouses are listed.

Table 15.—Refrigerated storage capacity of public apple houses, by States, October 1, 1953 1/

State	Plants Number	Gross space			Net piling space		
		Freezer 1,000 cu. ft.	Cooler 1,000 cu. ft.	Total 1,000 cu. ft.	Freezer 1,000 cu. ft.	Cooler 1,000 cu. ft.	Total 1,000 cu. ft.
Massachusetts & Conn..	6	7	982	989	6	764	770
New York.....	24	463	8,644	9,107	370	7,055	7,425
New Jersey.....	6	27	1,049	1,076	24	850	874
Pennsylvania.....	5	93	1,721	1,814	86	1,540	1,626
Ohio & Indiana.....	7	5	998	1,003	5	691	696
Illinois.....	5	-	1,258	1,258	-	1,040	1,040
Michigan.....	5	35	651	686	26	544	570
Missouri & Kansas.....	5	2	639	641	2	490	492
Virginia.....	12	146	11,056	11,202	121	8,940	9,061
West Virginia.....	3	-	1,939	1,939	-	1,784	1,784
Washington.....	18	327	9,863	10,190	259	8,214	8,473
Oregon & California...	5	1	654	655	1	574	575
Other States.....	6	11	573	584	10	445	455
United States.....	107	1,117	40,027	41,144	910	32,931	33,841

1/ Only those States having 3 or more warehouses are listed.

Table 16.—Refrigerated storage capacity of private and semiprivate apple houses, by States, October 1, 1953 1/

State	Plants Number	Gross space			Net piling space		
		Freezer 1,000 cu. ft.	Cooler 1,000 cu. ft.	Total 1,000 cu. ft.	Freezer 1,000 cu. ft.	Cooler 1,000 cu. ft.	Total 1,000 cu. ft.
New Hampshire.....	8	-	403	403	-	341	341
Vermont.....	13	8	757	765	7	622	629
Massachusetts.....	29	14	2,334	2,348	8	1,838	1,846
Connecticut.....	65	4	2,525	2,529	2	2,074	2,076
New York.....	89	35	8,976	9,011	31	7,503	7,534
New Jersey.....	20	16	1,434	1,450	11	1,134	1,145
Pennsylvania.....	16	40	2,524	2,564	38	2,101	2,139
Ohio & Indiana.....	18	16	829	845	13	649	662
Illinois.....	7	-	757	757	-	499	499
Michigan & Wisconsin..	42	45	2,299	2,344	31	1,931	1,962
Maryland.....	3	-	742	742	-	660	660
Virginia.....	18	-	2,856	2,856	-	2,377	2,377
West Virginia.....	10	429	1,722	2,151	359	1,486	1,845
Washington.....	116	-	53,938	53,938	-	44,162	44,162
Oregon & California...	42	989	15,696	16,685	830	12,012	12,842
Other States.....	6	16	1,546	1,562	12	1,228	1,240
United States.....	502	1,612	99,338	100,950	1,342	80,617	81,959

1/ Only those States having 3 or more warehouses are listed.

REFRIGERATED WAREHOUSE CAPACITY, BY CITIES

To offset the constant shift in our population from farms to cities, food conservation became an economic necessity. ^{9/} For preserving perishable products in their original condition, low-temperature storage has great advantages.

Accompanying the trend of farm population to cities and the growth of urban areas, there was an increase in warehouse space in concentration and terminal market areas. Historically, these areas always had a preponderance of the national refrigerated capacity. Facilities close to points of production were considered uneconomical because of the difficulty in assembling a sufficient volume of products for storage throughout the year.

Within recent years, however, as a result of increased frozen food production, warehouse facilities were being located nearer to points of production so as to have the advantage of processing products within a short time after harvest. While this gave rise to the growth of new storage areas, it did not reduce the importance of the historical centers of storage, for facilities in these centers still are major arteries through which production-point stocks are moved.

Listed in table 17 are cities with 3 or more warehouses having a gross capacity of at least 3 million cubic feet in 1953. Except for those centers engaged primarily in the storage of apples on the east and west coasts, almost all of the cities listed are concentration or terminal market points. There were as many centers in 1953 east of the Mississippi River as west, but the western cities, with a collective capacity of 206,999,000 cubic feet, were outranked by the cities east of the Mississippi, where warehouse capacity totaled 251,166,000 cubic feet.

The gross warehouse capacity of Chicago, the first ranking city, was more than one-third greater than that of the second ranking city, New York. Chicago had 61,189,000 cubic feet, although this storage capacity was in fewer warehouses than were reported in operation in New York. The importance of the apple storage industry in the State of Washington was indicated by the ranking of Yakima as third and Wenatchee as fifth on the basis of gross warehouse space. St. Louis, also west of the Mississippi, ranked fourth.

Although the ranking of these cities was identical to that in 1951, Chicago strengthened its hold on first place with an increase of almost 4,000,000 cubic feet, while in St. Louis, warehouse space was reduced by a like amount. This space loss, however, was accounted for by the exclusion of smoking and curing space in meat packing plants in 1953, which was not excluded in the 1951 survey. For New York, Yakima, and Wenatchee, warehouse capacity was not changed significantly. Adjustments, up or down, were not of sufficient size to affect their relative rank among the first five cities.

The next five leading cities were Los Angeles, Philadelphia, Dallas-Ft. Worth, San Jose, and Boston. By comparison, in 1951 Los Angeles was seventh; Philadelphia, ninth; Dallas-Ft. Worth, eighth; San Jose, eleventh; and Boston, sixth. Rochester, which was among the first ten in 1951, was not in this group when the 1953 rankings were compiled.

^{9/} Heitz, Thomas W. The Cold Storage of Eggs and Poultry. U. S. Dept. Agr. Cir. 73, p. 1. 1940 (rev.).

Table 17.—Total refrigerated storage capacity in cities having 3 or more warehouses and at least 3 million cubic feet net piling space, October 1, 1953 ^{1/}

City and State	Plants Number	Gross space			Net piling space		
		Freezer	Cooler	Total	freezer	Cooler	Total
		1,000 cu. ft.					
Boston, Mass.....	25	10,549	3,671	14,220	6,260	2,359	8,619
New York, N. Y.....	57	27,036	18,527	45,563	17,934	12,980	30,914
Buffalo, N. Y.....	16	3,688	2,569	6,257	2,661	2,042	4,703
Rochester, N. Y.....	20	3,081	9,694	12,775	2,236	7,562	9,798
Albany, N. Y.....	12	1,890	3,262	5,152	1,394	2,455	3,849
Poughkeepsie, N. Y....	64	1,265	8,402	9,667	1,109	7,050	8,159
Medina, N. Y.....	23	1,551	6,534	8,085	1,263	5,064	6,327
Geneva, N. Y.....	10	1,026	4,796	5,822	765	3,783	4,548
Bridgeton, N. J.....	8	3,579	897	4,476	2,764	631	3,395
Philadelphia, Pa.....	26	9,599	5,645	15,244	5,897	4,081	9,978
Pittsburgh, Pa.....	4	2,595	2,833	5,428	1,922	1,828	3,750
Cleveland, Ohio.....	13	5,142	5,175	10,317	3,626	3,423	7,049
Chicago, Ill.....	33	33,528	27,661	61,189	20,568	19,389	39,957
Detroit, Mich.....	11	6,279	5,597	11,876	4,446	4,008	8,454
Milwaukee, Wis.....	8	2,101	1,929	4,030	1,614	1,539	3,153
Green Bay, Wisc.....	14	797	4,613	5,410	645	3,694	4,339
Minn.-St. Paul, Minn..	10	5,197	3,081	8,278	3,432	2,205	5,637
St. Louis, Mo.....	20	7,447	9,894	17,341	5,089	6,980	12,069
Kansas City, Kans. & Mo	7	5,666	2,353	8,019	3,879	1,716	5,595
Wichita, Kans.....	5	1,633	2,488	4,121	1,292	1,890	3,182
Omaha, Nebr.....	11	9,165	3,402	12,567	6,194	2,432	8,626
Baltimore, Md.....	7	4,181	397	4,578	3,039	253	3,292
Winchester, Va.....	17	1,021	11,368	12,389	910	9,813	10,723
Waynesboro, Va.....	8	351	3,827	4,178	313	3,216	3,529
Nashville, Tenn.....	7	2,980	1,530	4,510	2,231	1,266	3,497
Oklahoma City, Okla...	4	2,014	2,050	4,064	1,487	1,766	3,253
Dallas-Ft. Worth, Tex.	12	11,540	3,544	15,084	8,452	2,806	11,258
Seattle, Wash.....	17	5,102	2,947	8,049	3,509	1,795	5,304
Yakima, Wash.....	62	999	29,236	30,235	807	24,047	24,854
Wenatchee, Wash.....	33	899	16,271	17,170	760	13,766	14,526
Brewster, Wash.....	17	-	10,280	10,280	-	8,039	8,039
Tonasket, Wash.....	13	-	5,045	5,045	-	4,231	4,231
Portland, Oreg.....	14	5,391	1,158	6,549	4,551	889	5,440
Medford, Oreg.....	7	300	4,085	4,385	217	3,170	3,387
Hood River, Oreg.....	8	-	6,929	6,929	-	4,867	4,867
Los Angeles, Calif....	26	9,291	7,196	16,487	6,955	4,744	11,699
San Francisco, Calif..	18	4,264	5,091	9,355	3,286	4,062	7,348
San Jose, Calif.....	32	5,384	9,001	14,385	3,828	7,108	10,936
Sacramento, Calif.....	5	2,754	1,353	4,107	2,167	1,103	3,270
Modesto, Calif.....	7	2,669	1,880	4,549	1,915	1,339	3,254
Total.....	711	201,954	256,211	458,165	139,417	195,391	334,808

^{1/} Includes the city and surrounding territory within a radius of 25 miles.

Public General Warehouses

The practice of locating warehouses in heavily populated cities accounted for the leadership of New York and Chicago as centers for public general warehousing. New York had the greatest number and capacity of public general warehouses of any city. On October 1, 1953, the 27 plants in the city and within a 25-mile radius of it had a collective gross capacity of 40,356,000 cubic feet. The net gain of more than 4,000,000 cubic feet since 1951 was a result of remodeling, expansion, and reclassification of nonpublic operations to public. Chicago's public general warehouse space, too, increased since 1951. The second ranking city increased its space for the public's use by more than 9,000,000 gross cubic feet to bring the city total up to 40,279,000 cubic feet. This capacity almost enabled Chicago to recapture first place which was lost in 1949 to New York.

The degree of concentration of public general warehouse space in New York and Chicago is shown in table 18. Each city alone had about as much public net piling space as the combined capacities of Dallas-Ft. Worth, Rochester, and Los Angeles, which ranked third, fourth, and fifth, in the order named.

The relative importance of cities having approximately 2 million cubic feet of net piling space is shown in figure 6. Within the first 10, six were cities east of the Mississippi River, located in Massachusetts, New York, Pennsylvania, Illinois, and Michigan. Significantly, the 10 leading cities controlled almost two-fifths of all the public general cooler and freezer net piling space in the country.

Table 20 shows monthly storage occupancy in public general warehouses. On the average, utilization of warehouse space was at a maximum during the late fall or early winter. The low point generally occurred during the spring.

Meat-Packing Plants

Meat packing space in cities in New York, Illinois, Missouri, Wisconsin, Minnesota, Iowa, Nebraska, and Texas accounted for more than two-fifths of all the gross space in meat packing facilities in the country (table 19). Chicago and St. Louis together had over 13,000,000 gross cubic feet. Omaha was next in order of importance, followed by Minneapolis-St. Paul and New York, in the order named.

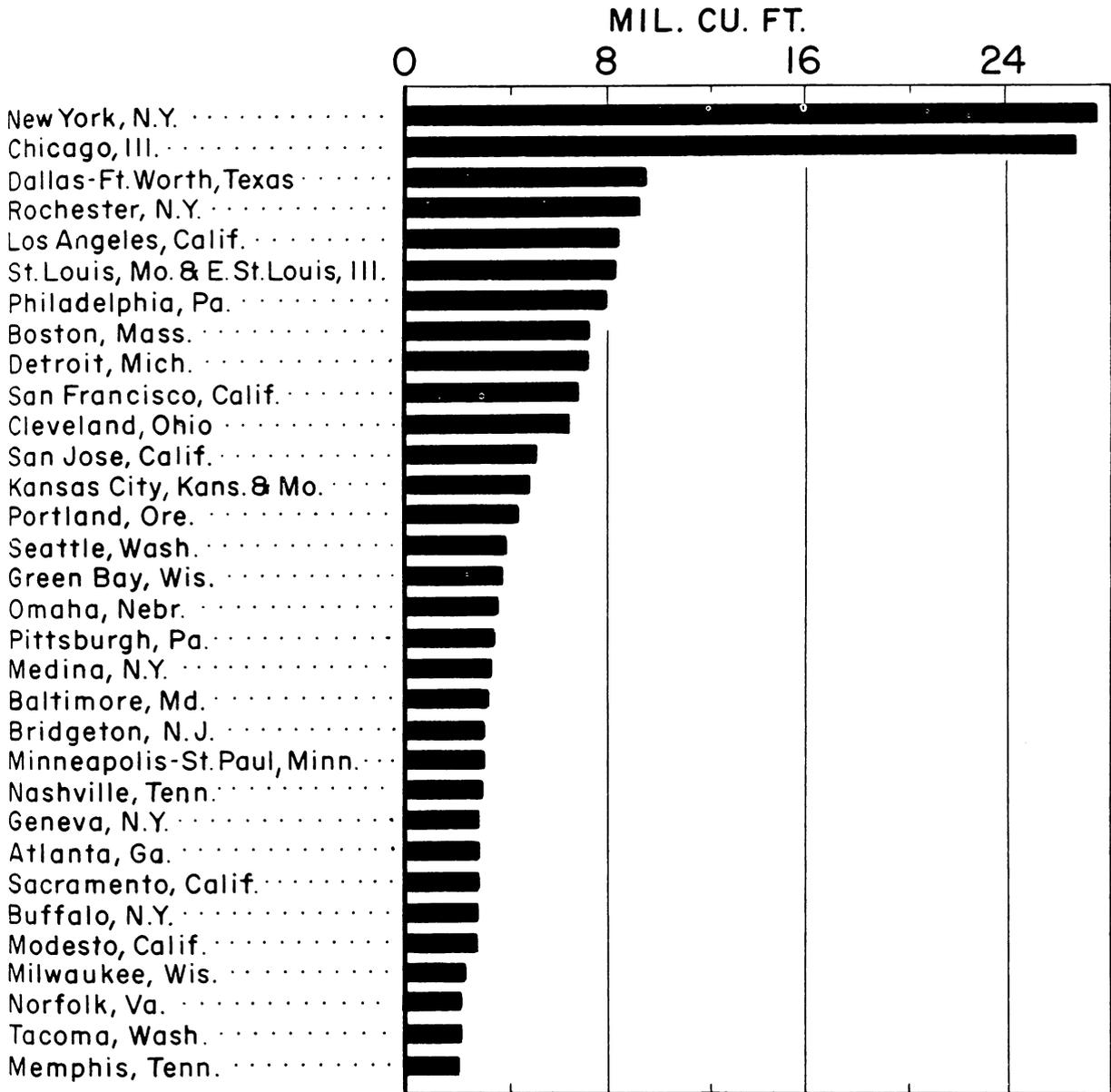
Table 18.—Refrigerated storage capacity in cities having 3 or more public general warehouses and approximately 2 million cubic feet or more net piling space, October 1, 1953 1/

City and State	Plants	Gross space			Net piling space		
		Freezer	Cooler	Total	Freezer	Cooler	Total
	Number	1,000 cu. ft.					
Boston, Mass.....	13	9,618	2,907	12,525	5,684	1,765	7,449
New York, N. Y.....	27	25,843	14,513	40,356	17,250	10,313	27,563
Buffalo, N. Y.....	3	2,934	1,081	4,015	2,054	795	2,849
Rochester, N. Y.....	17	2,972	9,031	12,003	2,161	7,071	9,232
Medina, N. Y.....	8	1,442	2,842	4,284	1,200	2,070	3,270
Geneva, N. Y.....	5	834	2,976	3,810	625	2,256	2,881
Bridgeton, N. J.....	4	3,552	485	4,037	2,739	333	3,072
Philadelphia, Pa.....	12	8,868	3,683	12,551	5,358	2,689	8,047
Pittsburgh, Pa.....	3	2,572	2,208	4,780	1,907	1,582	3,489
Cleveland, Ohio.....	5	4,835	4,486	9,321	3,435	3,061	6,496
Chicago, Ill.....	20	22,214	18,065	40,279	14,444	12,366	26,810
Detroit, Mich.....	7	6,047	4,251	10,298	4,335	3,072	7,407
Green Bay, Wis.....	4	538	4,194	4,732	443	3,400	3,843
Milwaukee, Wis.....	4	1,454	1,356	2,810	1,232	1,082	2,314
Minn.—St. Paul, Minn..	7	3,228	1,127	4,355	2,285	818	3,103
St. Louis, Mo.....	8	5,867	5,689	11,556	4,000	4,277	8,277
Kansas City, Kans. & Mo.	4	4,726	2,014	6,740	3,391	1,470	4,861
Omaha, Nebr.....	3	5,225	276	5,501	3,498	158	3,656
Baltimore, Md.....	5	4,446	269	4,715	3,008	167	3,175
Norfolk, Va.....	5	1,412	1,280	2,692	1,137	966	2,103
Atlanta, Ga.....	5	1,752	1,722	3,474	1,457	1,437	2,894
Nashville, Tenn.....	4	2,581	1,276	3,857	1,967	1,048	3,015
Memphis, Tenn.....	6	2,316	626	2,942	1,558	464	2,022
New Orleans, La.....	5	1,465	1,000	2,465	1,133	843	1,976
Dallas—Ft. Worth, Tex..	9	10,502	2,415	12,917	7,549	1,846	9,395
Seattle, Wash.....	8	4,045	2,293	6,338	2,750	1,205	3,955
Tacoma, Wash.....	7	3,069	193	3,262	1,964	128	2,092
Portland, Oreg.....	7	4,716	661	5,377	4,005	468	4,473
Los Angeles, Calif....	18	8,893	2,358	11,251	6,688	1,678	8,366
San Francisco, Calif..	13	3,949	4,446	8,395	3,095	3,690	6,785
San Jose, Calif.....	9	3,893	3,662	7,555	2,573	2,620	5,193
Modesto, Calif.....	5	2,518	1,435	3,953	1,848	951	2,799
Sacramento, Calif.....	4	2,754	902	3,656	2,168	762	2,930
Total.....	264	170,780	105,722	276,502	118,941	76,851	195,792

1/ Includes the city and surrounding territory within a radius of 25 miles.

CITIES WITH 2 MILLION OR MORE CUBIC FEET NET PILING SPACE

Each Having 3 or More Public General Refrigerated Warehouses



INCLUDES THE CITY AND SURROUNDING TERRITORY WITHIN A 25 MILE RADIUS

Figure 6.

Table 19.—Refrigerated storage capacity in cities having 3 or more meat-packing plants and approximately 2 million cubic feet net piling space, October 1, 1953 ^{1/}

City and State	Plants	Gross space			Net piling space		
		Freezer	Cooler	Total	Freezer	Cooler	Total
	<u>Number</u>	<u>1,000</u> <u>cu. ft.</u>					
New York, N. Y.....	13	951	2,688	3,639	480	1,668	2,148
Chicago, Ill.....	8	2,381	5,568	7,949	1,380	4,134	5,514
St. Louis, Mo.....	11	1,580	3,965	5,545	1,090	2,500	3,590
Madison, Wis.....	3	1,571	1,886	3,457	1,256	1,304	2,560
Minn.—St. Paul, Minn...	3	1,970	1,953	3,923	1,147	1,387	2,534
Sioux City, Iowa.....	3	997	1,699	2,696	584	1,069	1,653
Omaha, Nebr.....	4	2,194	2,801	4,995	1,373	2,059	3,432
Dallas—Ft. Worth, Tex..	3	1,037	1,130	2,167	903	960	1,863
Total.....	48	12,681	21,690	34,371	8,213	15,081	23,294

^{1/} Includes the city and surrounding territory within a radius of 25 miles.

Table 20.—Percentage of net piling space in public general warehouses occupied at end of month, 1942 - 53

Year	Cooler											
	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	<u>Pct.</u>											
1942.....	55	52	55	58	66	68	69	70	74	74	66	60
1943.....	59	57	61	64	68	76	77	77	75	77	73	68
1944.....	68	74	80	82	84	85	84	81	78	80	76	72
1945.....	70	68	67	66	66	65	67	69	67	65	64	60
1946.....	60	62	67	75	77	79	76	80	78	80	77	69
1947.....	65	62	61	65	68	74	77	76	73	76	78	74
1948.....	69	65	59	62	65	67	67	65	64	64	59	54
1949.....	52	48	48	49	50	52	53	53	60	68	67	64
1950.....	59	55	54	54	56	60	61	64	63	72	71	67
1951.....	65	60	60	59	62	65	64	65	65	69	66	63
1952.....	59	57	59	59	61	62	63	64	65	69	67	64
1953.....	61	57	56	57	61	61	62	64	65	70	67	63

Freezer												
1942.....	76	72	67	62	64	69	74	77	79	79	76	75
1943.....	69	64	61	62	67	77	83	87	90	89	89	89
1944.....	89	92	88	85	87	87	89	89	89	86	83	80
1945.....	73	69	65	64	67	73	78	81	82	83	85	85
1946.....	83	81	80	79	80	80	86	88	87	87	85	86
1947.....	84	82	80	73	74	78	79	80	81	83	84	85
1948.....	84	81	75	70	70	71	72	72	71	72	72	72
1949.....	71	68	64	60	59	61	63	66	67	70	73	76
1950.....	75	74	69	67	64	69	71	74	74	78	79	81
1951.....	80	76	72	70	71	73	76	78	81	83	83	83
1952.....	81	81	78	76	77	78	78	77	77	78	78	79
1953.....	79	76	73	70	69	70	73	76	79	81	80	78

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