1958

1941

17

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1000
3,36

1958

1941

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5336

MARKETING COSTS and MARGINS for...

U. S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
MARKETING RESEARCH DIVISION
WASHINGTON, D. C.

MARKETING RESEARCH REPORT NO. 225

Contents

The difference between the price the farmer gets and the price the consumer pays for a head of lettuce is known as the PRICE SPREAD, or MARKETING MARGIN. This margin includes the charges for handling, transporting, and selling.

June 1958

For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price 10 cents

Marketing Costs and Margins for California Lettuce

By Alvin Z. Macomber, *agricultural marketing specialist, Market Organization and Costs Branch, Agricultural Marketing Service*

Highlights

The major change in the lettuce industry over the past 10 years has been the transition from shed packing and icing to field packing and vacuum-cooling. With these changes the cost of harvesting and packing was reduced by 22 percent between 1950 and 1953, but it rose again by 4 percent in 1956.

Vacuum-cooling and standard refrigeration has replaced top icing as the typical method of refrigerating shipments of lettuce. Transportation costs for shipping California lettuce to Chicago increased 47 percent between January 1946 and December 1956; to New York City, 39 percent.

The marketing margin for California lettuce increased 60 percent to New York City and 75 percent to Chicago between 1946 and 1956. Transportation cost changes accounted for 27 percent of this increase.

The wholesale-retail margin made up 73 percent of the increase in the total marketing margin between 1946 and 1956. In Chicago most of the increase in this margin was at retail; there was a smaller increase at wholesale. The opposite occurred in New York City, more of the increase in margin being at wholesale.

Returns to farmers for growing Salinas-Watsonville lettuce represented about 10 percent of the consumer's dollar in 1950, and about 20-percent of this dollar in 1956.

California lettuce is marketed during two seasons from two major growing districts. The Imperial Valley marketing season is from November through March, the Salinas-Watsonville season from April to November (fig. 1). Salinas-Watsonville ships the largest volume—about two-thirds of all California lettuce, and nearly one-half of the total rail shipments of lettuce in the United States. In 1956, California produced 60 percent of the lettuce in the United States and made 70 percent of all shipments. Lettuce marketed in the United States in 1956 was valued at about $135 million, ranking third among all vegetables.

The past decade has seen significant changes in lettuce marketing practices. The primary change has been a shift from icing to vacuum-cooling as a means of cooling lettuce before shipment. This shift has been accompanied by a change from

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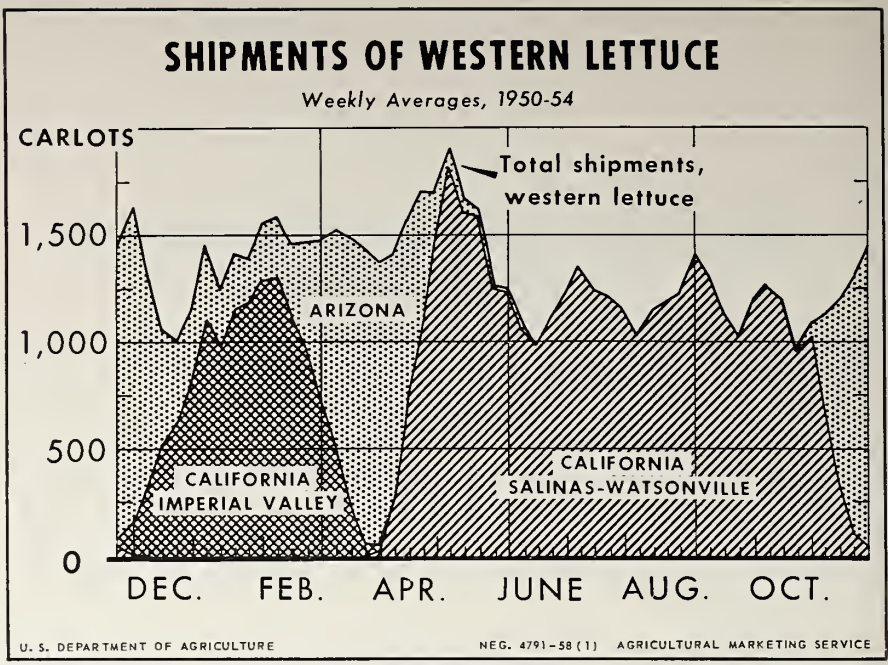

Figure 1

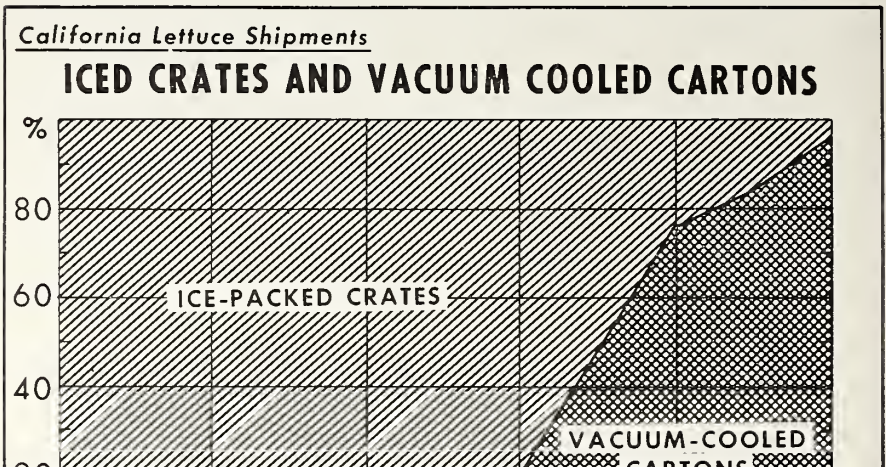

Figure 2

shed packing to field packing, and the use of fiberboard cartons in place of wooden crates (fig. 2).

These changes have had marked effects upon the costs of marketing. They have permitted more efficient harvesting, packing, and shipping of lettuce. While one cannot say how much the costs of these services would have increased if these changes in methods had not taken place, it is evident from recent studies that the increased efficiency has prevented marketing costs from rising as much as they would otherwise have done.

This report analyzing costs and margins for lettuce is one of a group of such reports being published by the Agricultural Marketing Service and is part of a broad research program aimed at improving market efficiency, and expanding markets for farm products. It gives the results of a study of the changes in marketing costs and margins for California lettuce sold in the two largest markets in the United States, New York City and Chicago. The report covers the decade from 1946 to 1956. Some of the data are from the Commodity Stabilization Service of the United States Department of Agriculture; some from cooperative studies of the California and Arizona agricultural experiment stations with AMS. Further data are from the U. S. Bureau of Labor Statistics.

Marketing Practices

Harvesting

Ten years ago almost all California lettuce processed for interstate shipment was handled through packing sheds. A field crew cut the lettuce and placed it on the belt of a conveyor-loader; the conveyor-loader dumped the lettuce into large field baskets carried on flat-bed trucks. These baskets held 700 to 900 heads of lettuce. The trucks hauled the lettuce to the packinghouse at distances up to 50 miles, where the heads were trimmed, graded, and packed into wooden crates with ice.

Today most California lettuce is field packed. Either a ground-pack or machine-pack method is used. The ground-pack was the first method used when packing moved from the sheds to the field and before large-scale field harvesting equipment was developed. It is now regaining popularity. By this method cutters harvest the lettuce and pack it directly into fiberboard cartons that are either on the ground or on low wheelbarrows.

With the machine-pack method a crew working with a field harvesting machine cuts, trims, packs, and assembles the lettuce in one operation. Cutters cut and trim and place into rows lettuce from two raised double-row plant beds. The harvesting machine follows the cutters, straddling several rows. Pickup men follow the harvester and place the heads on it. Essentially the harvester is a moving packinghouse for packers who grade and pack the lettuce in cartons on the machine. The cartons are then stapled closed and conveyed directly to a truck moving parallel with the harvester. The truck hauls the lettuce to a vacuum-cooling plant.

Cooling

When lettuce was packed in the packinghouses, it was cooled as a part of the trimming, grading, and packing operations. Ice and lettuce were packed in alternate layers in wooden crates typically holding 4 to 5 dozen heads and then loaded into precooled refrigerator cars. Top icing of 10,000 to 20,000 pounds was added before shipping.

The field packing method of harvesting in fiberboard cartons was

made feasible by vacuum-cooling. Commercial shipments of vacuum-cooled cartons began in 1948. By 1951 not more than 10 percent of California lettuce shipments was in vacuum-cooled cartons. By 1953 nearly 50 percent, and in 1956 approximately 95 percent were in cartons (fig. 2).

Vacuum-cooling reduces the body temperature of leafy vegetables rapidly. The quicker lettuce can be cooled after harvest, the longer its quality can be safeguarded. Air is extracted from a large air-tight cylinder, usually holding 320 cartons of lettuce, reducing the atmospheric pressure within the cylinder and creating a partial vacuum. This causes rapid moisture evaporation from the lettuce and results in cooling. At suitable pressures, the internal temperature of lettuce can be lowered to 35 degrees in 20 to 30 minutes.

Vacuum-cooling makes possible improvement in the quality of lettuce throughout the various marketing stages. Harvest quality can be maintained and the life of lettuce extended for relatively long periods. When cooled by ice, lettuce requires a longer time to reach optimum temperature. Several other advantages are attributed to vacuum cooling: There is (1) no bruising damage caused by ice and (2) less organic decay. On the other hand, ice packed lettuce has a crisp, fresh appearance upon arrival at the retail store, while vacuum-cooled lettuce may appear somewhat dry.

Changes in the organization of the lettuce packing industry are another outcome of vacuum-cooling. Vacuum-cooling companies chill the lettuce and load it into refrigerated railroad cars or trucks. Formerly, the packinghouses graded, iced, packed, and loaded the lettuce, but now they play a minor role in the marketing of California lettuce.

Transportation

With the increased use of fiberboard cartons, standard refrigeration has become more common than top icing for lettuce in shipment. Standard refrigeration includes a precooled refrigerator car with ice in the bunkers, fan air circulation, and bunker re-icing at specified points enroute.

Containers

At any one time a variety of containers holding different counts of lettuce have been in use. In addition, there have been several changes in the dimensions of the standard or most typical pack.

Prior to 1950 the LA (Los Angeles) crate was the most widely used container. It was largely replaced in 1951 by the WGA (Western Growers Association) crate, because research had shown that less damage occurred in the deeper and wider but shorter WGA crate. In 1953 the WGA crate was lengthened to better accommodate the more popular 4-dozen pack of larger heads and became known as the S–W (Salinas-Watsonville) crate. The LA, WGA, and S–W crates were usually packed with either 48 or 60 heads of lettuce.

By 1953 nearly 50 percent of the total shipments from California were vacuum cooled and in fiberboard cartons. Different fiberboard cartons also had varying dimensions and were used to pack 18, 24, or 30 heads of lettuce, but most commonly 24 heads. As many as seven different cartons have been authorized for rail shipment since their introduction. A fiberboard carton known as the standard carton was adopted in 1956 for general use throughout the industry.

Costs and Margins

The difference between the selling price at shipping point and the price consumers pay at retail is the marketing margin. In 1946 the average margin for California lettuce shipped to New York City was $4.20 per crate; the margin in 1956 averaged $6.70 for 2 cartons, the equivalent of 1 crate. The difference of $2.50, an increase of 60 percent, reflects both increased marketing costs for lettuce and the rise in the general price level between the two periods.

The total marketing margin between California shipping points and the point of retail sale in Chicago increased $2.44, from $3.26 in 1946 to $5.70 in 1956, an increase of 75 percent.

Cost of marketing California lettuce in Chicago is less than it is in New York City, even after allowance has been made for the transportation cost differential (fig. 3). If the higher price for lettuce sold in New York City over Chicago had been due to the longer shipping distance alone, then when transportation charges are deducted, the margins would be approximately the same. Figure 3 shows that when these transportation charges are taken from the total marketing margin in both cities the resultant wholesale and retail margin in New York City is still higher than that in Chicago. The additional difference may be due to greater cartage and handling costs in New York City than in Chicago.

The wholesale margin for lettuce sold in New York was greater than that in Chicago; it also has increased more since 1946 than the same margin in Chicago. In New York City, the average wholesale margin for 1955 and 1956 was 50 percent more than the average wholesale margin of 1946 and 1947, while in Chicago this margin was about

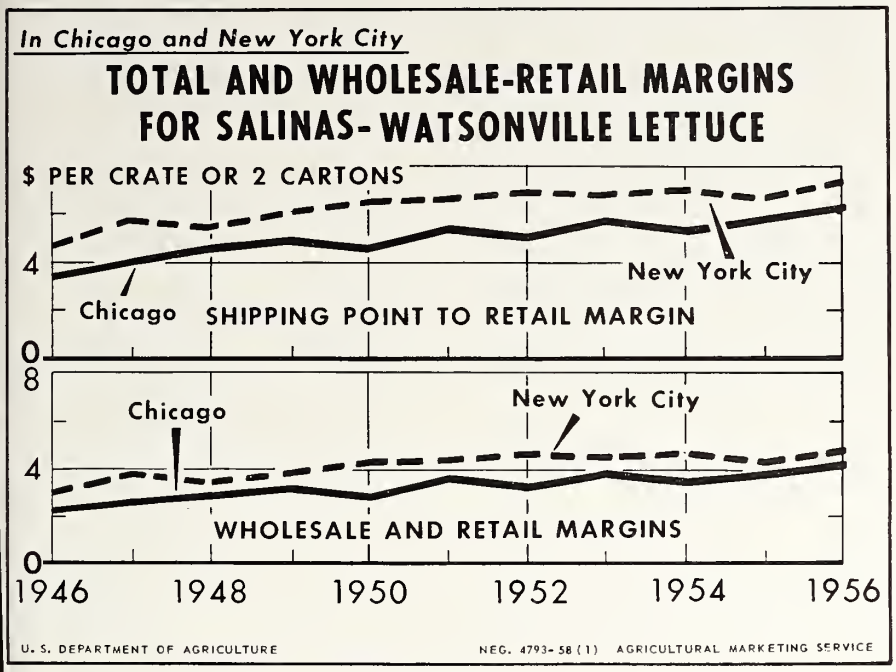

Figure 3

equal during both periods. The retail margin in Chicago for Salinas-Watsonville lettuce has increased 8 seasons out of 10 since 1946 and was up by 85 percent in 1955–56 from 1946–47. In New York City the retail margin increased only 25 percent (table 1).

TABLE 1.—*Specified margins and transportation costs per crate for Salinas-Watsonville lettuce sold in New York City and Chicago, season averages, 1946–1956* [1]

Year	New York City				Chicago			
	Shipping point to retail margin	Transportation costs [2]	Wholesale margin	Retail margin	Shipping point to retail margin	Transportation costs [2]	Wholesale margin	Retail margin
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
1946	4. 77	1. 73	0. 65	2. 39	3. 52	1. 35	0. 44	1. 73
1947	5. 83	1. 88	1. 08	2. 87	4. 06	1. 49	. 57	2. 00
1948	5. 55	2. 03	1. 25	2. 27	4. 62	1. 66	. 58	2. 38
1949	6. 06	2. 09	1. 39	2. 58	4. 97	1. 71	. 71	2. 55
1950	6. 52	2. 10	. 61	3. 81	4. 61	1. 73	. 37	2. 51
1951	6. 61	2. 14	1. 10	3. 37	5. 47	1. 75	. 72	3. 00
1952	6. 96	2. 24	1. 65	3. 07	5. 09	1. 86	1. 09	2. 14
1953	6. 87	2. 19	1. 87	2. 81	5. 71	1. 86	1. 12	2. 73
1954	6. 96	2. 23	1. 55	3. 18	5. 38	1. 84	. 63	2. 91
1955	6. 69	2. 30	1. 28	3. 11	5. 74	1. 90	. 60	3. 24
1956	7. 29	2. 50	1. 32	3. 47	6. 16	2. 06	. 43	3. 67
Increase, 1946 and 1947 to 1955 and 1956	1. 69	. 59	. 43	. 66	2. 16	. 56	. 01	1. 59
Percentage 1955 and 1956, above 1946 and 1947	*Percent* 32	*Percent* 33	*Percent* 49	*Percent* 25	*Percent* 57	*Percent* 39	*Percent* 2	*Percent* 85

[1] A crate of 4-dozen heads (or 2 two-dozen cartons).
[2] Average costs May to November.

The cost of marketing lettuce was greater from Salinas-Watsonville than it was from the Imperial Valley when shipped to New York City (fig. 4). These marketing charges averaged 73 cents greater per crate (or 2 cartons) per season from 1946 to 1956. In figure 4 allowance was made for more spoilage at retail during the warmer summer months of the Salinas-Watsonville season. Part of this difference between the marketing charges from the two areas is due to less need for refrigeration for shipping lettuce in the winter months of Imperial Valley season. Also indications are that prices were higher for lettuce in New York City during summer months than during the winter months.

Shipping Point Costs

The shift from shed packing to field packing has tended to reduce costs at shipping point, or at least to prevent them from rising as much as they would have with the old methods. For example, the 1953 costs of harvesting, packing, and cooling by shed packing methods were $1.89 per crate. By field packing methods, the costs were $1.48 for the same quantity of lettuce. This represents a reduction of 22 percent. In 1956 the

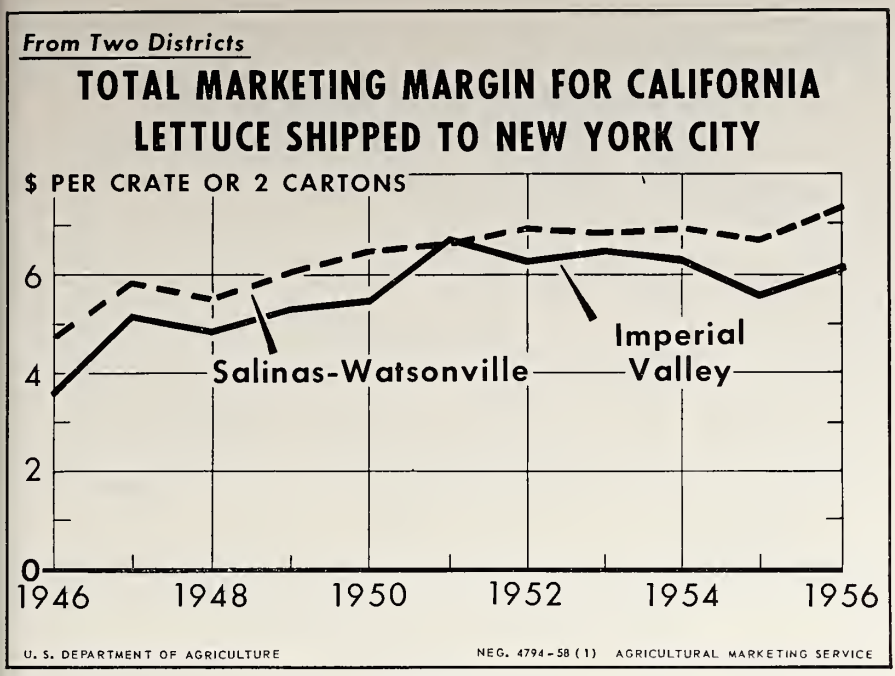

Figure 4

costs of harvesting, packing, and cooling a crate equivalent (2 cartons) were $1.54, or an increase of 4 percent over costs in 1953.

Transportation

Rail freight charges account for approximately 80 percent of the total transportation costs from California to New York City and Chicago. Other costs include refrigeration services, ice, and Federal tax.

Transportation costs per crate-equivalent have increased sharply during the past decade. At the end of December 1956, transportation costs to New York City were 57 percent (97 cents) above the January 1946 level. They had increased 66 percent (88 cents) to Chicago (fig. 5).

However, the billed weight per shipped container also increased, making the transportation cost increase 47 percent on a per-pound basis to Chicago. These charges were 1.75 cents per pound in January 1946 and 2.57 cents in December 1956. The per-pound transportation costs to New York City increased by 39 percent; from 2.22 cents to 3.09 cents per pound, 1946 to 1956.

From July to December 1956, it cost $1.27 to ship one 2-dozen carton of lettuce from Salinas, Calif., to New York City, and $1.06 to ship a carton to Chicago.

The average annual transportation charge per crate-equivalent of lettuce shipped to New York City increased 68 cents between 1946 and 1956. On shipments to Chicago the increase was 66 cents. In both cases this accounted for 27 percent of the increase in the shipping point to retail marketing margin.

Transportation costs in figure 5 are not adjusted for the various types of refrigeration services available. Standard refrigeration rates were used because of their availability for the 1946–56 period, while top icing under any one of various tariff rules was less expensive. Top

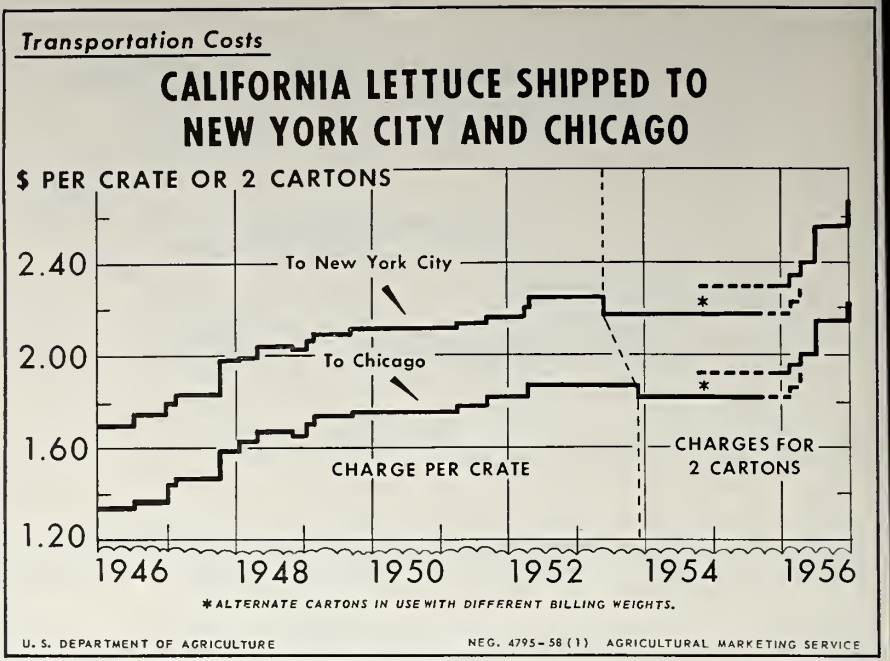

Figure 5

icing was the usual method of refrigerating lettuce shipped in wooden crates. Also some modified refrigerating system was usually used during cool winter weather.

With the change from wooden crates to fiberboard cartons, the amount of damage in transit to containers and lettuce has been lessened. Damage loss claims paid by railroads on all lettuce averaged $19.34 per rail car in 1951–53 when most lettuce was in crates and $8.76 per rail car in 1954–55 when cartons predominated. This saving of 3.2 cents per 4-dozen container accrues to the railroads but in the long-run may be reflected in the cost of transportation.

Because a head of lettuce appears somewhat dry when shipped after vacuum cooling, more outside or wrapper leaves are left on the head. The increased weight of these added leaves is a partial reason for the increase in billing weights which has accounted for a part of the rise in transportation costs.

Trend

Marketing charges for lettuce shipped from California to Chicago were 58 percent of the consumer's dollar for the 10-year average, 1946–56. Shipped to New York City this average was 63 percent of the consumer's dollar (table 2).

For Imperial Valley lettuce shipped to Chicago during the 5-year period 1951–56, marketing charges accounted for 60 percent of the consumer's dollar. This was a 10-point increase over the 50 percent for the same charges during the 1946–50 period. Shipped to New York City these charges were 57 percent of the retail dollar in 1946–50 and 65 percent in 1951–56, an increase of 8 percentage points. When Salinas-Watsonville lettuce was sold in New York City and Chicago, the marketing margin for the two 5-year periods increased 2 and 5 percentage points, respectively. The trend has been for the cost of marketing to take an

TABLE 2.—*Marketing margin as percent of the retail dollar for California lettuce sold in New York City and Chicago, 5-year averages, 1946–56*

Period	To New York City			To Chicago		
	Imperial Valley	Salinas-Watsonville	Average	Imperial Valley	Salinas-Watsonville	Average
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
1946–50	57. 0	63. 1	60. 1	50. 2	57. 4	53. 8
1951–56	65. 0	64. 9	65. 0	60. 2	62. 0	61. 1
1946–56	61. 3	64. 1	62. 7	55. 7	59. 9	57. 8

TABLE 3.—*Distribution of the retail dollar for Salinas-Watsonville lettuce, 1950, 1953, and 1956*

Item	New York City			Chicago		
	1950	1953	1956	1950	1953	1956
	Percent	*Percent*	*Percent*	*Percent*	*Percent*	*Percent*
Retail margin	40. 4	25. 8	24. 0	34. 2	30. 5	37. 8
Wholesale margin	6. 5	17. 2	18. 7	5. 0	12. 5	4. 1
Transportation	22. 3	20. 0	22. 6	23. 5	20. 8	21. 6
Harvesting and packing	20. 0	13. 6	13. 8	25. 7	16. 5	15. 9
Returns for growing	10. 8	23. 4	20. 9	11. 6	19. 7	20. 6
Retail price (percent)	100. 0	100. 0	100. 0	100. 0	100. 0	100. 0
	Dollars	*Dollars*	*Dollars*	*Dollars*	*Dollars*	*Dollars*
Retail price (dollars)	9. 43	10. 91	11. 17	7. 35	8. 95	9. 70

increasing share of the consumer's dollar for lettuce.

Returns for growing and shipping California lettuce sold in New York City decreased 5 percentage points, from 40 percent to 35 percent, between 1946–50 and 1951–56. In Chicago this decrease was 7 percentage points, from 46 percent to 39 percent of the retail dollar for the respective periods.

The level of prices has increased since 1950 for Salinas-Watsonville lettuce and the share received by the different marketing agencies has changed slightly (fig. 6). In New York City the share of the consumer's dollar for harvesting and packing declined from 20 percent in 1950 to 14 percent in 1956; the returns for growing increased from 11 percent in 1950 to 21 percent in 1956 for both New York and Chicago. The wholesale margin increased more in New York City than in Chicago from 1950 to 1956, while the retail margin in New York City decreased and in Chicago it increased. Transportation costs as a percentage of the retail dollar have remained essentially unchanged in both markets (table 3).

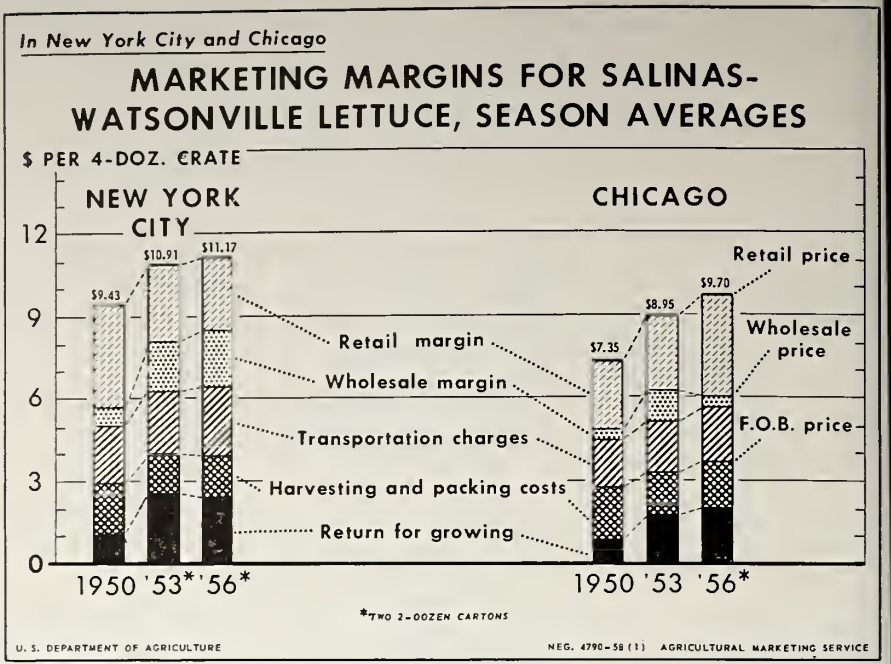

Figure 6

A Case Study

Costs in marketing lettuce may be illustrated by tracing a typical 2-dozen carton from California until it is sold in New York City, and another until it is sold in Chicago.

In this case study, let us assume that the carton of lettuce was harvested and shipped during the first week of October 1956 at Salinas, Calif. The grower was also the packer and shipper and had harvesting and packing costs in addition to his costs of production.

It took 9 days for our carton of lettuce from Salinas to arrive at the rail teamtracks in New York City. A few cartons of lettuce were taken to New York's Washington Street Market by the wholesaler as a sample for buyers to inspect. The wholesaler, who had paid for the transit costs to New York, sold our typical carton to a retail food store. A truck picked up the lettuce at the teamtracks and delivered it to a store in uptown Manhattan. The retailer had to prepare, trim, and display the lettuce for sale to his customers.

The carton that went to Chicago arrived in 6 days from Salinas, Calif. Here again the carload of lettuce was left on rail teamtracks while samples were on display at Chicago's South Water Market. Our typical carton was placed aboard the retailer's truck at the teamtracks and delivered to a store on Chicago's West side. The lettuce was trimmed and displayed,

much as it was in the New York store. In both cases, the retailer lost one head out of the carton because of spoilage.

The various items of costs and returns for each carton of lettuce were:

Item	Sold in Chicago	Sold in New York City
Retail price, allowing for waste and spoilage, October 15–17	$5. 19	$5. 84
Retail margin	1. 19	1. 67
Wholesale price, loaded on retailer's truck, October 15–16	4. 00	4. 17
Wholesale margin	. 79	. 74
Transportation charges (including 3 percent Federal tax):		
Freight, 640 cartons per rail car	. 89	1. 08
Full stage standard refrigeration	. 17	. 20
Price f. o. b. shipping point, October 8	2. 15	2. 15
Shipping point marking costs:		
Precooling and loading	. 15	. 15
Administrative costs, advertising and selling	. 11	. 11
Price f. o. b. shipping point—Continued		
Harvesting and packing costs:		
Labor	$0. 15	$0. 15
Machinery and equipment	. 06	. 06
Cartons and staples	. 30	. 30
Returns to grower for production	1. 38	1. 38

The consumer's dollar for California lettuce sold in Chicago and New York City, mid-October 1956, was distibuted as follows:

Item	In Chicago	In New York City
	Percent	*Percent*
Price to consumer	100. 0	100. 0
Retail margin	22. 9	28. 6
Wholesale margin	15. 2	12. 7
Transportation charges	20. 4	21. 9
Harvesting, packing, and shipping-point costs	14. 9	13. 2
Returns for growing	26. 6	23. 6

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