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Marketing aspects of the New England fishing industry

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BOSTON UNIVERSITY

College of Business Administration

THESIS

Marketing Aspects of the New England Fishing Industry

by

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TABLE OF CONTENTS

<u>Chapter</u>		<u>Page</u>
	LIST OF TABLES.	3
	FOREWORD.	4
I	GENERAL INTRODUCTION TO NEW ENGLAND FISHING INDUSTRY AND ITS PRODUCTS.	7
II	CONSUMPTION OF FISHERY PRODUCTS IN THE UNITED STATES.	25
	A. Recent Trends	25
	B. Sales Patterns in the United States	28
III	COMPETITION	48
	A. Domestic Competition.	48
	B. Foreign Competition	53
IV	COLD STORAGE AND TRANSPORTATION	63
	A. Cold Storage.	64
	B. Transportation.	69
V	THE DISTRIBUTION SYSTEM	80
	A. General Structure	80
	B. Mark-up Policies.	83
	C. Retailing	87
VI	RECENT CHANGES IN MERCHANDISING TECHNIQUES. .	94
	A. Packaging	94
	B. New Products.	102
VII	WHAT IS NEEDED.	106
	BIBLIOGRAPHY.	114

LIST OF TABLES

<u>Table</u>		<u>Page</u>
I	Fresh and Frozen Packaged Fish Production for U.S. and New England, Selected Years	19
II	Total Catch of Fisheries of New England and of U.S. and Alaska, Selected years 1880-1948	20
III	New England Fisheries Summary of Catch, 1948	21
IV	Number of Fishing Vessels at Major New England Ports by Gross Tonnage	22
V	Catch of Certain Species in New England for Selected Years 1887 to 1948	23
VI	Summary of Landings at Various New England Ports	24
VII	U.S. Civilian per Capita Consumption of Fishery Products, 1930 - 50	37
VIII	Total Production and Disposition of the Domestic Catch of Fishery Products 1929 to 1950, Inc.	38
IX	Cities and Years Surveyed	39
X	Importance of Regional Species of Fresh and Frozen Fish in Certain U.S. Cities in 1946 Compared to 1936 by Area Totals	40
XI	Importance of Regional Species of Fresh and Frozen Fish in Certain U.S. Cities in 1946 compared to 1936 by Area Totals	41
XII	Farm Output and Fish Production United States 1929 - 1950	42
XIII	Index Numbers of Consumption Per Person	43
XIV	Index Numbers of Average Monthly Retail Prices of Specified Foods in Leading Cities	44
XV	U.S. Imports of Groundfish Fillets and Country of Origin, 1939-1948, by Pounds	45
XVI	Import Quota for Groundfish Fillets, Including Rosefish Fillets, at Reduced Tariff and Total Imports of These Fillets, 1939-1948	46
XVII	Freezing Fish at Sea Pacific Fisheries Experimental Station, Tasting Panel	47

LIST OF TABLES (Cont'd)

<u>Table</u>		<u>Page</u>
XVIII	Production of Frozen Fishery Products, 1932-1948	76
XIX	Holdings of Frozen Fishery Products by Months Year 1949	77
XX	Distribution of Receipts of Fresh and Frozen Fish, Boston, Mass., 1940	78
XXI	New York, N.Y. Salt-Water Market Receipts of Fresh and Frozen Fish and Shellfish from all Sources by Types of Transportation - Selected years 1939-49	79
XXIa	Value of Fishery Products at Various Levels of Production and Distribution in the United States	93
XXII	Total Loss in Weight of Wrapped Fillets at 0° F.	112
XXIII	Production of Consumer Packages of Certain Frozen Sea Food, 1950-1951	113

FOREWORD

Most authorities are in agreement as to the four major problems which threaten the continued prosperity of the New England fishing industry. These are: increasing scarcity of key species; internal conflict, especially between Fishermen's Union and fish dealers; imports, particularly from Canada, jeopardize sales of New England's packaged fish in U.S. markets, especially in the Midwest; marketing difficulties and lack of intensive sales promotion have limited income from sales.

This thesis will deal primarily with the latter problem. It is my opinion that a more efficient distribution system and intensified sales promotion and educational programs will provide an indirect solution to the first three problems. An increase in consumer demand leads to more sales. A more efficient distribution system leads to more profits. Larger per capita consumption of fishery products accompanied by an overall increase in profits will be a major step in overcoming foreign competition arising from imports of groundfish fillets. This will also eventually lead to larger returns for fishermen and dealers at the primary markets, thus encouraging smoother operations within the industry itself. Increased sales income and profits will provide more funds for research and biological studies to determine means of preventing further depletion of key species and also to develop techniques for processing new

species of fish.

In the ensuing chapters, various marketing functions will be discussed, and possible solutions to marketing problems will be suggested. After an introductory section discussing the nature of the New England fishing industry and its products, other subjects to be included in this study are: consumption of fishery products in the United States; competition; cold storage; transportation; retailing of fish; distribution cost allocation; branding, packaging and development of new products; planning and administration of sales programs.

Publications of the U.S. Fish and Wildlife Service provided much of the technical and statistical data in this manuscript. I also conducted many personal interviews with people engaged in or associated with the New England fishing industry.

I wish to express gratitude for their helpful suggestions to Dr. K.D. Hutchinson, chairman of the Marketing department, Boston University and Mr. Albert Roy, chief librarian, Boston University, College of Business Administration .

Information which comes from first hand experience in any industry is of immeasurable value. It is to the following individuals for their patience and cooperation in supplying me with this type of material that I am particularly indebted. My thanks to: Harold Luther, head of the

marketing and advertising department, General Foods Corporation; John Mantia, Jr., office manager, John Mantia and Sons; Joseph Puncochar, chief of North Atlantic Research, U.S. Fish and Wildlife Service; John O'Brien, chief of Market News Service, U.S. Fish and Wildlife Service; Thomas Rice, executive secretary, Massachusetts Fisheries Association.

Gratitude is expressed also to the fishermen, dealers, and government employees, too numerous to mention individually by name, but whose assistance contributed materially to the successful completion of this study.

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Chapter I

General Introduction to the New England Fishing Industry and Its Products

New England is the leading supplier of fresh and frozen packaged fishery products in the nation. In 1948, it accounted for about 80 percent of the country's output of 193.5 million pounds* (see Tables I and II). Most of the packaged-fish output was produced by the four major seaports of New England: Boston, Gloucester, New Bedford, and Portland. These fishery products centers landed about two-thirds of the weight and five-sixths of the value of all fish brought into ports of the five New England States that support marine fisheries. These five New England States in order of importance were Massachusetts, Maine, Rhode Island, Connecticut and New Hampshire (see Table III).

The total number of vessels operating out of New England ports in 1948 was 940. These were mostly motor powered vessels having a total net tonnage of 31,280 tons (see Table IV). The total for the United States and Alaska was 9,632 vessels with a total net tonnage of 189,687 tons. The total number of fishermen in New England was 24,874 in 1948. Of these, 6,384 were on vessels and 18,490 were on

* 29, p.44

boats and on shore. The total for the United States and Alaska was 158,001 -- on vessels 49,001 and on boats and shore 109,000.*

The sources of supply of the hundreds of millions of pounds of fish and shellfish which are brought into the ports of New England each year are the offshore banks of the Northwest Atlantic and the inshore grounds of southern New England. New England is adjacent to 260,000 square miles of fine fishing grounds, and its coastline parallels the southern end of a continental shelf which extends for 1,000 miles along the North Atlantic coast in the area from Newfoundland to Long Island. East of Maine, New Hampshire, and Massachusetts lies the great basin of water known as the Gulf of Maine -- its northern, western, and southwestern rim formed by the curving shoreline from Cape Sable to Provincetown. To the south and east, the rim of the Gulf lies from 12 to 600 feet under water and consists of a 250 mile ridge (a sort of submarine mountain chain) that forms a barrier between the mile-deep waters of the open Atlantic and the shallower basin of the Gulf. Scattered along this curving ridge are the offshore fishing grounds of New England, known as Georges, Browns and Seal Island Banks.

* 29, p. 6

From Georges Bank, with its area of 22,000 square miles, about 100 million pounds of fish are taken each year. The fishing grounds included in the Georges area lie from 80 to 220 miles from Boston, which means that fish taken there usually arrive in port in first-class condition. Browns Bank, next to the eastward, is only a fraction of the size of Georges. Haddock, rosefish, cod, pollock, cusk, and flounders are the principal species making up its 35 million pound annual yield. Seal Island, the shoal which completes the seaward rim of the Gulf of Maine, is visited only by line trawlers and is a relatively unimportant fishing ground. More than a third of New England's fish come from the Gulf of Maine and its adjoining offshore banks. Another one-fourth to one-third comes from a more distant chain of banks that lie off the southeastern coasts of Nova Scotia and Newfoundland from 38 to 62 hours' trawler run from Boston - La Have, Emerald, Sable Island, and Banquereau; while southeast of Newfoundland lies the famous Grand Banks.* In recent years, the trend has been for the trawlers, especially those at Boston, to travel to the more distant banks, as fish become scarcer in local waters. A new fishery for Boston vessels was developed in 1950 on the southern edge of the Grand Banks of Newfoundland. During 1950 an unusually large supply of

* 30, pp.9,10

sea dab was taken at this location. However, the hazards involved in making long trips in the North Atlantic during winter and the sinking of the Boston trawler, "Gudrun", in these waters in 1951, has discouraged further sailings to the Grand Banks.

The fishing grounds of southern New England contrast markedly with those described above, consisting for the most part of gently sloping sea bottoms where shore fish such as flounders, squeteague, and sea bass are found. These grounds lie comparatively close inshore, and so most of the fishing is done by small boats.

Although each of the four major fishing ports of New England depends upon the fresh and frozen fish business as its mainstay, each is different in its structure and organization.

Boston is primarily a port of large otter trawlers. These trawlers, which account for 80 to 85 per cent of all fish landed, are for the most part owned or controlled by fish dealers, who are processors and wholesalers. Haddock is Boston's most valuable fish, taking over this honor from cod in 1914. From 1914 to 1949 haddock and baby haddock (scrod) constituted about half the total weight of fish landed at Boston. Their proportion of the value of total Boston landings rose from 40 per cent to 60 per cent over the period. Most of the industry's business is centered around the Boston

Fish Pier, which was built in 1914 by the State of Massachusetts at a cost of over a million dollars. It was leased to the Boston Fish Market Corporation, a private company formed and owned by the fish dealers, which spent another million dollars for buildings to be used for icing and cold storage plants, processing fish, and for offices.

"Beam" or otter trawling, the filleting process, and introduction of quick-freezing processes were the three technological improvements which stimulated production and led to the expansion of markets in Boston. Otter trawling, which was introduced from England in 1906 consists of fishing with a large conical bag, about 150 feet long. This is towed along the bottom of the sea. The mouth of the conical bag is kept open by two boards at either side of the entrance. The haul with net usually takes $1\frac{1}{2}$ -2 hours. Three thousand to five thousand pounds may be taken in a $1\frac{1}{2}$ hour haul.* However, fishing with otter trawls is limited to smooth bottoms. Filleting and quick-freezing will be more fully discussed in subsequent chapters.

Nearly all fish landed in Boston are sold through the New England Fish Exchange at the Boston Fish Pier. Commission men act as agents of the vessel owners during the fish auctions. Each species on each vessel is sold separately. Dealers who buy fish on the Exchange, which is open to

* 1, p.78

all legitimate fish merchants who pay the Exchange fees (at present \$100 a year) and comply with its rules, must post a bond to cover their purchases. A source of much controversy between dealers and fishermen is the "sellover". This provision allows for a resale, as second or third quality, any fish which do not qualify as first quality as they are removed from the vessel after the original sale.

The integration of boat owning and dealing in the Boston market has intensified the interest of the dealers in low prices on the Exchange. They have more to gain from the purchase of cheap fish than they could possibly realize, as vessel owners, from higher landing prices. Filleting yields the dealer only about 40 per cent clear meat. He can save approximately 2.5 cents in fillet production costs for every cent the cost of raw fish can be reduced.* Consequently, the dealer-boat-owners are as interested as the non-vessel-owning dealers in keeping prices to a minimum on the Exchange. This situation has contributed to the continued strife between Boston's fishermen, whose earnings depend upon the price of fish, and the boat-owning dealers.

The port of Gloucester now leads New England in volume of landings and as a producer of food fish, although Boston continues to hold a small margin as to total value of the catch. In 1951, Gloucester had a record catch of

* 28, p.3

253,000,000 pounds. The average wholesale price was \$5.40 a hundredweight, almost a dollar more than 1950. Most of the catch was rosefish. The bulk was processed for marketing in the Middle West, but some was filleted and served in the East as ocean perch. The previous record catch was 251,000,000 pounds in 1948. Boston fishermen, on the other hand, landed 171,000,000 pounds, about 1,000,000 more than they did in 1950. The wholesale price was \$7.86 to \$8.35 a hundredweight.* The catch was principally haddock and scrod, but big landings of whiting accounted for the increase. Most of the whiting is refrigerated for sale in other sections of the country. Most of the haddock is filleted and packaged and shipped to eastern and mid-western distribution centers.

Gloucester, which had been primarily a salt-fish center prior to 1935, has expanded phenomenally during the last seventeen years. Until 1935, Gloucester had steadily declined in importance as a fishing port, after losing much of its salt-fish trade to lower-cost foreign competitors. However, the development of a large mid-western market for rosefish or redfish, a species which had been discarded as trash prior to 1933, led to the present position of Gloucester in New England's fishing industry. Redfish landings soared from a few thousand pounds in 1934 to more than 200 million pounds in 1951. The discovery that the redfish yields a

* 12

small white fillet with the taste and texture of fresh-water perch, saved the day for Gloucester's fishing industry.

Unlike Boston, most of the vessels operating out of Gloucester are owned independently rather than by dealers, and the community of interest between fishermen and boat owners is considerably greater than it is in Boston. Since 1944, fish landed at Gloucester have been sold through a selling room established and managed by the Atlantic Fishermen's Union. A union-paid custodian conducts the bidding. Each sale is consummated when the vessel's captain accepts a bid for his "trip", or boat load of fish. Any dealer may bid in the selling room, and there is no admittance fee.

After 1937 New Bedford became one of the leading seafood-producing centers of New England. Yellowtail flounders and deep-sea scallops are the major species landed in New Bedford. In 1948 yellowtail flounders accounted for one third of the weight and one fifth of the value of New Bedford's landings. About 95 per cent of the nation's sea-scallop supply comes from New Bedford. Scallops constituted 45 per cent of the value of the 1948 catch. Their value is emphasized by the fact that they accounted for only 13 per cent of the total weight.*

The development of flounder filleting and the introduction in 1936 of refrigerated trucking service to New

* 28, p.4

York's Fulton Market were factors which accelerated the rise of New Bedford as a leading fishing port. An increase in demand for fish generated by World War II helped New Bedford to expand, as it did other New England ports.

Fish landed at New Bedford are sold through a selling room operated by the Atlantic Fishermen's Union, and the relationship between fishermen, boat-owners, and dealers is similar to that at Gloucester where most vessels are independently owned.

Portland's proximity to fishing grounds where redfish are caught and its empty wharf and storage space encouraged the growth of the redfish fishery at a time when Portland had reached one of its lowest ebbs in production. Landings of redfish expanded from 70 thousand pounds in 1935 to over 20 million pounds in 1946. However, Portland has not expanded its facilities, as Gloucester and New Bedford, and with few exceptions, docks and buildings are in poor repair.* Fish are sold to the dealers by fishing captains on an individual basis. The industry in Portland is not as well organized as in other large New England ports. Most of the fishermen are unorganized, and the union does not possess the bargaining strength which it has in Boston, Gloucester, and New Bedford.

All New England fishermen receive their wages as

* 28, p.4

shares in the value of the catch under a system known as the "lay". The gross value of the catch, after the deduction of certain expenses, is divided between the fishermen and the owner of the vessel according to stipulated percentages. The present percentage (1952) is sixty per cent for the fishermen and forty per cent for the owners.

The channels of distribution vary greatly at New England fishing centers. Dealers and chain stores are the principal purchasers of fish at the ports. They may process the fish into fillets or sell them whole. Certain fish, such as redfish, make it almost mandatory that filleting take place because of the method of marketing the fish as ocean perch and because of the large amount of waste which would make transportation charges prohibitive. The larger dealers distribute fish through their own brokers in key cities to jobbers who supply the retail trade. Others sell through independent brokers to wholesalers and retailers. Many of the smaller dealers and processors ship directly to institutional buyers and retail stores, occasionally on a "cash and carry basis". Secondary wholesalers and processors at such large secondary seafood markets as New York, Chicago, Philadelphia, and Cleveland buy fish from dealers at primary markets and ship to retailers in their local area. A few of the larger chains, such as the A & P, and First National Stores maintain their own processing and cold storage facilities and distribute fish directly through their own retail

outlets. In Boston, fifteen or twenty commission houses handle fish from foreign countries and outside fishing areas. They sell these products to dealers at the Boston Fish Pier and to wholesalers and processors in secondary markets.

In New England, one of the specific problems of marketing is to spread consumption more uniformly over the nearly 80 species of fish and shellfish that are brought into local ports each year. Production records of the fishing industry show a serious lack of balance -- overexploitation of a few species on one hand, wasteful underexploitation of many species on the other. Eighty-five per cent of the total weight of the New England catch of fish and shellfish consists of only ten species, while the remaining 70 species are landed in quantities so limited that they make up only 15 per cent of the total catch* (see Tables V and VI). Seven leading species of fish in New England are groundfish, or bottom-swimming species. These are redfish, haddock, whiting, flounder, cod, pollock, and hake. Two are surface-swimming, migratory fish, which fluctuate greatly in abundance. They are herring and mackerel. The last species, the clam, is in the shellfish family.

Still little utilized are wolffish, cusk, some species of flounders, sea dab, skates, anglers, and grayfish, just to mention a few.

There are two reasons for this wasteful use of marine resources. First, is the obvious fact that some species are more abundant or more easily caught than others. Second and more important because remediable, is the lack of demand for the neglected seventy caused by the fact that the public is unfamiliar with them and hesitates to try new species it knows nothing about. Consumer education is necessary. An organized publicity program must be initiated and maintained. These fishes should be introduced as separate entities -- each with its own individual flavor, its own food values, and its own appeals to the sense of taste. With this in mind, we are now ready to survey the market and its sectional consumer preferences. .

TABLE I

Fresh and Frozen Packaged Fish Production
for U.S. and New England, Selected Years
(000,000's omitted)

	<u>New England</u>		<u>United States</u>	
	<u>Pounds</u>	<u>Value</u>	<u>Pounds</u>	<u>Value</u>
1929	73.5	\$13.0	84.4	\$14.8
1932	41.7	4.2	52.0	5.7
1940	107.8	10.9	129.4	14.3
1945	160.6	34.3	204.9	48.4
1947	156.6	35.4	185.0	44.7
1948	151.3	35.2	193.5	48.4

Source: Fish and Wildlife Service,
United States Department
of Interior.

TABLE II

Total Catch of Fisheries of New England and of U.S. and Alaska, Selected years 1880-1948, in Pounds (000's omitted)

	<u>New England</u>	<u>U.S. & Alaska</u>	<u>N.E. as % of total</u>
	<u>Quantity</u>	<u>Quantity</u>	<u>Quantity</u>
1880	589,764	1,614,789	36.5
1887	520,214	1,290,016	40.3
1888	572,908	1,435,874	39.9
1889	653,170	1,598,048	40.9
1890	493,458	1,612,782	24.4
1902	534,075	1,951,430	27.4
1905	480,284	1,887,368	25.4
1908	530,029	1,892,908	28.0
1919	467,340	2,242,733	20.8
1924	406,822	2,075,741	19.6
1928	603,598	2,383,984	25.3
1929	694,286	2,915,854	23.8
1930	701,351	3,286,580	21.3
1931	540,298	2,657,317	20.3
1932	480,521	2,614,140	18.4
1933	499,936	2,899,048	17.2
1935	655,430	4,152,349	15.8
1937	670,864	4,352,549	15.4
1938	631,520	4,253,445	14.8
1939	663,866	4,443,328	14.9
1940	626,054	4,059,524	15.4
1942	705,085	3,876,524	18.2
1943	645,591	4,202,000	15.4
1945	830,000	4,570,000	18.2
1946	790,000	4,396,000	18.0
1948	998,380	4,564,060	21.8

Source: Fish & Wild Life Service,
U.S. Department of Interior

TABLE IIINew England FisheriesSummary of Catch, 1948

<u>Product</u>	<u>Massachusetts</u>		<u>Maine</u>	
	<u>Pounds</u>	<u>Value</u>	<u>Pounds</u>	<u>Value</u>
Fish	627,899,600	\$36,929,100	275,047,600	\$7,119,125
Shellfish, etc.	21,796,300	9,736,287	28,456,700	8,957,844
Total	649,695,900	46,665,387	303,504,300	16,076,969

<u>Product</u>	<u>Rhode Island</u>		<u>Connecticut</u>	
	<u>Pounds</u>	<u>Value</u>	<u>Pounds</u>	<u>Value</u>
Fish	19,586,700	\$ 1,006,119	16,681,700	\$1,284,165
Shellfish, etc.	6,858,800	2,233,411	1,523,100	465,656
Total	26,445,500	3,239,530	18,204,800	1,749,821

<u>Product</u>	<u>New Hampshire</u>		<u>Total</u>	
	<u>Pounds</u>	<u>Value</u>	<u>Pounds</u>	<u>Value</u>
Fish	118,300	\$ 5,803	939,333,900	\$46,344,312
Shellfish	411,400	250,353	59,046,300	21,643,551
Total	529,700	256,156	998,380,200	67,987,863

Source: Fishery Statistics of the
United States, 1948, U.S.
Fish and Wildlife Service

TABLE IVNumber of Fishing Vessels at Major New England Ports by

<u>Port</u>	<u>Gross Tonnage</u>			
	<u>Total</u>	<u>Small</u> <u>1-49 tons</u>	<u>Medium</u> <u>50-149 tons</u>	<u>Large</u> <u>150 & over</u>
Boston	147	66	42	39*
Gloucester	184	64	111	9
New Bedford	182	103	76	3
Portland	<u>60</u>	<u>51</u>	<u>8</u>	<u>1</u>
Totals	573	284	237	52

* 1950 Source - Market News Service, U.S. Fish & Wildlife Service.

Source: Official Yearbook of the Fishing Masters Association, 1947

TABLE V

Catch of Certain Species in New England For Selected Years1887 to 1948

(in millions of pounds)

<u>Year</u>	<u>Cod</u>	<u>Had-</u> <u>dock</u>	<u>Floun-</u> <u>der</u>	<u>Hake</u>	<u>Her-</u> <u>ring</u>	<u>Mack-</u> <u>erel</u>	<u>Pol-</u> <u>lock</u>	<u>Rose-</u> <u>fish</u>	<u>Whit-</u> <u>ing</u>
1887	207.4	40.8	2.4	20.3	42.8	33.1	6.6	--	--
1888	196.3	46.9	2.8	21.0	52.5	19.7	8.5	--	--
1889	164.1	45.8	3.0	21.0	43.1	10.2	11.4	--	--
1898	125.4	46.8	4.1	39.8	66.1	9.9	11.0	--	--
1902	123.6	48.0	4.8	35.6	200.6	23.2	20.1	--	2.5
1905	93.8	77.6	5.8	36.4	85.9	17.9	29.6	--	4.8
1908	95.3	59.5	9.8	34.2	121.7	11.5	29.2	--	6.3
1919	89.1	89.8	15.5	20.3	98.0	16.2	25.1	--	16.2
1924	93.5	93.6	30.9	18.5	61.6	27.1	8.4	--	8.1
1928	90.3	237.7	50.3	17.5	70.6	42.7	11.0	--	8.4
1929	87.0	255.9	48.9	26.4	107.2	92.3	14.3	--	10.3
1930	101.6	264.5	49.2	32.2	82.9	50.7	17.8	.1	9.9
1931	92.5	181.1	41.8	16.7	63.9	46.7	10.7	.2	8.1
1932	86.3	150.5	37.5	16.9	38.1	60.1	10.7	.1	7.2
1933	99.6	160.1	37.8	15.3	48.1	40.8	15.0	.3	9.4
1935	120.3	194.6	38.7	26.5	54.3	62.0	33.4	17.2	17.4
1937	118.4	169.5	48.2	25.1	53.1	23.4	37.6	58.4	22.5
1938	82.3	157.9	46.8	23.8	21.0	39.3	40.3	65.0	25.1
1940	65.1	141.9	57.6	14.3	44.1	36.0	37.3	85.1	40.9
1942	65.5	137.4	75.3	11.3	99.7	46.7	31.9	128.1	46.9
1943	65.5	117.2	66.2	15.9	60.1	53.5	22.1	114.7	53.0
1948	68.25	154.6	71.8	21.6	192.0	40.8	37.7	238.1	80.4

Sources: R. H. Fiedler, Fishery Industries of the U.S. (1929-1938),

R. H. Fiedler, Fishery Statistics of the U.S. (1939-1941), and

E. A. Power, Fishery Statistics of the U.S. (1942-1943, 1948).

TABLE VI1946Summary of Landings at Various New England Ports

(POUNDS)

<u>Port</u>	<u>Total Landings</u>	<u>Landings of Principal Species</u>	
Gloucester	217,968,000	130,899,000	(rosefish)
Boston	158,152,000	71,414,000	(haddock)
New Bedford	90,324,000	31,364,000	(flounders)
		33,014,000	(haddock)
Provincetown & Cape Cod	40,970,000	14,520,000	(whiting)
Portland	35,612,000	20,892,000	(rosefish)

Note: Importance of haddock at New Bedford was result of depletion on nearby flounder grounds. In 1946, rosefish fillets outranked haddock in national packaged fish production.

Source: New England Landings, 1946
Fish and Wildlife Service.

Chapter II

Consumption of Fishery

Products in the United States

A. Recent Trends

One of the major tasks with which the fish dealer, both wholesaler and retailer, is concerned is that of getting people to eat more fish. The total civilian consumption of fresh and processed fishery products has not noticeably increased since 1930. In 1930, the U.S. per capita consumption, excluding military requirements, was 10.5 pounds of fresh and processed fish. This figure fell to 8.9 pounds in 1932 and rose to a peak of 12.0 pounds in 1936. It struck an average of 11.1 pounds from 1935 to 1939. (This period is often used by the government as the base period for the various indices concerning food products and prices.) Before World War II consumption reached 11.8 pounds. During the war, however, heavy military requirements forced civilian consumption in 1943 to fall to 8.2 pounds. By 1946 it again reached 11.1 pounds. In 1947, demand declined slightly. In the following three years there was a mild upward trend. However, by 1950, consumption was only 1/10 of a pound above the 1935 - 1939 level of 11.1 pounds. (see Table VII)

A breakdown of the above figures by types of fishery products reveals certain changes in the buying habits of

the consumer. Consumption of fresh and frozen fish has been increasing, especially packaged fish. Canned fish has recovered rapidly from its wartime low level of 1.9 pounds per capita consumption. Cured fish has steadily declined (see Table VII).

Before 1939 the trend for per capita consumption of fresh and frozen fish was downward from 5.9 pounds in 1930 to 5.3 pounds for 1935-1939. The same period showed a 45% per capita increase of canned fishery products. However, after 1939, fresh and frozen fish rose to an average of 6.3 pounds for 1946 and 1947. Canned fish consumption fell from a pre-war level of 4.8 pounds to less than 2 pounds in 1943, and by 1946 and 1947 it was only 3.8 pounds, 29% below pre-war levels. Recent indications refute the possibility that fresh and frozen fish may have taken the place of canned products (see Table VIII). Unusually large canned fish purchases for military agencies and export to allied nations during World War II accounted for curtailment of civilian consumption during that period.

There is, on the other hand, definite evidence of a shift in consumer preference in the United States to packaged fresh and frozen fish. This is one of the more recent developments which has proved to be of great importance to the New England fishing industry. The New England area is a large producer of groundfish fillets and leads the nation in this and other packaged fresh and frozen fishery products

From 1930-1945, domestic total production of packaged fishery products increased more than 160%. From a pre-war average to 1946, production of packaged products increased by 70% and their value by more than 280% (see Table I). The rapid growth in packaged fish has not necessarily meant the displacement of canned fish. The frozen fillet market in various inland markets has tended rather to displace local fresh fish and to increase annual per capita consumption. In terms of quantity of packaged foods per capita consumption increased by 90% from 1935-1939 to 1946. This included domestic production plus imports. The pre-war average of imports was 10,000,000 pounds annually as compared with about 60,000,000 pounds of fillets in 1946.*

The reasons for the increased consumption of packaged fish are numerous. The packaged fish trade has been expanding rapidly in new inland markets, especially in the Midwest. The wartime shortage of canned sea foods and meat permitted greater substitution than would normally be accepted, thereby resulting in a stimulated consumer demand for fresh and frozen fish. The development of fresh and frozen fish fillets, products which are convenient for household and institutional use, and also improvements in packaging, transportation and local storage facilities did much to expand domestic consumption of packaged fresh and frozen fishery products.

* 2, p.86

B. Sales Patterns in the United States

Because New England is the chief producing area of fresh and frozen packaged fish and shellfish in the United States, this section will be confined to an analysis of the sales patterns for fresh and frozen fishery products.

Two market surveys*, which were conducted by the Marketing Section of the U.S. Fish and Wildlife Service in 1936 and 1946, revealed some interesting conclusions concerning the distribution of fish in the United States. In 1936 it was concluded by Fred F. Johnson that:

The species of fresh and frozen fish and shellfish consumed in greatest quantities in cities close to important producing waters usually are those caught in these waters. Thus cod, haddock, and mackerel are included among the species predominating as aquatic foods along the Middle and North Atlantic Coasts; croaker, mullet, red snappers, sea trout and shrimp are outstanding in the cities of the South Atlantic and Gulf Coasts; halibut, salmon, ling cod, crabs, and oysters are among the leading species consumed on the Pacific Coast; and catfish, lake herring, lake trout, the pike, perches, and whitefish are among the most popular species of the Middle West.

It frequently is true, however, that certain species of sea food have become so well known or liked in geographical areas far from their sources that they are consumed in preference to species of local abundance. Outstanding instances of important fish and shellfish marketed long distances from their points of origin are halibut and salmon,

which are produced chiefly in the Pacific Northwest, and haddock from the North Atlantic, all of which are marketed widely over the country. Similarly, shrimp from the South Atlantic and Gulf Coast and oysters from all of our coasts have wide ranges of markets.*

These observations concerning fish consumption are still, to a certain extent, pertinent today. For example, most New England housewives are loyal to local varieties. Citizens of Fall River, Massachusetts, show a year-round preference for haddock, followed by mackerel and cod fillets, while Bostonians favor haddock fillets, haddock, and mackerel. Manchester, New Hampshire, eats more haddock and mackerel than any other fish. Providence, Rhode Island, favors haddock, mackerel, and cod fillets in that order.**

However, there were important new factors evident in the 1946 survey which did not appear in the 1936 survey. Fillets of fish were found to be the No. 1 consumption item, according to volume, much more frequently than formerly. Fillets of the North Atlantic, especially, entered many markets and ranked there as No. 1 and No. 2 consumption items. This is particularly true of rosefish or redfish fillets which enjoyed a phenomenal growth in Midwestern markets since 1935. The 1946 survey indicated that in many inland cities local or regional fish varieties were

* 41, p.2.

** 41, pp.15,33,44,63.

displaced as top ranking consumption items, according to volume, and replaced by fillets of North Atlantic groundfish in most months of the year. Examples of this were noted in the following cities according to the 1946 survey: Atlanta, Georgia; Butte, Montana; Cincinnati, Ohio; Cleveland, Ohio; Indianapolis, Indiana; Little Rock, Arkansas; Pittsburg, Pennsylvania; Scranton, Pennsylvania; Washington, D.C. In some of the eastern seaboard markets fillets of fresh local fish supplanted local varieties of whole (round) fish. Fall River, Massachusetts, New York City, and Providence, Rhode Island were among the eastern cities where fillets predominated.

The two government surveys were conducted through the use of questionnaires which were mailed directly to those firms reporting. Questionnaires were sent to fish specialty stores, combination food stores, independent retailers, chain retailers and in some cases fish wholesalers if it was felt their sales would accurately reflect retail sales in the respective city. Sampling methods were used, and the number of questionnaires mailed in each city was proportional to the size of the city. The 1936 survey covered 61 cities, while the 1946 survey covered 65 cities (see Table IX).

In the first survey, taken in 1936, reporters were asked to give their opinion concerning the six principal species of fish and shellfish important in the retail trade of the city in which they were located. In the 1946 survey,

reporters were asked to indicate the six principal species of fish and shellfish important in their own retail business, wholesale business, or dealings of their organization. Replies to the 1946 questionnaire showed the relative importance of the top ranking items in trade of the reporters covered in that survey. For the year as a whole, on the average, sales of the 1st choice item were 29.9% of total sales of those firms reporting this information and sales of the 2nd choice item amounted to 20.2% of total sales.

The results of the surveys are summarized in Tables X and XI. New England and Middle Atlantic species ranked 1st to 6th in importance in 65.6% of the cities surveyed in 1936, and this was increased to 83.1% in 1946. Chesapeake species declined from 41.0% to 32.3%. Southern Atlantic species also declined in importance from 27.9% in 1936 to 24.6% in 1946. Great Lakes and Pacific fishing products fell from 34.4% to 30.8% and 73.8% to 64.6% respectively. "Inland Rivers'" fish rose slightly in importance from 42.6% in 1936 to 43.1% in 1946. The only other substantial gain, in addition to that of New England species, was the Gulf regional species group which attained popularity among 64.6% of the cities in 1946 as compared with 32.8% in 1936.

There were, however, certain limitations which should be considered in interpreting the results of the surveys. Sales as reported did not always indicate "preference for fish", but rather "availability of fish". Fish from New

England may not have appeared in abundance in certain cities because of high transportation rates or inadequate local storage facilities. In many instances, retailers were not accustomed to handling frozen packaged fish nor did they have properly refrigerated display equipment. Another consideration was the fact that certain regional species, such as the Gulf varieties, were popular in only a few months of the year as revealed by the smaller number of opinions rendered as compared with New England species which were more popular throughout the entire year (see Table XI). The last factor was foreign imports. Most imports of fillets from other countries are ground fish, such as haddock, which would normally be considered to be part of the New England regional species group. The increased expansion in foreign imports of ground fish fillets since 1939 may in part account for the increase in popularity of so called "New England" species.

In spite of these qualifying remarks, valuable conclusions can be drawn from the two market surveys. First, many Southern markets have not been sufficiently developed by New England producers. Second, competing species from other regions have invaded new markets and overtaken New England species in popularity through the use of well planned sales programs and better merchandising methods. Notable was the shrimp industry of the Gulf states.

Among surveyed cities in the South which showed no New England species among the leading three varieties of fish

and shellfish were: Birmingham, Alabama; Jackson, Mississippi; Knoxville, Tennessee; Mobile, Alabama; New Orleans, Louisiana; Norfolk, Virginia; Richmond, Virginia; Savannah, Georgia; Winston-Salem, North Carolina. Local varieties led in these cities. On the other hand, certain successes could be cited in some Southern cities, which was indicative of the fact that with a properly executed merchandising and sales plan, some measure of success might be achieved in other cities. In Atlanta, Georgia oysters ranked first, with rosefish fillets running a close second in importance in 1946. In 1936 rosefish fillets had not been mentioned. An outstanding example of successful merchandising of fish in the South was Louisville, Kentucky. In this all three top positions were held by New England species in 1946 with cod fillets first in importance, rosefish fillets second, and whiting third. In 1936, "fillets, unclassified" was first with whiting second and catfish in third place.*

The shrimp industry of the Gulf region replaced New England species in popularity in many sections of the country. In Albuquerque, New Mexico, shrimp ranked first in importance although it was not shown among the first six species in the 1936 report. Haddock, which was second in popularity in 1936, did not appear among the first six species in 1946. Shrimp was again first in Charleston, South

* 41, pp.12,43.

Carolina, and Jacksonville, Florida. No New England species appeared in these cities in the first three positions in 1946. However, in Jacksonville, Florida rosefish fillets, which did not appear at all in 1936, were rated fourth in popularity in 1946. In El Paso, Texas, haddock slipped from its number three position in 1936 to a point below the first six varieties in 1946. Shrimp, in the meantime, not mentioned in 1936, was in the position of second importance in 1946. In Milwaukee, Wisconsin, shrimp again assumed first place in importance in 1946. It had not been mentioned in 1936. Rosefish fillets rose from sixth in 1936 to second place in 1946.

The tremendous recent success of the shrimp industry was based upon cooperation among the shrimp dealers, culminating in the formation of their own trade association, the Texas Shrimp Association, in 1950. An intensive nationwide sales promotion campaign was conducted with the cooperation of the National Fisheries Institute, an organization in Washington, D.C. which is composed of fish dealers throughout the country. The primary objective of this organization is to make people more "fish conscious". Even the popular hit song, "Shrimp Boats", was a carefully planned selling aid for the shrimp industry. Sales promotion and the efforts of the National Fisheries Institute will be more fully discussed in a subsequent chapter.

In fairness to the New England fishing industry, a

good job was done in opening Midwestern markets for rosefish fillets. These were merchandised as "ocean perch". Most of them were sold in the one pound package. Other species which achieved some measure of success in Midwestern states were haddock, cod and flounder fillets, and whole whiting.

Nevertheless, there is much room for improvement, especially with respect to the assimilation of marketing information and the execution of market research studies. More information should be made available to the industry by New England fish dealers. Lack of cooperation has resulted in a scarcity of figures by which standards could be set to measure the efficiency of marketing operations. Studies of the market, consumer buying habits, and foreign and domestic competition should be undertaken through trade associations such as the Massachusetts Fisheries Association. The available evidence attributes the lack of such surveys to petty differences and antiquated ideas of secrecy among the fish dealers (brokers, wholesalers, processors, and retailers) themselves. Market research is of benefit to all parties - the fishermen, boat owners, and dealers. Cooperation can be encouraged through education and orientation of the parties concerned. Even the largest processing companies in New England have only recently undertaken extensive marketing research programs with long range objectives in view. To meet the growing threat of being priced out of the market by foreign competitors, the New England fishing industry must

take immediate steps to strengthen its own position by improving its products and methods of distributing these products. Market surveys and knowledge of consumer preferences and buying habits should set the stage for long range merchandising and sales programs.

TABLE VII

U.S. Civilian Per Capita Consumption of Fishery Products,
1930 - 50

<u>Year</u>	<u>Fresh and Frozen (pounds)</u>	<u>Canned (pounds)</u>	<u>Cured (pounds)</u>	<u>Total Fresh and Processed (pounds)</u>
1930	5.9	3.3	1.3	10.5
1931	5.0	3.2	1.0	9.2
1932	4.4	3.4	1.1	8.9
1933	4.2	3.9	.9	9.0
1934	4.4	4.2	.9	9.5
1935	5.2	4.7	1.1	11.0
1936	5.2	5.8	1.0	12.0
1937	5.6	4.2	.9	10.7
1938	5.3	4.8	1.0	11.1
1939	5.4	4.6	.9	10.9
Average				
1935-39	5.3	4.8	1.0	11.1
1940	5.7	4.2	.9	10.8
1941	6.3	4.7	.8	11.8
1942	5.3	2.2	.8	8.3
1943	5.6	1.9	.7	8.2
1944	5.6	2.6	.7	8.9
1945	7.1	2.6	.9	10.6
1946	6.3	3.8	1.0	11.1
1947	6.2	3.8	.8	10.8
1948	N.A.	N.A.	N.A.	11.0
1949	N.A.	N.A.	N.A.	11.0
1950	N.A.	N.A.	N.A.	11.2

N.A. - Not Available

Source: U.S. Fish and Wildlife
Service.

TABLE VIII

Total Production and Disposition of the Domestic Catch of
Fishery Products 1929 to 1950, inclusive

(round weight basis)

<u>Year</u>	<u>Fresh & Frozen</u>	<u>Canned</u>	<u>Cured</u>	<u>By Pro- ducts & Bait</u>	<u>Total Production</u>
	Million pounds	Million pounds	Million pounds	Million pounds	Million pounds
1929	1,352	1,286	150	779	3,567
1930	1,389	1,077	145	676	3,287
1931	1,121	962	130	444	2,657
1932	1,032	787	140	655	2,614
1933	1,012	991	135	795	2,933
1934	1,087	1,293	130	1,548	4,058
1935	1,250	1,220	130	1,466	4,066
1936	1,321	1,459	135	1,845	4,760
1937	1,339	1,356	130	1,528	4,353
1938	1,355	1,234	130	1,534	4,253
1939	1,366	1,281	130	1,666	4,443
1940	1,461	1,280	130	1,189	4,060
1941	1,660	1,645	125	1,650	5,080
1942	1,407	1,230	115	1,125	3,877
1943	1,495	1,165	114	1,428	4,202
1944	1,585	1,225	110	1,580	4,500
1945	1,846	1,230	110	1,389	4,575
1946	1,674	1,277	100	1,405	4,456
1947	1,545	1,384	100	1,315	4,344
1948	1,663	1,488	100	1,324	4,575
1949 1/	1,647	1,626	100	1,427	4,800
1950 1/	1,654	1,774	100	1,372	4,900

1/ Preliminary

Source: U.S. Fish and Wildlife
Service

TABLE IX

Cities and Years Surveyed

	<u>1936</u>	<u>1946</u>		<u>1936</u>	<u>1946</u>
Albuquerque, N.M.	X	X	Milwaukee, Wisc.	X	X
Atlanta, Ga.	X	X	Minneapolis, Minn.	X	X
Baltimore, Md.	X	X	Mobile, Ala.	X	X
Birmingham, Ala.	X	X	Nashville, Tenn.	X	X
Boston, Mass.	X	X	Newark, N.J.	X	X
Bridgeport, Conn.	X	X	New Haven, Conn.	X	X
Buffalo, N.Y.	X	X	New Orleans, La.	X	X
Butte, Mont.	X	X	New York, N.Y.	X	X
Cedar Rapids, Ia.	X	X	Norfolk, Va.	X	X
Charleston, S.C.	—	X	Oklahoma City, Okla.	X	X
Chicago, Ill.	X	X	Omaha, Nebr.	X	X
Cincinnati, O.	X	X	Peoria, Ill.	X	X
Cleveland, O.	X	X	Philadelphia, Pa.	X	X
Columbia, S.C.	X	X	Pittsburgh, Pa.	X	X
Columbus, O.	X	X	Portland, Me.	X	x
Dallas, Tex.	X	X	Portland, Ore.	X	X
Davenport, Ia.	X	X	Providence, R.I.	X	X
Denver, Colo.	X	X	Richmond, Va.	X	X
Detroit, Mich.	X	X	Rochester, N.Y.	X	X
El Paso, Tex.	X	X	St. Louis, Mo.	X	X
Fall River, Mass.	X	X	St. Paul, Minn.	X	X
Houston, Tex.	X	X	Salt Lake City, Utah	X	X
Indianapolis, Ind.	X	X	San Francisco, Calif.	X	X
Jackson, Miss.	—	X	Savannah, Ga.	X	X
Jacksonville, Fla.	X	X	Scranton, Pa.	X	X
Kansas City, Mo.	X	X	Seattle, Wash.	X	X
Knoxville, Tenn.	—	X	Sioux Falls, S.D.	X	X
Lincoln, Nebr.	X	X	Spokane, Wash.	X	X
Little Rock, Ark.	X	X	Springfield, Ill.	X	—
Los Angeles, Calif.	X	X	Tucson, Ariz.	X	X
Louisville, Ky.	X	X	Washington, D.C.	X	X
Manchester, N.H.	X	X	Winston Salem, N.C.	X	X
Memphis, Tenn.	X	X			

X Information Available

— No information Available

Source: U.S. Fish and Wildlife Service

TABLE X

IMPORTANCE OF REGIONAL SPECIES OF FRESH AND FROZEN FISH IN CERTAIN U.S. CITIES IN 1946
COMPARED TO 1936 BY AREA TOTALS

Number of Opinions Recorded For*

Regional Species Groups	<u>1st to 6th Importance</u>				<u>1st or 2nd Importance</u>				<u>3rd or 4th Importance</u>				<u>5th or 6th Importance</u>			
	<u>Number</u>		<u>Percentage</u>		<u>Number</u>		<u>Percentage</u>		<u>Number</u>		<u>Percentage</u>		<u>Number</u>		<u>Percentage</u>	
	<u>1946</u>	<u>1936</u>	<u>1946</u>	<u>1936</u>	<u>1946</u>	<u>1936</u>	<u>1946</u>	<u>1936</u>	<u>1946</u>	<u>1936</u>	<u>1946</u>	<u>1936</u>	<u>1946</u>	<u>1936</u>	<u>1946</u>	<u>1936</u>
New England and Middle Atlantic	3878	2123	43.4	29.2	1383	951	15.5	13.1	1262	713	14.1	9.8	1233	461	13.8	6.3
Chesapeake	626	468	7.0	6.4	231	218	2.6	3.0	200	142	2.2	2.0	195	108	2.2	1.5
Southern Atlantic	259	262	2.9	3.6	28	58	.3	.8	75	122	.8	1.7	156	82	1.7	1.1
Gulf	1051	715	11.8	9.8	352	199	4.0	2.7	387	279	4.3	3.8	312	237	3.5	3.3
Great Lakes	791	1107	8.9	15.2	284	403	3.2	5.5	259	310	2.9	4.3	248	394	2.8	5.4
Pacific	1766	1613	19.8	22.2	632	521	7.1	7.2	635	576	7.1	7.9	499	516	5.6	7.1
Inland Rivers	558	987	6.2	13.6	186	316	2.1	4.3	159	427	1.8	5.9	213	244	2.4	3.3

* Total of 8929 opinions recorded in 1946 and 7277 opinions recorded in 1936.

Source: U. S. Fish & Wildlife Service

TABLE XI

IMPORTANCE OF REGIONAL SPECIES OF FRESH AND FROZEN FISH IN CERTAIN U.S. CITIES IN 1946
COMPARED TO 1936 BY AREA TOTALS

Cities In Which Regional Species Ranked*

Regional Species Groups	1st to 6th Importance				1st or 2nd Importance				3rd or 4th Importance				5th or 6th Importance			
	Number		Percentage		Number		Percentage		Number		Percentage		Number		Percentage	
	1946	1936	1946	1936	1946	1936	1946	1936	1946	1936	1946	1936	1946	1936	1946	1936
New England and Middle Atlantic	54	40	83.1	65.6	31	25	47.7	41.0	16	11	24.6	18.0	7	4	10.8	6.6
Chesapeake	21	25	32.3	41.0	12	12	18.5	19.7	7	12	10.8	19.7	2	1	3.1	1.6
Southern Atlantic	16	17	24.6	27.9	5	8	7.7	13.1	10	4	15.4	6.6	1	5	1.5	8.2
Gulf	42	20	64.6	38.8	15	7	23.1	11.5	13	8	20.0	13.1	14	5	21.5	8.2
Great Lakes	20	21	30.8	34.4	10	12	15.4	19.6	6	6	9.2	9.8	4	3	6.2	4.9
Pacific	42	45	64.6	73.8	11	18	16.9	29.5	22	16	33.8	26.2	9	11	13.8	18.0
Inland Rivers	28	26	43.1	42.6	10	8	15.4	13.1	5	11	7.7	18.0	13	7	20.0	11.5

* Total of 65 cities surveyed in 1946 and 61 cities surveyed in 1936.

Source: U. S. Fish & Wildlife Service

TABLE XIIFarm Output and Fish Production United States 1929 - 1950

Index Numbers (1935 1939 = 100)

<u>Year</u>	<u>Farm Output</u>	<u>Fish Production</u>
1929	97	82
1930	95	75
1931	104	61
1932	101	60
1933	93	67
1934	79	93
1935	96	93
1936	85	109
1937	108	99
1938	105	97
1939	106	102
1940	110	93
1941	114	116
1942	128	89
1943	125	96
1944	130	103
1945	129	105
1946	134	102
1947	129	100
1948	141	105
1949	140	110 1/
1950	135 1/	112 1/

1/ Preliminary

Source: Bureau of Agricultural
Economics and U. S. Fish and Wildlife Service

TABLE XIII

Index Numbers of Consumption Per Person

1930 - 1950

(1935 - 1939) = 100

<u>Year</u>	<u>Meat</u> Index	<u>Chickens</u> (2) Index	<u>Eggs</u> (4) Index	<u>Fish</u> Index
1930	101.7	119	110	95
1931	102.9	108	111	83
1932	103.2	110	104	80
1933	107.2	113	99	81
1934	113.4	104	96	86
1935	92.3	101	93	99
1936	102.9	101	96	108
1937	99.4	100	103	96
1938	100.0	94	103	100
1939	105.2	104	104	98
1940	112.3	104	106	97
1941	113.2	114	104	106
1942	110.6	130	106	75
1943	115.8	170	116	74
1944	121.6	149	117	80
1945	114.5	160	133	95
1946	121.8	142	126	100
1947	123.0	132	127	97
1948	115.2	129	130	99
1949	114.0	141(3)	126(3)	99(3)
1950	114.9(1)	146(1)	128(1)	101(3)

Source: Bureau of Agricultural
Economics and U. S. Fish
and Wildlife Service

- (1) Tentative Indication.
(2) Includes Commercial Broilers.
Includes Consumption on Farms.
(3) Preliminary
(4) Includes eggs consumed on farms.

TABLE XIV

Index Numbers of Average Monthly Retail Prices of Specified Foods in Leading Cities.(1) (1935-39 Average) = 100

<u>Year</u>	<u>Fresh and Frozen Fish</u> <u>Index No.</u>	<u>Meats</u> <u>Index No.</u>	<u>Dairy Products</u> <u>Index No.</u>	<u>Eggs</u> <u>Index No.</u>
1947	243.4	214.7	186.2	200.8
1946	240.6	150.8	165.1	168.8
1945	220.4	118.0	133.9	164.4
1944	209.6	117.9	133.6	153.0
1943	209.0	124.2	134.6	161.9
1942	160.0	122.5	125.4	136.5
1941	119.2	106.5	112.0	112.2
1940	106.7	94.4	101.4	93.8
1939	99.8	96.6	95.9	91.0

(1) 51 cities covered prior to February, 1943, 56 Cities thereafter.

Source: Bureau of Labor Statistics, and U. S. Fish and Wildlife Service.

TABLE XV

U. S. Imports of Groundfish Fillets and Country of Origin,
1939-1948, by Pounds

<u>Year</u>	<u>Canada</u>	<u>Newfoundland</u>	<u>Poland</u>	<u>Norway</u>
1939	9,367,065	46,420	12,800	---
1940	9,653,497	22,870	46,507	---
1941	9,743,869	186,937	224	---
1942	15,905,792	728,280	40,000	---
1943	14,566,516	1,084,676	672,224	---
1944	21,335,931	2,484,142	680,496	---
1945	38,141,624	3,937,393	1,090,139	---
1946	39,427,420	5,503,414	4,234,437	1,818
1947	25,909,252	5,018,471	4,165,712	---
1948	33,408,680	15,788,865	3,964,406	395,109
1949	42,459,033(1)	---	4,859,133	437,979
1950	51,067,779(1)	---	12,529,576	2,080,376

(1) Includes Newfoundland

Source: U.S. Fish and Wildlife
Service

TABLE XVI

Import Quota for Groundfish Fillets, Including Rosefish Fillets, at Reduced Tariff and Total Imports of These Fillets, 1939-1948

<u>Year</u>	<u>Quota at Reduced Tariff</u> <u>Pounds</u>	<u>Total Imports</u>	
		<u>Pounds</u>	<u>Value</u>
1939	15,000,000	9,426,285	\$ 714,420
1940	15,000,000	9,739,853	853,114
1941	15,000,000	9,931,030	963,621
1942	17,174,495	16,674,082	2,336,772
1943	17,804,126	16,323,416	2,705,945
1944	18,210,658	24,545,569	4,913,744
1945	17,668,311	43,169,156	8,657,558
1946	20,380,724	49,171,089	9,929,191
1947	23,906,423	35,093,435	6,193,741
1948	24,930,188	53,963,546	10,751,838
1949	(1)	47,322,265	8,728,272
1950	(1)	64,799,711	11,735,589

(1) Not available

Source: U. S. Fish and Wildlife Service

TABLE XVII

Freezing Fish at SeaPacific Fisheries Experimental Station, Tasting Panel

Results from Halibut frozen aboard Fishing Vessel vs. Stored in Ice

Test Number	Date of vessel's departure for fishing grounds 1951	Date of vessel's return to Vancouver Port 1951	Days spent on fishing grounds	Fish frozen aboard the vessel: History after being caught until delivered to Tasting Panel	Days unfrozen "control" fish kept on ice	Delivery date of treated & "control" sample to Tasting Panel 1951	Tasting Panel Results					
							Preferred frozen fish		Preferred iced "control" fish		No preference	
							No. of Tasters	% of Tasters	No. of Tasters	% of Tasters	No. of Tasters	% of Tasters
* 4	July 4	July 13	2½	Slow frozen; allowed to slowly thaw out during return trip to port; refrozen in laboratory; thawed for steaking before delivery to Panel	7	July 15	68	50	59	44	8	6
5	July 18	July 26	3½		7	July 31	54	40	65	48	17	12
6	July 18	July 26	3½	Part of frozen fish from Test 5 thawed and kept on ice in Lab. for 6 days before delivery	13	Aug. 7	46	33	65	46	30	21
8	Aug. 30	Sept. 8	5	Frozen and kept at 20°F. aboard; transferred frozen to station's freezer and stored at 10° F. until thawed for steaking before delivery	7	Sept. 13	33	25	48	37	49	38
9	Sept. 10	Sept. 18	3½	Frozen and kept at 10°F. aboard; remainder of treatment as in Test 8	12	Sept. 28	85	45	72	38	32	17
10	Sept. 10	Sept. 18	3½		18	Oct. 4	95	54	55	31	26	15

*Stored well-iced in room held at 36°F in station

Source: Fishing Gazette, January, 1952

Chapter III

Competition

The problem of competition is twofold in nature: domestic and foreign. Domestic competition is that afforded New England fishery products primarily by United States producers of foods rich in protein content. More specifically, those products which would be in direct competition with fish are meats, poultry, eggs and cheese. Of course, to a lesser extent, all foods would be in competition with each other. This discussion, however, will be limited only to those products which compete in food markets directly with fish. Another problem in connection with the domestic phase of competition to the New England fishing industry is the competitive position of other fish producing areas in the food markets of the United States.

Foreign competition entails a study of the recent sharp increase in imports of ground fish fillets from Canada, Newfoundland, Iceland, and Norway. The subject to be discussed in the second-half of this chapter will be the conditions surrounding the rapid expansion of foreign competition, tariffs, and freezing of fish at sea as one method of overcoming the advantageous position of the foreign producer.

A. Domestic Competition

Containing a high protein content, fish compete in food markets primarily with other proteins. In pre-World War II period, the average annual consumption of fish was about 11 pounds, while meat consumption was about 125 pounds per person. Per capita consumption of poultry and cheese was 55 pounds. Fish represented about 6% of consumption of competing foods.*

Farm output, which is partially subsidized by the government, rose approximately 35% over the 1935-39 average, while fish production in the United States only increased by 12%.** (see Table XII)

Meat consumption per person increased from 126.2 pounds in 1938 to 145 pounds in 1950 for a gain of about 14.9%. Chicken consumption increased by 46% over 1935-39 average while eggs in 1950 showed a per capita rise of 28%. On the other hand, per capita consumption of fish was only 1% higher in 1950 than in 1939 (see Table XIII).

There are several reasons why foods which compete directly with fish enjoy greater popularity among consumers. Perhaps foremost among these reasons is the idea that Friday as the only fish day is firmly ingrained in the minds of the American consuming public. The evidence tends to bear out this "fish-day" idea. An analysis of fish consumption in

* 2, p.68.

** 31, p.2.

New York City was made by Morgan in 1938. New York City is considered to be typical of the region where New England fish are marketed.* Although the following study was made in 1939, the "fish-day" idea still appears to be prevalent in 1952.

Percentages of Weekly Supply of Sea

Foods Sold Daily in New York City

<u>Outlet</u>	<u>Mon.</u>	<u>Tues.</u>	<u>Wed.</u>	<u>Thur.</u>	<u>Fri.</u>	<u>Sat.</u>
General markets	4.0	5.0	8.0	11.0	69.0	3.0
Meat and fish stores	0.53	0.61	4.77	3.26	90.33	0.30
Fish stores:						
Mixed nationality	4.0	4.0	12.0	10.0	67.0	3.0
Italian	2.0	4.0	20.0	5.0	67.0	2.0

Source: Fishing Gazette, January, 1939

During 1951, shipments to the Midwest and other interior sections of the country were three or four times heavier on Monday and Tuesday than in the latter part of the week. Fish were shipped early in the week so that they would reach interior markets by Thursday or Friday. Most of the landings at the Boston Fish Pier took place in the early part of the week. Lent or other religious holidays were the only exceptions to the rule.

The concentration of fish sales in one day of the week has resulted in increased costs for dealers in the form of storage and handling charges and erratic production schedules. In addition, consumers do not always receive fish in the best condition and, as a result, become prejudiced against using fish as food unless they have to.

* 1, p.151.

Another important measurement of consumer preference for protein foods other than fish is the price factor. When prices are low in relationship to other foods proportionately more fish is sold. An exception to this was the boom enjoyed by the fishing industry during World War II when wartime scarcities of several foods necessitated the substitution of fish by many housewives. In the minds of many of these women it has remained a "substitute to be eaten once in a while", rather than used as an "everyday" item.

The prices of fresh and frozen fish have been high in relation to the prices of competing foods (see Table XIV). The reasons for the increase in price during World War II and after were: an increased demand for food when supplies of fish were curtailed and the delay until spring of 1943 of placing wartime price ceilings on fishery products.

Some interesting economic conclusions advanced by Burt^t* were that price and value of fish normally were dependent upon the relationship to competing food prices; that price and value of fish were dependent upon overall changes in demand and supply relationships of foods as a whole. He claimed that in the first instance, demand for fish would tend to be elastic. If price of fish relative to other competing food prices was compared with the consumption of fish, the relationship should indicate that an increase in relative fish prices would result in a more than proportionate falling

* 2, p.68.

off in quantity consumed and therefore a decrease in output of fish. In the second instance, the reverse is true. An increase in all food prices (relative fish prices remaining unchanged) would lead to a less than proportionate fall in quantity sold and hence to a rise in the value of output.

Other buying motives and consumer buying habits, such as appeals to taste and eye, nutritional value, high quality, ease of preparation, and effect of religious holidays will be studied in later chapters.

New England is protected from competition of other American fishing areas to a limited extent by distance. With currently rising transportation costs this protection becomes more effective. Before World War II it was estimated that half the fish produced in New England were eaten there.* Although no actual statistics are available, many dealers estimate that today 80 to 90% of New England fishery products are consumed outside of the New England area.

Through recent technological advances in filleting, freezing, and packaging methods, particularly the latter, the formerly unattractive, soft-fleshed fish of New England have now become popular in many midwestern and western areas of the United States.

However, promotional efforts of other regions, especially the shrimp industry in the Gulf area, have provided

* 1, p.152.

stiff competition for New England fish products in regions outside of New England. Halibut from the Pacific areas also provides competition in Western and Midwestern cities. One of the major problems has been to get the people of inland cities accustomed to the taste of sea food as opposed to the taste of their own fresh water varieties of fish. Success has been achieved in some cities, but much effort is still necessary in many areas, particularly around the Great Lakes region. Chicago, Illinois still finds local varieties, with the exception of halibut, holding top honors in popularity. Yellow pike, lake trout, and carp held second, third and fourth position respectively in a 1946 government survey. Detroit, Michigan also finds lake varieties holding top ranking positions. Popular here, according to the same survey, were lake trout, whitefish, sheepshead, halibut, and white bass.*

B. Foreign Competition

One of the sore spots in the New England fisheries has been the rapid rise in foreign imports, particularly ground fish fillets which compete directly in American markets with New England's packaged ground fish fillets. Canada is the principal exporter of ground fish fillets with New-

* 41, p.23,31.

foundland, Iceland and Norway following in that order (see Table XV). Principally from these countries, imports of fillets of cod, haddock, hake, pollock, cusk and rosefish in 1950 totaled 64,799,711 pounds -- almost seven times the average annual imports of 9,600,000 pounds for the years 1939 to 1941.

This accelerated rate in imports was, to a great extent, caused by conditions created during and after World War II. During the War, fishing operations were halted by European belligerents. In order to supply allies in Europe, production facilities were expanded in Canada, Newfoundland and Iceland. Modern plants and refrigeration equipment were installed to produce fillets for export, mainly to Great Britain. Newfoundland and Iceland, both large producers of salt fish before the War, now concentrated their efforts on higher priced fillets. After the War, Europe's demand decreased when its fleets again engaged in fishing operations. The U.S. demand, however, continued at a high level and Canada, Newfoundland, and Iceland found new markets in the U.S. for their high quality fillets. Dollar shortages in these countries also encouraged expansion of exports to the United States.

Total ground fish fillets imported, including rosefish fillets, in 1941 was 9,931,030 pounds, valued at \$963,621. By 1946, these imports totaled 49,171,089 pounds, valued at \$9,929,171. In 1948, total imports climbed to

53,963,546 pounds, valued at \$10,751,838 (see Table XVI). By 1951, these imports were estimated to have reached more than 83,000,000 pounds.*

Liberal government subsidies also helped the fishing fleets of Canada, Newfoundland, and Iceland to grow. Canada, especially Nova Scotia, has government subsidies for ship building, low interest bearing loans for vessel building and outfitting, and assistance in scientific fishing research and in expansion of markets. Newfoundland passed the Fishermen's Assistance Act in 1939 to make good losses insured by exporters on a specified scale of minimum prices. In 1944, the government proposed the development of fifteen centers for processing of fish and general expansion of the frozen fish industry with funds made available for loan at low interest rates. In Iceland the government exercises full control over exports and imports, negotiating directly with foreign buyers concerning the terms of sale of the product, particularly fish, which comprise more than 90% of the country's total exports.**

The major advantage that foreign competitors have over New England fish producers is their nearness to fishing grounds. They thus have lower production costs because of shorter trips and the greater probability of returning to

* 9, p.8.

** 2, p.202.

port with full loads. As a result of less time spent at sea, the fish are landed in excellent condition, which in turn produce high quality fillets. Labor costs in processing fillets are also substantially lower as are also the initial prices paid for fish when landed. Dealers in foreign countries pay 40 to 50 per cent less for ground fish than New England dealers pay. Although their output is as high as New England labor, shore workers in Canada, Newfoundland and Iceland receive wage rates from 35 to 60 cents an hour less than prevailing rates in New England.*

As a means of overcoming these conditions, New England dealers have advocated various types of tariffs and quota systems. Since the invention of the filleting process in 1921, tariffs have been attempted as a means of protecting New England fishery products from foreign competition. In 1922, a tariff act was passed which provided for an import duty of 2.5 cents a pound on all fillets. A trade agreement with Canada in 1939 reduced the duty on ground fish fillets to 1.875 cents a pound. These reduced rates applied to annual imports of 15 million pounds or 15 per cent of the average annual United States consumption of fillets in the three preceding years, whichever was the greater. Those ground fish fillets which exceeded the quota and imports of all other fillets remained subject to duty at 2.5 cents a

* 28, p.8.

pound.

Inflationary trends have made the existing tariff rates ineffective. In 1939, the average unit price of imported fresh and frozen fillets was 7.6 cents a pound. The duty rate of 2.5 cents a pound represented an ad valorem duty (based on value of the product) of 32.9%. In 1948, when the price had risen to an average of 20.4 cents a pound, the ad valorem equivalent of the 2.5 cent rate of duty had declined to 12.2 per cent.* This has led to a larger volume of imports at the 2.5 cent rate than at the quota rate of 1 7/8 cents a pound in recent years.

Tariffs and quotas, however, tend to restrict the flow of free trade. In these days of mutual assistance pacts and economic aid to foreign countries, the United States government is not in favor of raising existing tariff rates or of installing quota systems which would aggravate the "dollar-shortage" situation in other countries. In addition, our own export trade with Canada, which now totals \$2 billion dollars annually would be jeopardized by such a move. Therefore, a more logical solution to the problem would be a further development of markets by New England dealers and more efficient use of equipment by vessel owners and processors. Technological improvements in production, filleting, and packaging should be undertaken through research projects.

* 9, p.28.

At the present time, filleting in New England is carried on almost entirely by hand operation. Many phases of packaging are also performed by hand.

A recent project, now nearing completion, may be the deciding factor in the battle between the fishermen of New England and the Canadians. This is the problem of freezing whole fish right on board the fishing vessel. It has been undertaken by the Boston office of the technological section of the branch of commercial fisheries, U.S. Fish and Wildlife Service. Experiments along this line have been carried out successfully on the Pacific coast, and in some segments of the industry it is an accomplished practice. However, this is the first study of freezing of fish at sea as applied under operating conditions similar to those encountered by the New England fishing industry.

Small vessels which make trips of from only a few hours to two or three days are not a problem since the catches landed by them can be frozen while the fish are in prime condition. The larger vessels, the trawlers, operating for the most part from Boston and making trips to the distant banks for their catch, constitute the real problem. Trawler trips vary from eight to fourteen days and the fish landed may be from six to twelve days out of the water when prepared for freezing. Because of the complex engineering and economic problems involved, radical changes in design and operation of trawlers, as well as the shore methods of

handling, will be required before freezing fish at sea can become a common practice.

From a marketing viewpoint, this potential change in method of operation, is important because it increases the likelihood of attaining uniformly high quality fillets. The increased chance of repeat sales to consumers plus consumer satisfaction should result in additional good will toward the New England fishing industry and its products. An indication of the preference for fillets produced from fish which have been frozen at sea can be obtained from the results of a tasting panel at the Pacific Fisheries Experimental Station (see Table XVII). If fish is to become an "every day" food item, then it must endeavor to maintain consistently high standards of quality and palatability.

According to research conducted by government agencies, there is a definite ripening period for harvesting agricultural products in order that a frozen pack of the highest quality can be obtained. To reduce to a minimum the time between harvesting and processing freezing equipment often is moved to points as near the harvesting area as possible. Fish should be considered a food even more perishable than agricultural products, since it is adjusted to temperatures generally lower than the atmosphere. Fish is either killed in catching or shortly thereafter and, as dead tissue, is subject to enzymatic breakdown which is doubled

for each 10 degrees Fahrenheit increase in temperature.*

To duplicate the practices applied to other food products, it is necessary to freeze fish immediately after they are taken from the water. Although the available evidence, both scientific and practical, tends to bear out the benefits of freezing fish at sea, some large processing companies, through their own laboratories and tasting panels do not concur with the government findings. They claim that there is no apparent difference in taste or quality of fish which has been frozen immediately after being caught as compared with fish frozen within ten days after being caught. These companies assume that every precaution has been taken in the proper handling and icing of fish on board ship so that the fish when landed will be in prime condition. As a practical matter, however, it would seem more reasonable to expect higher quality of the boat load as a whole when fish are frozen immediately after being caught. One must remember that freezing cannot improve the quality of fish. It can only hope to maintain that quality which exists at the time of freezing. If fish are crushed, iced improperly, or unloaded carelessly, some damage to the condition of the fish will result, and when frozen, this condition will reflect itself in the quality of the finished product.

Other advantages which would accrue to the New

* 44, p.1.

England fishing industry if this concept of freezing fish at sea can be applied on a large scale would be: utilization of fish that have short storage life, such as pollock, hake, cusk; larger catches of fish, since vessels could stay longer on distant fishing grounds. In addition, more utilization would be made of by-products such as livers and viscera, which are not now brought ashore when fish are gutted at sea. There would be less work at sea for the fishermen, in that fish would not have to be gutted and iced; and increased efficiency of shore processing plants would result, since fish frozen aboard vessels could be held in commercial cold storage and used as needed.*

Filleting fish at sea was attempted by one Boston vessel owner. This experiment was abandoned because of personnel difficulties. It seemed the shore workers or "filleters", in addition to not being addicted to the sea, did not relish the thought of spending three weeks at sea each trip. No such difficulties appear to be in sight for the current experiments involving freezing of fish at sea. These fish are to be frozen in the round with all processing operations taking place on shore.

Because fish are highly perishable products, special problems are encountered in storage and transportation. The next chapter deals with the problems of the industry

* 8, p.9.

regarding these two important subjects.

CHAPTER IV

Cold Storage and Transportation

Because fish is extremely perishable in nature, the marketing functions of storage and transportation deserve special attention. Fish is unlike meat, the flavor and texture of which is improved by "hanging" for several weeks. Vegetables, too, can be kept in near-fresh condition for a period of months with a minimum of processing. Fish, however, if marketed fresh, must be sold within ten to fifteen days after it is caught if it is to retain its texture and flavor. Therefore, most species of New England fish are sold in a preserved form. The most popular method of preservation is freezing, although a small volume of New England fishery products is distributed in a pickled, salted, dried, smoked, marinated or canned form.

With more than three quarters of the fish caught from New England vessels being distributed outside the regional area, transportation becomes a major factor. Refrigerated truck and rail are the two methods most widely used in transporting New England fishery products to secondary markets in New York and Chicago and to other Midwestern and Southern market centers. Some high-priced items, like oysters and lobsters, may be shipped by express or plane.

A- Cold Storage

The Newfoundland government defines quick-freezing of seafood as a process in which the fall in temperature of the fish during freezing at 32°F to 25°F occurs at a speed which insures a minimum, disturbance of the tissue structure.* However, there is no standard definition of "quick-freezing." Each firm is apt to refer to its own method as quick-freezing regardless of the condition under which the results are accomplished. Nevertheless, it was the quick-freezing technique, which in 1923 was first developed by Clarence Birdseye, that helped to broaden the market for New England seafood products. This process replaced salting as a means of preservation. In addition, it turned out a product which approached fresh fish in taste. Quick-freezing allowed for shipment to all parts of the United States by low cost transportation. It particularly aided in the shipment of rosefish fillets to Midwestern cities, thus raising the consumption of New England products in the Midwest.**

The development of quick-freezing necessitated the building and operation of refrigerated storage warehouses and freezers. The facilities offered by these warehouses is

* 43, p. 3

** 1 pp. 151, 152

commonly referred to as cold storage space. In the case of a public warehouse or freezer, the space is rented to those who wish to store their products there. Private warehouses are also operated by individual firms.

The supply and demand for fish fluctuates with seasons availability. It is a perishable and seasonal product. Therefore, properly operated and adequate cold storage facilities are necessary. In view of the seasonally low catch in the late fall and winter seasons, frozen fish stocks are highest at the end of the year. On an edible weight basis, the quantity of frozen fish reported held in commercial cold-storage facilities on January, each year has ranged from about 8 to 12 per cent of the quantity of the previous year's catch utilized in the form of fresh and frozen fish. The estimated January 1 cold-storage holdings in 1933 and 1934 were about 7 per cent of the corresponding preceding year's output and the beginning stocks of 1947 and 1948 were 13 and 11.5 per cent, respectively.*

The New England fishing industry has been a major producer of frozen fishery products since the inception of quick-freezing. After World War II this region has consistently accounted for more than 50% of the total United States and Alaska production of frozen seafood products (see table XVIII). The popularity of frozen fishery products has grown

* 53, p. 5

tremendously among consumers within the past decade. Present indication is for further increases in demand and production.

If the cold storage holdings of fishery products for the twelve months of the year were presented in graphical form, one would notice a sharp dip from January to April and May when a low point would be reached. Then, there would be a sharp rise in the curve until a peak was reached near the end of the year. (See Table XIX). This represents the depletion of stocks due to the Lenten season and the subsequent replenishment of stocks during the period of high productivity and low consumption. The cycle has repeated itself each year with slight variations, depending upon when Lent falls.

This fluctuation of cold storage holdings is partially caused by religious reasons and partially through ingrained buying habits of the consumer. Within each week of the year, there is also a sharp curve because of the Friday "fish-day" idea. To effect more efficient use of storage facilities through planned frozen fish production should be an aim of the industry. This can be done by "smoothing out the curve" through properly executed consumer education and planned sales programs. If this condition can be remedied, it will mean lower operating costs, particularly in storage and handling charges. The costs of carrying inventories are high. They include, among other things, charges for storage, interest on investment, handling, insurance, taxes, depreciation, and spoilage. To reduce these costs would result in lower prices to consumers and a probable overall increase in

volume. This should produce additional profits for dealers and fishermen alike.

The accumulation of heavy inventories can have a disastrous effect upon the industry when supplies become so heavy that "dumping" is necessary. "Dumping" large quantities of fish on the market usually results in a break in the price with resultant losses to dealers and lower prices to fishermen. At the present time, rosefish is in very heavy supply. Cold storage holdings on January 1, 1952, were 20,828,354 pounds as compared with holdings on January 1, 1951, of 9,720,294 pounds and the 5-year average 1947-1951 of 12,455,792.* Such a situation is dangerous and can result in a "break" in the market. It must be remembered that frozen fish have only a limited storage time before spoilage takes place. Eight to ten months is the average period that frozen fish may be stored safely. The following is an estimate of the probable storage life of some New England species.**

<u>Species</u>	<u>Round or Headed & Guttled</u>	<u>Wrapped & Packaged</u>
	<u>Months</u>	<u>Months</u>
Cod	8-10	10-12
Flounders	8-10	10-12
Haddock	8-10	10-12
Mackerel	6-8	6-8
Pollock	8-10	10-12
Rosefish	6-8	8-10
Sole	8-10	10-12
Whiting	8-10	10-12

* 48, F.L. 336 K, p. 13

** 43, p. 5

Special promotions of fish should be planned to clear inventories, the same as the clearance of merchandise from other establishments which are overstocked.

Certain technical difficulties concerning cold storage facilities are worthy of mention here. The problem of odor transfer in cold storage rooms is one of long standing and fraught with much misconception. It has been found by actual experimentation that fish can be stored successfully together with other products without imparting "off odors." The only requirement for the storage of fish and other products together in the same cold storage room is that both products should be properly protected by wrapping in a recognized moisture-vapor-proof material.*

Many of the failures of satisfactorily freezing fish were formerly attributed to the fact that the fish were not "quick-frozen." It is now recognized that the constant storage temperature in the warehouse may have as great or greater influence upon the success of freezing fish as the rate at which it is originally frozen. Even the effect of extremely fast freezing can be off-set by a wide fluctuation in the temperature of storage rooms, since the fluctuation in room temperature causes a growth of the size of the ice crystals in the tissue. Boxes and cartons of frozen fish should be piled in the warehouse with care to insure free circulation of the cold air around and between them.

* 43, p. 3

The piles should be spaced well away from outside walls of the building. They should also be stored away from walls which adjoin rooms carrying a higher temperature. These precautions are necessary to insure constant storage temperature because, due to internal heating, the center of a tight pile of cartons of fish has, at times, been known to defrost even at a room temperature of 0°F. Fish which are frozen in the round, or those which are too large to be wrapped in moisture-vapor-proof material, should be glazed with a heavy coating of ice to prevent freezer burn or dehydration.

The salability of frozen fish is greatly affected by the quality which has been maintained during cold storage. It must be remembered that freezing cannot improve the original quality of the fish. Therefore, it is important that the fish was in good condition before being frozen. The warehouse operator has little control over the quality of the product delivered to his establishment, but by prompt and proper handling, he can contribute much toward delivering the final product to the consumer in the best possible condition.

B- Transportation

The reasons for the lag in increase of fish consumption as compared to consumption of other food products, (reviewed in Chapter III) lie partly in competitive handicaps

to which the fishing industry is subjected. The difficulties in transportation to wish some other competitive industries are not exposed play an important part in this situation.*

The pattern for transportation of New England fishery products is much different than for many other foods. The large majority of fish landed in this area are shipped to distant inland markets. In 1940, about 60% of fresh and frozen fish produced in Boston were sent, via truck, express and freight to destinations from 200 to more than 1000 miles from Boston (See Table XX). Today, with improvements in transportation and packaging, even a greater proportion of shipments are destined for inland markets. Many other food products are customarily produced in areas closer to the consumer. For example, there are many more beef cattle, potato, and vegetable producing areas near coastal consuming regions than there are seafood producing areas near inland consuming regions. Therefore, a vailability of proper transportation facilities is of the utmost importance to the New England fishing industry. Lack of adequate facilities and increased transportation rates have hampered the industry.

From the time that fish are unloaded from vessels at the port until they reach retail outlets, various mediums for their transport are used. Upon their arrival at the various New England fishing ports, the fish are unloaded

* 31, p. 3

either on elevators, often of the endless chain, bucket type which can be lowered to the level of the vessel or by means of basket or bushels. The latter method is employed by the majority of the smaller boats. This involves unloading by hand into bushels which then may be lifted by hoists to the wharf. However, it is time consuming, and it is not an efficient method of handling fish. In addition, many of the chain type conveyors or elevators are in poor condition and often lead to lost time in handling fish, a factor which can affect the ultimate quality of the final product.

The fish are then weighed and carted to the fish house for dressing and packing for shipment. The vehicles used in Boston for transporting the fish to the dealer's establishment are truck or tractor - drawn carts or flat cars. Here again, one finds outmoded methods being employed. Most dealers still resort to carts drawn by trucks rather than the more modern tractor-drawn flat cars. When carts are used, fish are loaded in bulk and unloaded by hand. More labor is involved. On the other hand, with flat cars, fish are loaded into boxes. When they reach the dealer's shop, the boxes are unloaded by a hoist. This saves time and labor, and less handling may help to keep the fish in better condition. The advantages of using a tractor rather than a truck to haul the carts or flat cars is that fish can be weighed while inside the cart or flat car without disconnecting it from the tractor. The weight of the cart or flat car and

boxes and an allowance for ice is deducted in order to arrive at the weight of the fish. If a truck were used, the cart or flat car would have to be disconnected before weighing could take place. This would involve more time and inconvenience than the tractor method.

The four methods of transportation of fresh and frozen fish to distribution centers are truck, rail, air, and water. In New England, the vast majority of fishing products are shipped by truck. In 1940, of 216,000,000 pounds shipped from Boston, about 71% went via truck, as compared with 24% by freight, and 5% by express (See Table XX). The recent hikes in freight and express rates have caused the industry to favor trucks even more today than in 1940. The rails have obtained a 57 per cent increase in rates since the close of World War II.* They now have pending before the Inter-State Commerce Commission a further substantial rate increase application. During this same period truck rates have also increased, but not to the same extent as the rails with the results that in most instances it is cheaper to ship fishery products by truck than by rail. In most sections of the country trucks appear to be getting overwhelming preference over other forms of transportation by seafood producers (See Table XXI). Air transportation is expensive. It is used only to a limited extent, mostly for high-priced products such as lobsters or for samples

* 26, p. 41

or emergency shipments of frozen foods. There are several companies that fly labosters from Maine directly to New York and other distribution centers. Water is used as a method of transportation on a small scale, usually for coastwise movement of products to areas having truck or rail facilities.

When shipped by rail, the boxes, cartons, or barrels, of fish are placed either in refrigerated cars having ice bunkers at each end or in the regular express cars. In the case of truck transportation, the boxes of fish are frequently covered with cubes of dry ice and the latter inclosed with insulated tarpaulins. This practise greatly reduces melting of ice and eliminates necessity for re-icing in transit.* Space does not permit a detailed discussion of the technical aspects of shipment by truck or rail.

There is one phase of trucking in the industry that may be of interest. That is the ownership and operation of the trucks themselves. Very few producers own their own trucks.** The contract carrier, which hauls for hire under specific contract between the shipper and receiver, and the common carrier, which hauls for anyone, anytime, have to secure "rights" from the Inter-State Commerce Commission to transport between certain points and places. The private carrier is owned by the shipper who

* 51, p. 3

** 27, p. 42

hauls his own merchandise. This type of carrier does not have to be licensed by the Inter-State Commerce Commission.

Several problems are associated with current truck transportation of fishery products. One of these is the lack of uniformity of state road-weight laws. These vary all the way from 42,000 pounds in Kentucky, Missouri, and Tennessee to 60,000 pounds in New Jersey for the single axle tractor, semi-trailer, taking into consideration the height and length of the trailer. For the semi-trailer tandem axle tractor the weight laws vary from 42,000 pounds on designated highways in Kentucky to 80,000 pounds in West Virginia, also considering height and length of trailer.* This diversification in law impede the free movement of trucks among the various states.

Long hauls of fish by truck have been made recently. In January, 1952, a 3200-mile fish haul was made from Hay River, Northwest Territories to New York City.** The fish arrived in excellent condition, but the problem was the volume and type of back loads which the trucks were able to obtain for the return journey. Long trips would not be profitable unless large loads of other products could be obtained for the return trip.

* 26, p. 41

** 19, p. 46

One of the things necessary to improve truck transportation is some system whereby trucks might coordinate their operation and service. Many authorities favor the formation of an association or bureau which could provide information to shippers on the availability and movement of trucks and which could exercise control over the class of equipment and operators.

One other important point to consider is that the fish wholesaler or retailer to whom shipment is being made usually bears the expense of transportation. Less than truckload shipments have higher rates than full truckload shipments. However, most dealers in New England do not pool shipments to take advantage of lower truckload or carload rates. A truckload is 24,000 pounds while a carload (rail) is from 36,000 to 46,000 pounds. This lack of cooperation by dealers has added an additional expense to the already overburdened distribution system.

TABLE XVIII

Production of Frozen Fishery Products, 1932 - 1948

Year	New England <u>1,000 lbs.</u>	United States and Alaska <u>1,000 lbs.</u>
1932	39,856	92,472
1933	39,604	95,874
1934	58,460	133,494
1935	77,989	149,643
1936	96,173	179,274
1937	79,772	168,224
1938	87,097	186,096
1939	85,874	183,408
1940	87,370	196,155
1941	117,850	246,588
1942	118,462	247,165
1943	100,790	246,053
1944	120,958	266,537
1945	125,278	286,001
1946	131,823	280,065
1947	125,900	246,624
1948	158,969	291,988

Source: U. S. Fish and
Wildlife Service

TABLE XIX

Holdings of Frozen Fishery Products by Months - Year 1949

<u>Date</u>	<u>New England</u>	<u>Total U.S. and Alaska</u>
January 1	31,969,205	133,843,860
February 1	23,832,322	112,045,665
March 1	16,405,739	90,491,181
April 1	12,789,949	76,743,236
May 1	12,544,036	68,267,629
June 1	16,505,888	85,600,671
July 1	24,384,214	100,536,821
August 1	36,154,324	127,473,945
September 1	39,780,269	135,927,863
October 1	38,298,661	140,160,701
November 1	39,006,104	148,049,055
December 1	<u>41,984,545</u>	<u>158,007,754</u>
Average	27,804,605	114,762,365

Source: U. S. Fish and
Wildlife Service

TABLE XX

DISTRIBUTION OF RECEIPTS OF FRESH AND FROZEN FISH, BOSTON, MASS., 1940*Distribution
of shipment

	TRUCK		EXPRESS		FREIGHT		ALL		
	Volume (Pounds)	Methods %	Volume (Pounds)	Methods %	Volume (Pounds)	Methods %	Volume (Pounds)	Dest %	Methods %
Metropolitan Area	52,000,000	100	-	-	-	-	50,000,000	23	100
M.A. to 200 Miles	30,000,000	75	10,000,000	25	-	-	40,000,000	19	100
201 to 500 Miles	18,000,000	30	-	-	42,000,000	70	60,000,000	28	100
501 to 1000 Miles	32,000,000	90	-	-	3,600,000	10	36,000,000	17	100
Over 1000 Miles	22,500,000	75	-	-	7,500,000	25	30,000,000	13	100
TOTAL	152,900,000	71	10,000,000	5	53,100,000	24	216,000,000	100	100

*Estimated

Source: Boston Fishery Market News Service.
U.S. Fish and Wildlife Service

TABLE XXI

New York, N. Y. Salt-Water Market Receipts of Fresh and Frozen Fish and Shellfish
from all sources by types of Transportation - Selected Years 1939-49

<u>Year</u>	<u>Truck Pounds</u>	<u>Express Pounds</u>	<u>Railroad Pounds</u>	<u>Coastwise Boat Pounds</u>	<u>Total Pounds</u>
1939	122,949,380	14,185,765	49,408,398	871,728	187,415,271
1940	142,490,211	13,471,158	46,912,175	842,484	203,716,028
1945	216,515,638	13,077,786	33,029,793	--	262,623,217
1946	185,885,313	12,357,369	21,698,178	--	217,940,860
1947	177,303,704	10,086,566	20,418,006	--	207,808,276
1948	181,592,625	9,071,328	16,432,606	--	207,096,559
1949*	186,358,159	8,804,382	9,102,123	--	204,264,664

*Estimated

Source: U. S. Fish and
Wildlife Service

Chapter V

The Distribution System

A. General Structure

Factors which determine the channels of distribution used in the marketing of New England fishery products are: the product itself, the size of the company, and the location of markets.

For example, in Boston there are several large companies which specialize in the distribution of branded, packaged frozen fishery products. These firms own fishing vessels. They operate their own processing plants where fish are cleaned, filleted, frozen, packaged, stored, and in some cases, pre-cooked. These products are distributed throughout the country. Most of these items are shipped outside the New England area. The companies use their own sales force, coupled with brokers in key cities, to contact wholesalers, chain stores, and large retailers. Independent small fish stores and general markets are served by the wholesalers who perform the functions of cold storage, delivery, extension of credit, selling, and sometimes aid retailers in displays and advertising. In less densely populated areas independent fish retailers may perform wholesale functions in addition to their retail operations. In this dual capacity they supply restaurants, hotels and schools in their locality.

At the various New England fishing ports other marketing situations exist. There are smaller dealers at the port, also referred to as the "primary" market, who do not maintain their own sales force and who use brokers to a very limited extent. These dealers sell mostly by phone, through advertisements in trade journals, or through the local Chambers of Commerce to other wholesalers and retailers in the Midwest. Their frozen products are usually shipped, either filleted or in the round, in bulk in large wooden boxes or in barrels as opposed to the more convenient "one pound" consumer-size packages shipped by the larger companies.

There is a third group of dealers at New England fishing ports who are engaged in an integrated operation. These are the large chain stores. They have their own wharf space, process their own fish, maintain cold storage plants, finance the complete operation, and deliver fish to their own retail outlets. This vertical method of operation allows for closer control and better coordination between production and sales. Their generally lower prices at the retail level would seem to indicate a more efficient operation. However, they sell mostly fresh fish, filleted or round, mainly in local markets in departmentalized stores. Savings in transportation, handling and in rental charges may account for some of the economies enjoyed by these chains. It must also be remembered that the seasonal nature of fish products plus the "one-day" fish idea allow chain stores to make use of the

space allocated to fish by displaying other products in its place during the slow part of the week or year.

A group of firms who have highly individualized traits are those dealing in lobsters. These companies usually perform both retail and wholesale functions. Most of their business is done as wholesalers. Lobster, being a luxury item among fishery products, commands a high price in all stages of distribution. The dealers at the various New England ports import much of their supply from Nova Scotia. They pay high prices and work on small mark-ups. Because of the relative scarcity of lobsters, there are no volume reductions. Institutional buyers, usually better hotels and restaurants, are among the customers served in a wholesale capacity by these dealers. Maine produces the greatest quantity of high quality lobsters. Lobsters from Maine and those imported from Nova Scotia are shipped all over the nation, including the West coast and Alaska. They can stand higher shipping charges than other fishery products. Lobsters are comparatively delicate, and they must be kept alive during shipment. Because of this, rail and plane transportation are most frequently used as mediums of transport for lobsters. They are received in other cities by food brokers or wholesalers who arrange for their distribution to local retailers and restaurants and hotels. Some large chain food stores and institutional buyers purchase direct, but most lobsters are distributed through secondary wholesalers or brokers because

proper handling is imperative and price concessions are small.

Very few figures are available on the actual volume of fishery products which are marketed through each channel of distribution. Even shipments by type of product to different markets have not been accurately tabulated. The lack of this information is not due to any fault of government agencies or of the various fisheries associations in New England. Rather it is because of lack of cooperation on the part of dealers, large and small alike, to divulge information about their operations, that this condition exists.

B. Mark-Up Policies

"Mark-up", the difference between cost and selling price, usually is figured by New England fish dealers by a "rule of thumb" measure. Lack of uniformity of "mark-up" percentages seems to hold true whether it be at the wholesale or retail level. At the major ports, firms typically aim at a gross profit of one to two cents a pound on whole fish and a 10 to 20 per cent mark-up on fillets. Large wholesalers in the secondary markets, such as New York and Chicago, attempt to operate at mark-ups of from 30 to 40 per cent, while retailers have been known to mark-up fish from 50 to 100 per cent,* although the most common retail mark-up

* 28, p.7.

per cent is about 25% to 30% (see Table XXI). Mark-up percentages which are in daily use in business are usually calculated on selling price.

Although inflation coupled with war has caused an upward spiral in prices since 1939, the per cent relationship between ex-vessel prices (prices paid fishermen) and prices received at the retail level throughout the U.S. has fluctuated very little. In 1939, "ex-vessel dollars" amounted to \$96,532,000 as compared with \$316,431,000 "retail dollars". This amounted to ex-vessel prices being about 31% of retail prices, or, in other words, an overall mark-up on retail selling prices of approximately 69%. In 1940 the relationship was about the same, percentage-wise. In 1946, ex-vessel prices rose to \$253,000,000 and retail dollars were \$887,791,000 for a spread of about 73%. By 1950 the price at the wharf had soared to \$365,000,000 as compared with "retail dollars" of \$1,119,273,000. However, the relationship between prices at the various levels of distribution in 1950 had only slightly changed from their relationship in 1939. The ex-vessel prices in 1950 were about 33% of prices at the retail level, while the mark-up based on retail selling prices was about 67% (see Table XXIa).

There is a high degree of price competition among dealers at the "primary" market, the fishing port. These

dealers may process fish, such as filleting,[#] pre-cooking and freezing or they may just sell fresh fish in the round (whole form). Regardless of the functions they perform, it appears from the limited information available that they have adopted a pricing policy of "charging what the traffic will bear". For example, one well known Boston processing firm which sells fresh and frozen packaged fillets locally and in the Midwest figures its price calculations somewhat as follows:

		(cents)
Ex-vessel price-round fish-per lb.		10.50
Cost after filleting		24.42
Cost of packaging		
Box	1.50	
Can	2.00	
Cellophane	1.25	4.75
Total cost per lb.		<u>29.17</u>

A fish which originally cost $10\frac{1}{2}\phi$ per pound in the round would thus be increased to about 24.42ϕ per pound after filleting. This is based on a 42% or 43% recovery in preparing haddock or cod fillets with skin on. Skinless recovery on these species would be about 36%. Redfish has a recovery of 27% for skin-on fillets and all sole fillets rate a 25% skin-on recovery value. This indicates that by filleting fish, a process which many New England species undergo before reaching the market, the largest proportion of the fish is waste. Much of this waste is money wasted to most dealers who sell it at an average of $3/4\phi$ a pound. This waste is known as gurry. When processed, it is used for

[#] Filleting is process whereby fish is split and backbone removed, thus leaving edible portions intact.

fertilizer, and as cat and other animal food. A lucrative gurry industry has developed in New England. However, many dealers still neglect making profitable use of gurry.

The cost of packaging was added to the cost after filleting to produce a total cost per pound to the processor of 29.17¢. To this, he will add about 5 cents to arrive at the selling price to the wholesaler in the secondary market. This margin of 5 cents will vary, depending upon the availability of the species, demand, experience, and competition--both foreign and domestic. Judgment and personal experience of the processor play an important part in setting prices. There is but a small relationship between operating expenses and gross margin. Dealers sell at the highest mark-up obtainable at a particular time, hoping that over a period of time, the "proper" margin for profitable operations will be reached.

The greatest bargaining power is held by independent wholesalers and retailers. Daily information on prices paid by dealers at the main ports are available to wholesalers. They thus are in a position to take advantage of "breaks" in the market and of the keen price competition among dealers. Certain types of retail outlets, especially the grocery chains and independent markets in mid-western regions, have been offered higher margins in order to get them to handle frozen packaged sea food. To many of them it is a relatively new product to which they have to become accustomed. It requires

special display cases. It is highly perishable and is subject to "one-day" a week selling. For these additional risks, the retailer demands larger profits per unit. The mark-up at the retail level is higher than for most other food items, perhaps with the exception of meat. However, the turnover is less because of the "Friday" idea and religious reasons as part of the ingrained buying habits of consumers. Because fish is highly perishable, it requires special handling, and when in a frozen state, special equipment is needed for storage and display purposes. Wholesalers also have defended high mark-ups because of special handling and higher capital requirements due to low turnover. Perhaps, under the present marketing system, wide margins are in order. To effect a reduction of margins and still maintain volume and profits is the problem. To solve the problem, the industry must first eliminate or at least modify the causes of the condition. The turnover rate should be increased by getting people to treat fish as an "every day" food item. Research should be intensified with a view toward reducing processing costs through development of machines for filleting, new packaging and new methods of preservation. Educational programs should be conducted among wholesalers and retailers concerning proper handling, storage and display of fishery products.

C. Retailing

Because retailing is the critical point in the distribution of fishery products, special attention in this section is focused on problems which are peculiar to the retailing of fish. It is at the retail store that the consumer decides whether the products offered are satisfactory. The consumer's desire and ability to purchase fish of the species, quality, form, size, weight, and price offered, determine in the final analysis how much fish will be sold for home use.*

The major types of retail outlets which distribute New England fishery products, both fresh and frozen, are independent fish stores, general markets and meat and fish stores. A large quantity of fish is also distributed through chain food stores. The number and types of outlets vary, depending upon such factors as location, population and competition. Certain fundamentals which are characteristic of any other successful retail operation are also essential for success in retailing fishery products. Such things as pleasing personality and selling ability of the proprietor, well trained salespeople, adequate capital and facilities and good management are the backbone of any retail business. It is, however, with problems peculiar to the fish retailer that the remainder of this chapter is devoted.

Maintaining consistently high quality is perhaps the foremost concern of the retailer of fish. It is the key

* 49, p.1.

to increased consumer acceptance and greater demand. The ultimate consumer is primarily interested in three properties of fish: keeping quality after purchase, appearance and odor during preparation, and palatability of the cooked fish.*

The keeping quality after purchase is affected by several factors. Prior to the sale to the consumer, the fish had been kept in crushed ice at a temperature not much above 32 degrees Fahrenheit. When removed from the ice for delivery, the temperature immediately rises, sometimes considerably if during spring or summer, since no attempt is made to refrigerate it during delivery. The rate of spoilage increases greatly with rising temperatures. In addition, the rate of decomposition of fish stored at the temperature of the average household refrigerator is about four times as great as that of fish kept well iced.** It is important that the fish when purchased by the retailer is in excellent condition so that it will not deteriorate at a rapid rate.

A fish of high quality will have an appetizing appearance during preparation. Bad odors during cooking will result from fish of inferior quality. Normal flavors and odors, satisfactory texture, and good appearance of cooked fish are factors affecting palatability. The texture of high quality fish is tender, firm and moist. Abnormal textures such

* 52, p.1.

** Ibid., p.1.

as stringy, rubbery, jelly-like, or tough may be the result of improper handling, either at the port or by the retailer. Such symptoms may also be due to improper methods of cooking.

It is, therefore, apparent that care must be exercised by the dealer in handling, storing, and displaying fish. Rough handling should be avoided because bruises and punctures of the flesh tissues induce and hasten spoilage. In addition, the retail dealer must endeavor to purchase only high quality fish. He should examine carefully each shipment for signs of spoilage or damage. He should become familiar with the various organoleptic tests -- the determination of quality through use of the senses of sight, touch, odor and taste. Other laboratory tests are being developed through research by some of the larger processing firms. If successful, they should result in the setting of scientific specifications as standards for determination of quality. This may eventually lead to the determination of quality through the use of chemical analysis of a sample of the boat load or shipment of fish. At present, the observation of experienced individuals is relied upon in determining quality.

Another problem which is encountered by the fish retailer is the full utilization of the time of sales personnel. The latter part of the week, particularly Friday, finds most fish markets extremely busy. If salespeople, necessary to accommodate the "Friday rush", were employed on a full time basis, they would have little to do during the early part of

the week. This problem can be overcome by hiring additional help on a part-time basis during busy periods. They can perform ministerial duties, such as weighing and packing fish. Cleaning of fish can be performed by the regular personnel, and if volume warrants it, a cashier may be employed. Another solution may be to carry an additional line of canned goods or perhaps meat and chicken and eggs so that the employment of an adequate full-time sales staff will be warranted.

Displays, local promotions and advertising deserve special attention. Merchandise should be attractively displayed in equipment which is strategically located to attract the customer's attention. Window displays of nautical materials, aquaria, or unusual signs will draw attention. Many stores use attractive displays of fresh fish on ice to draw attention. Help customers to find the desired merchandise by placing neat signs at strategic locations. Photo murals of fish or processing often provide attractive decoration for the interior of the store. Advertisements in local newspapers should be used to focus attention on fish. This advertising should be carried on not only during the Lenten season, but periodically throughout the entire year so that sales may occur more frequently and overall volume be increased. Cooking recipes should be available to consumers.

Favorable location, good interior and exterior appearance, and cleanliness are also important to the suc-

cessful operation of a retail fish store or department. However, it should always be remembered that it takes only one bad fish to lose a customer. High quality products plus strategic advertising and display should result in more customers. Good management will pave the way to larger profits.

Table XXIa

Value of Fishery Products at Various Levels
of Production and Distribution in the United States
 Selected Years 1939-1950

Year	<u>Production or Distribution Level</u>			
	<u>Ex-Vessel</u> Dollars	<u>Processor</u> Dollars	<u>Wholesale</u> Dollars	<u>Retail</u> Dollars
1939	96,532,000	188,237,000	245,480,000	316,431,000
1940	99,000,000	198,200,000	255,600,000	327,400,000
1943	204,000,000	397,759,000	518,711,000	668,692,000
1946	253,000,000	528,105,000	688,697,000	887,791,000
1949	325,000,000	601,998,000	769,633,000	996,613,000
1950	365,000,000	676,090,000	864,357,000	1,119,273,000

Source: U.S. Fish and Wildlife Service

Chapter VI

Recent Changes in Merchandising Techniques

The term "merchandising" has been used to describe product planning, or the adjustment of merchandise produced or offered for sale to customer demand.* Since the end of World War II, New England fish processing firms have developed new techniques in merchandising their products. The most important changes have occurred in the packaging of frozen fishery products and in the development of new products.

A. Packaging

Packaging of frozen fishery products serves two major functions, protection and merchandising.

Proper packaging protects the fish during various stages of distribution -- storage, transportation, and in the retailer's display case. The package serves an important function in helping to control the degree of spoilage caused by bacterial action by preventing further contamination of the product during handling. Packaging is of importance in retarding oxidative changes in fish.** Oxidation of the fat

* 5, p.92.

** 47, p.3.

that is present in fish is a factor, which has much to do with the period of time that fish can be maintained in a satisfactory condition in frozen storage. The fat contained in fish is much more susceptible to oxidation than is the fat found in other animal or vegetable foods. Oxygen is rapidly absorbed by this fat and will soon cause the loss of fresh flavor and the development of rancidity. Packaging the products tightly with essentially air-tight wrappings to prevent ready passage of air to the fish can retard these oxidative changes.

Low temperatures which are required for proper storage of frozen fishery products will cause extreme desiccation or drying out unless special preventive precautions in packaging are taken. Any exposed or improperly packaged food products in cold storage may lose moisture, in the form of water vapor, or will develop a dry, spongy surface with the subsequent toughening of the tissues. To prevent this, care is needed to package the food properly in containers which have a very low or, ideally, a zero rate of water-vapor transfer, so that the moisture will remain within the package.

High quality is important if the product is to be successfully merchandised. The use of proper packaging materials is essential if consistently high quality is to be maintained by the New England packaged frozen fish producers.

Emphasis should be placed upon the use of packing materials having low water-vapor transmission rates. The package must be tightly sealed. It should not become brittle when subjected to low storage temperatures. It must provide structural support during filling and freezing, as well as prevent physical damage to the contents in the normal course of handling during storage and distribution. The paperboard used in the fabrication of the container should be waxed or otherwise treated to prevent loss of rigidity and discoloration which might occur through contact with wet materials or through condensation of moisture on the surface of the package. This point is especially important with respect to packing fillets, for invariably, the fillets are quite moist. The materials from which the container is constructed should be tasteless, odorless and non-toxic.

Various types of packing materials have been subjected to experimentation. The tinfoil can was thought to be an ideal container for frozen seafood, because there was no water-vapor-loss and no leakage of the contents from a sealed can.* There is one serious drawback to distributing consumer-sized packages in cans. To the ultimate consumer of canned goods, the tin can is generally associated with processed foods which can be held on the shelf at room temperature. For this and other reasons, frozen fishery products

* 39, p.1.

have been sold to the consumer in distinctive paperboard containers. However, research is still being conducted by laboratories of private firms and government agencies in an endeavor to find the ideal combination of wrapping materials. The results of one of these tests indicated the superiority of certain wrapping materials in retaining the original weight of frozen fillets while in storage for a period of twelve months (see Table XXII).

Some New England producers still use makeshift containers which do not meet the high specifications required of frozen fishery products. If high quality is to be maintained from the time of freezing until the product reaches the consumer, proper containers and wrapping materials must be used. Care in selection, processing and storing may be entirely wasted unless the product is adequately protected until it is consumed.

New packages and methods of packaging can also help in merchandising frozen fishery products. A properly designed and attractively printed package having a clean, sanitary appearance will go far in conveying merchandising appeal to invite purchase and encourage consumer acceptance.

Since the invention of filleting more than thirty years ago, perhaps the greatest contribution toward boosting fish sales has been the use of the "one-pound" # consumer-

Terminology used by the industry in describing fixed weight consumer-size packages of frozen fillets (edible portion of fish). Contents are usually 12 or 16 ounces, but may be any weight up to two pounds.

sized frozen fillet package. Within the past three years, there has been widespread use of these packages by New England firms. The introduction of filleting provided the consumer with only the edible portions of the fish. No cleaning or scaling was necessary. Savings in transportation were effected because only the edible portions were shipped. Filleting, coupled with the perfection of the quick-freeze technique and the introduction of the refrigerated truck in the thirties opened many new inland markets to the New England fishing industry. The recent introduction of more convenient, better designed "one-pound" consumer packages has led to an increase in consumer demand for frozen fillets in these markets -- most of them located in the Midwest.

Many advantages to wholesaler, retailer and consumer have been provided by this new type of package. It is easier to store, and it gives added protection to the fish while in storage and during shipment. The "one-pound" package lends itself to more attractive displays in the frozen food or meat compartments of retail stores. It also affords the retailer an opportunity to make effective use of point-of-sale displays. With the trend toward more self-service food stores, both chain and independent, this package is well adapted to modern methods of selling. The big advantage to the housewife is that she can buy the fish in a sanitary, neat wrapper and keep it air-tight in a home refrigerator without the fish imparting odors.

From the time that filleting and quick freezing were first developed, various types of containers and boxes have been used for shipping fillets to local and distant markets. At first, during the early thirties, frozen fillets were shipped unwrapped in wooden boxes in fifteen-pound quantities. Very often, retailers would sell them as fresh fish because, for many years, both the retailer and the housewife were prejudiced against frozen fishery products. However, with improvements in the quick-freeze process, cold storage plants, packaging, and the introduction of refrigerated display cases, this prejudice was almost completely overcome. After the fifteen pound box, ten pound and five pound cartons were developed for storage and shipment of fillets. Each fillet was individually wrapped, by hand, in a vegetable parchment wrapper. The next development in packaging was the wrapping of frozen fillets individually in printed cellophane wrappers. These were packed in five pound boxes, about six fillets to a box. The most recent improvement, which came within the past few years, was the "one-pound" consumer-sized package of frozen fillets. Cellophane was at first used around the paperboard box. However, it was found that cellophane didn't stand up too well as an overwrap. Now, many concerns use a 44 lb. waxed or a 32 lb. coated bleached kraft paper as an outer wrapper for their consumer packages. Cardboard cartons, in which several consumer sized packages are packed, serve as containers during shipment.

These new one-pound packages have been subjected to many tests by several large New England firms before being introduced on the market. In addition to experiments with a variety of types of wrapping materials, designs were tested on consumers for color appeal, visibility of lettering, and a general design effectiveness. One such test was conducted by a large Boston processing firm in a city in up-state New York. About three hundred persons were interviewed. On the basis of this and other tests, it was decided that the outer wrapper of the package should be colorful, using color combinations that attract the eye such as yellow and blue. It should also have a product illustration of cooked fish ready to be served, a brand name, and a printed description of the contents -- for example, haddock fillets. Cooking recipes were printed on the bottom panel of the box. As a result, the company is now using this design on its consumer-size package of frozen fillets. The firm's sales have increased since it adopted the newly designed package.

Not all New England fish processors are in agreement with the above firm on its findings. Some believe that romantic sea scenes are more effective than pictures of prepared fish. Others believe that multi-color packages are unnecessary and are only an additional expense to the company. A few dealers still adhere to the cellophane open-view type of package, in which the contents are exposed to the eye. The current trend, however, is away from the window carton and

toward pictorial labels, with ready-to-eat appeal.* From the widespread adoption of brand names and from the information available, it appears that consumers show a definite preference for branded packaged frozen fillets. More marketing information about consumers' buying habits must be gathered before definite conclusions can be reached as to which design is most effective.

The increase in the production of consumer packages of frozen fillets from 26,930,000 pounds in 1950 to an estimated 32,250,000 pounds in 1951 indicates the rapid growth in popularity of the consumer-sized package. In 1950, forty firms processed fillets.** This trend, showing acceptance of the "one-pound" package, was not limited to New England frozen fish products. A recent survey by the United States Fish and Wildlife Service covered the production of consumer packages of frozen fillets, shrimp, scallops, and oysters throughout the U.S. It revealed that the total freezing of these species in 1950 amounted to 168,398,000 pounds. The amount channeled into the production of the consumer packages of these items came to 42,655,000 pounds, approximately 25% of the total freezings of these items (see Table XXIII). Figures on production of consumer packages prior to 1950 were not available.

* 22, p.3.

** Ibid., p.9.

Although tremendous strides have been made by the New England fishing industry in developing the consumer frozen packaged fish and shellfish business, the full potential of this new merchandising technique has not yet been realized. The industry is lacking in adequate production and market information. Evidence of this fact was brought out at a recent National Fisheries Institute Convention. A large number of processors had gotten together at the convention to consider ways and means of promoting the new fixed weight consumer packaged fish and shellfish, but they found that very little, if any, production and market information was available to them.* If the major fish processors don't have this information, then who does? Once again, lack of cooperation in the fishing industry is apparent. The Fish and Wildlife Service has tabulated actual production figures for one year, 1950, but they did not provide answers to the all important marketing questions concerned with consumers' buying habits and motives or the location of new potential markets. Without the necessary facts and figures to use as a guide in their production plans, further growth of the "one-pound" consumer package phase of the New England fishing industry will be difficult.

B. New Products

* 22, p.7.

Another comparatively recent method of increasing fish consumption has been the stimulation of consumer demand through the introduction of new products. The most successful of the new products produced by New England processing firms has been the "ready-to-cook", breaded, frozen packaged fillets. This involves breading the fillets so that the housewife no longer has to prepare them herself. From a merchandising standpoint, it brings the product closer to the consumer by eliminating one more step from the sea to the table. The savings in time and trouble should provide strong purchasing incentives to the woman who works and to the busy housewife.

The breading of the fish takes place after it is filleted and before it is wrapped and quick-frozen. The fillet is dipped in egg batter and then rolled into bread crumbs. The idea of ready-to-cook breaded fillets is supposed to have started with a small Boston firm a few years ago. Since that time many companies have followed suit and have expanded on the idea. Recently, a section of a large processing plant in Gloucester, Massachusetts was fully equipped to handle breaded, frozen packaged fillets. This section functions as a separate department, which is operated independently from any other of the company's departments. It is a complete service plant within itself, having its own quick freeze and refrigeration plant with an expansive holding room.* It also uses a laboratory kitchen method in

* 23, p.36.

breeding the fillets. Recipes and formulas are continually compounded and tested. A bacteriological department is also maintained.

The basic idea of "ready-to-cook" fishery products is good. However, certain abuses have arisen in connection with these products. Some processors, inadvertently or otherwise, sometimes add too much bread to cover up a small piece of fish. This practice can lead only to a loss of customers for the firm involved. It also loses goodwill for the fishing industry as a whole. Therefore, high standards of quality and careful supervision of processing must be constantly maintained if repeat sales are to be realized.

During 1950, two other innovations in sea food were introduced. These were canned scallops and fish "franks". Neither idea was successful. The first idea failed because a chemical reaction took place in the scallops which, although not harmful, gave them an unpleasant appearance. The second product was not accepted readily, it was surmised, because of the public's reluctance to try out radical food ideas.

A large Gloucester producer of cod fish has recently had success with two new products. One is strained cod fish which has been canned and is now being marketed as baby food. The other new product relates to canned salt cod fish. Here, again, the processor has eliminated one of the steps in the preparation of the product before cooking. Formerly,

salt cod was sold in salted strips packed in waxed containers. It always involved the process of desalting the fish in fresh water before cooking. This was not convenient for the housewife, some of whom soaked the fish overnight. The processor now freshens the salt cod at the factory before it is canned, thus eliminating much of the fuss in preparing the cod fish for cooking.

All of these product improvements have provided added inducements for more purchases of fish by consumers. To derive the full benefits of new merchandising techniques, the processors must consistently produce products of the highest quality. Retailers must cooperate through the effective use of point-of-sale posters and displays and by storing frozen fishery products at the recommended low storage temperatures.

Chapter VII

What Is Needed

A basic need of the New England fishing industry is for more adequate production and marketing information. This condition exists because of a lack of cooperation among members of the industry. Proper organization is needed to gather and interpret important production and marketing information. A regional trade association, which would coordinate the activities of diversified interests, might be a possible solution. Cooperative advertising programs might also be undertaken by this group. Some of the existing trade associations in New England seem to be so preoccupied with attempting to raise tariffs, that they have devoted little time to the important job of gathering facts and figures concerning the marketing of their products.

Only a few of the larger firms have conducted marketing research studies. A regional organization may help in making such surveys. Small and medium sized firms would certainly benefit from such additional information.

In the earlier chapters, the low per capita consumption of fresh and frozen fishery products in relation to competitive protein foods was cited. To increase consumer demand and to smooth out its weekly and annual sales curve is a major problem of the industry. The "one-day a week" demand increases operational cost, and it also increases the chance

of spoilage. Making fish an everyday food item will be difficult because of firmly ingrained buying habits of the American public. Most fish sales now occur on Friday or during particular religious seasons, such as Lent. To accomplish this Herculean task, a carefully planned sales and marketing program must be formulated.

Widespread consumer education should be conducted at national, regional and local levels. The National Fisheries Institute, an organization in Washington, D.C., established for the promotion of fish products, has started this work at the national level. Its initial task has been to make people more "fish-conscious". Contributions from its six hundred vessel owner, dealer, and distributor members provide funds for promotional work. A large advertising agency disperses information for the Institute through various channels. The main media used are food editors' columns in newspapers and magazines, publication of fish cook books, and newspaper and magazine advertisements. Special regional campaigns are sometimes conducted through the National Fisheries Institute for the promotion of specific products. An example of this was the 1949-1950 promotion of redfish, in which the Gloucester Fisheries Association contributed \$40,000* to the National Fisheries Institute for advertising redfish (ocean perch). The National Fisheries

* 28, p.11.

Institute has made a good start at the national level. It is now time for intensive consumer education at the regional and local levels.

Cooking demonstrations can be conveniently conducted locally through properly organized groups. A survey made by Parent's Magazine in 1946 disclosed that 70 per cent of the women served only fried fish. What the housewife does with the fish after she gets it is important. Fresh or frozen fish, when properly prepared, tastes good and is often reason enough for a repeat sale. Therefore, more emphasis should be placed on the distribution of cook books or recipes by producer and retailer alike.

The nutritional benefits of fish should be publicized. Fish has been proved to contain nutritional benefits, in the form of vitamins and minerals, equal to and in some cases greater than other competing protein foods. Many housewives are not aware of these facts. In many cases, fish is treated as an inferior substitute for meat.

Motion picture films on various phases of the New England fishing industry would be of help in educating the public. They could be shown at business or civic clubs, P.T.A. groups, churches, and on television programs. A movie would be the next best thing to an individually-conducted tour through the plant. Let the public see how the product is produced. Let people see the care used to safeguard its quality, cleanliness of the plant and other sanitary

measures taken to maintain high standards.

More advertising should be conducted by producers and retailers. Perhaps cooperative advertising programs can be worked out. Chain food stores, consisting of many units, could use large or local newspapers as their advertising media. Smaller retailers would probably benefit most from local newspaper or circular advertising. Both types of operations would also help to increase their sales volume through attractive displays of consumer packaged frozen fillets. Point-of-sale displays coupled with strategically placed posters and signs should bring favorable response from consumers. Many producers have found radio and television advertising to be of benefit, particularly when introducing a branded, packaged fish product in a new area.

Testing and experimenting with various wrapping materials and package designs should be continued in an effort to find the "ideal" package. Technological research should be conducted in an effort to improve upon present equipment and processes. A filleting machine, which can be adapted to producer's needs, might lead to a reduction in costs. Standards for judging the quality of fish should be based on laboratory measurements, rather than relying solely on the experience of the individual.

New methods of merchandising and the development of new products will help to increase the volume of sales. However, consistently high standards of quality must be

maintained by fish processors if they are to retain the goodwill of the consumer. Successful merchandising requires that producers and wholesalers work more closely with retailers, since this is where the product meets its big test. Here it is determined whether the product will be selected from hundreds of other competing foods. Retailers can gain materially by having the assistance from the source of supply, both from the promotional standpoint, and the assurance of marketing only top quality products.

However, not only are new merchandising techniques and new products necessary to the expansion of markets, but new outlets should also be explored. Advertising in trade newspapers of the hotel and restaurant field may bring favorable results along this line. Another outlet that bears investigation are schools. Fish and chip shops may also deserve attention as possible new outlets. Thus far, their popularity has been limited to certain sections of the country. St. Louis, Missouri is one area in which they've attained popularity.

Above all, keeping old customers and making new ones depends, in the long run, upon the production of high quality fishery products. Research should be constantly conducted in an effort to improve upon the quality of the product.

The education of consumers to the facts about fish;
the execution of a well-planned advertising campaign coupled with some personal selling effort;

the development of improved merchandising, freezing and processing techniques;

the maintainance of high standards of quality through all stages of distribution;

the formation of a regional organization to gather and disperse production and marketing information;

and finally, the cooperation between fisherman, dealer, broker, wholesaler and retailer -----

these are the things that will eventually lead to an increase in per capita consumption of New England fishery products and to an increase in sales income to the New England fishing industry.

Table XXII

Total Loss In Weight of Wrapped Fillets at 0° F.

<u>Months in Storage</u> <u>Type of Wrapper</u>	<u>Weight loss in percent</u>			
	<u>3</u>	<u>6</u>	<u>9</u>	<u>12</u>
Aluminum foil (.001 inch)	.06	.21	.20	.45
Cellophane (No.300 MSAT)	.16	.18	.30	.33
Freezer paper	3.23	6.64	8.47	10.77
Freezer paper	_____	_____	_____	23.3
Pliofilm (120 FF)	.15	.17	.21	.18
Polyethylene (.001 inch)	.08	.11	.13	.13
Saran (.001 inch)	.06	.06	.06	.08
Vynylite (.001 inch)	.13	.30	.35	.50

Source: U.S. Fish and
Wildlife Service - Tests
Conducted at College Park,
Maryland Laboratory, 1948.

Table XXIII

Production of Consumer Packages of
Certain Frozen Sea Food, 1950-1951

<u>Item</u>	<u>1950</u> (Pounds)	<u>1951</u> * (Pounds)
Fillets	26,930,000	32,250,000
Shrimp	11,060,000	15,000,000
Scallops	3,800,000	4,400,000
Oysters	<u>865,000</u>	<u>1,050,000</u>
Total	42,655,000	52,700,000

* Estimated--

These data include the domestic production of frozen sea foods in consumer packages of fixed weight, weighing two pounds or less each. Breaded and cooked sea foods of these varieties are included. Small packs of other products and specialty items are not included.

Source: U.S. Fish and
Wildlife Service

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