VOL. XV

SEPTEMBER 1950

A *Survey* OF The CAPACITY of REFRIGERATED STORAGE WAREHOUSES in the United States

AS OF OCTOBER 1, 1949

U.S. DEPARTMENT OF AGRICULTURE
Production and Marketing Administration
Transportation and Warehousing Branch
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SCOPE AND OBJECTIVES OF THE SURVEY

Compilation of information with respect to storage holdings and storage capacity in the Nation's refrigerated warehouses has been the concern of the United States Department of Agriculture for about three decades. A report on storage holdings was first released on December 1, 1914, while the first of the present series of biennial surveys on storage capacity was made on October 1, 1921. All surveys were made as of October 1, except the 1941 survey which was made in June.

For this fifteenth biennial survey of refrigerated storage capacity in the Nation, questionnaires were mailed to all public, private, and semiprivate refrigerated storage facilities, to fruit houses (apple and grape) having artificially cooled storage facilities and to meat-packing plants with refrigerated space used for storage purposes. Every attempt was made to effect complete coverage of the refrigerated warehousing industry by working closely with trade associations and other sources of information to learn of newly constructed refrigerated facilities. It is believed therefore that the coverage of this industry is as complete as possible within the limitations imposed by a voluntary reporting system.

Refrigerated storages included in this survey are facilities artificially cooled to 50° F. or lower wherein foodstuffs are generally stored for 30 days or more. Refrigerated facilities operated by wholesalers, jobbers, or retailers who do not store for a period of 30 days or longer are not included in this survey. Space in lockers of 25 cubic feet or less, plants owned by the Armed Services, the Natural Cooler Storage of the United States Department of Agriculture in Atchison, Kans., and space in plants operated as part of a retail food business, hotel, or other establishment where persons are housed or fed also are not reported.

The replies on all questionnaires on storage capacity were carefully analyzed and checked with previous reports from the warehouse and 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 leased to others, and meat packers were asked to report only that space used for storage purposes.

The primary objectives of these biennial surveys are:

1. To measure the refrigerated storage capacity of the United States and to determine whether it has expanded or decreased since the last survey, by how much, and in which areas.
2. To provide a more accurate basis on which monthly analysis of storage occupancy can be reported in the periodic Cold Storage Report.
3. To provide information upon which an orderly and efficient expansion program can be recommended and by which unneeded plant construction can be discouraged.
4. To aid in locating refrigerated storage space, particularly for heavy seasonal crops, in order to facilitate the preservation of foods.

DEFINITION OF TERMS USED

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 various food commodities for others in his plant 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 in included. Working space, chill rooms, and coolers used exclusively for hanging dressed carcasses prior to shipping are excluded.

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

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.

Cooler: Space capable of being held at temperatures from 29° F. to 50° F.

Freezer: Space capable of being held at temperatures from 0° F. to 29° F.

Sharp freezer: Space capable of being held at 0° F. and below.

Geographic regions used 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.

REFRIGERATED STORAGE CAPACITY IN THE UNITED STATES

Four Percent Increase in Gross Storage Space since 1947: From reports covering warehousing activities in every State, the October 1949 survey indicated our Nation has a refrigerated storage capacity of approximately 701 million cubic feet (table 1). Within the 2-year period since the last biennial survey, refrigerated storage capacity increased 26 million cubic feet, most of which occurred in the Pacific region. Other areas showed slight gains; however, in the West North Central and East South Central sections only, storage capacity fell off but not sharply from the 1947 level.

Refrigerated warehouses in operation on October 1, 1949, totaled 1,849 and were concentrated largely east of the Mississippi, only 668 refrigerated storages being west of the Mississippi. However, the gross refrigerated storage capacity of this third of the Nation's storage warehouses accounted for about two-fifths of the total gross capacity in the United States (table 2).

The classification of gross storage capacity according to temperature range is shown in figure 1 and table 2. Although more than half of the gross storage space in the country can be held only between 30° and 50° F., the lower temperature ranges have made signal gains since 1947. For some time now there has been a trend to convert portions of existing facilities to sharp freezer space and for newly constructed facilities to have significant capacities in this temperature range. A comparison of sharp freezer capacity in 1947 and 1949 shows that during this 2-year period there was a 23-million-cubic-feet increase. Freezer storage (0° F. to 29° F.) capacity remained unchanged, while cooler space increased only 3 million cubic feet since 1947. The fact that more than 88 percent of the national increase in gross refrigerated storage space was attributable to the growth in sharp freezer capacity indicates only in a small way the emphasis placed on zero degree storage space. The best measures of this growth are the relative proportions of gross storage capacity capable of maintaining at least zero degree in the last 10 years. Today, exclusive of space in meat-packing plants1/, 1 out of every 4 cubic feet of gross storage space can be held at zero degree or below; in 1939 only 1 out of 6 cubic feet could be held at this temperature.

NET REFRIGERATED STORAGE CAPACITY

Net piling space may be correctly thought of as a more reliable measure of storage capacity than gross space, for the very reason that it is the actual area used for foodstuffs storage. Because it is not as rigidly defined as gross space, which represents the physical measurements of a room or rooms, net piling space storage capacity is affected by various warehousing practices. Variations within the industry in aisle widths, air space around piles, and location of refrigeration units are just a few of the factors affecting net piling storage capacity. These variances, however, do not affect the utility of net piling

1/ Gross refrigerated storage capacity in meat-packing plants is excluded in the comparison because prior to 1943 all space in meat-packing plants was included in the national total, whereas since that date only space used for storage purpose is reportable.

space as a measure of capacity for, in the final analysis, it reduces all types of warehousing operations to a common denominator. Net piling space is the best measure for evaluating space requirements and for converting cubic capacity to pound capacity.

Total net capacity for all types of refrigerated facilities amounted to 513 million cubic feet--an increase of 16 million cubic feet since 1947 (table 2). Storage space in all temperature ranges did not share in this increase; it was, instead, almost wholly accounted for by gains reported in the sharp freezer capacity. This type of storage space, at 119 million cubic feet, reflected a 15-million-cubic-feet increase over the 1947 level. With the exception of the Middle Atlantic and West North Central geographic divisions, all regions reported greater storage capacity in the sharp freezer range. The largest gain since 1947 occurred in the West South Central area followed by the Pacific coast and East North Central regions.

Public General Warehouse Space: Refrigerated storage capacity in warehouses engaged in storing food commodities for others for pay showed only a slight increase since 1947. The net piling storage area on October 1, 1949, totaled approximately 263 million cubic feet as compared with 262 million cubic feet in 1947.

At first glance, it would appear that the capacity of public general warehouses remained relatively unchanged during the 2-year period since the 1947 survey, but on closer inspection of capacity, by temperature range, it was found that this was not the case. According to the reports received form 605 plants (there were 583 in 1947), net storage space capable of maintaining sharp freezer temperatures increased 11 million cubic feet (13 percent) to 94 million cubic feet (figure 2 and table 3).

Part of the increase was at the expense of cooler space, which underwent conversion during this period. Storage capacity for this temperature range actually decreased 9 million cubic feet since 1947. New construction and changes in type of warehousing operation also accounted for the increased net piling space classified as sharp freezers. Freezer storage capacity in the 0° F. to 29° F. range was equal to 41 million cubic feet, or about the same as in 1947.

Public general warehouses were in operation in every State except Wyoming. New York, with 83 public general warehouses, led all other States in this type of warehousing acitivity.

Storage capacity used for public storage, exclusive of public apple houses, made up almost four-fifths of all the sharp freezer space, three-fifths of the total freezer space, and almost two-fifths of all the cooler space in the country. On the average, 1 out of every 2 cubic feet of refrigerated net piling space was classified as public general space. If to this is added the space in public apple houses, the ratio of public storage space to nonpublic increases to almost three out of five.

Private and Semiprivate General Warehouses: An analysis of comparative changes in refrigerated storage capacity in the United States would not be

complete without considering the role of private and semiprivate general refrigerated storage warehouses. Notwithstanding their small number, the growth in storage capacity for this type of warehousing has, percentagewise, exceeded all others.

The number of plants in operation on October 1, 1949, totaled 411, with a net refrigerated storage capacity of 59 million cubic feet. These plants were concentrated largely in the East North Central region, principally Wisconsin. The majority of these nonpublic warehouses are largely cheese storages (table 4).

The net increases in private and semiprivate refrigerated net storage capacity since 1947 are as follows: number of plants increased by 9 percent; sharp freezer space, 35 percent; freezer space, 50 percent; cooler space, 50 percent. Average over-all increase in capacity amounted to 45 percent. The relative importance of this segment of the refrigerated warehousing industry is further illustrated by the fact that in 2 years the percentage of the national storage capacity classified as private and semiprivate generally increased from 8 to 15 percent.

Meat-packing Plants: Refrigerated storage space in meat-packing plants showed a net reduction of 10 million cubic feet since 1947, leaving only about 77 million cubic feet in operation on October 1, 1949 (table 5). There are many more meat packers than 227, which is the number reporting for this survey, but, many packers do not operate storage facilities that come within the reporting requirement for this survey. There is therefore no comparability between the number of packers in the United States and the number for which reports were received on storage capacity.

There is also no significance in the fact that net refrigerated storage capacity in meat-packing plants fell off sharply in 2 years. The reason for this is that in their 1947 report some packers erroneously listed working space, chill rooms, and cooler space used exclusively for hanging dressed carcasses prior to shipping. Capacity for these nonstorage areas was eliminated from their 1949 report..

Apple Houses: The distribution of refrigerated storage space specializing in the storage of apples may aptly be described as open parentheses, one half of which borders on our eastern coast and the other half on our western coast. The three geographical regions in the Atlantic side of the parentheses (New England, Middle Atlantic States, and South Atlantic States) and the three States which make up our western border contain within their boundaries more than 81 percent of the apples houses in the country, these having a combined net piling space area of 107 million cubic feet (tables 6, 7, and 8). Of the national total, 115 million cubic feet, more than half is on the Pacific coast, yet this region has only 162 out of a total of 606 plants.

Apple storage capacity increased approximately 7 million cubic feet since 1947 and in number increased by 40 plants. For this type of specialized warehousing, cooler space (30° F. to 50° F.) is of major importance (figure 2). Although cooler capacity in apple houses is second only to that in public general warehouses, since 1947 the percentage of the national cooler capacity devoted principally to apple storage increased from 32 to 35 percent. During the same period, public general warehouses reported that their net capacity in coolers was reduced by about 9 million cubic feet.

Table 1.--Total refrigerated storage capacity, by type of warehousing operation, October 1, 1949

Type of refrigerated storage 1/	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 Through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
Public general....	605	133,691	56,183	173,460	363,334	94,079	41,046	127,717	262,842
Private & semi-private general..	411	20,934	20,206	38,506	79,646	15,695	14,785	28,397	58,877
Meat-packing plant	227	12,257	18,905	85,162	116,324	8,203	12,128	56,561	76,892
Apple houses.....	606	1,068	1,476	138,930	141,474	872	1,270	112,604	114,746
Public.....	146	605	1,056	48,261	49,922	503	942	40,184	41,629
Private & semi-private.....	460	463	420	90,669	91,552	369	328	72,420	73,117
Total.....	1,849	167,950	96,770	436,058	700,778	118,849	69,229	325,279	513,357

1/ For definitions of types of refrigerated storage, see page 4.

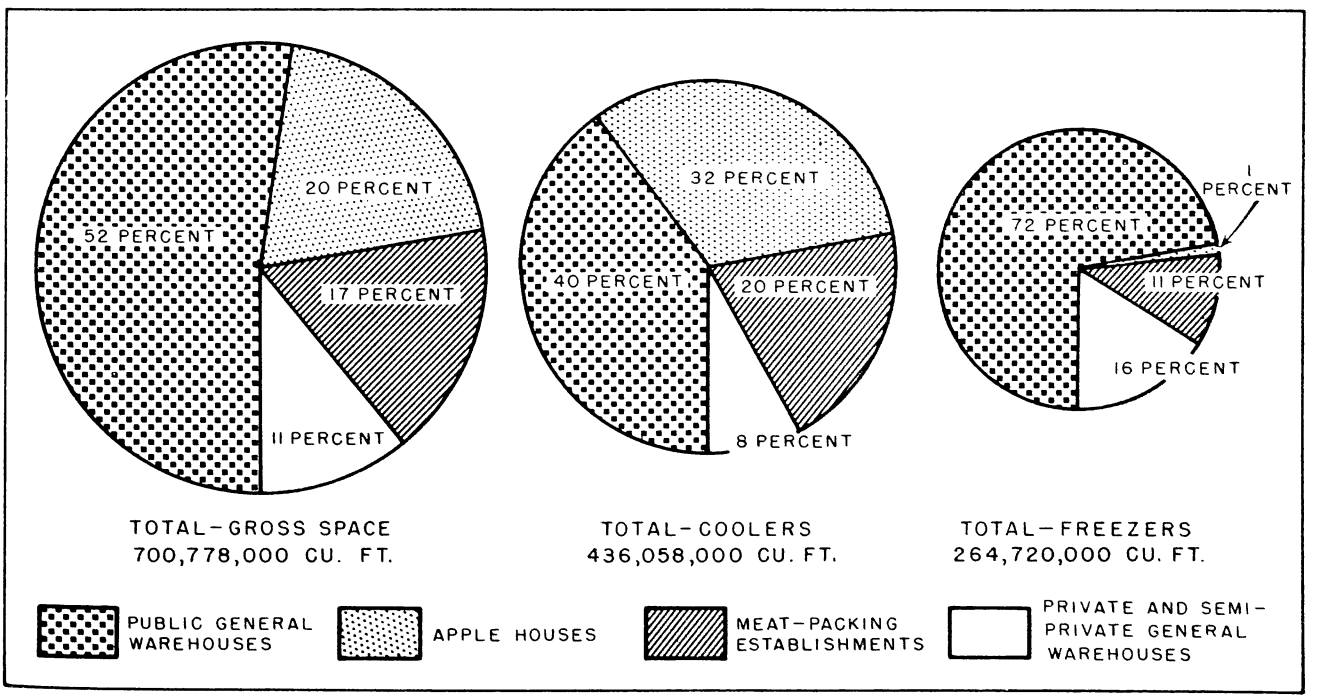


Figure 1.- Distribution of total gross refrigerated storage space by type of warehouse, October 1, 1949

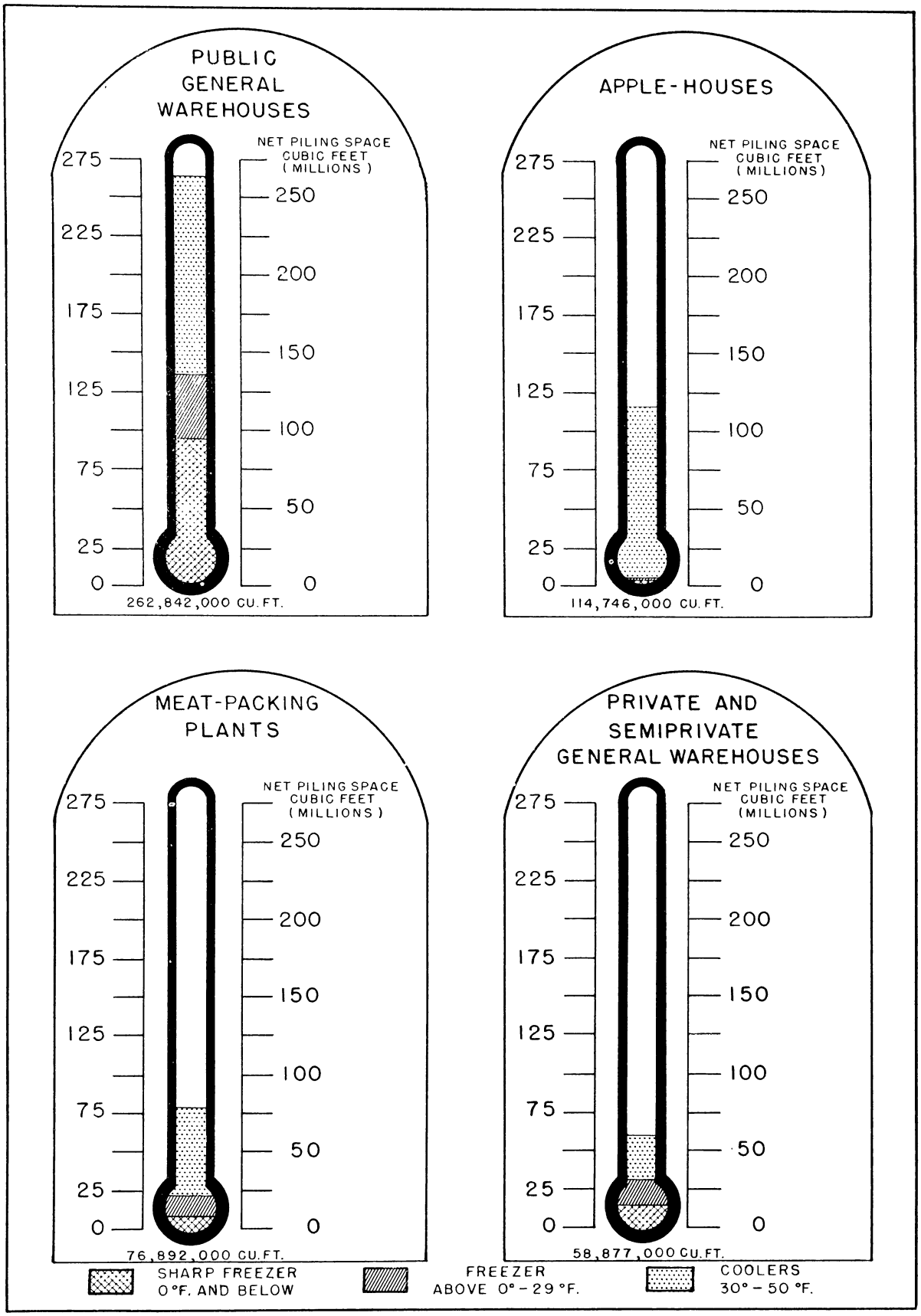


Figure 2.—Distribution of cooler and freezer net piling space by type of refrigerated storage, October 1, 1949

REFRIGERATED STORAGE CAPACITY BY GEOGRAPHIC REGIONS

Combined net refrigerated storage capacity of the Pacific region continued to exceed all other geographic divisions. To maintain its leading position first reached on the basis of the 1947 survey, net piling space in Washington, Oregon, and California totaled 125 million cubic feet, an increase of 11 million cubic feet since the last survey and 27 million cubic feet since October 1, 1945 (table 2).

Approximately half of the storage capacity on the West coast, however, was utilized for apple storage purposes—62 million cubic feet—and in this type of warehousing operation, the region ranked first in the Nation (figure 3).

The 3 States comprising the Middle Atlantic area—New York, New Jersey, and Pennsylvania--ranked second in order of total storage capacity but first in space devoted to public general warehousing (table 3). With more plants than any other region, 434, and with more public general refrigerated storage space, 76 million cubic feet, the Middle Atlantic region in total has a storage capacity of 111 million cubic feet according to the 1949 survey. In addition, this area ranked second in the amount of space used principally for apple storages and third in the Nation for space classified as private, semiprivate, and meat-packing refrigerated storage space (figure 3).

More than half of the 101 million cubic feet of the refrigerated storage capacity in the East North Central region was devoted to public general warehousing and as such ranked second in the Nation for this type of warehousing and third in total refrigerated storage capacity. The East North Central region led all others, however, in the amount of private and semiprivate refrigerated storage facilities and was second only to the West North Central region in storage capacity of meat-packing plants (table 4). On October 1, 1949, there were 113 plants doing business as private or semiprivate warehouses with a combined capacity of 21 million cubic feet. This exceeded by 5 million cubic feet the next leading area, the Pacific coast, and by 12 million cubic feet the Middle Atlantic area, which ranked third in private and semiprivate capacity.

In the West North Central part of the United States, total refrigerated storage capacity of 68 million cubic feet ranked fourth in the Nation. However, almost half of this storage capacity was in meat-packing plants and as such led all other areas in this type of warehousing (table 5). Public general warehousing facilities were next in order of capacity, with 28 million cubic feet.

Other areas in order of total refrigerated storage capacity are as follows: South Atlantic, West South Central, New England, East South Central, and Mountain (figure 3).

Regional differences with respect to capacity by temperature range indicate a concentration of sharp freezer space in the Middle Atlantic, East and West North Central regions. These three areas, with 73 million cubic feet collectively, account for three-fifths of the Nation's total capacity in this temperature range. Moreover, their respective capacities in the freezer range for the three

aforementioned regions account for more than half of all the space in the Nation capable of maintaining 0° F. to 29° F. (figure 4).

Cooler space was predominant on the West coast, with about 91 million cubic feet, which was almost three-fourths of the total space in the area. The Middle Atlantic region ranked second, with 71 million cubic feet, followed by the East North Central region where cooler capacity totaled 62 million cubic feet. In these two respective regions, more than three-fifths of the total net storage capacity for the area was classified as cooler space.

The growth of sharp freezer space is indicative of the upward trend in frozen food production and storage holdings. Even during such a relatively short period as from 1945 to 1949, sharp freezer capacity increased from 97 to 119 million cubic feet; the net increase in total storage capacity during this period was 36 million cubic feet. It is significant that more than the major increase in sharp freezer space occurred in the regions west of the Mississippi. The increase reflected new constructions and conversions to this type of space, as more than 15 million cubic feet of sharp freezer space was added since 1945. Public general warehouses in the West South Central area increased their sharp freezer capacity by 6 million cubic feet and on the West coast 3 million cubic feet was added during the last 4 years (figure 4).

Table 2.--Total refrigerated storage capacity, by regions, October 1, 1949

Region	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
New England	181	9,479	6,942	14,385	30,806	5,746	5,253	11,223	22,222
Middle Atlantic	434	35,962	19,398	94,033	149,393	25,388	14,286	70,851	110,525
East North Central	350	36,490	20,012	87,057	143,559	25,403	13,359	62,322	101,084
West North Central	152	31,874	13,739	54,659	100,272	22,648	8,944	36,140	67,732
South Atlantic	173	8,079	7,203	40,991	56,273	5,778	5,407	32,949	44,134
East South Central	43	3,843	2,334	8,107	14,284	2,831	1,693	6,200	10,724
West South Central	82	13,589	3,962	14,005	31,556	10,491	2,794	9,993	23,278
Mountain	55	4,467	1,824	6,098	12,389	3,120	1,355	4,229	8,704
Pacific	379	24,167	21,356	116,723	162,246	17,444	16,138	91,372	124,954
United States	1,849	167,950	96,770	436,058	700,778	118,849	69,229	325,279	513,357

Table 3.--Refrigerated storage capacity of public general warehouses, by regions, October 1, 1949

Region	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
New England	31	8,436	5,581	4,541	18,557	4,937	4,182	3,106	12,225
Middle Atlantic	141	33,044	13,746	58,377	105,167	23,199	9,783	42,592	75,574
East North Central	84	29,969	7,566	39,563	77,098	20,846	5,491	29,273	55,610
West North Central	64	20,263	3,715	15,413	39,391	14,619	2,501	11,311	28,431
South Atlantic	80	5,141	5,154	15,222	25,517	3,566	3,852	11,152	18,570
East South Central	25	3,605	1,827	5,871	11,303	2,677	1,361	4,580	8,618
West South Central	47	12,156	2,474	7,648	22,278	9,442	1,833	5,842	17,117
Mountain	27	3,583	744	2,455	6,782	2,528	562	1,749	4,839
Pacific	106	17,495	15,376	24,370	57,241	12,265	11,481	18,112	41,858
United States	605	133,691	56,183	173,460	363,334	94,079	41,046	127,717	262,842

Table 4.--Refrigerated storage capacity of private and semiprivate general warehouses, by regions, October 1, 1949

Region	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
New England	21	715	804	588	2,107	528	612	489	1,629
Middle Atlantic	91	2,297	4,541	4,708	11,546	1,717	3,671	3,582	8,970
East North Central	113	3,796	8,073	18,077	29,946	2,764	5,281	12,495	20,540
West North Central	34	4,589	526	2,813	7,928	3,370	384	2,071	5,825
South Atlantic	25	2,597	774	1,057	4,428	1,923	485	822	3,230
East South Central	4	130	31	272	433	79	22	169	270
West South Central	18	886	230	1,469	2,585	732	170	1,085	1,987
Mountain	14	443	431	253	1,127	343	358	171	872
Pacific	91	5,481	4,796	9,269	19,546	4,239	3,802	7,513	15,554
United States	411	20,934	20,206	38,506	79,646	15,695	14,785	28,397	58,877

Table 5.--Refrigerated storage capacity of meat-packing plants, by regions, October 1, 1949

Region	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
New England	6	317	533	2,398	3,248	272	443	1,970	2,685
Middle Atlantic	46	220	771	8,019	9,010	154	527	5,575	6,256
East North Central	54	2,689	4,302	22,066	29,057	1,765	2,542	14,717	19,024
West North Central	46	7,017	9,493	35,331	51,841	4,655	6,056	22,025	32,736
South Atlantic	15	157	642	2,659	3,458	122	490	2,245	2,857
East South Central	13	108	476	1,589	2,173	75	310	1,144	1,529
West South Central	15	536	1,251	4,856	6,643	307	788	3,040	4,135
Mountain	12	441	649	2,911	4,001	249	435	1,940	2,624
Pacific	20	772	788	5,333	6,893	604	537	3,905	5,046
United States	227	12,257	18,905	85,162	116,324	8,203	12,128	56,561	76,892

Table 6.--Total refrigerated storage capacity of apple houses, by regions, October 1, 1949

Region	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
New England	123	12	24	6,858	6,894	9	16	5,658	5,683
Middle Atlantic	156	401	340	22,929	23,670	318	305	19,102	19,725
East North Central	99	36	71	7,351	7,458	28	45	5,837	5,910
West North Central	8	5	5	1,102	1,112	4	3	733	740
South Atlantic	53	184	633	22,053	22,870	167	580	18,730	19,477
East South Central and West South Central	3	11	7	407	425	10	3	333	346
Mountain	2	-	-	479	479	-	-	369	369
Pacific	162	419	396	77,751	78,566	336	318	61,842	62,496
United States	606	1,068	1,476	138,930	141,474	872	1,270	112,604	114,746

Table 7.--Refrigerated storage capacity of public apple houses, by regions, October 1, 1949

Region	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
New England	8	7	-	928	935	6	-	701	707
Middle Atlantic	41	370	337	11,638	12,345	294	303	9,675	10,272
East North Central	28	31	33	4,116	4,180	24	25	3,204	3,253
West North Central	7	5	5	968	978	4	3	628	635
South Atlantic	25	181	621	16,370	17,172	165	571	14,064	14,800
West South Central and Mountain	3	11	7	41	59	10	3	33	46
Pacific	34	-	53	14,200	14,253	-	37	11,879	11,916
United States	146	605	1,056	48,261	49,922	503	942	40,184	41,629

Table 8.--Refrigerated storage capacity of private and semiprivate apple houses, by regions, October 1, 1949

Region	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
New England	115	5	24	5,930	5,959	3	16	4,957	4,976
Middle Atlantic	115	31	3	11,291	11,325	24	2	9,427	9,453
East North Central and West North Central	72	5	38	3,369	3,412	4	20	2,738	2,762
South Atlantic	28	3	12	5,683	5,698	2	9	4,666	4,677
East South Central and Mountain	2	-	-	845	845	-	-	669	669
Pacific	128	419	343	63,551	64,313	336	281	49,963	50,580
United States	460	463	420	90,669	91,552	369	328	72,420	73,117

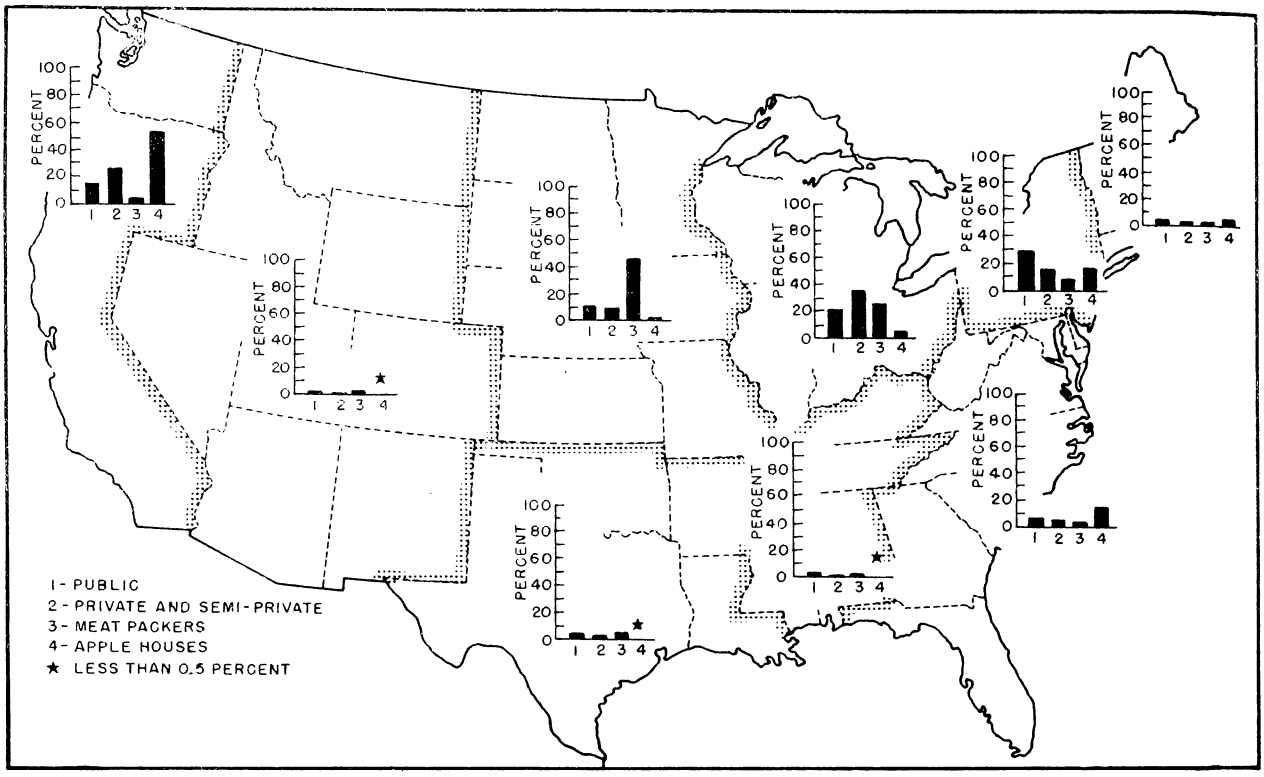


Fig. 3.- Regional distribution of gross refrigerated storage space in the United States by type of warehouse operation, October 1, 1949

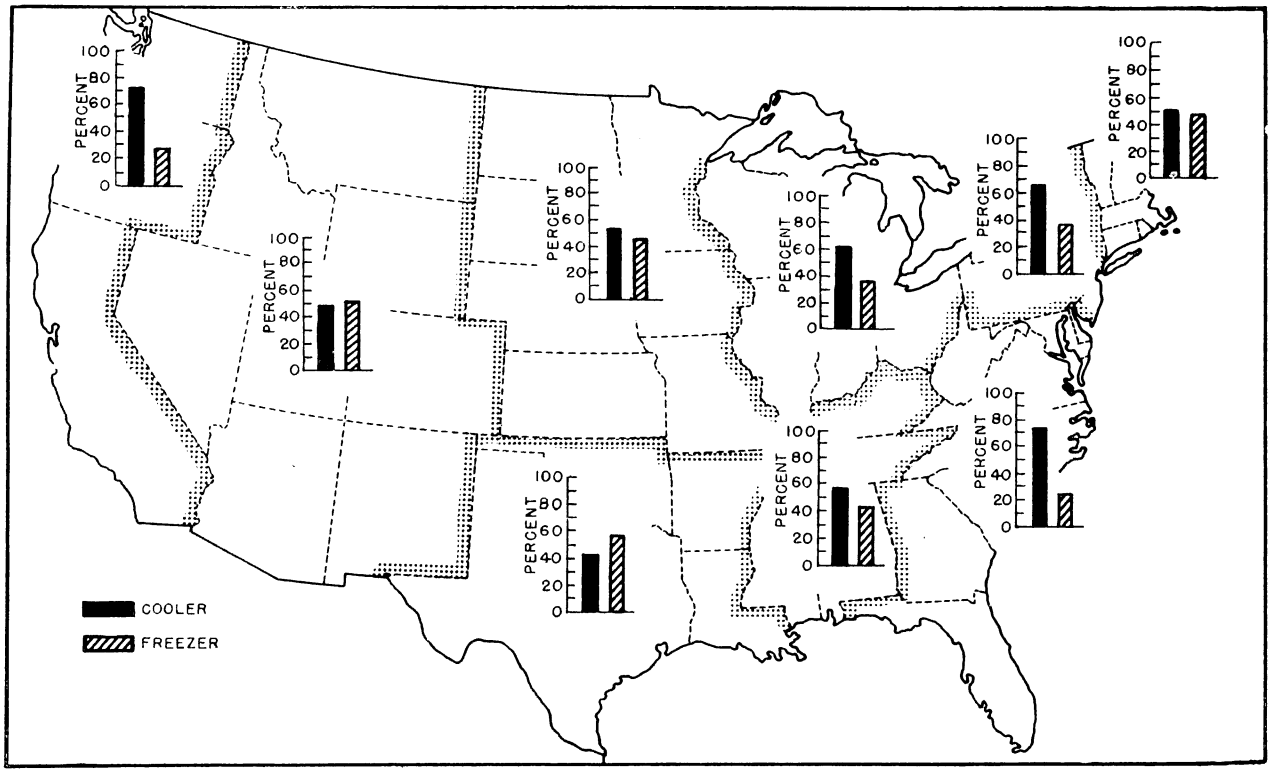


Fig. 4.- Regional distribution of refrigerated net piling space by coolers and freezers, October 1, 1949

REFRIGERATED STORAGE CAPACITY BY STATES

Refrigerated net storage capacity showed marked differences, not only among the nine regions but within regions as well. These differences are a result of historical factors and within recent years of current developments which have created special areas for storage.

Historically, warehouses tended to concentrate in or around terminal and port areas. Such factors are still important for storage locations, but with the growth of the frozen food industry new factors have developed. Warehouses are now being built nearer points of frozen food production and in areas offering greater flexibility in diversion of foodstuffs through in-transit storage privileges. The population shift westward also may have contributed to the increase in storage capacity of the States west of the Mississippi. For example, since 1947, net refrigerated storage capacity increased 11 million cubic feet in the western half of the United States, while States east of the Mississippi increased only 5 million cubic feet (figures 5 and 6).

The distribution of total refrigerated storage capacity by States is shown in table 9. If the States and the District of Columbia are arrayed in order of net piling space capacity, New York, with 66 million cubic feet, leads all others and is followed by Washington, with 65 million cubic feet, and Illinois, with 50 million cubic feet. The next 7 States in order are: California, Pennsylvania, Virginia, New Jersey, Oregon, Ohio, and Missouri. These 10 States have more than two-thirds of the total net piling space in the Nation and a little more than half of the plants.

There were as many States with more than 3 million cubic feet as with less. Fourteen States have less than a million cubic feet and a like number have between 1 and 5 million cubic feet. In addition, there are more States with a capacity of 16 to 20 million cubic feet than States with 6 to 15 million cubic feet.

Refrigerated net storage capacity devoted to public general warehousing is greatest in New York, Illinois, and California, in the order named. The leading State has 42 million cubic feet capacity, each of the second and third leading States has 26 million cubic feet of public general warehouse space (table 10). The capacity of public warehouses in these three States exceeds the combined capacity of the next seven States leading in this type of warehousing operation. Texas, which ranks within the 10 leading States, increased public general warehouse capacity by 5 million cubic feet. This was the greatest increase for this type of operation reported by any State since the 1947 survey. Massachusetts was next with a 3 million cubic feet increase.

An analysis of public general warehouse space according to comparative capacities indicates that 16 States have less than a million cubic feet; 19 States have only between 1 and 5 million cubic feet. In other words, almost three-fourths of the States having public general warehouses have less than 6 million cubic feet capacity. The extent to which public general warehousing is concentrated, particularly in New York State, is evidenced by the fact that the combined capacity of the States comprising the lower two-thirds of the distribution according to public general warehouse capacity is about equal to the capacity of New York.

Table 9.--Total refrigerated storage capacity, by States, October 1, 1949 1/

State	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
Maine	10	243	389	414	1,046	177	296	327	800
New Hampshire	10	60	14	443	517	44	11	354	409
Vermont	19	269	8	779	1,056	231	7	643	881
Massachusetts	69	7,917	5,594	9,000	22,511	4,604	4,298	6,981	15,883
Connecticut	71	300	226	3,744	4,270	226	162	2,916	3,304
New York	292	17,123	10,811	59,522	87,456	12,630	7,994	45,588	66,212
New Jersey	48	10,430	4,499	13,357	28,286	7,218	3,047	9,234	19,499
Pennsylvania	94	8,409	4,088	21,154	33,651	5,540	3,245	16,029	24,814
Ohio	75	7,290	2,695	14,058	24,043	5,540	1,945	10,103	17,588
Indiana	30	1,563	1,249	6,488	9,300	1,116	821	4,051	5,988
Illinois	63	19,653	10,477	41,967	72,097	13,000	6,592	30,699	50,291
Michigan	91	5,324	4,418	12,150	21,892	3,737	3,234	9,171	16,142
Wisconsin	91	2,660	1,173	12,394	16,227	2,010	767	8,298	11,075
Minnesota	25	6,077	3,231	3,965	13,273	4,091	2,022	2,691	8,804
Iowa	35	4,694	3,280	9,975	17,949	3,360	2,143	6,386	11,889
Missouri	41	10,037	1,998	13,553	25,588	6,853	1,286	8,682	16,821
North Dakota	3	278	13	-	291	184	12	-	196
South Dakota	3	395	1,377	2,946	4,718	315	988	1,970	3,273
Nebraska	18	5,756	1,666	10,839	18,261	4,133	965	5,988	11,086
Kansas	27	4,637	2,174	13,381	20,192	3,712	1,528	10,423	15,663
Delaware	6	87	331	818	1,236	61	237	660	958
Maryland	13	1,909	292	1,647	3,848	1,174	208	1,090	2,472
Virginia	52	1,231	2,399	24,000	27,630	928	1,907	19,761	22,596
West Virginia	17	21	452	4,893	5,366	16	348	4,144	4,508
North Carolina	13	418	277	880	1,575	342	221	741	1,304
South Carolina	4	27	73	87	187	23	50	58	131
Georgia	43	477	2,625	5,644	8,746	371	1,971	4,417	6,759
Florida	23	2,412	754	1,721	4,887	1,800	465	1,102	3,367
Kentucky	11	629	314	2,502	3,445	429	220	1,856	2,505
Tennessee	20	2,677	1,237	4,122	8,036	1,960	852	3,172	5,984
Alabama	9	529	408	1,226	2,163	435	351	976	1,762
Mississippi	3	8	375	257	640	7	270	196	473
Arkansas	8	316	66	717	1,099	201	45	497	743
Louisiana	10	1,758	324	1,309	3,391	1,453	245	1,109	2,807
Oklahoma	14	795	704	2,538	4,037	544	585	1,983	3,112
Texas	50	10,720	2,868	9,441	23,029	8,293	1,919	6,404	16,616
Montana	7	203	95	166	464	155	66	119	340
Idaho	14	939	575	1,156	2,670	624	484	802	1,910
Colorado	14	1,487	778	3,505	5,770	1,020	523	2,390	3,933
New Mexico	4	5	81	136	222	3	58	101	162
Arizona	3	93	117	172	382	63	93	93	249
Utah	11	1,712	178	943	2,833	1,231	131	704	2,066
Washington	183	7,447	6,170	69,280	82,897	5,550	4,411	55,145	65,106
Oregon	48	3,818	5,718	13,114	22,650	2,993	4,742	10,392	18,127
California	148	12,902	9,468	34,329	56,699	8,901	6,985	25,835	41,721
Other States	6	2,215	711	1,326	4,252	1,551	479	998	3,028
United States	1,849	167,950	96,770	436,058	700,778	118,849	69,229	325,279	513,357

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

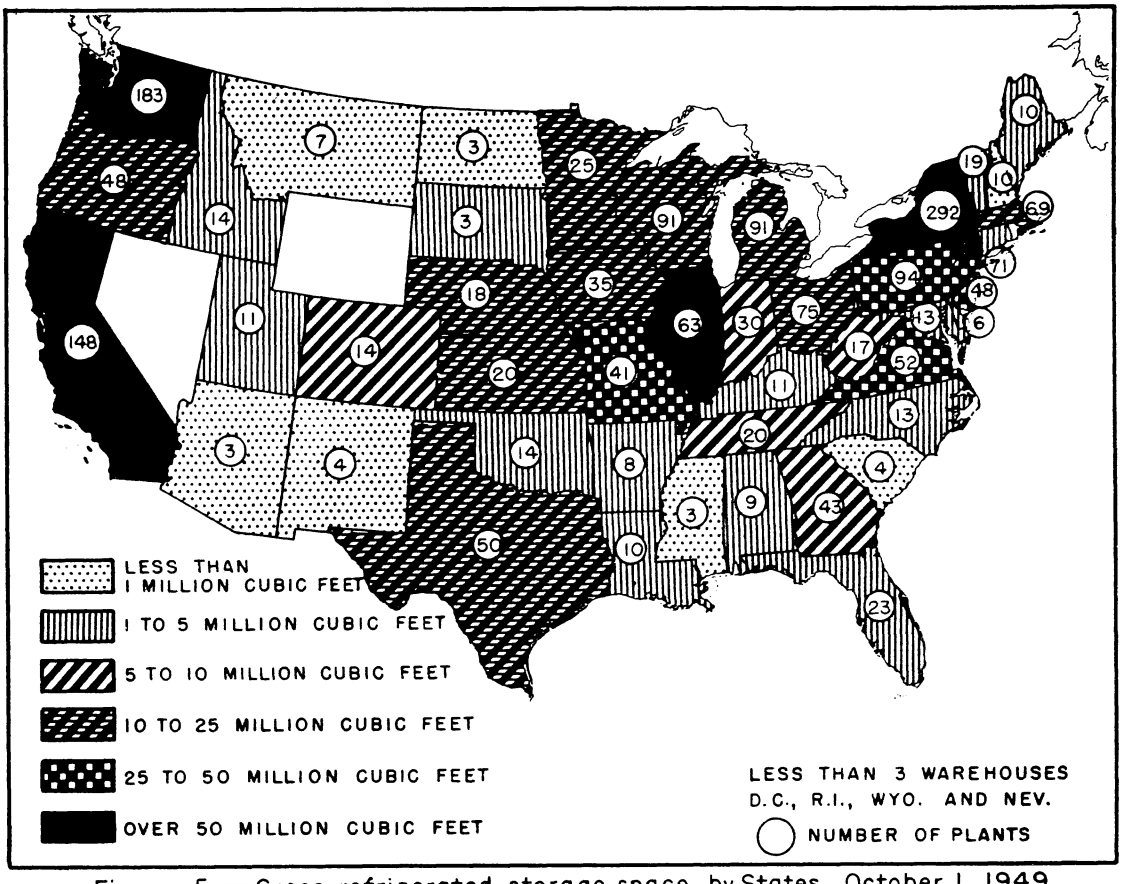


Figure 5.— Gross refrigerated storage space, by States, October 1, 1949

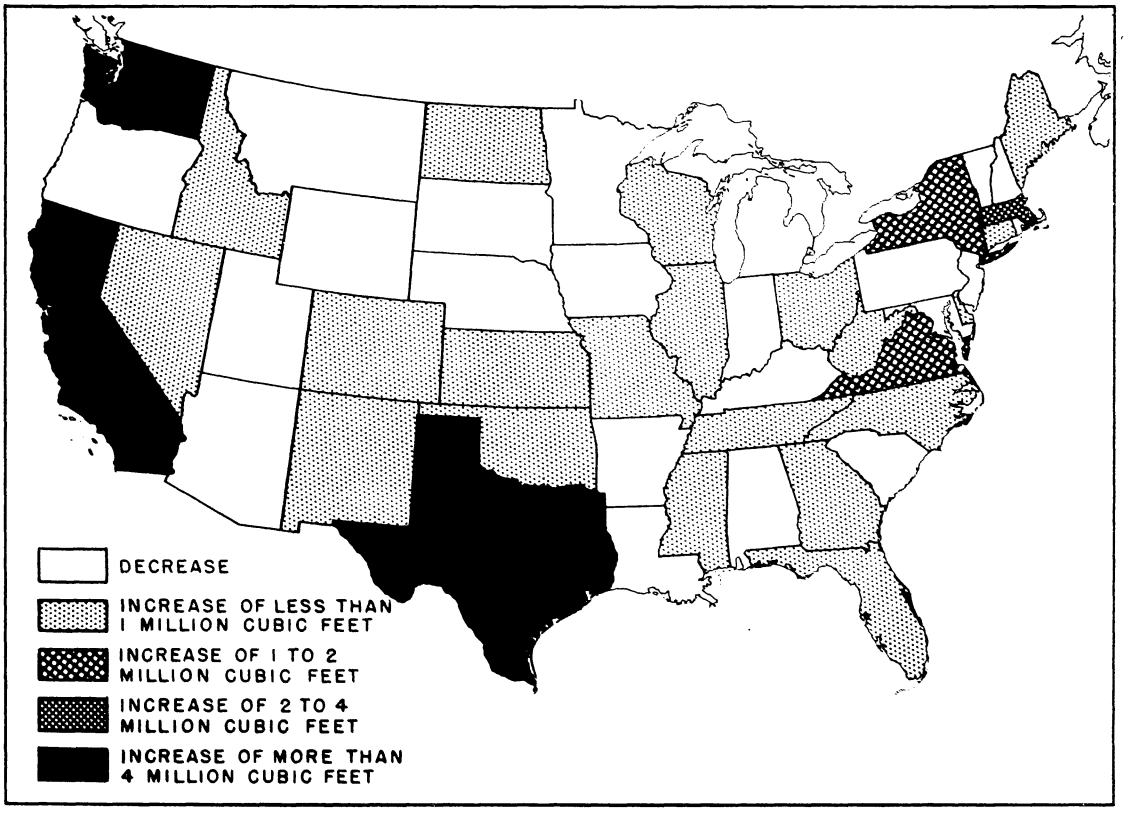


Figure 6.— Net increase or decrease in refrigerated storage space, by States, October 1, 1947 to October 1, 1949

Table 10.--Refrigerated storage capacity of public general warehouses, by States, October 1, 1949 1/

State	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
Maine	5	214	363	324	901	158	276	253	687
Massachusetts	18	7,107	4,418	3,828	15,353	3,974	3,360	2,624	9,958
Connecticut	4	223	75	299	597	171	56	162	389
New York	83	15,423	8,009	33,670	57,102	11,399	5,765	24,942	42,106
New Jersey	18	10,190	2,910	10,813	23,913	7,017	1,766	7,191	15,974
Pennsylvania	40	7,431	2,827	13,894	24,152	4,783	2,252	10,459	17,494
Ohio	19	6,963	2,016	8,729	17,708	5,283	1,454	6,120	12,857
Indiana	9	852	607	1,508	2,967	604	450	1,123	2,177
Illinois	26	16,273	1,935	18,506	36,714	10,654	1,382	13,858	25,894
Michigan	14	4,203	2,899	5,743	12,845	2,919	2,124	4,221	9,264
Wisconsin	16	1,678	109	5,077	6,864	1,386	81	3,951	5,418
Minnesota	11	3,324	1,385	1,712	6,421	2,294	868	1,169	4,331
Iowa	13	2,581	586	1,178	4,345	1,925	411	899	3,235
Missouri	21	8,852	1,123	7,894	17,869	6,144	761	5,536	12,441
Nebraska	5	2,887	95	1,188	4,170	2,223	72	973	3,268
Kansas	12	2,336	501	3,225	6,062	1,843	371	2,574	4,788
Delaware	3	87	316	324	727	61	223	229	513
Maryland	5	1,852	108	734	2,694	1,130	74	440	1,644
Virginia	11	602	1,610	5,105	7,317	463	1,226	3,817	5,506
North Carolina	9	418	265	741	1,424	342	212	626	1,180
Georgia	31	205	2,061	4,164	6,430	160	1,538	3,160	4,858
Florida	16	440	357	1,601	2,398	314	244	1,012	1,570
Kentucky	5	492	248	1,778	2,518	346	173	1,331	1,850
Tennessee	11	2,587	824	2,853	6,264	1,896	586	2,235	4,717
Alabama	6	518	380	983	1,881	428	332	818	1,578
Mississippi	3	8	375	257	640	7	270	196	473
Arkansas	6	305	64	649	1,018	191	44	447	682
Louisiana	7	1,017	284	1,259	2,560	827	215	1,071	2,113
Oklahoma	6	696	222	1,210	2,128	466	169	865	1,500
Texas	28	10,138	1,904	4,530	16,572	7,958	1,405	3,459	12,822
Idaho	7	599	209	414	1,222	349	170	254	773
Colorado	7	1,071	409	1,344	2,824	799	300	992	2,091
New Mexico	3	5	81	127	213	3	58	94	155
Utah	5	1,628	-	457	2,085	1,174	-	330	1,504
Washington	23	4,211	4,191	2,793	11,195	3,086	2,853	1,730	7,669
Oregon	14	1,993	4,212	3,837	10,042	1,575	3,570	3,514	8,659
California	69	11,291	6,973	17,740	36,004	7,604	5,058	12,868	25,530
Other States q	16	2,991	1,232	2,972	7,195	2,123	877	2,174	5,174
United States	605	133,691	56,183	173,460	363,334	94,079	41,046	127,717	262,842

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

Table 11.--Refrigerated storage capacity of private and semiprivate general warehouses, by States, October 1, 1949 1/

State	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
Maine	3	29	24	1	54	19	18	-	37
Massachusetts	13	486	662	294	1,442	352	510	255	1,117
New York	73	1,298	1,936	3,527	6,761	938	1,539	2,734	5,211
New Jersey	8	213	1,509	194	1,916	182	1,220	123	1,525
Pennsylvania	10	786	1,096	987	2,869	597	912	725	2,234
Ohio	15	214	341	845	1,400	182	264	707	1,153
Indiana	4	254	111	509	874	240	92	415	747
Illinois	7	2,205	6,323	10,853	19,381	1,470	3,944	6,909	12,323
Michigan	19	876	1,054	1,867	3,797	694	810	1,454	2,958
Wisconsin	68	247	244	4,003	4,494	178	171	3,010	3,359
Minnesota	7	999	104	131	1,234	798	77	100	975
Iowa	10	800	117	614	1,531	531	80	469	1,080
Missouri	4	53	124	297	474	41	109	228	378
Nebraska	9	2,074	80	914	3,068	1,495	51	629	2,175
Kansas	4	663	101	857	1,621	505	67	645	1,217
Maryland	3	32	59	40	131	27	48	33	108
Virginia	4	449	163	474	1,086	301	105	360	766
Georgia	5	140	101	225	466	106	71	184	361
Florida	7	1,972	397	120	2,489	1,486	221	90	1,797
Kentucky	3	130	25	269	424	79	17	166	262
Texas	14	157	67	1,289	1,513	116	44	964	1,124
Montana	4	44	31	42	117	39	20	34	93
Idaho	4	319	358	191	868	256	308	123	687
Utah	4	59	33	16	108	36	23	12	71
Washington	27	2,794	1,258	897	4,949	2,125	1,038	760	3,923
Oregon	18	1,653	1,442	535	3,630	1,259	1,119	477	2,855
California	46	1,034	2,096	7,837	10,967	855	1,645	6,276	8,776
Other States	18	954	350	678	1,982	788	262	515	1,565
United States	411	20,934	20,206	38,506	79,646	15,695	14,785	28,397	58,877

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

Table 12.--Refrigerated storage capacity of meat-packing plants, by States, October 1, 1949 1/

State	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
Massachusetts	3	317	501	1,955	2,773	272	421	1,662	2,355
New York	27	195	559	5,350	6,104	140	411	3,813	4,364
New Jersey	3	8	55	851	914	6	41	653	700
Pennsylvania	16	17	157	1,818	1,992	8	75	1,109	1,192
Ohio	15	112	337	3,213	3,662	74	226	2,276	2,576
Indiana	12	457	531	3,734	4,722	272	279	2,050	2,601
Illinois	15	1,174	2,187	10,083	13,444	875	1,241	7,873	9,989
Michigan	5	211	427	1,722	2,360	98	281	1,181	1,560
Wisconsin	7	735	820	3,314	4,869	446	515	1,337	2,298
Minnesota	7	1,754	1,742	2,122	5,618	999	1,077	1,422	3,498
Iowa	12	1,313	2,577	8,183	12,073	904	1,652	5,018	7,574
Missouri	11	1,127	746	4,433	6,306	664	413	2,324	3,401
Nebraska	4	795	1,491	8,737	11,023	415	842	4,386	5,643
Kansas	8	1,638	1,572	9,126	12,336	1,364	1,090	7,065	9,519
Virginia	3	-	20	798	818	-	18	702	720
Georgia	7	132	463	1,255	1,850	105	362	1,073	1,540
Kentucky	3	7	41	455	503	4	30	359	393
Tennessee	7	90	407	891	1,388	64	261	627	952
Alabama	3	11	28	243	282	7	19	158	184
Oklahoma	5	70	352	1,194	1,616	62	317	1,032	1,411
Texas	8	425	897	3,622	4,944	219	470	1,981	2,670
Colorado	5	395	360	2,157	2,912	209	216	1,396	1,821
Washington	7	174	378	1,398	1,950	125	239	864	1,228
California	11	426	346	3,505	4,277	320	245	2,636	3,201
Other States	23	674	1,911	5,003	7,588	551	1,387	3,564	5,502
United States	227	12,257	18,905	85,162	116,324	8,203	12,128	56,561	76,892

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

Table 13.--Total refrigerated storage capacity of apple houses, by States, October 1, 1949 1/

State	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
New Hampshire	8	-	-	391	391	-	-	312	312
Vermont	16	-	8	697	705	-	7	578	585
Massachusetts	35	7	13	2,923	2,943	6	7	2,440	2,453
Connecticut	64	5	3	2,847	2,855	3	2	2,328	2,333
New York	109	207	307	16,975	17,489	153	279	14,099	14,531
New Jersey	19	19	25	1,499	1,543	13	20	1,267	1,300
Pennsylvania	28	175	8	4,455	4,638	152	6	3,736	3,894
Ohio	26	1	1	1,271	1,273	1	1	1,000	1,002
Indiana	5	-	-	737	737	-	-	463	463
Illinois	15	1	32	2,525	2,558	1	25	2,059	2,085
Michigan	53	34	38	2,818	2,890	26	19	2,315	2,360
Missouri	5	5	5	929	939	4	3	594	601
Kansas	3	-	-	173	173	-	-	139	139
Maryland	3	-	-	548	548	-	-	389	389
Virginia	34	180	606	17,623	18,409	164	558	14,882	15,604
West Virginia	12	4	15	3,543	3,562	3	13	3,184	3,200
Washington	126	268	343	64,192	64,803	214	281	51,791	52,286
Oregon	14	-	-	8,312	8,312	-	-	5,996	5,996
California	22	151	53	5,247	5,451	122	37	4,055	4,214
Other States	9	11	19	1,225	1,255	10	12	977	999
United States	606	1,068	1,476	138,930	141,474	872	1,270	112,604	114,746

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

Table 14.--Refrigerated storage capacity of public apple houses, by States, October 1, 1949 1/

State	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
Massachusetts	3	7	-	603	610	6	-	471	477
Connecticut	5	-	-	325	325	-	-	230	230
New York	25	192	304	8,768	9,264	140	277	7,208	7,625
New Jersey	6	3	25	762	790	2	20	660	682
Pennsylvania	10	175	8	2,108	2,291	152	6	1,807	1,965
Ohio	6	-	-	491	491	-	-	409	409
Indiana	5	-	-	737	737	-	-	463	463
Illinois	11	1	29	2,272	2,302	1	22	1,854	1,877
Michigan	6	30	4	616	650	23	3	478	504
Missouri	5	5	5	929	939	4	3	594	601
Virginia	17	180	606	13,934	14,720	164	558	11,851	12,573
West Virginia	4	1	15	1,964	1,980	1	13	1,861	1,875
Washington	28	-	-	13,384	13,384	-	-	11,196	11,196
California	4	-	53	449	502	-	37	338	375
Other States	11	11	7	919	937	10	3	764	777
United States	146	605	1,056	48,261	49,922	503	942	40,184	41,629

Table 15.--Refrigerated storage capacity of private and semiprivate apple houses, by States, October 1, 1949 1/

State	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
New Hampshire	8	-	-	391	391	-	-	312	312
Vermont	16	-	8	697	705	-	7	578	585
Massachusetts	32	-	13	2,320	2,333	-	7	1,969	1,976
Connecticut	59	5	3	2,522	2,530	3	2	2,098	2,103
New York	84	15	3	8,207	8,225	13	2	6,891	6,906
New Jersey	13	16	-	737	753	11	-	607	618
Pennsylvania	18	-	-	2,347	2,347	-	-	1,929	1,929
Ohio	20	1	1	780	782	1	1	591	593
Illinois	4	-	3	253	256	-	3	205	208
Michigan	47	4	34	2,202	2,240	3	16	1,837	1,856
Virginia	17	-	-	3,689	3,689	-	-	3,031	3,031
West Virginia	8	3	-	1,579	1,582	2	-	1,323	1,325
Washington	98	268	343	50,808	51,419	214	281	40,595	41,090
Oregon	12	-	-	7,945	7,945	-	-	5,651	5,651
California	18	151	-	4,798	4,949	122	-	3,717	3,839
Other States	6	-	12	1,394	1,406	-	9	1,086	1,095
United States	460	463	420	90,669	91,552	369	328	72,420	73,117

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

REFRIGERATED STORAGE CAPACITY BY CITIES

There are 41 cities in the United States that have 3 or more warehouses and net space of at least 3 million cubic feet. These cities (table 16) account for a little more than two-thirds the total net space in the Nation. Although the concentration of refrigerated storage space is usually in or near large cities, noticeable exceptions are: Yakima and Wenatchee, Wash. and Winchester, Va., which cities rank third, fifth, and ninth respectively among others having the greatest amount of net refrigerated storage space. Space in these comparatively small cities, however, is almost entirely cooler space used in the specialty storing of apples, whereas in the larger key cities warehouses of all types may be found and freezer space is of equal importance with cooler space.

For space in all types of refrigerated warehouses, Chicago leads all other cities with 40 million cubic feet of net refrigerated space, 8 million cubic feet more than New York City, the second largest storing center in the United States (figure 7). Yakima, whose storage houses have a capacity of 24 million cubic feet, is followed by St. Louis, which has slightly more than one-third the storage space of Chicago. In order of magnitude, Wenatchee, Kansas City, Los Angeles, Dallas, Winchester, and Philadelphia follow. Warehouses in the 10 aforementioned cities account for more than half the capacity of storage plants in all the key cities listed in table 16. Net storage capacity of warehouses in cities located east of the Mississippi River slightly exceeds the capacity of storage plants in western cities. Warehouses in eastern cities have a storage capacity of 183 million cubic feet, as compared with 161 million cubic feet of piling space in plants located in cities west of the Mississippi River.

Public general refrigerated warehouses in key cities (table 17) located in the Middle Atlantic and East North Central regions account for the major amount of public storage space in their respective areas. For instance, 43 percent of all public general plants in the East North Central region are located in Cleveland, Cincinnati, Chicago, Detroit, and Milwaukee, and have a collective net storage capacity of 74 percent of the total public space in this area. In the Middle Atlantic region three-fifths of the public general plants are in 9 key cities and account for more than four-fifths of the public storage capacity in the entire region. New York City, housing 28 of the 83 plants in the 9 key cities of the Middle Atlantic region, accounts for 44 percent of the total capacity of the 83 plants. Half of the 36 plants operating in the 5 important storage cities in the East North Central region are located in Chicago and account for more than half the capacity of all 36 plants. In the Pacific region the number of public general warehouses and their storage capacities are evenly distributed between city and rural communities.

Public general refrigerated storage space is located predominantly in cities east of the Mississippi River, the exception being Dallas, which ranks third among cities having the greatest capacity in this type of warehouse. There are 227 public warehouses (excluding apple houses) in the 30 storage centers listed in table 17. Of the 227 plants, 141 are east of the Mississippi River. The capacity of the eastern plants amounts to 119 million net cubic feet,

or 68 percent of the total capacity of all plants in the 30 cities. In cities west of the Mississippi River there are 86 plants with a combined net capacity of 55 million cubic feet. Plants located in New Orleans, Dallas, Kansas City, Minneapolis, and St. Louis have a collective net capacity of 50 percent of all space in western cities, while warehouses in 9 cities in the Pacific Coast States account for the remaining space.

New York City leads all others in public general storage capacity, with 28 million net cubic feet; Chicago is second in importance, with 22 million cubic feet. New York City's storage space is divided among 28 warehouses, while Chicago's space is shared by 18 plants. Space in these two cities comprised more than one-fourth the capacity of public general storage plants in all cities, having at least 3 warehouses and a minimum of 2 million cubic feet of net piling space. Dallas, with approximately one-third the storage capacity of New York City, ranks third, and is followed by Philadelphia, Rochester, St. Louis and Detroit. The combined net storage capacity of these cities is greater than the total net piling space in the remaining cities.

A major part of the supply of the Nation's meat and meat products is stored in meat-packing establishments located in the West North Central region. Forty-three percent of the total U. S. storage capacity in this type of plant is in warehouses located in this area. Plants within a 25-mile radius of Kansas City, St. Louis, Omaha, Minneapolis, and Sioux City account for 25 million cubic feet or three-fourths of the region's total net storing capacity of 33 million cubic feet. Kansas City plants have a collective capacity of one-fourth the area's meat-storage space.

The second most important area for the storage of meats is the East North Central region. In this area, meat-packing plants account for one-fourth of the capacity of such establishments throughout the Nation. The capacity of meat-packing establishments in key cities in this area (table 18) is slightly more than half of the total piling space in the region. Meat-packing plants in Chicago, Indianapolis, Detroit, and Milwaukee account for 10 million of the region's 19 million cubic feet of net capacity. Meat-packing establishments in Chicago alone have a combined capacity of almost one-third of the region's piling space.

New York City, Los Angeles, Dallas, and Denver are the key cities in which meat-packing plants are located in their respective areas. The capacity of plants in New York City amounts to approximately two-fifths of the total space in all meat-packing plants in the Middle Atlantic States, and Los Angeles plants comprise one-half of the space in the Pacific region. Meat-packing plants in Dallas and Denver account for more than half of the refrigerated space devoted to this type of storage in their respective areas, Dallas warehouses having 56 percent of the total capacity in the West South Central area and Denver warehouses having 68 percent of the capacity of meat packing establishments in the Mountain region.

Table 16.--Total refrigerated storage capacity in cities having 3 or more warehouses and at least 3 million cubic feet net space, October 1, 1949 1/

City & State	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
Boston, Mass.	24	6,464	1,673	5,195	13,332	3,512	1,280	3,802	8,594
New York, N. Y.	69	13,668	7,157	26,203	47,028	9,397	4,719	18,004	32,120
Buffalo, N. Y.	13	1,556	2,314	3,099	6,969	1,164	1,883	2,508	5,555
Rochester, N. Y.	20	2,056	755	9,462	12,273	1,543	600	7,333	9,476
Albany, N. Y.	11	1,221	75	3,961	5,212	938	49	3,043	4,030
Poughkeepsie, N. Y.	61	130	771	7,888	8,789	118	697	6,492	7,307
Medina, N. Y.	22	694	280	5,870	6,844	580	197	4,619	5,396
Geneva, N. Y.	12	1,462	100	5,224	6,786	1,175	50	4,086	5,311
Bridgeton, N. J.	8	2,423	576	1,302	4,301	2,088	380	969	3,437
Philadelphia, Pa.	25	6,679	1,407	7,282	15,368	3,791	1,123	5,132	10,046
Pittsburgh, Pa.	6	743	1,427	3,427	5,597	562	1,106	2,304	3,972
Chambersburg, Pa.	6	157	48	3,866	4,071	106	44	3,359	3,509
Cleveland, Ohio	17	4,024	847	6,201	11,072	3,155	563	4,308	8,026
Cincinnati, Ohio	5	1,689	221	2,386	4,296	1,187	171	1,871	3,229
Indianapolis, Ind.	9	956	905	3,978	5,839	594	564	2,308	3,466
Chicago, Ill.	32	18,759	9,966	31,369	60,094	12,264	6,288	21,850	40,402
Detroit, Mich.	12	3,978	2,469	5,768	12,215	2,670	1,794	4,117	8,581
Milwaukee, Wis.	9	1,641	427	4,286	6,354	1,218	232	2,191	3,641
Minneapolis, Minn.	12	3,197	2,210	3,228	8,635	2,204	1,418	2,214	5,836
Sioux City, Iowa	7	947	933	3,034	4,914	686	572	1,788	3,046
St. Louis, Mo.	20	5,890	1,005	11,993	18,888	3,936	660	9,439	14,035
Kansas City, Mo.	8	4,565	1,540	11,132	17,237	3,365	1,046	8,654	13,065
Omaha, Nebr.	10	5,043	1,500	9,922	16,465	3,585	849	5,284	9,718
Winchester, Va.	16	118	622	11,302	12,042	112	532	9,772	10,416
Waynesboro, Va.	8	291	3	3,911	4,205	243	2	3,272	3,517
Nashville, Tenn.	7	2,065	442	1,758	4,265	1,545	299	1,440	3,284
Dallas, Tex.	11	9,107	1,513	5,159	15,779	7,137	863	3,124	11,124
Denver, Colo.	7	1,077	675	2,813	4,565	690	456	1,857	3,003
Seattle, Wash.	15	1,917	2,281	2,631	6,829	1,328	1,430	1,431	4,189
Takoma, Wash.	11	2,978	852	700	4,530	2,165	547	474	3,186
Yakima, Wash.	58	268	570	29,228	30,066	214	472	23,202	23,888
Wenatchee, Wash.	32	-	658	16,562	17,220	-	570	13,348	13,918
Brewster, Wash.	17	-	120	10,339	10,459	-	96	8,609	8,705
Tonasket, Wash.	12	-	-	4,504	4,504	-	-	3,836	3,836
Portland, Oreg.	14	816	3,604	2,366	6,786	735	3,168	2,194	6,097
Medford, Oreg.	7	11	518	3,661	4,190	5	340	3,161	3,506
Hood River, Oreg.	8	-	-	6,503	6,503	-	-	4,536	4,536
Los Angeles, Calif.	23	3,400	3,279	8,821	15,500	2,341	2,270	6,756	11,367
San Francisco, Calif.	17	1,790	1,793	5,944	9,527	1,196	1,465	4,525	7,186
San Jose, Calif.	26	2,806	6	7,627	10,439	2,060	2	5,661	7,723
Modesto, Calif.	7	2,053	189	1,649	3,891	1,562	173	1,279	3,014
Total	714	116,639	55,731	301,509	473,879	81,171	38,970	224,152	344,293

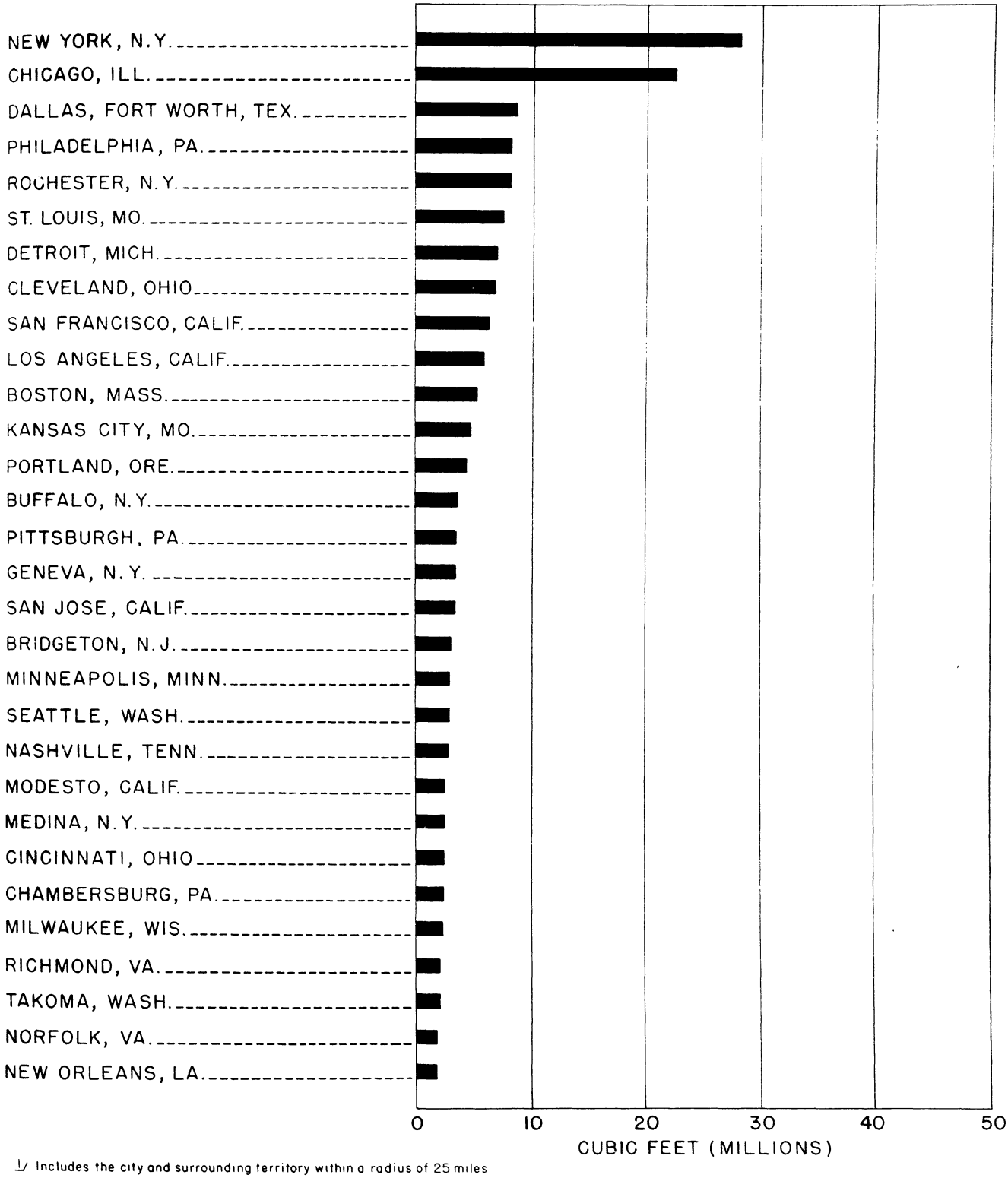
1/ Includes the city and surrounding territory within a radius of 25 miles.

Table 17.--Refrigerated storage capacity of public general warehouses in cities having 3 or more warehouses and approximately 2 million cubic feet or more net space 1/

City & State	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
Boston, Mass.	10	6,147	1,097	2,521	9,765	3,239	816	1,579	5,634
New York, N. Y.	28	13,543	5,891	21,839	41,273	9,334	3,754	14,990	28,078
Buffalo, N. Y.	3	964	2,189	1,679	4,832	684	1,776	1,316	3,776
Rochester, N. Y.	16	1,971	577	8,137	10,685	1,485	451	6,274	8,210
Medina, N. Y.	6	639	225	2,457	3,321	544	150	1,828	2,522
Geneva, N. Y.	7	1,270	100	3,404	4,774	1,035	50	2,547	3,632
Bridgeton, N. Y.	4	2,420	551	882	3,853	2,086	359	642	3,087
Philadelphia, Pa.	12	6,677	843	5,731	13,251	3,789	686	3,862	8,337
Pittsburgh, Pa.	4	743	1,420	2,916	5,079	562	1,103	2,084	3,749
Chambersburg, Pa.	3	67	48	2,490	2,605	33	44	2,210	2,287
Cleveland, Ohio	5	3,936	697	5,035	9,668	3,094	463	3,489	7,046
Cincinnati, Ohio	3	1,682	134	1,420	3,236	1,181	92	994	2,267
Chicago, Ill.	18	15,767	1,935	14,932	32,634	10,204	1,382	10,771	22,357
Detroit, Mich.	6	3,787	2,196	3,995	9,978	2,585	1,616	2,905	7,106
Milwaukee, Wis.	4	1,174	23	1,519	2,716	975	20	1,182	2,177
Minneapolis, Minn.	7	2,497	464	1,237	4,198	1,771	321	888	2,980
St. Louis, Mo.	7	5,027	290	5,276	10,593	3,386	234	4,169	7,789
Kansas City, Mo.	4	3,048	627	3,262	6,937	2,092	418	2,521	5,031
Richmond, Va.	4	143	515	2,011	2,669	100	384	1,501	1,985
Norfolk, Va.	4	172	1,085	1,311	2,568	108	838	934	1,880
Nashville, Tenn.	4	2,065	119	1,454	3,638	1,545	83	1,234	2,862
New Orleans, La.	5	898	264	1,078	2,240	738	198	920	1,856
Dallas, Tex.	8	8,682	745	1,855	11,282	6,918	491	1,394	8,803
Seattle, Wash.	7	1,217	1,725	1,978	4,920	842	1,065	1,073	2,980
Takoma, Wash.	4	1,950	800	118	2,868	1,390	504	83	1,977
Portland, Oreg.	7	244	3,435	1,510	5,189	221	3,014	1,390	4,625
Los Angeles, Calif.	14	3,209	2,701	2,729	8,639	2,196	1,841	1,940	5,977
San Francisco, Calif.	12	1,497	1,698	5,348	8,543	986	1,400	4,152	6,538
San Jose, Calif.	6	2,083	6	2,985	5,074	1,407	2	2,105	3,514
Modesto, Calif.	5	1,940	-	1,399	3,339	1,464	-	1,052	2,516
Total	227	95,459	32,400	112,508	240,367	65,994	23,555	82,029	171,578

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

Fig. 7.- Public general cold storage space in cities with 3 or more warehouses and approximately 2 million cubic feet or more net space 1/.



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

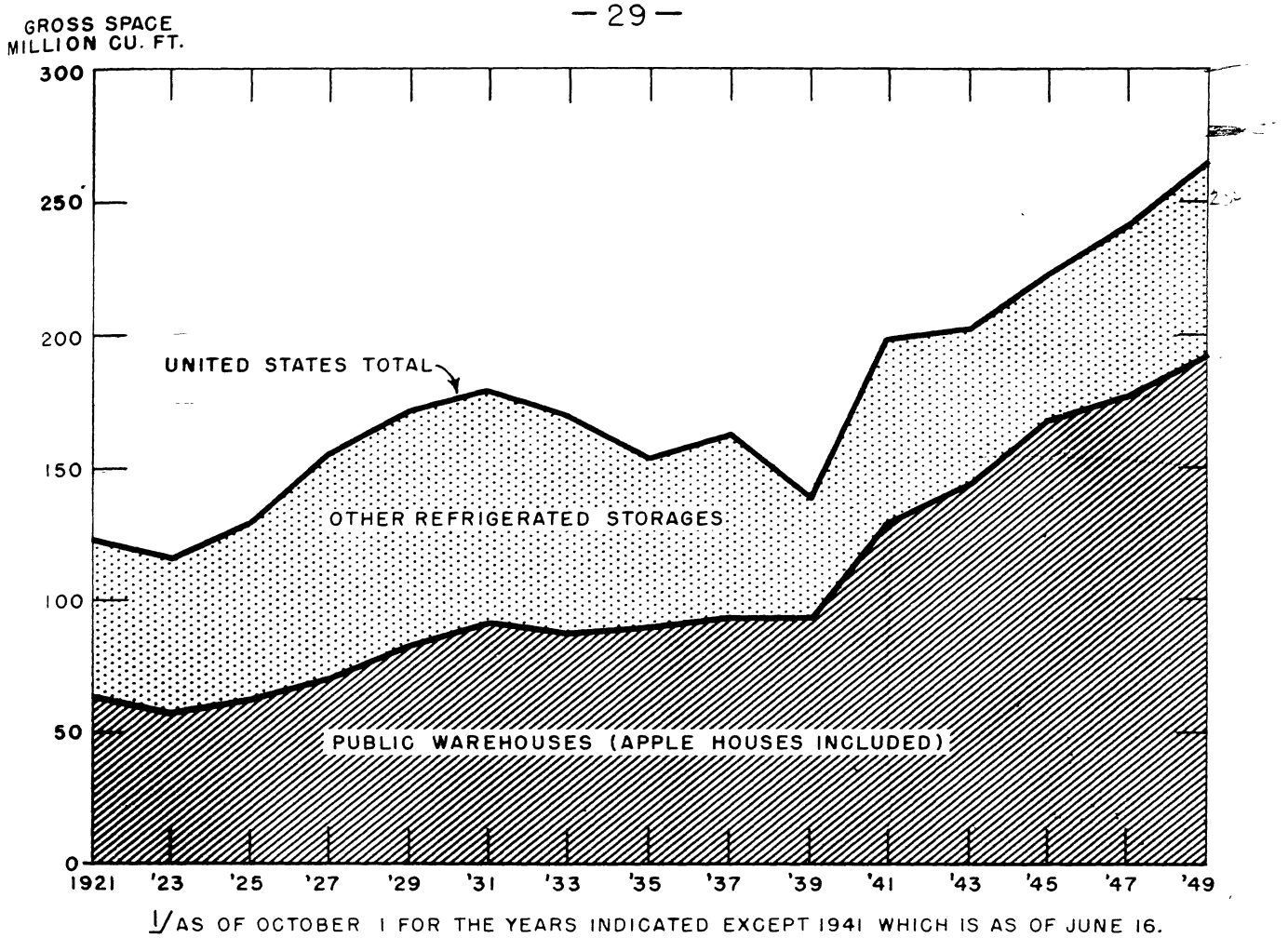
Table 18.--Refrigerated storage capacity of meat-packing plants in cities having 3 or more plants and at least 2 million cubic feet net space 1/

City & State	Plants	Gross space				Net piling space			
		Freezer		Cooler	Total	Freezer		Cooler	Total
		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.		Zero F. and below	Above 0 through 29° F.	Above 29 through 50° F.	
	Number	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.
New York, N. Y.	19	31	290	3,554	3,875	18	205	2,377	2,600
Indianapolis, Ind.	4	304	476	2,747	3,527	152	240	1,409	1,801
Chicago, Ill.	9	793	1,766	5,656	8,215	595	1,007	4,227	5,829
St. Louis, Mo.	11	858	713	6,402	7.973	546	423	5,033	6,002
Detroit, Mich.	3	192	272	1,630	2,094	86	178	1,107	1,370
Milwaukee, Wis.	3	381	303	2,767	3,451	195	139	1,009	1,343
Minneapolis, Minn.	4	682	1,696	1,963	4,341	421	1,056	1,306	2,783
Sioux City, Iowa	3	537	602	2,836	3,975	366	349	1,654	2,369
Omaha, Nebr.	4	795	1,491	8,736	11,022	415	842	4,385	5,642
Kansas City, Kans.	4	1,516	913	7,870	10,299	1,273	628	6,133	8,034
Dallas, Tex.	3	425	767	3,305	4,497	218	372	1,730	2,320
Denver, Colo.	4	395	360	2,114	2,869	209	216	1,364	1,789
Los Angeles, Calif.	5	163	226	2,865	3,254	120	161	2,198	2,479
Total	76	7,072	9,875	52,445	69,392	4,613	5,816	33,932	44,361

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

Table 19.--Percentage of space occupied in public general warehouses, by months, 1940-49

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.	Pct.
						Cooler						
1940	45	39	36	37	41	45	52	55	57	57	61	60
1941	52	46	40	40	47	53	58	58	61	63	68	64
1942	60	55	52	55	58	66	68	69	70	74	74	66
1943	60	59	57	61	64	68	76	77	77	75	77	73
1944	68	68	74	80	82	84	85	84	81	78	80	76
1945	72	70	68	67	66	66	65	67	69	67	65	64
1946	60	60	62	67	75	77	79	76	80	78	80	77
1947	69	65	62	61	65	68	74	77	76	73	76	78
1948	74	69	65	59	62	65	67	67	65	64	64	59
1949	54	52	48	48	49	50	52	53	53	60	68	67
						Freezer						
1940	67	66	63	58	55	58	65	69	68	69	68	71
1941	78	77	70	63	61	63	69	75	74	73	72	75
1942	76	76	72	67	62	64	69	74	77	79	79	76
1943	75	69	64	61	62	67	77	83	87	90	89	89
1944	89	89	92	88	85	87	87	89	89	89	86	83
1945	80	73	69	65	64	67	73	78	81	82	83	85
1946	85	83	81	80	79	80	80	86	88	87	87	85
1947	86	84	82	80	73	74	78	79	80	81	83	84
1948	85	84	81	75	70	70	71	72	72	71	72	72
1949	72	71	68	64	60	59	61	63	66	67	70	73



1/ AS OF OCTOBER 1 FOR THE YEARS INDICATED EXCEPT 1941 WHICH IS AS OF JUNE 16.

Figure 8.— Growth of freezer storage space, United States, 1921–1949 1/

Table 20.--Total gross refrigerated storage capacity in the United States, by type, October 1, 1929 - October 1, 1949

Type of refrigerated storage	1929	1931	1933	1935	1937	1939	1941	1943	1945	1947	1949
	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.	1,000 cu. ft.	1,000 cu. ft.	1,000 cu. ft.
Public 1/	316,810	325,703	317,211	322,450	333,833	351,368	371,771	389,991	403,832	408,252	413,256
Private 1/	29,133	35,222	32,739	31,051	33,890	32,072	43,973	49,544	62,291	83,781	85,417
Semiprivate 1/	60,322	58,853	64,718	53,863	52,957	50,438	48,407	42,081	45,254	52,035	85,718
Meat-packing plant 2/	322,330	321,065	297,274	303,206	309,642	312,562	302,232	169,650	134,814	130,993	116,324
Total	728,595	740,843	711,942	710,570	730,322	746,440	766,383	651,266	646,191	675,041	700,778

1/ Includes apple house refrigerated storage space.
2/ The apparent decrease in over-all storage space since 1941 is due to meat-packing plants not reporting refrigerated working space as they did in previous years.

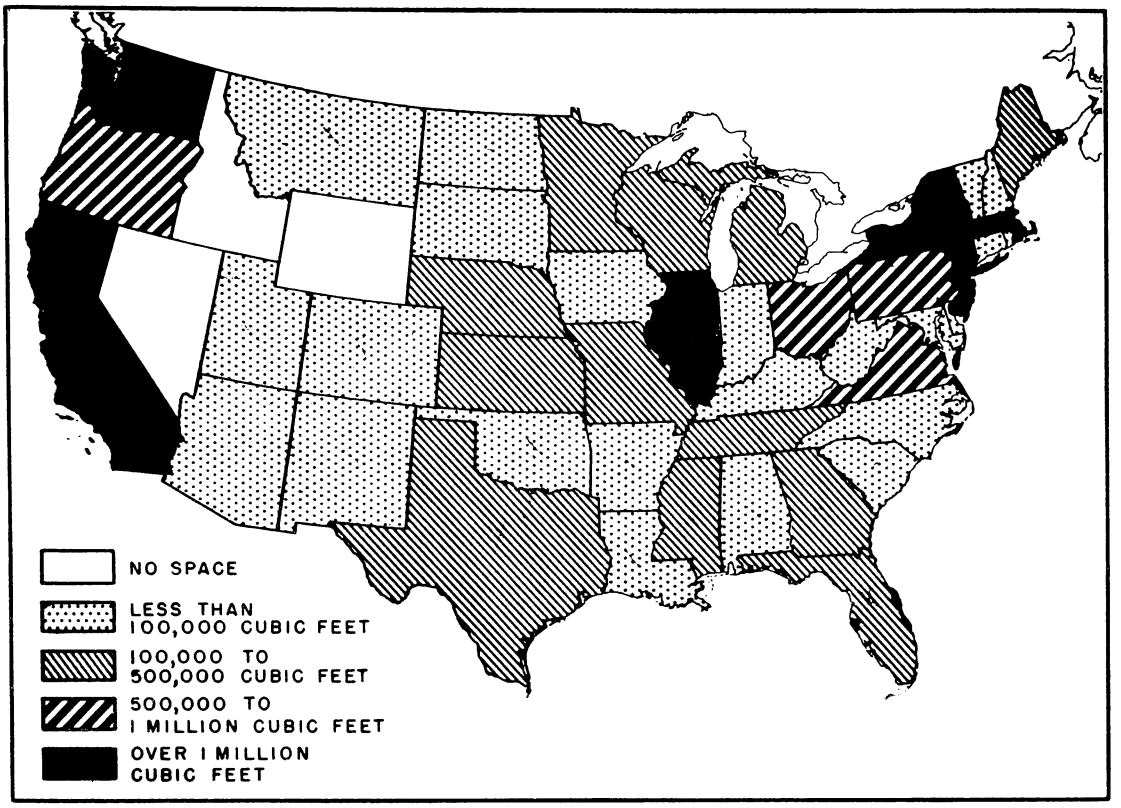


Figure 9.— Distribution of refrigerated storage space suitable for fish storage, by States, October 1, 1949

Table 21.--Refrigerated storage capacity devoted to fish storage, October 1, 1949 1/

State or Region	Plants	Cooler: Above 29 through 50° F.	Freezer: 29° F. and below
	Number	1,000 cu. ft.	1,000 cu. ft.
Maine	6	37	227
Massachusetts	18	326	2,360
Other States	5	2	78
New England	29	365	2,665
New York	29	365	1,693
New Jersey	7	368	663
Pennsylvania	17	91	518
Middle Atlantic	53	824	2,874
Ohio	14	9	805
Indiana	7	3	82
Illinois	9	203	802
Michigan	10	31	447
Wisconsin	7	11	132
E. North Central	47	257	2,268
Minnesota	5	21	174
Iowa	4	4	18
Missouri	5	40	305
Nebraska	5	2	112
Other States	5	2	139
W. North Central	24	69	748
Maryland	3	6	82
Virginia	7	137	450
Georgia	7	30	110
Florida	6	4	113
Other States	9	28	148
South Atlantic	32	205	903
Kentucky	3	6	26
Tennessee	9	3	192
Other States	3	13	156
E. South Central	15	22	374
Louisiana	4	-	46
Texas	15	9	467
Other States	3	-	24
W. South Central	22	9	537
Colorado	3	1	38
Other States	6	9	28
Mountain	9	10	66
Washington	13	671	807
Oregon	7	51	564
California	23	73	13,895
Pacific	43	795	15,266
United States	274	2,556	25,701

1/ All space shown in this table is shown in previous tables.

List of Tables and Charts

TABLES

COLD STORAGE CAPACITY IN THE UNITED STATES

COLD STORAGE CAPACITY BY GEOGRAPHIC REGIONS

COLD STORAGE CAPACITY BY STATES

COLD STORAGE CAPACITY BY CITIES

MISCELLANEOUS TABLES

CHARTS

Form MF-52 (9-6-49) U. S. DEPARTMENT OF AGRICULTURE
PRODUCTION AND MARKETING ADMINISTRATION
MARKETING FACILITIES BRANCH

SURVEY OF REFRIGERATED STORAGE SPACE AS OF OCTOBER 1, 1949

DATE OF THIS REPORT

BUDGET BUREAU NO. 40-R669.3
APPROVAL EXPIRES 12/31/49

NAME OF REPORTING COMPANY

MAIN OFFICE ADDRESS (STREET & NO., CITY & STATE)

LOCATION OF PLANT (STREET & NO., CITY & STATE)

PLEASE FILL OUT A SEPARATE FORM FOR EACH SEPARATE PLANT AND MAIL NOT LATER THAN OCTOBER 15, 1949 TO:

UNITED STATES DEPARTMENT OF AGRICULTURE
PRODUCTION AND MARKETING ADMINISTRATION
WASHINGTON 25, D. C.

ATTENTION: COLD STORAGE REPORTS

INSTRUCTIONS (Please Read Carefully)

1. WHO SHOULD REPORT: The operator of a refrigerated warehouse or the operator of a refrigerated storage facility in a meat-packing plant, apple house, or fish house (public, private or semi-private) should report refrigerated storage space in his plant; *include any space leased to others.*
2. WHAT SPACE SHOULD BE REPORTED: All storage space artificially cooled to a temperature of 50° F. or below in which food commodities are at any time stored for 30 days or more. Do not report space occupied by individual lockers of 25 cubic feet or less.

   NOTE: Meat packers and operators of apple houses, should report space used only for storing commodities including curing rooms in meat-packing plants. *Do not* report refrigerated space used exclusively for working space, chill rooms, ice storage or pre-cooling operations.
3. HOW SHOULD SPACE BE REPORTED: It should be reported as GROSS and NET space. GROSS SPACE includes space inside refrigerated rooms, measured from wall to wall and floor to ceiling making no deductions for aisles, columns, cooling coils, etc. NET OCCUPIABLE SPACE means actual space in which commodities can be stored; that is, the space inside rooms minus space for ventilation (outside of pile), aisles, coils, posts, sprinklers, etc. ALL CONVERTIBLE SPACE that at any time can be held at 29° F. or below with present equipment should be reported as Freezer or Sharp Freezer space.

REPORT ON SPACE

ITEM	REFRIGERATED STORAGE SPACE THAT CAN BE HELD AT TEMPERATURE OF			TOTAL REFRIGERATED SPACE (CUBIC FEET)
	SHARP FREEZER 0° F. AND BELOW (CUBIC FEET)	FREEZER 1° TO 29° F. INCLUSIVE (CUBIC FEET)	COOLER 30° TO 50° F. INCLUSIVE (CUBIC FEET)	
Gross Space				
Net Occupiable Space				

PLEASE ANSWER THE FOLLOWING QUESTIONS

a. Check below the type of storage that most nearly describes the plant operated by you.

0 ☐ PUBLIC COLD STORAGE - a warehouse in which commodities are stored for the general public for pay. (Apple houses excluded).

1 ☐ PRIVATE COLD STORAGE - a warehouse which is used as a part of a producing, processing or distributing business. (Apple houses excluded).

2 ☐ SEMI-PRIVATE STORAGE - a warehouse which is used by an operator partly for his own commodities and partly for storage of commodities of others for pay. (Apple houses excluded).

3 ☐ MEAT-PACKING PLANT - a plant engaged in processing animals and animal products for food, having some refrigerated storage space.

4 ☐ FISH HOUSE - a warehouse storing fishery products only.

5 ☐ PUBLIC APPLE HOUSE - a warehouse which stores principally apples for the public for pay.

6 ☐ PRIVATE APPLE HOUSE - a warehouse which stores principally apples belonging to the operator.

7 ☐ SEMI-PRIVATE APPLE HOUSE - a warehouse which stores principally apples, some of which are owned by the operators and some by others.

b. Have you expanded your facilities since October 1, 1947? . . . . . Yes ☐ No ☐

c. Do you have locker service? . . . . . Yes ☐ No ☐

d. How much, if any, of your net space reported above is devoted to fish storage? . . . . Coolers _____ cu. ft.
Freezers _____ cu. ft.

e. Do you have dry storage facilities connected with your cold storage? . . . . . Yes ☐ No ☐

f. If any of the space reported above is leased to others for storage purposes and you have no control over commodities being stored in that space, please give the name and address of each lessee. (Attach separate sheet if necessary).

g. Do you include estimates of lessee's holdings in your cold storage reports to the Department of Agriculture? . . . . . Yes ☐ No ☐

Any correspondence related to this report will be directed to the person whose name appears here ➧

(NAME OF PERSON MAKING THIS REPORT)