

PEACHES

1. Characteristics of Peaches Affecting their Price and Cost of Marketing

Peaches are among the most perishable of the fruits in Canada and are available for fresh consumption only about two to three months of the year. The bulk, however, of Canadian peaches is harvested in a period of about six weeks. Because of high perishability, peaches must be moved to the market promptly. Also, careful handling and packaging are essential to avoid bruising. There are many varieties of peaches and these are usually grouped into two general classes "clingstone" and "freestone", with the latter predominating. The marketing of fresh peaches includes three major functions - packing, transporting and selling. Packing peaches is a costly process in which materials account for over one-half of the cost, labour over one-fourth, and overhead (which includes depreciation on buildings and equipment, taxes, power, repairs and miscellaneous) for the rest.

When fresh peaches are sold directly out of the orchard to the consumer, then there are no custom packing or transportation costs and the waste is at its minimum. When, however, selling is done through commercial channels, the packers, wholesalers and retailers apply their markups which include an allowance for the risk of spoilage.

Peaches are used in fresh, canned, dried and frozen forms. Of the total peach production, about half is being marketed as fresh peaches and almost half is used for processing and sold as canned peaches. Dried and frozen peaches made their debut in the past few years, but the quantities produced are small.

2. Grading Standards and Inspection

According to government regulations,¹ fresh peaches are graded as Canada Select, Canada No. 1 and Canada No. 2. They have to be of one variety, well formed, uniformly mature and sound, for all grades. In size, the government regulations state, Canada Select must be a minimum of 2-3/8 inches in diameter or a box count of 60, Canada No. 1 must have a 2-inch minimum or a box count of 90, and Canada No. 2 also a box count of 90.

1 Canada Department of Agriculture, The Fruit, Vegetables and Honey Act and Regulations, Ottawa, 1957.

3. Supply and Disposition

Trends in fresh peach production and the disposition of the total supply over the decade 1949-58 are summarized in Table 1. Although there have been considerable changes in the production of peaches from year to year, the trend in peach production has been upwards for several decades and this can be seen in comparing the following periods: 1935-39 - 1,023,000 bushels; 1945-49 - 1,833,000 bushels; 1950-54 - 2,250,000 bushels and 1955-58 - 2,618,000 bushels.

Also, per capita consumption of fresh peaches has shown a significant increase over the past decade, 1949-58. The imports which by far outweigh the exports, depend greatly on the domestic crop. Over the last decade, the quantities imported have varied greatly from year to year.

Table 2 summarizes the production, disposition and consumption of canned peaches over the decade 1949-58. The commercial production of canned peaches shows a pattern similar to that for total production of peaches. It will be of interest to note that the imports of canned peaches show a considerable increase in the past few years despite the increased domestic production and the larger stocks of canned peaches.

4. Geographical Pattern of Production and Marketing

The production of peaches in Canada is confined practically to two provinces only and more specifically to two small parts of Ontario and British Columbia. In Ontario, The Niagara Peninsula and Essex-Kent counties are the main peach producing districts and, in British Columbia, the Southern Okanagan Valley, which accounts for close to 100% of the production of peaches in that province. Besides these two principal areas which are entirely suitable for the production of peach crops, there is a small area of production in the Annapolis Valley, Nova Scotia, but its production is negligible in comparison with Ontario and British Columbia.

The number of peach trees in Ontario has declined over the years since 1921 and in British Columbia there has been a steady increase. The importance of British Columbia in terms of peach trees increased from 5.7% in 1921 to 16.2% in 1956. In terms of production, British Columbia accounted for 20% of the Canadian total and Ontario 80% during the decade 1949 to 1958.

The canning of peaches is carried on in both Ontario and British Columbia. The main varieties are Jubilee, Elberta, and the V-types. These are all freestone peaches. In the years 1949-53 there were considerable changes in proportion of peaches used for processing, but since 1954 there has been evident stabilization in the trend of processing. On the whole, over 50% of Ontario peaches and about 35% of

TABLE 1. FRESH PEACHES, TOTAL SUPPLY AND DISPOSITION, CANADA, 1949 To 1958

Year	Total Production	Imports	Total Supply	Exports	Processed	Available for Domestic Use ^a	Per Capita Consumption (Fresh)
			(thousand bushels)				(pounds)
1949	2,011	1	2,012	3	1,153	856	2.5
1950	1,222	349	1,571	1	861	709	2.0
1951	1,792	349	2,141	53	1,095	993	3.2
1952	2,917	338	3,255	11	909	2,335	6.5
1953	2,893	371	3,264	30	971	2,263	6.3
1954	2,425	498	2,923	16	1,214	1,693	4.9
1955	2,883	256	3,139	63	1,511	1,595	4.5
1956	1,667	799	2,466	9	829	1,628	3.7
1957	2,801	424	3,225	35	1,426	1,764	4.7
1958	3,043	533	3,576	16	1,235	2,325	5.5

^a Waste not deducted.

Source: Department of Agriculture, Seasonal Price Summaries, annual.

TABLE 2. CANNED PEACHES, SUMMARY OF SUPPLY, DISPOSITION AND CONSUMPTION, CANADA, 1949 TO 1958

Year	Commercial Production	Stocks		Exports	Imports	Available Supplies	Per Capita Consumption (Canned)
		Jan. 1	Dec. 31				(pounds)
		(thousand pounds)					
1949	46,875	26,213	35,194	47	5,047	42,894	3.2
1950	39,143	35,194	30,579	34	7,801	51,525	3.7
1951	51,253	30,579	47,271	34	14,173	48,700	3.5
1952	39,493	47,271	45,650	67	7,844	48,891	3.4
1953	39,199	45,650	35,237	41	9,206	58,777	4.0
1954	52,340	35,237	37,712	817	10,197	59,245	3.9
1955	66,455	37,712	52,089	2,454	9,171	58,795	3.8
1956	39,133	52,089	34,516	882	12,286	68,110	4.1
1957	58,591	34,516	54,960	251	19,057	56,953	3.4
1958	56,036	54,960	54,181	284	18,356	72,367	4.2

Source: D.B.S.

of British Columbia peaches have been commercially processed. For Canada as a whole the 1949-58 average is 50%.

Marketing and Prices

In British Columbia marketing of all fresh peaches is done through B.C. Tree Fruits Ltd. which acts as the central sales agency for the whole regulated area. It sells one part of the crop to canners and processors and the remainder to wholesalers and chain stores for the fresh fruit market. B.C. Tree Fruits sets a price for peaches going for processing and the same price is charged to each canner. The British Columbia growers get an average price for each grade and variety of peaches, irrespective of where these were used, for fresh fruit market or the cannery market.

In Ontario, however, there are two marketing boards, one for peaches that go for processing and the other for peaches sold to the fresh market. The growers selling peaches to these two different markets gets different prices. The minimum price of peaches for processing is negotiated each season under the Ontario Peach Growers' Marketing Board between the representatives of growers and processors. The established minimum price is announced by the Board and usually maintained during the whole season. Since 1954 fresh peaches have been marketed under the Fresh Peach Growers' Marketing Board and through its selling agency, the Ontario Fresh Peach Growers' Co-operative. Prior to 1954, there was no overall marketing organization. The prices for fresh peaches change during the season, depending upon market conditions.

Sales of canned peaches in Canada are made directly by the canners to wholesalers, brokers and chain stores. The price of canned peaches is not regulated.

The most important market for the Niagara Peninsula fresh peaches is Ontario which takes approximately 60% of the whole crop. Next in importance is Quebec and then follow the Maritimes, Manitoba and Saskatchewan. In Ontario itself, Metropolitan Toronto takes over 50% of the total.

Okanagan Valley fresh peaches find their most important markets in British Columbia and Alberta. Saskatchewan purchases about 70% of British Columbia peaches and 30% of Ontario peaches. Usually Manitoba gets the bulk of peach shipments from British Columbia, but in some years it takes up to 50% from Ontario.

Methods of Transporting Fresh Peaches

The available figures for Canada for the years 1955-57¹ show that up to 60% of fresh peaches were transported by rail and about 40%

¹ Canada Department of Agriculture, Annual Unload Report, Fresh Fruit and Vegetables on 12 Canadian Markets.

by truck. Practically all peaches are shipped to Metropolitan Toronto by truck. Vancouver gets up to 85% of shipments by truck and all other cities get the bulk of shipments by rail. Generally the distance to market is one of the main factors determining the means used to haul peaches to their destinations.

5. Year-to-Year Variations in Supply and Prices

Farm and retail prices of peaches are closely connected with the quantities produced. With a large crop the farm prices drop immediately and with a poor crop farm prices go up. The retail prices for canned peaches do follow a similar trend but with a time lag. For example, because of a poor crop in 1956 farm prices reacted immediately upwards but the retail prices increased noticeably only at the beginning of 1957. Over the decade 1949-58 farm prices showed considerable fluctuations, whereas retail prices for canned peaches maintained much greater stability. These changes in prices and production are shown in Table 3.

Because the peach producing regions are located in two widely separated provinces, they are not always affected by the same adverse weather conditions and in view of that, the farm prices will sometimes show different fluctuations in each province. On the whole, Ontario farm prices were higher than British Columbia (except for 1950, 1951 and 1958) and showed greater stability over the period under study. Table 4 shows farm prices for peaches in Ontario and British Columbia.

6. Seasonal Pattern of Price Variation

In analyzing the seasonal pattern of price variation of peaches one has to take them into two separate groups: canned peaches and fresh peaches.

Canned Peaches

There are practically no seasonal variations in price for canned peaches at either farm, wholesale or retail levels. Farm prices for peaches going into processing are negotiated and announced at the beginning of the crop and they usually stay, unchanged for the whole season. Also, the retail and wholesale prices usually stay at the same level for most part of the year. The major changes occur after the arrival of a new stock. If the crop is poor, the prices will rise and stay at approximately the same level till the next crop; if the crop is large they will drop.

TABLE 3. INDEXES OF PEACH PRODUCTION, AVERAGE FARM
AND RETAIL PRICES, CANADA, 1949 TO 1958

(1949 = 100)

Year	Production	Farm Price	Retail Price	Processor Price
1949	100.0	100.0	100.0	100.0
1950	60.5	103.4	97.9	107.5
1951	89.5	102.3	105.3	114.0
1952	145.6	80.7	104.3	100.0
1953	143.9	87.5	96.8	100.0
1954	121.1	98.9	98.9	114.0
1955	143.9	96.6	102.1	107.5
1956	83.3	120.5	103.2	135.5
1957	139.5	102.3	114.9	121.5
1958	151.8	81.8	108.5	n.a.

Source: Adapted from Crop and Seasonal Price Summaries, Canada Department of Agriculture, and D.B.S. sources.

TABLE 4. AVERAGE FARM PRICES FOR PEACHES, ONTARIO
AND BRITISH COLUMBIA, 1949 TO 1958

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
	(dollars per bushel)									
Ontario	2.18	2.18	2.13	1.85	1.94	2.16	2.21	2.72	2.33	1.75
British Columbia	2.15	3.13	2.56	1.41	1.80	2.04	1.73	2.19	1.74	1.92

Source: Canada Department of Agriculture, Crop and Seasonal Price Summaries, annual.

Fresh Peaches

The prices for peaches going to fresh market do show well pronounced seasonal variations at all three levels; farm, wholesale and retail. They are highest at the beginning and end of the season, July and October, and are lowest at the end of August and the beginning of September. However, the growers in British Columbia do not feel immediately the changes in prices during the season because they sell their crop through the B.C. Tree Fruits and are paid an average price for the whole crop.

7. Estimating the Price Spreads for Canned and Fresh Peaches

Farm-Processor-Retail Spreads on Canned Peaches, Canada, 1949 to 1957

These estimates are based on national averages and are subject to variation when applied to specific place, time, quality or size of container. The farm and processor prices used are average prices for all grades, varieties and sizes of containers, while the retail prices are for the choice 15-ounce can. In view of this, the farmer's share as shown in these estimates is slightly on the low side.

Although there have been year-to-year changes in prices, the overall relationship between the farm, processor and retail prices did not change much over the decade as a whole. The farmer's share showed only a slight upward trend and the difference between the highest and the lowest share was less than 2% over the whole period. The farm-retail spread, which up to 1956 was increasing very slowly, in 1957 showed a considerable increase. On the average the farmer's share of the retail value was about 21%, the processor's share about 48% and the wholesale-retail share combined about 31%. The estimates of farm-processor-retail spreads on canned peaches are shown in Table 5.

Farm-Wholesale-Retail Spreads on Fresh Peaches, Toronto, 1957

National estimates of the farm-retail spread on fresh peaches could not be made for lack of a continuous series of retail prices. The figures presented in Table 6 were adapted from the brief submitted by the Government of Ontario. As the data presented cover the Toronto area only during the 1957 season, the conclusions drawn would not necessarily be true for the whole decade and for the entire country. The present study includes adjustments for waste which were not mentioned in the brief; therefore, the farmer's share and the price spread as shown in this study differ from those presented in the brief. Table 6 shows that the farm, wholesale and retail prices change in the same direction but not in the same proportion. Of the three sets of prices, wholesale prices show the smallest and farm prices the largest seasonal variations. Although the farm-retail spread is larger when marketings are light and smaller when marketings are heavy, the wholesaler's margins do not move in the same direction. The wholesaler's markups are the highest during the heaviest marketings and the smallest at the beginning and the end

TABLE 5. SUMMARY OF FARM-PROCESSOR-RETAIL SPREADS ON CANNED PEACHES,
CANADA, 1949 TO 1957^a

Calendar Year	Retail Price ^a (¢/15-oz. can)	Retail Equivalent Value of 1 lb. Fresh ^b (¢)	Processor Equivalent Value of 1 lb. Fresh ^b (¢)	Farm Value Calendar Year Basis ^c (¢/lb.)	Farm Retail Spread (¢)	Processor's Share of Retail Value (%)	Farmer's Share of Retail Value (%)
1949	20.7	21.6	13.8	4.6	17.0	42.6	21.3
1950	20.3	21.2	14.8	4.5	16.7	48.6	21.2
1951	21.8	22.8	15.4	4.6	18.2	47.4	20.2
1952	21.6	22.6	14.1	4.6	18.0	42.0	20.4
1953	20.2	21.1	14.0	4.5	16.6	45.0	21.3
1954	20.5	21.4	15.2	4.5	16.9	50.0	21.0
1955	21.2	22.2	15.1	4.7	17.5	46.8	21.1
1956	21.5	22.5	18.1	4.9	17.6	58.7	21.8
1957	23.8	24.9	17.0	5.2	19.7	47.4	20.9

a Price for 15-oz. tin, choice quality.

b 1 lb. canned = 1.02 lb. fresh.

c Average price for all varieties of peaches going for processing. It is assumed that 7/10 of canned peaches sold to consumers in any one year come from the previous year's peach crop and 3/10 are from the current year's peach crop.

TABLE 6. SUMMARY OF CALCULATIONS OF FARM-WHOLESALE-RETAIL SPREADS OF FRESH PEACHES,
TORONTO, AUGUST 2/57 TO SEPTEMBER 27/57

	Retail Price (Chain Stores)	Retail Equivalent Value ^a	Toronto F.O.B. Equivalent Value	Farm Net Price	Farm Wholesale Spread	Wholesale -Retail Spread	Farmer's Share of Retail Equivalent Value
	(£/ lb.)	(£)	(£)	(£/lb.)	(£)	(£)	(%)
Aug. 2	11.44	10.49	8.60	5.17	3.43	1.89	49.0
Aug. 9	12.31	11.29	9.17	5.47	3.70	2.12	48.0
Aug.16	11.63	10.66	8.42	4.58	3.84	2.24	43.0
Aug.23	10.03	9.19	7.87	4.01	3.86	1.32	44.0
Aug.30	9.97	9.14	7.82	3.78	4.04	1.32	41.0
Sept.6	9.91	9.08	8.17	3.99	4.18	.91	44.0
Sept13	10.77	9.87	8.13	4.28	3.85	1.74	43.0
Sept20	11.05	10.13	8.92	4.90	4.02	1.21	48.0
Sept27	11.12	10.19	8.34	5.00	3.34	1.85	49.0
Yearly Average	10.54	9.67	8.20	4.24	3.96	1.47	44.0

a Assuming 9% waste between farm and wholesale sales.

Source: Adapted from the brief presented by the Government of Ontario, Proceedings, Vol.16, p. 2672, Table 4.

of the season. The retailer's markups and the farmer's share are highest at the beginning and lowest in the middle of the season. The estimates for 1957 show that on the average the farmer's share was 44%, the wholesaler's and the retailer's shares 41% and 15% respectively.

8. Comparisons with the United States

The United States Department of Agriculture publishes the price spreads for canned peaches only and in view of that comparisons can only be made with that kind of Canadian peaches. However, there is a difference in the types of canned peaches between Canada and the United States. American processed peaches are both "clingstone" and "freestone" with the former predominating, while Canadian are "freestone". These types give different yields in processing, which in turn brings a different farmer's share. Taking into account all differences in the types of peaches, conversion rates, size of the production and marketing, we will find, however, that the farmer's share of the retail equivalent value in both countries is, by and large, similar in trend and in proportion.

TABLE 7. COMPARISONS OF FARMER'S SHARE OF RETAIL
EQUIVALENT VALUE OF CANNED PEACHES,
UNITED STATES AND CANADA, 1948 TO 1957

	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
U.S.A.	17	17	16	19	20	17	16	18	21	18
Canada	20	21	21	20	20	21	21	21	22	21

Source: U.S.D.A., Farm-Retail Spreads for Food Products, Agricultural Marketing Service, Misc. Pub. 741, Washington, 1957, p. 131; and this study, Table 5.

SUGAR BEETS

1. Characteristics of Sugar Beets and Beet Sugar
Affecting Their Price and Cost of Marketing

Sugar beets are a root crop with a sugar content varying somewhat from year to year, depending mainly on the weather. The range of sugar content is unlikely to exceed 13 to 20% over the years. Although all of the sugar cannot be extracted commercially, it is obvious that the seasonal variations in sugar content affect annual refining costs per pound of sugar. The beet sugar refining companies tie their price paid for sugar beets both to the current price of refined sugar and to the average sugar content of that year's crop of sugar beets.

The culture of sugar beets also affects beet sugar yields, and the refining companies make certain detailed specifications in their contracts with the individual growers. The terms of the contract vary between producing provinces and over time, but, for example, the contract states the grower's acreage and requires the grower to use seed purchased from the company, and may specify that the land must be fertilized or that the land must not have been planted to sugar beets the year before. Beets judged by the company to be unsuitable for making sugar may be rejected.

Sugar beets are a perishable commodity and in ordinary farm storage they are subject to damage by shrinking, freezing etc. In such adverse circumstances the contract permits the grower to silo undelivered beets for their protection. Ordinarily, however, the grower can silo only a limited proportion of his beets and only upon permission and instructions from the company. The company pays the grower extra for siloed beets, but also takes silo shrinkage into account. The grower bears the costs of delivering the sugar beets. When delivered the beets must be clean or else the grower suffers deductions. The perishability of sugar beets necessitates processing without delay before heavy frost, and then the refineries stand idle as far as refining is concerned for more than two-thirds of the year. Also large stocks of beet sugar have to be stored for part of the year.

The grower receives an initial payment upon delivery of his sugar beets, and the balance subsequently when the company knows what its "net returns" are from the sale of sugar made from that year's crop. In Manitoba and Ontario in recent years, the sugar companies have offered to pay a bonus when the total tonnage of sugar beets exceeded certain amounts. In Manitoba there has also been a bonus when average purity exceeded 83% clarity.

Molasses and beet pulp are by-products of the refining process. The sugar beet grower is paid extra for these by-products, again in relation to the next return received by the company from their sale. The beet pulp is used as a feed for livestock. It should also

be mentioned that the beet tops which are removed by the grower before delivery may be used by him on the farm for feed.

All beet sugar when refined is the white granulated kind. Refined sugar is not a highly perishable product, but it is subject to damage and loss from moisture, torn sacs, dirt, etc.

2. General Disposition of the Supply

Trends in the amount of sugar refined in Canada, and in the proportions refined from imported raw cane sugar and from domestic sugar beets over the last two decades, are summarized in Table 1. The long-run upward trend in sugar production is clearly shown in the table. Also, the proportion of sugar refined from domestic sugar beets has been substantially greater in the post World War II period than in the 1935-39 period. Over our 1949-58 period of study, total inventories of refined sugar increased considerably, compared with World War II years, and exceeded the amounts of beet sugar produced.

TABLE 1. TRENDS IN SUGAR PRODUCTION OVER THE LAST TWO DECADES
IN CANADA BY AMOUNTS REFINED AND PROPORTIONS REFINED
FROM IMPORTED RAW CANE SUGAR AND FROM DOMESTIC SUGAR BEETS

	Average 1935-39	Average 1949-53	Average 1954-58
Total Refined (000 lb.)	1,057,582	1,398,977	1,554,825
Made from Cane	86.6%	81.1%	82.6%
Made from Beets	13.4%	18.9%	17.4%

Source: D.B.S., The Sugar Refining Industry, annual.

The amount of refined sugar imported over the 1949-58 period amounted to less than 1% of total sugar refined in Canada. Exports of refined sugar also were less than 1% of the sugar refined in Canada over the period of study.

The tariff on refined sugar imports is \$1.89 per 100 lbs., which is approximately 20% of the retail price of refined sugar in Canada in recent years. The British Preferential tariff on raw sugar averages 28.7¢ per 100 lbs., and the Most Favoured Nation and General Tariff averages \$1.29 per 100 lbs.¹

1 Canada Department of Agriculture Marketing Services, Canada and the United States Tariffs on Selected Agricultural Products, Ottawa, Revised Dec. 1957, p. 16. Although there is no British Preferential tariff on sugar beets, there is an M.F.N. tariff on sugar beets of 27½% ad valorem.

3. Geographical Pattern of Sugar Beet Production

Traditionally, sugar beets have been a labour-intensive crop, but mechanization is well under way, (blocking, thinning, weeding, cultivation, and harvesting). Nearly all of Alberta's beets are now harvested by machine. Sugar beet growing calls for a deep rich soil, a requirement which influences the geographical pattern of production. Beet sugar production costs exceed those of cane sugar. Beet sugar yields per acre are lower than cane and yet labour costs, land values and taxes are higher. The competition from cane sugar is keenest in eastern Canada where markets are more accessible to West Indies exports. Some measure of tariff protection for the beet sugar industry is accorded. The two World Wars, which disrupted the cane sugar trade, provided a special stimulus to beet sugar production.

Sugar beets are a crop of special importance in certain localities in Canada. Sugar beet growing began in Quebec in the 18th century, but it has not achieved great prominence in that province. The present Quebec Sugar Refinery was set up at St. Hilaire in 1944. Early in the 20th century, beet sugar refineries were built in Ontario. The two Ontario refineries now existing are at Wallaceburg and Chatham, both owned by the Canada and Dominion Sugar Company. Beet sugar production began in Alberta about 33 years ago, and in Manitoba about 10 years ago. In Alberta, the sugar beets are grown on irrigated land in the Lethbridge district. The three beet sugar refineries in Alberta are located at Raymond, Picture Butte and Tabor, all three plants being owned by Canadian Sugar Factories Ltd. The Manitoba refinery is at Fort Garry, Winnipeg, and is owned by the Manitoba Sugar Company.

The trends in sugar beet production in Canada and for the four producing provinces over the last two decades are summarized in Table 2. Canada has produced an annual average of 1,055,519 tons of sugar beets over the five-year period 1954-58, compared with an average of 972,649 tons during 1949-53 and 504,200 tons during 1935-39.

TABLE 2. TRENDS IN SUGAR BEET PRODUCTION IN CANADA, AND FOR THE PRODUCING PROVINCES, OVER THE LAST TWO DECADES

	Av.1935-39		Av.1949-53		Av.1954-58	
	(tons)	(%)	(tons)	(%)	(tons)	(%)
Alberta	219,200	43.5	404,883	41.6	486,274	46.1
Ontario	285,000	56.5	327,491	33.7	283,401	26.9
Manitoba	n.a.	n.a.	148,248	15.2	217,197	20.6
Quebec	n.a.	n.a.	92,027	9.5	68,047	6.4
Canada	504,200	100.0	972,649	100.0	1,055,519	100.0

Source: D.B.S., Handbook of Agricultural Statistics, Part I, Field Crops, and Supplement to Part I.
Quarterly Bulletin of Agricultural Statistics, Jan.- Mar., 1958.

Table 2 shows that Alberta has been the major sugar beet producer, and its relative importance increased significantly over the decade 1949-58 (from 41.6% to 46.1% of total Canadian production). Ontario is the second largest sugar beet producing province, but its production actually declined over the decade of study, and its share has been declining prominently over the longer run (from 56.5% during 1935-39 to 33.7% during 1949-53 to 26.9% during 1954-58). Apparently, more remunerative cash crops can be grown in Ontario. Manitoba is in third place in sugar beet production, but its share has increased substantially over the period of study (from 15.2% during 1949-53 to 20.6% during 1954-58). Quebec's production and share of sugar beets, like that of Ontario, declined over the 1949-58 period. In summary, increasing sugar beet production in the western provinces (Alberta and Manitoba) is more than offsetting the declining production in the eastern provinces (Ontario and Quebec).

The numbers of sugar beet growers in the four producing provinces and Canada in 1956 are shown in Table 3. The table also shows the marked differences between the eastern and western provinces in acres of sugar beets per grower, tons of beets produced per grower and average receipts from the sale of sugar beets.

TABLE 3. NUMBERS OF SUGAR BEET GROWERS AND THEIR AVERAGE ACREAGE, PRODUCTION AND INCOME, CANADA AND PRODUCING PROVINCES, 1956

	Beet growers	Acres per Grower	Tons of Beets Per Grower	Receipts Per Grower (\$)
Quebec	1217	4.7	45.1	676
Ontario	1492	9.5	97.0	1,478
Manitoba	784	29.1	292.1	4,919
Alberta	1280	28.2	362.8	6,709
Canada	4774	16.5	187.1	3,242

4. Year-to-Year Variations in Supply and Price

In the longer run, sugar price levels in Canada are set by the price of raw cane sugar in the world market, plus our tariffs on imports, plus refining costs and costs of domestic distribution. The price of sugar in Canada, in turn, contractually influences (but does not completely determine) the price received by growers for their sugar beets. The relevant price for contract purposes is the "net return" to the refining company from their sugar shipments after deducting selling expenses (e.g. freight, discounts, storage, brokerage, shipping costs and losses, sales, salaries and travelling, insurance, advertising etc.)

The production of refined sugar in Canada over the 1949-1958 period has been subject to variations about a rising trend line. Some

measure of stability in sugar prices has been imparted, however, by compensatory inventory adjustments.

Percentage changes from year to year in imports and exports of refined sugar have been great but, because the level of imports and exports is so low, it is unlikely that this has had much influence, either a stabilizing or de-stabilizing kind, upon sugar prices.

The year-to-year changes in sugar production in Canada have not been large relative to the level of production, however. As indicated in section 2, about 82% of this production is from imported raw cane sugar and, relatively speaking, the production of refined cane sugar has been much more stable than beet sugar production. The instability in beet sugar production is the joint result of year-to-year variations in sugar beet acreages, sugar beet yields per acre, and the yields of refined sugar per ton of beets.

5. The Seasonal Pattern of Price Variability

Within the years of our decade of study, no seasonal pattern of retail prices is discernible. Retail sugar prices for month to month are very stable. The month-to-month stability of retail sugar prices is in marked contrast to the seasonal variability in sugar sales and inventories. Table 4 shows retail sugar prices and refinery stocks and sales of sugar, averaged for each month of the nine-year period 1949-57. Domestic sales of sugar by refineries are highest during the summer months June-September and are lowest in January and February. During the fourth quarter of the year sugar inventories of refineries, which reach a minimum by the beginning of October, are rebuilt. This is partly due to a

TABLE 4. SEASONAL PATTERN OF RETAIL SUGAR PRICES AND REFINERY SALES AND INVENTORIES IN CANADA, OVER THE NINE YEARS, 1949-1957

	Jan.	Feb.	Mar.	Apr.	May	June
Av. Retail Price (¢/lb.)	10.4	10.5	10.5	10.5	10.4	10.4
Av. Domestic Sales (million lb.)	90.7	89.3	103.3	101.6	113.7	143.2
Av. Stocks ^a	301.7	277.1	262.0	230.9	206.9	210.7
	July	Aug.	Sept.	Oct.	Nov.	Dec.
Av. Retail Price (¢/lb.)	10.4	10.4	10.5	10.4	10.4	10.5
Av. Domestic Sales (million lb.)	156.3	146.0	147.2	123.5	120.5	97.5
Av. Stocks ^a (million lb.)	191.1	133.6	116.5	96.3	189.0	290.4

^a At beginning of the month.

Source: D.B.S. Prices and Price Indexes, Monthly and Quarterly Bulletin of Agricultural Statistics Jan.-Mar., 1950-58.

declining volume of domestic sales and partly due to the refining during the fourth quarter of the current crop of sugar beets. Inventories decline from January through September due to expanding domestic sales, but only during August-September do sales normally exceed stocks.

6. Estimating Farm-Refinery-Retail Spreads for Sugar Beets into Sugar

The results of calculations of the farm retail spread on sugar beets for the prairie region are summarized in Table 5. Both sugar beet production and beet sugar consumption are distinctive (although not exclusive) features of the Prairie region of Canada, and so sugar beet price spread calculations for this region are more valid and reliable than for other regions or for Canada as a whole. The calculation is based on a year-to-year comparison of the farm price of a ton of sugar beets, less the farm value of by-products, and the refinery and retail values of the amount of sugar refined each year from a ton of beets.

Over the period of study as a whole the trend in the farm-retail spread on a ton of sugar beets in the prairie region has been downward. The spread increased from \$15.56 in 1949/50 to a maximum of \$21.00 in 1952/53, and then declined to a minimum of \$14.18 in 1954/55. The spread increased again over the next two years and decreased in 1957/58.

The sugar beet grower's share of the retail price in the prairie region averaged 45.5% over the period as a whole, being highest in 1951/52 (47.1%) and 1956/57 (47.0%), and lowest in 1952/53 (42.1%). No upward or downward trend in the grower's share was discernible. The refiner's share of the retail price increased slightly over this period of study and averaged 36.7%. A combined share of 17.8% is, therefore, left for the wholesaler and retailer.

7. Comparison with the United States

The Canadian sugar beet grower's share of the retail price over the last decade corresponded closely with United States figures, as shown in Table 6. The U.S. beet grower's share averaged 45.2% over the nine years 1949-50 to 1957-58 compared with an average Canadian figures of 45.5% for the same period.

TABLE 5. SUMMARY OF FARM-REFINERY-RETAIL SPREADS ON SUGAR BEETS INTO SUGAR,
PRAIRIE REGION, CROP YEARS, 1949/50 to 1957/58

Crop Year	Retail Price Sugar ^a	Retail Equivalent Value of 1 Ton Beets ^b	Refinery Equivalent Value of 1 Ton Beets ^c	Farm Price ^d	Farm Value of Beets Less By-Products ^e	Farm- Retail Spread ^f	Refiner's Share of Retail Value	Farmer's Share of Retail Value
	(¢/lb.)	(\$)	(\$)	(\$/ton)	(\$/ton)	(\$)	(%)	(%)
1949/50	11.4	28.63	23.73	13.29	13.07	15.56	37.2	45.7
1950/51	13.9	37.31	28.50	17.32	16.96	20.35	30.9	45.5
1951/52	14.0	32.10	25.68	15.71	15.11	16.99	32.9	47.1
1952/53	12.3	36.29	29.59	15.53	15.29	21.00	39.4	42.1
1953/54	11.3	30.45	25.28	13.78	13.43	17.02	38.9	44.1
1954/55	10.8	26.60	22.81	12.71	12.42	14.18	39.1	46.7
1955/56	10.9	30.49	26.15	14.47	14.13	16.36	39.4	46.3
1956/57	13.3	37.32	31.34	17.93	17.55	19.77	37.0	47.0
1957/58	12.2	28.99	23.26	13.27	12.98	16.01	35.5	44.8

a Weighted price of white granulated sugar, sold in 5-pound bags in 5 major prairie cities.

b Retail price weighted by the average yield of refined sugar from a ton of beets. The yield of refined sugar changes from year to year.

c Prairie refiner's price of beet sugar weighted by the yield of refined sugar from a ton of beets.

d Average prairie farm price per 1 ton beets.

e By-products - molasses and beet pulp.

f Retail equivalent value less farm value.

Source: Dominion Bureau of Statistics.

TABLE 6. COMPARISON OF FARMER'S SHARE OF
RETAIL VALUE OF BEET SUGAR

	United States ^a	Canada
	(%)	(%)
1949-50	45	46
1950-51	46	46
1951-52	46	47
1952-53	47	42
1953-54	45	44
1954-55	44	47
1955-56	46	46
1956-57	44	47
1957-58	44	45

a Including government payments.

Source: U.S.D.A., Farm-Retail Spreads for Food Products, Misc. Pub. 741, Washington, Nov. 1957, pp. 94 and 137, and this study, Table 5.

MAPLE SYRUP AND SUGAR

1. Characteristics of Maple Syrup and Sugar Affecting Their Price and Cost of Marketing

During the World Wars, cane sugar was scarce, and this provided economic incentive for increased and improved production of maple products. Central packing and marketing and improved quality also resulted in more widespread distribution of maple products. In Canada, maple products are supposed to be sold only in the pure state, and are used chiefly as dessert foods.

Maple syrup and sugar, and some specialty items, are produced by the farmer by boiling down the sap of the hard maple tree. The run of maple sap is normally limited to three or four weeks in March and April, and sometimes lasts only a few days. In 1958, maple syrup reached the Montreal and Toronto markets in the third week of March, one to two weeks earlier than in 1957.

The maple bush can be a good source of off-season income to the farmer. Aside from favourable weather conditions, production of maple syrup requires considerable readily-available farm labour. A Vermont Bulletin claimed in 1956 that¹

"Apparently the biggest problem facing the maple syrup industry is the shortage and high cost of labor. Much human labor is needed for tapping trees, hanging buckets, gathering sap, sugaring off, and packing the product. It is therefore a large item of expense for sugarmakers who must hire extra help. The use of labor-saving devices is one solution to this problem. Power drills help to speed up the tapping process. Dumping stations with pipelines to the sugarhouse are another means of saving time. Pipelines running directly from the trees to the house may be a solution in some cases. It may be that larger scale operations are needed so it will become more economical to use laborsaving methods."

The principal maple product is syrup, but certain specialty products -- maple sugar, taffy, butter, cream and wax -- are also processed from maple sap. The main difference among all of these maple products is in moisture content, but colour and flavour are also important. Apparently, most consumers prefer a light-coloured syrup.

Grades for interprovincial and export trade are provided by

1 G.M. England and E.H. Tompkins, Marketing Vermont's Maple Syrup, Vermont Agricultural Experiment Station Bulletin 593, Burlington, June, 1956, pp. 17 and 18.

The Maple Products Industry Act and Regulations, administered by the Canada Department of Agriculture, Marketing Service, Fruit and Vegetable Division. This federal grading is not compulsory, however. According to the federal standards, maple syrup must be pure and must not contain more than 35% water, and a gallon of syrup must weigh at least 13 pounds 2 ounces. Within these requirements, there are four grades of maple syrup — Canada Fancy, Light, Medium and Dark — depending on colour and flavour. According to the federal standards, maple sugar must be pure and must not contain more than 10% water. There are three grades of maple sugar, depending on colour and flavour — Canada Light, Medium and Dark.

Maple syrup is partly perishable. Perhaps the greatest waste is due to poor methods on the part of some farmers, which result in syrup of poor quality -- not readily saleable as a table product at premium prices and, indeed, for any other than industrial use.

Processing involves the collection, heating, blending, cleaning, packaging and storing of the maple products. Maple syrup is subject to fermentation if the moisture content has been inadequately controlled during processing. This is important, even to the farmer, who sometimes is left with unsold syrup on his hands beyond the spring season. In March, 1957, for the first time in many years, there was a carryover from the previous year. In processing and bottling there is some wastage also, but it is probably not great because maple syrup is not particularly viscous and hence drains readily from containers. Some spoilage in storage after reaching the consumer is not unknown. Maple sugar is not perishable, but it needs protective wrapping.

The crop is disposed of either by direct farm-to-consumer or farm-to-wholesale or farm-to-retail sale in gallon or smaller containers or in bulk to domestic packers and industry and export dealers. Direct marketings by farmers to consumers are mostly seasonal, but commercial packs are sold in the grocery stores throughout most of the year. Maple syrup for table use used to be merchandised mainly in gallon containers, but 26-ounce cans and 16-ounce bottles are being used with increasing frequency. Wholesale and retail grocers and jobbers usually handle farmer's packs in gallon or half-gallon tins. This syrup requires no further processing.

The larger dealers and handlers locate their bulk drums with grower to be filled and gathered. The bulk selling of syrup and sugar cuts down on the farmer's initial investment in equipment, containers etc., but it limits market outlets to a few processors and bulk handlers. There are 14 processing plants that are licenced by the Canada Department of Agriculture to deal interprovincially and export maple products. Normally, the processors reprocess the maple products to prevent fermentation, and package them under various brand names. Extensive advertising seems to be precluded because of the limited volume of sales. The maple products are held in common storage. Maple sugar is handled in blocks in sacks or boxes. Modernization of equipment and appliances has resulted in improved, and more uniform, quality of maple products.

During the last few years, at least, maple products have faced keen competition from cheaper artificial substitutes. Although these substitutes are labelled "artificial", they are also labelled "maple" and the general public perhaps thinks that these substitutes are at least partly maple. The Commission was informed that even genuine maple syrup can be upgraded by artificially lightening the colour of dark syrup -- this does not enhance its flavour, but it looks better and sells at a higher price.

2. General Disposition of the Supply

Trends in production, exports and imports of maple syrup in Canada over the last two decades are summarized in Table 1. In general, the production has been on a very slight downward trend from an average of 2,683,000 gallons over the prewar period 1935-39 to 2,590,000 gallons over the period 1954-58.

There was a marked increase over the last two decades in the proportion of our maple syrup production that was exported, from about 25% in the 1935-39 period to about 44% in the 1954-58 period.¹ Our maple exports go almost entirely to the United States. These exports

TABLE 1. TRENDS IN PRODUCTION, EXPORTS AND IMPORTS
OF MAPLE SYRUP, IN CANADA OVER THE LAST
TWO DECADES.

	Average <u>1935-39</u>	Average <u>1949-53</u>	Average <u>1954-58</u>
Production, (thousand gallons) 2,683		2,639	2,590
Exports, (% production)	24.9	42.5	43.7
Imports, (% production)	-	0.5	0.5

Source: Canada Department of Agriculture The Current Review of Agricultural Conditions in Canada, annual Situation Issues.

are partly for table use but mainly for use in the manufacture of compound syrups and in the tobacco and other industries. Bulk exports of maple sugar are mainly in 70-pound blocks. Imports have remained almost negligible except in 1953 and 1956. Our import tariff on maple

¹ On p.222 of Volume II of the Report it was erroneously indicated that exports amounted to over 80% of production in recent years.

sugar and syrup is 17½% ad valorem, contrasted with U.S. tariffs of about 5% (actually 2¢ pound on maple sugar and 1½¢ pound on maple syrup.¹)

The figures in Table 1 show the total production of maple syrup, both for use as syrup and for processing into sugar. Less than 5% of the maple syrup produced is being processed into sugar by the farmer, and the proportion has been declining over our decade of study, from about 7% at the beginning of the decade to about 4% in recent years.

3. Geographical Pattern of Production

Over the last decade, Quebec accounted for about 86% of the maple syrup, and for about 92% of the maple sugar, produced in Canada. Ontario is the second most important producing province, and small amounts of maple syrup are produced in New Brunswick and Nova Scotia. Lack of maple trees rules out production in other provinces.

Table 2 shows the geographic pattern of production of maple products in Canada by provinces for the years 1949-58. The sharp changes from year to year, due mainly to weather conditions, are clearly evident.

The Province of Quebec promotes the production and marketing of an increased quantity and improved quality of maple products. Quebec maple products must be graded prior to sale or else declared "unclassified". A large co-operative, Les Producteurs de Sucre d'Erbable, at Levis and Plessisville, packs and markets a substantial portion of the Quebec crop. The Co-operative is able to maintain a quality control over its maple products more uniform than among non-member producers of syrup. Members of the Co-operative are paid an advance upon delivery of their syrup and subsequent interim payments as the product is sold by the Co-operative. In 1957 and 1958 a major part of Quebec's maple products were marketed under the federal Agricultural Products Co-operative Marketing Act. This guaranteed an initial payment by the co-operatives to their members amounting to about 60% in 1957 and 70% in 1958 of average farm prices for equivalent grades over the previous three years.²

There are persistent regional differences in the farm price of maple products. Table 3 shows the average farm values of maple syrup and sugar for the four producing provinces and Canada over the decade 1949-58. The largest producing province, Quebec, received decidedly lower farm prices for its maple products than the other three

1 Canada Department of Agriculture Canada and the United States Tariffs on Selected Agricultural Products, Ottawa, March, 1957, p.16.

2 Canada Department of Agriculture The Current Review of Agricultural Conditions in Canada, Conference Issue, Ottawa, November, 1958, p.50.

TABLE 2. TOTAL PRODUCTION OF MAPLE PRODUCTS EXPRESSED
AS SYRUP, BY PROVINCES, CANADA, 1949-58

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
	(thousand gallons)									
Quebec	2,059	2,442	1,900	2,979	1,815	2,136	1,987	2,388	2,758	2,135
Ontario	403	510	383	461	122	266	218	271	339	321
N.B.	15	23	19	23	9	14	20	14	29	22
N.S.	8	8	7	7	3	6	6	4	8	7
CANADA	2,485	2,983	2,309	3,470	1,949	2,422	2,231	2,677	3,134	2,485

Source: Canada Department of Agriculture Crop and Seasonal Price Summaries, Part I, Ottawa, annual.

TABLE 3. AVERAGE FARM VALUES OF MAPLE SYRUP AND SUGAR
FOR THE FOUR PRODUCING PROVINCES AND CANADA
OVER THE DECADE 1949-58.

Average Farm Value	CANADA	Quebec	Ontario	New Brunswick	Nova Scotia
Syrup, ((\$/gallon)	3.79	3.69	4.38	4.60	4.66
Sugar, (\$/lb.)	.43	.42	.45	.51	.56

Source: Canada Department of Agriculture Crop and Seasonal Price Summaries, Part I, Ottawa, annual.

provinces. Ontario, the second largest producer, received the second lowest prices. Since Quebec has a large maple products co-operative which would try to pay to its members as large a return as possible, some explanation is required for Quebec's low farm prices. It has been suggested that these farm prices reflect a lower degree of preliminary refinement of maple syrup delivered by Quebec farmers to plants for further processing. Another possible explanation is that Quebec's farm prices are lower because a large amount of the maple syrup is exported in bulk at wholesale prices for industrial purposes. Finally, supplies of maple products in Quebec are large relative to the size of the market, compared with the situations in the other producing provinces. These farm prices, of course, do not indicate relative profits to the farmers, since costs and volume of sales would also have to be taken into consideration.

As a further gauge of the degree of sensitivity of farm price to volume of supply, indexes were compared of the production and average farm value of maple syrup in Quebec for the 10 years 1949-58. These are shown in Table 4. Table 4 indicates that normally the year-to-year changes in production of maple syrup in Quebec over the last decade were accompanied by inverse changes in the farm price. The inverse relationship between supply and price, which might be expected, was not invariably strong, however. This may have been due mainly to conflicting influences on supply in certain years from competing areas of production such as New England and Ontario. Compensating shifts in the demand for maple products in certain years could have been a contributory factor, but it is difficult to see why erratic changes in demand should occur.

TABLE 4. INDEXES OF PRODUCTION AND FARM PRICE
OF MAPLE SYRUP, QUEBEC, 1949-58
(1949 = 100)

	<u>Production Index</u>	<u>Farm Price Index</u>
1949	100	100
1950	120	95
1951	92	98
1952	147	92
1953	89	102
1954	107	127
1955	101	136
1956	123	99
1957	143	85
1958	109	86

Source: Adapted from Canada Department of Agriculture Crop and Seasonal Price Summaries, Part I, Ottawa, annual.

4. The Seasonal Pattern of Price Variability

Unfortunately, systematic data on retail prices of maple products are not available for our decade of study. This means that it is impossible to derive a monthly retail price pattern. Seasonal information is available, however, on wholesaler-to-retailer prices for maple syrup by major markets (e.g., Montreal, Toronto, Ottawa, Quebec City) and by province of origin.¹ An examination of these data indicate that the normal seasonal price pattern for maple syrup is to begin high and then fall progressively throughout the short spring season. There are exceptions to this. For example, in Montreal at the end of the 1958 season, the wholesale price of syrup rallied slightly.

5. Estimating the Farm-Wholesale Spread for Maple Syrup

Due to the lack of systematic retail prices, it is not possible to estimate the farm-retail spread for maple products. Because of the relative unimportance in the United States of maple products, farm-retail spread figures are not available there either. The best that can be done, and even this involves pushing the data hard, is to estimate the farm-wholesale spread for maple syrup in Ontario and Quebec. Wholesale quotations are available for the six-to-10 week syrup season, but they are actually a combination of wholesale and retail prices. This is because a substantial proportion of the maple syrup reaching the consumer during the maple season is sold by the producer himself on farmers' markets at prices recorded as "wholesale". Furthermore, an unknown amount of maple syrup is sold by the farmer at unknown prices directly to retail stores or to tourists and local residents at roadside stands.

As already pointed out, annual average farm prices are available for the producing provinces. No adjustment for exports was made to these prices because of lack of information on the farm value of maple product exports. Seasonal average wholesale prices are available for Montreal, Quebec City, Toronto and Ottawa for the years 1950-58. To derive provincial wholesale prices for Quebec and Ontario, it was considered advisable to weight these annual city prices by their respective populations. The results of these farm-wholesale spread calculations are summarized in Table 5.

¹ Canada Department of Agriculture Fruit, Vegetable and Honey Crop and Market Reports, Ottawa, weekly; and Crop and Seasonal Price Summaries, Part I, Ottawa, annual

Table 5 shows that, on the average over the nine years 1950-58¹, the wholesale and farm prices of maple syrup in Ontario exceeded those in Quebec by substantial amounts. This was true especially of the farm price which averaged \$4.42 a gallon in Ontario, compared with \$3.69 in Quebec. The farm-wholesale spread in Quebec exceeded that in Ontario by an average of about 22¢ per gallon. The Quebec spread, moreover, was more volatile from year to year. In 1954, for example, the Quebec spread dropped to 4¢ per gallon, contrasted with 63¢ in Ontario. A better quality crop and a strong United States demand were mainly responsible for the jump in farm prices in Quebec in 1954, compared with previous years. The year 1956 was unusual, especially in Quebec, as indicated by the large farm-wholesale price spread. The Quebec farm price in 1956 dropped back from the high levels of the two previous years, but the wholesale price continued to advance. The 1956 spread in Ontario also was unusually large, only to drop back sharply in 1957. The larger crop in 1957 was reflected in lower wholesale prices generally, but the farm price in Quebec sagged more than in Ontario. The 1958 crop of maple syrup was smaller than in 1957, and prices rallied.

The farmer's share of the wholesale price of maple syrup averaged about 89% in Ontario over the period, compared with about 81% in Quebec.

The Commission was informed that the retailer takes a markup of 20% to 25%. If the retail markup in Canada on maple syrup over the period had averaged 20% to 25% (and this only an assumption), the farmer's share of the retail price would have been between 65% and 69%.

6. Retail Markup in Vermont

In the Vermont study referred to earlier, 89 retailers were asked in 1953 what markup they felt they had to get for handling maple products. About 84% of these retailers answered for markups between 20% and 35%.²

1 In Volume II, Table 61, calculations are for the eight year period, 1950 to 57.

2 Marketing Vermont's Maple Syrup, pp. 19 and 20.

TABLE 5. SUMMARY OF FARM-WHOLESALE SPREADS ON MAPLE SYRUP,
QUEBEC AND ONTARIO, 1950 TO 1957

Calendar Year	QUEBEC			ONTARIO		
	Wholesale Value ^a	Farm Value	Farm- Wholesale Spread	Wholesale ^b Value	Farm Value	Farm- Wholesale Spread
(dollars per gallon)						
1950	3.75	3.44	.31	4.45	4.05	.40
1951	4.07	3.55	.52	4.56	4.29	.27
1952	3.96	3.33	.63	4.80	4.21	.59
1953	4.51	3.69	.82	4.94	4.32	.62
1954	4.64	4.60	.04 ^c	4.91	4.28	.63
1955	5.51	4.91	.60	5.36	4.48	.88
1956	5.98	3.57	1.41	5.88	4.71	1.17
1957	4.40	3.08	1.32	4.96	4.65	.31
1958 ^d	4.49	3.11	1.38	4.89	4.81	.08

a Average annual wholesale prices for Montreal and Quebec City, weighted by estimated relative populations.

b Average annual wholesale prices for Toronto and Ottawa, weighted by estimated relative populations.

c Something may be wrong with the official figures for Quebec for 1954; a farm-wholesale spread of 4¢ per gallon seems too small.

d Preliminary

Source: Canada Department of Agriculture Crop and Seasonal Price Summaries, Part I, Ottawa, annual; D.B.S. Census of Canada 1956, Population Incorporated Cities, Towns and Villages, Ottawa, 1957.

FISHERIES PRICE SPREAD STUDIES

INTRODUCTION TO STUDIES OF FISHERIES COMMODITIES

While Chapters 1 and 2 of Part VI in Volume II of the Commission Report contain general and particular information on the Canadian fisheries and the domestic market for fisheries products, a considerable amount of information and analysis was not included, in consideration of available space and proportionate treatment of subjects. In this volume, the commodity studies are presented in greater detail, preceded by some general information concerning fish as a food product and its perishability. Government measures applicable specifically to fishermen and the fishing industry were only briefly mentioned in Volume II.¹ Further particulars concerning the more important and directly applicable measures of this kind are contained also in this introduction.

1. The Perishability of Fisheries Food Products

Perishability is a difficult problem, of course, in the handling and distribution from primary producer to consumer of many agricultural, as well as fisheries products, requiring the observance of certain limitations relating to time, temperature and humidity in transportation and storage of the products. The solution for some highly perishable products, such as fluid milk for consumer use, is to locate production, processing and distribution geographically close to the consumer. With limited exceptions, fish has to be taken from natural waters located at great distances from large urban consuming centres, and the very fact of its perishability requires that processing be carried out close to its point of landing. The principal agricultural protein foods may be kept for quite long periods under proper conditions, and fresh-killed beef, for instance, can in fact be improved in flavour and tenderness by storage in a cooler for several days to break down the connective tissues. Fish flesh, on the contrary, is more delicate and more perishable than meat; supported as it is by the water around it, the fish does not need the strong fibres and connective tissues found in the muscle of land animals. Furthermore, bacteria capable of growing at low temperatures are present in large numbers in the protective slime on the skin of the fish; consequently, it is impossible to prevent some degree of infection of the flesh with these bacteria in the process of gutting or beheading or filleting the fish, no matter how careful the washing and handling of the fish may be. Autolysis and proteolysis, and in the case of fatty fishes, rancidity, also play their part in the development of undesirable flavours and odours. The fish in its ocean habitat is subject to a temperature range usually from the freezing point to 50°F. or 60°F. The enzymes and bacteria carry on their decaying action rapidly at higher temperatures, and deterioration of the flesh begins as soon as the fish is dead.

¹ See, for example, pp. 229-230 and 251 of Volume II.

Various methods have been developed and used for the preservation of fish. Quite early in history, the removal of moisture by drying or salting, or a combination of both, was used to prevent spoilage of meat and fish. This made possible the extensive exploitation of codfish from the northwest Atlantic by European countries from the beginning of the sixteenth century. Oily fish, such as herring and salmon, become rancid because the unsaturated oil in the flesh is oxidized through contact with the air; smoking the fish retards rancidity because the phenols in wood smoke react with the oil. Salting, smoking, and the discovery of tight coopering to provide barrels that would hold brine and exclude air, formed the basis of the extensive use of North Sea herring as food in the Middle Ages, and of the wealth of Dutch and North German cities in trade. Exclusion of air is a feature of the canning process - combined also with sterilization of the food by heat - which was introduced and improved during the nineteenth century. By the beginning of the twentieth century, cured and canned fisheries products were widely distributed in world trade.

These methods of preservation change the fish in flavour, colour, odour, and texture. The flavour of fresh fish was known only to those living near to the place where it was caught until the development of steam power for rapid rail and water transportation made it possible to supply distant and inland consumers with nearly fresh fish - particularly when ice was used to slow down the process of deterioration. Where distances were great, however, as in North America, the development of commercial freezing, and the establishment of distribution and holding facilities for frozen fish were necessary to the growth of a mass market.

Because of the speed at which deterioration in fish takes place, good quality in fresh or frozen fillets is dependent upon filleting the fish as soon as possible after it is caught, combined with careful handling on the vessel and wharf and in the plant. On the vessel, such things as careless gutting and washing, over-exposure to warm air and sun on deck before icing, bruising or slashing or forking through the fillet portion of the fish, and scanty or otherwise faulty icing and storage can shorten the keeping life of the fish enormously. Unloading at the wharf requires care to avoid bruising or forking the sides of the fish; in the plant, proper icing is required to keep the temperature of the fish close to the freezing point, if the fish has to be held for a time before filleting. Good processing requires the use of the best sanitary methods and equipment to minimize bacterial contamination of the fillets during the cutting, candling and packaging operations.

Use of some chemical bacteriostats improves the keeping quality of fillets. Sodium nitrite in solution was formerly used, but is no longer authorized. More recently, some tetracycline antibiotics have proved to be very effective in inhibiting the growth of bacteria in the flesh of fish or poultry. Chlortetracycline (CTC) and oxytetracycline (OTC) in a dilute-food grade-solution (as trade products "Aureomycin", "Acronize", "Biostat") have been authorized by health authorities for use on fish and poultry meat. The antibiotic is dissipated

in the heat of cooking and in the low concentrations used, only inconsequential or trace elements of it are left in the cooked food.

Some plants and some fishermen rate very high marks for their fish handling methods, but others still seem to be unaware that their product is to be used as human food. Education is a slow process at times, and the institution of a compulsory inspection and grading system for fresh and frozen fish might be necessary to raise quality standards adequately. During recent years, federal Department of Fisheries inspectors have been grading fish on the wharf and in the plant by voluntary agreement with plant management. Currently, plants conforming to definite specifications as to sanitation, equipment and methods may have their products inspected and use a "Canada Inspected" label on the wrapper or container of frozen fish items meeting quality and processing standards. Whole or filleted fresh fish passing inspection may be labelled "Processed Under Government Supervision".

It is not generally recognized, however, that the care required to ensure first class quality in fish represents, in many instances, an additional cost. Fishermen are not likely to use more ice and take extra care, if their catch does not carry a higher value when landed than someone else's fish handled in the old indifferent way. In processing, modern and sanitary equipment, such as stainless steel tables, is expensive, and adequate candling to remove bones and impurities from the fillets may require large additions to staff. Maintenance of quality enlarges the price spread in distribution as well. Ice or refrigeration is necessary in the shipment and storage of fresh or frozen fish. The express charge on iced shipments commonly includes an additional 20% or 25% on the net weight of the fish; refrigerator boxes, a more efficient method of maintaining fresh fish at a constant low temperature from plant to retailer or restaurant, may require an additional 40%. Public or private cold storage space is necessary for holding frozen fillets, and the fresh fish wholesaler or retailer should have refrigeration facilities capable of keeping the fish at 34°F.

Waste through spoilage represents a higher cost in the fresh fish trade, of course, than in frozen fish. Fillets under the best conditions of handling, processing, transportation and storage, from fish landed not more than four or five days after being caught, might average three or four days as fresh fillets of highly acceptable quality in the retail store, with an additional life of perhaps three days as acceptable quality fillets. After purchase, the fillets might be stored for a further period in the consumer's refrigerator before being cooked. Acceptable quality fillets may be defined as edible, but somewhat unappetizing to one accustomed to the flavour of fresh fish; the retailer could realize some salvage value by selling them (perhaps at a reduced price), but would be doing himself and the industry a disservice in reality, if the customer finds the product stale and unattractive and buys less fish in the future, as a result of such experience.

Quick-freezing of fish produces smaller ice crystals, hence there is less water loss or drying-out of the fish on thawing. Frozen fillets may be kept several months or a year without appreciable deterioration, if quite fresh when first processed, and if a storage

temperature 5° to 20° below zero Fahrenheit (or lower) is maintained. Denaturation of the protein is one of the more serious changes that occur at higher storage temperatures, although no noticeable change occurs from exposure to 10°F. or 15°F. for a day or two, for instance, during transportation. Humidity conditions of the storage atmosphere are also important; dessication ("freezer-burn") occurs by evaporation of water from exposed surfaces. Vapour-proof wrapping or glazing by dipping the fish in water immediately after freezing it are common methods of protection against dessication. Other gradual losses in quality occur through the chemical action of other substances in the fillet; the most common of these is the development of rancidity in fatty fishes. This is not a serious problem with groundfish fillets. Nevertheless, they cannot be stored indefinitely without loss of quality in terms of flavour, colour and texture; proper handling of frozen fillet stocks requires that they be replaced every few months.¹

2. Government Assistance to the Primary Fisheries²

Certain government programs set up in Canada for the specific purpose of assisting fishermen have had direct or indirect influences on fisheries production. While some of the programs are applicable nationally, a number are limited in their regional or provincial application. Among the latter are certain federal programs and, of course, those established by provincial jurisdictions. However, the following statement is by no means intended to cover all government assistance, either federal or provincial. It does not take into account the research, protection, fish culture, inspection and other fields of activity, and only touches briefly upon one or two aspects of the marketing

1 For more complete information on the subject of quality maintenance in fish, see the following: (1) The Commercial Fisheries of Canada, Royal Commission on Canada's Economic Prospects, Ottawa, 1956, Chapter 3, "The Products"; (2) C.H. Castell, Spoilage Problems in Fresh Fish Production, Bulletin No. 100, Fisheries Research Board of Canada, Ottawa, 1954; (3) W.A. MacCallum, Fish Handling and Hold Construction in Canadian North Atlantic Trawlers, Bulletin No. 103, Fisheries Research Board of Canada, Ottawa, 1955; (4) Progress Reports of the Atlantic Coast Stations, Fisheries Research Board of Canada, Nos. 59, 62 and 65; (5) W.J. Dyer, "Storage and Transportation of Frozen Fish", Canadian Fisherman, Gardenvale, P.Q., June, 1957; and (6) Frozen Fish Improved Quality and Packing - Project No. 325, The European Productivity Agency of the Organization for European Economic Cooperation, Paris, 1956.

2 This statement covers only the more important and direct fisheries assistance programs of governments, federal and provincial. In addition, fishermen, of course, participate in general social welfare programs, and in some instances, specific provision is made for fishermen in other programs, such as, for example, those pertaining to extension work, education, The Sick Mariners Service and Unemployment Insurance.

field and certain educational grants. The subjects considered in the following section include loans to fishermen, subsidies on fishing vessel construction, improvements to the supply of bait, boat insurance, and government deficiency payments and price support programs for fisheries products. Fishermen also benefit from various federal and provincial social security programs, applicable to all citizens.

Loans to Fishermen

Fishermen's loan agencies have been established by the governments of the three Maritime Provinces, Newfoundland and Quebec. These provide loans to fishermen otherwise unable to purchase hulls or boats, engines, or fishing gear, provided certain requirements, including a cash down payment, can be met. Loans are available also to associations of fishermen, to companies, and in certain circumstances, to boat builders. In some provinces, provincial loans have assisted the establishment or improvement of fish processing facilities.

In Quebec, fishermen obtain loans also from their "Credit Maritime" system of credit unions for the purchase of boats and gear. The provincial government assists by paying part of the interest on loans and the premium on insurance policies on the lives of the borrowers. The Quebec and New Brunswick governments pay a part of the insurance premiums on boats upon which provincial loans have been made.

The federal Fishermen's Loan Act of 1955 empowered the Minister of Finance to guarantee to the lender, loans made to a fisherman not exceeding \$4,000, under certain prescribed conditions, for any such purpose as the purchase or construction of a fishing vessel or fishing equipment, the major repair or overhaul of a fishing vessel or its engine, the purchase or construction or repair of a shore installation or building, or any prescribed improvement of a fishing enterprise. The term of such loan is not to exceed eight years, and the rate of interest not to exceed 5%.

Dragger and Long-Liner Assistance

To promote the modernization of fishing operations of fishermen in the postwar years, the Canadian Government has paid, through the provincial fishermen's loan boards, a grant of \$165 a gross ton for the approved construction of fishing vessels of the dragger or long-liner types. Payments on this account over the 12 fiscal years April 1, 1947, to March 31, 1959, amounted to just under \$2,125 thousand.¹

The Government of Quebec pays graduated subsidies of \$2, \$4, or \$6 per foot of length on construction of small fishing boats. In Newfoundland also, the provincial government pays a grant amounting to \$160 per gross ton for approved fishing vessel construction. The

¹ Data from the annual Public Accounts of Canada, Queen's Printer, Ottawa. In addition, in the two years 1946/47 and 1947/48, federal government expenditures amounting to over \$145 thousand were made for "assistance in the construction of dragger type vessels and conversion of fishing schooners to draggers".

federal and provincial assistance in that province has amounted to around 42% of the original cost of boat and equipment. In the other Atlantic Provinces, the federal grant has represented about one-quarter of the cost of long-liners (50 to 60 feet in length) and about one-sixth of the cost of the more strongly constructed draggers.¹ Boat-building costs have continued to rise, and the subsidy is currently a smaller share of the total cost of construction.

Bait Assistance

A measure to ensure bait supplies in Atlantic areas has been a grant to processors and cold storage operators to cover part of the cost of approved facilities to freeze and store bait. These subsidies, in the nine years to March, 1957, totalled close to \$140 thousand. No payments were made in the two following years.

With the entry of Newfoundland into confederation in 1949, the federal government assumed responsibility for the operation of bait depots in that province. The costs of the aggregate deficit, on this account, in the 10 years ended March, 1959, was just short of \$2,132 thousand.

Small Boat Insurance

Marine insurance rates on the small boats and vessels of in-shore fishermen are high because of the high cost of providing the service to isolated and widely separated communities. In consequence, few small vessels are insured with commercial companies, and fishermen are subject to serious hardship from lost or damaged boats and the consequent interruption of their fishing activities. In 1953, the Canadian Government instituted an insurance plan restricted to fishermen-owned, powered fishing vessels in the appraised value range of \$250 to \$7,500 (the approximate value range of inshore fishing craft). The upper limit was raised to \$10,000 in 1957. An annual premium rate of 1% of the appraised value was set, with an indemnity of 60% of the appraised value in case of total loss, or the approved cost of repairs above 30% of the appraised value in cases of partial loss. The hazard of storm damage to inshore craft is less in the protected waters of the British Columbia coast, and the rates of indemnity for that province have, consequently, been raised to 70% of appraised value for total loss, and approved costs in excess of 15% of the appraised value for partial loss.

An insurance plan for lobster traps was also established.² To administer the insurance, a group of fisheries officers were given special training in vessel appraisal and damage adjustment, and area administrators were appointed in the four main fishing regions.

1 John Proskie, Operations of Modern Long-Liners and Draggers, Atlantic Seaboard, 1952-1956, Economics Service, Department of Fisheries, Ottawa, 1957, Vol. 6, Part 1. See also Vol. 7, Part 1, pp. 14-15.

2 Particulars of the plan for lobster traps are given in the commodity study for lobsters.

In six years of operation, to March 31, 1959, net premium revenues in the vessel insurance plan amounted to \$476,619 and claims paid, to \$508,183. The coverage at the end of March, 1959, included 3,202 vessels with an insured value of \$4,806,025 on the Atlantic coast, and 1,929 British Columbia vessels with an insured value of \$9,819,860. The lobster trap insurance scheme at that date had received \$97,164 in net premiums, and had paid indemnities amounting to \$303,648.

Price Support Purchasing and Deficiency Payments

Under the Fisheries Prices Support Act of 1944, the Fisheries Prices Support Board was established in 1947, given a working fund of \$25 million, and empowered to support prices of fisheries products (1) by the purchase of any fisheries product at a prescribed price, or (2) by deficiency payments to producers of a fisheries product, equal to the difference between a prescribed price and the average price realized for such product during a specified period. Each support program undertaken by the Board was by authority of an Order-in-Council, prescribing quantities, prices, and certain other conditions.

The net cost of each of the various programs undertaken during the 10 years ending March 31, 1958, is shown in the table below:

FISHERIES PRICES SUPPORT BOARD OPERATIONS, 1948/49 TO 1957/58

	Net Cost (\$)
1. Net Losses on:	
(a) Manitoba lakes frozen fish (1949/50)	264,808
(b) East coast canned fish (1948-51)	1,144,708
(c) Newfoundland salt cod (1949 production)	82,565
(d) Prairie frozen fish (1953/54)	191,521
(e) Atlantic coast bloaters	42,741
(f) Atlantic coast salted fish (1953 production - shipped to Korea)	446,903
2. Deficiency Payments on:	
(a) Quebec hair seals (1950/51)	5,342
(b) Labrador salt cod (1950 production)	447,860
(c) Newfoundland shore-caught salt cod (1950 production)	810,105
(d) Pickled mackerel fillets (1952-54)	22,258
(e) Saguenay County (Quebec) salted codfish (1953 production)	37,521
(f) Newfoundland salted codfish (1953 production)	646,984

Fisheries Salt Assistance

As a means to improve the unsatisfactory position of Atlantic coast fishermen dependent upon the production and marketing of salted fish products, the Governor-in-Council approved the payment of assistance to producers of designated salted fish products, in the amount of 50% of the laid-down cost of salt used. Products marketed in the United States were excluded from salt assistance. The Fisheries Prices Support Board was made responsible for the administration of the salt assistance program. In the four years the program has been in operation, to the end of March, 1959, a total of \$2,400,440 has been paid out in salt assistance, of which \$1,544,424 was paid to fishermen and \$856,016 to processing plants.

Fishing Bounty

Under authority of the Deep Sea Fisheries Act, the Governor-in-Council may authorize the payment, out of the consolidated revenue fund, of an annual grant not exceeding \$160 thousand to aid in the development of the sea fisheries of Canada, and the improvement of the condition of fishermen. The \$160 thousand represents the annual interest on the amount awarded to Canada by the United States under the Treaty of Washington of 1871, in return for certain fishing privileges in Canadian waters. Fishermen who have engaged in deep sea fishing for at least three months of the year, and who have caught not less than 2,500 pounds of sea fish, receive a grant; likewise, owners of boats of not less than 12-foot length of keel, and vessels of not less than 10 tons, register.

CANNED SOCKEYE SALMON

1. The Raw Material

The Pacific salmon are the most important group in the Canadian fisheries, comprising about two-thirds of the value of British Columbia landings and one-fifth or more of the value of all Canadian landings. The five species by common names, (species names in brackets) are sockeye (*Oncorhynchus nerka*), pink (*Oncorhynchus gorbuscha*), chum (*Oncorhynchus keta*), coho (*Oncorhynchus kisutch*), and spring (*Oncorhynchus tshawytscha*). The flesh of springs is sometimes red, sometimes pink, and sometimes white; early maturing males are called jacks. Bluebacks and steelhead trout are also caught in British Columbia, but the blueback is really a coho in British Columbia and the steelhead (*Salmo gairdnerii*) is the anadromous member of a species that may also live wholly in fresh water. It resembles in appearance and habits the Atlantic salmon (*Salmo salar*).

All Pacific salmon are anadromous - ascending fresh-water streams from the sea to spawn in the gravelly stream-beds. The five salmon species spawn once, then die, but steelhead, like Atlantic salmon, may make several spawning trips from the sea. When the salmon leave the ocean, they are well-fed and strong, but they eat nothing after they start for the spawning grounds; their reserve fat and some muscle protein are used up in the journey and in the formation of eggs or milt. At the same time, the upper jaw becomes hooked (the name "*Oncorhynchus*" means "hooked snout"), and the male pink salmon also develops a hump on its back. Sockeye ascend to the interior of British Columbia to spawn in streams tributary to lakes, and the young leave these streams for the lakes, where they spend one or two or sometimes three years before descending to the sea.

Some comparative data concerning the five Pacific salmon species are given on the following page.

The general uniformity in size of salmon within species facilitates handling and processing by mechanical means. A salmon-run consists of salmon of the same age group. The iron chink, a machine for the automatic beheading and gutting of fish was introduced into salmon canneries in 1906, and many technological improvements in canning have been made since that time.

Practically all sockeye and pink salmon are canned. Sockeye retains its colour well when canned, which appears to be the principal reason it retails at about twice the price of pink salmon. The other three species and steelhead trout are also canned, but a considerable part of the catch is sold in the fresh and frozen forms. Spring salmon is the species usually used for mild-curing. It is also smoked and dry-salted and used for frozen fillets. Indians smoke a good deal of chum salmon for their own use.

Species (Other Names)	Life Span (years)	<u>Approximate Size at Maturity</u>		Principal Forms	<u>Ranking</u>	
		Length (ft.)	Weight (lb.)		Protein Content	Fat Content
Sockeye. (Red)	4 (up to 5 or 6)	2	5 (up to 15)	Canned	3rd	2nd
Pink (Humpback)	2 (occas. 3)	2	3-5 (up to 10)	Canned	1st	4th
Chum (Keta) (Qualla) (Calico)	4 (occas. 3 or 5)	2½	8 (up to 30)	Canned Fresh Frozen Dry-salted	4th	5th
Coho (Cohoe)	3 (occas. 4)	2½	6-12 (up to 26)	Canned Fresh Frozen	2nd	3rd
Spring (King) (Chinook) (Quinnat) (Tyee, if over 30 lb.)	4 or 5 (3 to 8)	3	20 (10 to 50)	Fresh Frozen Mild-cured Smoked Dry-salted	5th	1st

2. Disposition of the Catch

The British Columbia sockeye catch averaged 31.8 million pounds a year over the 10 years 1949-58, with an average value of \$7.7 million. The 10-year annual average for all Pacific salmon species was 159.4 million pounds worth \$22.8 million.¹

The Canadian average annual canned sockeye salmon pack for the same 10-year period was 461 thousand standard cases of 48 one-pound tins or the equivalent, and the pack of all species averaged 1,560 thousand cases. Using a conversion rate of 69 pounds of sockeye, landed weight, to the standard case, the average sockeye pack represents landings of about 31.8 million pounds a year - i.e., virtually all of the sockeye landings.

The British Columbia sockeye pack represented 29% of the total British Columbia canned salmon production over the 10 years 1949 to 1958, inclusive. In the same period, the Canadian sockeye pack was also 29% of the total North American canned sockeye salmon output.

The British Columbia sockeye salmon pack averaged about 461 thousand cases a year for the 10-year period 1949-1958. Although canned salmon imports into Canada are usually negligible, an estimated 350 thousand cases of Japanese canned salmon (mostly sockeye, but some coho) were brought in during the three years 1956, 1957 and 1958, and these added to the Canadian sockeye pack raised the average supply figure for the 10 years to about 496 thousand cases a year. Canadian exports of canned sockeye amounted to an average 162 thousand cases a year over the period 1949-1958. (Table A3, Appendix.) Stock changes from year to year are not known, but evidently about one-half of the great 1958 sockeye pack - perhaps half-a-million cases - was not shipped out until 1959. Otherwise, the yearly carry-over averaged out over a 10-year period would not be a very important factor. Assuming that stocks at the end of 1958 were greater by 350 thousand cases than at the beginning of 1949, the apparent average domestic disappearance of canned sockeye salmon was of the order of 300 thousand cases or more than 14 million pounds a year.

Production figures were low for 1955, 1956 and 1957, and the Canadian domestic disappearance of canned sockeye apparently fell off to an average of 282 thousand cases a year for 1956 and 1957 - about double the amount imported. However, an estimate of domestic "consumption" for any one year lacks reliability in the absence of adequate information on stock holdings at all levels in the processing and distributing trades.

British Columbia's average annual pack of all salmon species for the period 1949 to 1958 was 1,560 thousand cases, of which 804 thousand or just over one-half were exported. Including imports of about 350 thousand cases over the 10 years, sales of all varieties of

¹ See Appendix, Table A1.

TABLE 1. BRITISH COLUMBIA CANNED SALMON PACK, BY SPECIES AND BY YEARS, 1949 TO 1958(Thousands of Cases)^a

Year	Sockeye	Pink	Chum	Coho & Blueback	Spring & Steelhead	All Species, Total
1949	260	710	228	215	24	1,436
1950	408	445	503	124	12	1,492
1951	428	736	462	313	17	1,956
1952	449	679	92	65	13	1,299
1953	510	795	394	110	16	1,825
1954	681	336	581	128	18	1,743
1955	245	831	125	186	19	1,406
1956	320	364	204	212	13	1,112
1957	228	752	240	193	12	1,424
1958	1,079	456	229	132	12	1,908
Average (1949-58)	461	610	306	168	16	1,560
Species Per Cent of 1949- 58 Total Pack	29	39	20	11	1	100
	Red	Pink	Keta	Medium Red	King or Chinook & Steelhead	Total
N. American Average 1949-58	1,566	2,148	1,272	433	200	5,619
Canadian Average Pack as a Per Cent of N. American 1949-58	29	28	24	39	8	28

a The unit is the standard case of 48 one-pound tins or the equivalent.

Source: Economics Service, Department of Fisheries of Canada; United States pack data from the Pacific Fisherman, Yearbook Number, Jan. 25, 1959, p. 85. Totals do not agree in all cases to sum of species packs because of rounding.

canned Pacific salmon in the Canadian market averaged about 790 thousand cases or 38 million pounds a year.

3. Location and Conditions of Production

British Columbia sockeye salmon landings in 1958 were 73.2 million pounds valued at a total of \$20.2 million, compared with 15.7 million pounds worth \$4.4 million in 1957, and a 10-year average 1949-58 of 31.8 million pounds and \$7.7 million. The yearly figures for sockeye and for all Pacific salmon are contained in Table A1 of the Appendix. Both the volume and value of the total Pacific salmon catch vary more widely from year to year than for sockeye alone - leading to the conclusion that the sockeye catch is a more stable element in salmon fishermen's incomes.

Salmon can be caught on the high seas, but are most easily caught in quantity in coastal waters and estuaries when they return to their home rivers to spawn. The most common method of fishing for sockeye is the gill-net, set at the mouths of rivers, but purse-seine nets are also used. A few stationary trap-nets are permitted in part of the Strait of Juan de Fuca, but the catch is only a small part of the total, the figures being included with those for seine-caught fish. Only a few sockeye are landed by trollers, which catch mainly spring and coho.

Over the years 1951 to 1957, gill-nets accounted for 76% of the Canadian sockeye catch and 43% of the catch of all salmon species, while purse-seines accounted for slightly less than 24% of the sockeye and 44% of total salmon landings. Trollers landed nearly 14% of the catch of all salmon species. Purse-seines landed nearly 54% and gill-nets 45% of the tremendous sockeye catch of 1958, but the gear proportions of the catch of all species were not greatly different from the 1951-57 averages.¹

Salmon moving home to the Fraser River become concentrated in the Strait of Juan de Fuca and large numbers are caught there and in the internationally-regulated waters west of the Strait. At times (as in 1958), Fraser salmon approach the river around the north end of Vancouver Island and through the Johnstone and Georgia Straits. The sockeye catch is heavy also just north of Vancouver Island (Rivers Inlet and Smith Inlet) and in the Naas and Skeena areas near Prince Rupert.

The Fraser River system has nearly a thousand square miles of lakes - about twice the area of all of the other British Columbia sockeye-producing lakes. The rock slides at Hell's Gate in 1913-14 almost

1 The Commercial Salmon Fisheries of British Columbia, Statistical Basebook Series, No. 3, Department of Fisheries of Canada, 1958 (hereinafter called the Salmon Basebook), Table 6, p. 20. Data for 1957 and 1958 from British Columbia Catch Statistics, Department of Fisheries of Canada, Pacific area.

wiped out the Fraser River sockeye runs. International action to rehabilitate the runs was delayed until the International Pacific Salmon Fisheries Convention was ratified by Canada and the United States in 1936. The fishway at Hell's Gate (completed in 1945), the removal of stream obstructions and the construction of other fishways, week-end and special closures during the fishing season to ensure adequate spawning escapement of fish, and other regulatory measures have gradually restored the runs on the Fraser and other streams. Conservation measures could well bring about a considerable further increase in sockeye stocks.¹

The number of sockeye salmon caught each year by British Columbia fishermen is dependent primarily upon the size of the runs to British Columbia rivers, the catch in Convention waters being regulated by the International Pacific Salmon Fisheries Commission by closures and other methods to provide an approximately equal division of the catch between Canadian and United States fishermen and to ensure an adequate spawning escapement. The four-year sockeye life cycle means that a dominant stock in any one of the lakes produces a heavy run to that area every fourth year. Thus, the tremendous run to the Fraser in 1958 produced by the "Adams River" dominant stock was preceded by heavy, although lesser, runs in 1954 and in 1950. Since 1930, the dominant stocks in the different lakes have been more evenly distributed among the four years of each cycle, so that annual total catch variations have been somewhat reduced.² Nevertheless, the year-to-year catch differences are still wide; Canadian sockeye landings in 1955, for instance, were little more than one-third of those of the previous year, and the 1957 catch was even smaller - the lowest since 1943.

Spring salmon are caught throughout the year, but runs of sockeye and of the other species occur from late May to October, with some chum and a few coho being taken in November. The seasonal pattern of sockeye landings is illustrated by the 10-year monthly average data given in Table A2 of the Appendix.

The International Pacific Salmon Fisheries Commission, just previously referred to, was established in 1936 for joint Canadian-United States control of the sockeye salmon fishery. By agreement at the end of 1956, the Commission was also placed in control of the pink salmon stocks of the Fraser River-Strait of Juan de Fuca area. In 1952, Canada, Japan and the United States concluded the International Convention for the High Seas Fisheries of the North Pacific Ocean, setting up a Commission for research and recommendations and agreeing to abstain from fishing on the high seas any stocks under scientific management and already fully exploited by one or two of the parties to the Convention.

British Columbia fishermen are strongly organized, their organizations being the United Fishermen and Allied Workers' Union (which also

1 The Commercial Fisheries of Canada, Royal Commission on Canada's Economic Prospects, 1956, p. 19.

2 Ibid.

represents the workers in the processing plants), the Vessel Owners' Association, and the Native Brotherhood of British Columbia (Indian fishermen). All of the major processing companies belong to the Fisheries Association of British Columbia. For several years minimum prices for gill-net and seine-caught salmon of the different species have been negotiated between the unions and the Fisheries Association at the beginning of each season. Separately negotiated contracts cover other aspects of fishing operations, such as wages for tendermen and shore workers in the camps and processing plants, minimum number of crewmen on the fishing boats, and contributions to a welfare fund.

There are several fishermen's production co-operatives in British Columbia, the largest being the Prince Rupert Fishermen's Co-operative Association. The co-operatives market a comparatively small amount of canned salmon; their pack is processed by custom canners. The Fishermen's Co-operative Federation was incorporated in 1944 to market the products of the member associations. Sales in the United States are handled through Fishermen's Federation Incorporated, which is the sales agency also for the Halibut Producers' Co-operative of Seattle, Washington. Members of the producers' co-operatives can also obtain co-operative marine insurance and can borrow from their credit unions.

Almost all seine fishermen operate on a share basis, shares of the catch being allocated also to the boat and gear. For instance, on a purse-seiner with seven in the crew, $2\frac{1}{2}$ shares might be allocated to the boat and $1\frac{1}{2}$ shares to the net, making a total of 11 shares in the division of the proceeds of the catch after certain expenses (fuel, food, etc.) are deducted. The smaller boats are usually owned by fishermen, although frequently a fishing company has a mortgage equity in the boat. Many of the larger seiners are company-owned, and independently-owned seiners are usually chartered to a fishing company for the season.

By owning an equity in, or by chartering a boat, the fishing company obtains the right to purchase the catch or puts the skipper under moral obligation to deliver his catch to the company. By chartering his vessel, the boat owner obtains an assured income from a daily charter fee for a guaranteed number of days. If he is the skipper, he may also draw a bonus for delivering his catch to the company.

To meet commitments for canned salmon in food contracts during World War II and the period following, under the authority of wartime legislation, restrictions were imposed upon the export to the United States of certain species of raw salmon. After the expiry of wartime and emergency legislation, an embargo was in effect from time to time on the export of raw salmon and in 1956 the British Columbia fishing regulations were amended to prohibit the export of fresh coho salmon after August 31 of each year. The export of pink and sockeye salmon in fresh form is generally prohibited.

The schedule of Canadian customs tariff rates on salmon products is as follows:

Tariff Item	Product	British Preferential	Most-Favoured Nation	General
115	Mackerel, herring, salmon & all other fish, n.o.p., fresh, salted, pickled, smoked, dried or boneless (per lb.)	$\frac{1}{2}\phi$	$\frac{3}{4}\phi$ $\frac{1}{2}\phi$ GATT	1 ϕ
123	Fish prepared or preserved n.o.p: (b) Salmon	17 $\frac{1}{2}\%$	27 $\frac{1}{2}\%$ 15% GATT	30%

The United States tariff rates (under GATT) are as follows:

Tariff Paragraph	Product	Rate
717 (a)	Salmon, fresh or frozen, whole or beheaded or eviscerated, or both	$\frac{1}{2}\phi$ /lb.
717 (b)	Salmon, filleted, skinned, boned, sliced or divided	1 $\frac{1}{2}\phi$ /lb.
718 (b)	Salmon, prepared or preserved (canned)	15% ad. val.
719 (1)	Salmon, pickled, or salted	10% ad. val.
720 (a)(1)	Salmon; smoked	10% ad. val.

There are considerable differences in capital costs and in fishing receipts according to the type of boats and gear in use.¹ Three main types of boats are used in salmon fishing: gill-netters, seine boats, and trollers. Gill-net boats are usually within the range of 25 to 35 feet in length and cost \$8,000 to \$10,000 or up to \$15,000. Nets and gear might cost \$1,500-\$2,000 for an entire season in different locations; a nylon gill-net 200 fathoms long costs about \$500 and would last about two years. The average value of fishing capital owned by 64 gill-net fishermen in 1953 and 1954 was about \$3,700 - the boat alone representing about \$2,900; these boats had been owned six years on the average, but they may not have been new when their last owner acquired them.²

For the 64 gill-net fishermen in the two years, the average annual gross receipts were \$3,369, the average operating expenses \$1,434, and the average net operating receipts, accordingly, \$1,935.

1 See D.R. Buchanan and B.A. Campbell, The Incomes of Salmon Fishermen in British Columbia 1953-1954, No. 2, Economics Service, Department of Fisheries of Canada, 1957.

2 The data are not analyzed on an enterprise basis; however, the gill-net fisherman usually owns his own boat and operates it alone or with a wife or son accompanying him in the boat.

After allowance of \$215 a year for depreciation on fishing capital, the average net income from fishing operations was \$1,720.¹ This represented about \$21 a day for an average of 84 fishing days afloat, but the total time spent in fishing operations was more than double that figure, counting week-ends and other closure times during the season and time spent in readying and maintaining boats and gear.

Seine boats range from 45 to 80 feet in length; the drum-seiners are operated by a crew of three or four, but the larger table-seiners use six to eight men. The introduction of the "Puretic" power block in 1955 to replace the hand-hauling of the seine did not greatly affect the number of men employed, but it enabled the seiner to make a larger number of sets per day. A new large seiner, with echo-sounder and other gear, would cost up to \$150 thousand; a 60-65 foot boat might cost \$80 to \$85 thousand. A sample of 25 seiners in 1954 averaged \$29,360 each in current market value and about 20 years in age. The 25 seine nets on those boats were valued at an average \$4,000 each; new salmon seines might cost \$9,000 to \$15,000, according to size. The seine captains owned about 45% of the capital value of the 25 boats and gear, and most of the balance was owned by fishing companies.

The average value of fishing capital owned by the 25 seine captains in 1953 and 1954 was \$17,061, and that of 32 seine assistants was \$710. The average net income from fishing operations, after allowance for depreciation on fishing capital, as well as all operating expenses, was \$5,449 for seine captains and \$2,453 for assistants. The seine captains averaged 92 days afloat in each of the two years and about 178 in fishing operations, while the seine assistants averaged 72 days and 128 days, respectively.

Salmon trollers use boats from 25 to 45 feet long, trailing from long poles four to eight stainless steel lines, with metal flashers, plugs or spoons to attract the fish and three to six hooks to the line. Some operate from a base to which they deliver their catch daily; others may carry ice and remain on the fishing grounds for several days, and these are sometimes manned by two fishermen. The larger boats are also used to fish halibut, and some may mount seine-tables in the fall season to fish local runs of chum salmon. The capital cost of a new boat could be as high as \$25,000. Perhaps \$300 to \$400 would be the cost of gear. A sample of 50 troll boats in 1953 had an average value of nearly \$5,000, and had been in the possession of their owners about nine years. Their owners spent about the same time as seine captains in fishing activities, and received net incomes averaging about \$1,550 after depreciation on fishing capital.

4. Fishermen's Methods of Selling

Gill-net and seine fishermen usually deliver their salmon in the round form to the company packer or collector boat on the fishing

1 Op. cit., Table 7, p. 28.

grounds, and obtain from it necessary supplies for further fishing. Ordinarily, ice is not used, because the packer proceeds straightway to the cannery wharf. Trollers may carry ice, if they do not come in each day with their catch.

The minimum prices for net-caught salmon, negotiated each year between the fishermen's unions and the processors' association, are paid to fishermen as a credit on account at the time of delivery to the collector boat or (infrequently) to the company wharf. The fish are weighed when delivered; pinks and chums are usually counted and the weight computed by applying an average weight as determined for the area. The number of buyers (processing companies) is small, but all pay the minimum contract price; if the fish are scarce or if a high percentage is going into the fresh trade, competition may raise the price to the fishermen above the contract minimum. Troll-caught salmon are not included in the contract; they are usually a better quality of fish sold mainly dressed instead of in the round for the fresh and frozen trade, and the price realized is higher than the minimum for net-caught fish. Sockeye and pink salmon are mostly net-caught and, moreover, mostly canned; consequently, their annual average landed value is usually only fractionally above the season contract minimum price. These differences are indicated in Table 2.

TABLE 2. CONTRACTUAL MINIMUM PRICE AND ANNUAL AVERAGE LANDED VALUE OF BRITISH COLUMBIA SOCKEYE SALMON, 1948-1958

(Cents per Pound)

Year	<u>Sockeye</u>		<u>Pink</u>	
	Contract Minimum Price	Average Landed Value	Contract Minimum Price	Average Landed Value
1948	18.00	20.50	6.75-7.25	7.40
1949	18.00	17.78	6.00-6.50	6.58
1950	20.00	20.13	6.75-7.25	7.09
1951	25.00	25.01	9.50	9.52
1952	25.00	25.00	7.50	8.00
1953	22.00	22.04	7.50	7.33
1954	22.00	22.12	7.75	7.76
1955	24.00	24.05	7.75	8.90
1956	24.00	27.59	9.00	9.03
1957	28.00	28.16	9.25	9.43
1958	28.00	27.58	9.25	9.15

Source: Salmon Basebook, Tables 49 and 50. Data for 1956, 1957 and 1958 from the annual British Columbia Catch Statistics, Department of Fisheries of Canada, and the Monthly Review of Canadian Fisheries Statistics, Dominion Bureau of Statistics.

The co-operatives make an initial payment to the fishermen upon delivery of the fish and a final payment at the end of the season

when the necessary bookkeeping work has been completed.

5. Processing

About a dozen packing companies market British Columbia canned salmon, but three or four account for the greater part of the pack. Some of these operate more than one cannery, and there are a number of custom canneries, but the total number of canneries has declined greatly (to 19 at present) since the First World War as the industry became more concentrated, and some canning firms have gone out of business. There has been little change since 1950. The salmon canneries are highly specialized, although two or three operate on tuna, clams, oysters or herring for limited periods of time, during the closed season for salmon.

The canneries try to maintain a continuous supply of salmon during the fishing season by purchasing on the fishing grounds, sending out packers from base camps along the coast to collect the fish and bring it in to the cannery. Peak supplies are handled by three-shift operation, if necessary, and surplus quantities of raw salmon may be held a short time in ice or refrigerated sea-water.

Because of the relatively high incomes obtainable in alternative occupations in British Columbia, the wage rates for plant labour are higher than on the Atlantic coast. Hourly rates for unskilled labour are around \$1.25 for women and \$1.50 for men, and monthly wages for semi-skilled and skilled trades, \$300 to \$400 a month. These rates represent an increase of perhaps two-thirds over the 1949 level.

The direct labour cost in canning, per case, has increased to a lesser extent - 10% to 20% - since 1949. This indicates a gain in labour productivity - largely, no doubt, through increased capital investment and increased use of power per worker - although many of the major labour-saving technical innovations and improvements in canning processes (such as mechanical handling and beheading and cutting, re-torting, high temperature steam, and automatic closure of the cans) were developed and put into use in earlier periods.

Canneries have warehouse space for storage of current production, and some companies have extensive storage facilities, but some of the pack is shipped to public warehouses serving major marketing areas. The cost of public storage for a year might amount to \$2.50 a case (5¢/lb.), including insurance and interest on the invested capital, hence an attempt is made to clear carry-over stocks by the time the new pack comes on the market (except to the extent that some carry-over is necessary from heavy production years into lean years, to average out the market supply).

Under the Canadian Meat and Canned Foods Act, each shipment of canned salmon, whether for export or domestic sale, must be inspected and a certificate of inspection issued before it passes from the control of the producer. Code marking on the cans must identify the species,

the date of canning, and the name of the packer, and the cases must show the same information. Canned salmon passing inspection as sound, firm, well-packed and in good merchantable condition must bear the word "Canada" embossed on the top of the can. If a parcel of canned salmon does not qualify for a certificate, but is found by the laboratory to be sound, wholesome and fit for human food, before shipment of such a parcel or lot an additional cover embossed "Grade B" must be cemented over the end of each can on which "Canada" is embossed, and such "Grade B" salmon may not be labelled "Fancy", "Choice" or "Standard" or any similar designation. Cannerys may use empty cans embossed "Grade B" instead of "Canada" for a pack which is expected to be passed by the laboratory as "Grade B".

The trade recognizes within the Grade "A" salmon further identifications of "Fancy" and "Standard" and occasionally "Choice". The lower end of "A" quality may be sold in some markets under minor labels. But the small firms seem to be at a disadvantage in the domestic market in that the public generally associates the identification "Fancy" with the brand label.

Further quality differences are recognized by the requirement that other forms of canned salmon be embossed, e.g., "Grade B Tips and Tails", "Grade B Minced Salmon", or such other designation as may be approved by the Department of Fisheries. The principal distinction, of course, is by species. Beyond this, there is certain market differentiation according to brand.

British Columbia canneries processing fish or shellfish for export do not require a permit from the Minister of Fisheries as is the case in the Atlantic Provinces, but canneries are licensed by the Provincial Government and sanitation and operating methods are subject to approval by Department of Fisheries inspectors.

Salmon oil and meal are processed from the offal. Sixty-eight to 70 pounds of raw sockeye salmon are used to produce a standard 48-lb. case of canned sockeye, hence the scrap or offal represents about 22 pounds out of 70 pounds, or 30% to 31% of the landed weight. The average yield from a ton of salmon scrap is 340 pounds of meal and 18 gallons of oil. Salmon offal (frozen) is used also for mink feed. In fish meal production it is commonly mixed with other fish offal.

The periods of operation of the canneries is indicated fairly well by the monthly pattern of salmon landings. (See Appendix Table A2.) The volume of the pack is, of course, dependent upon the size of landings.

Canned salmon is a grocery item like other canned products, and is handled in the same way and on the same terms. Sales are made to wholesalers and chain stores f.o.b. cannery or warehouse. The processors' policy is designed to keep their branded products continuously before the consumers' eyes on retail shelves and the flow of the commodity into markets is adjusted to achieve that end. Efforts are made to retain export markets too, of course, by continuing sales. The large imports of Japanese canned salmon for the domestic market by British

Columbia canning companies during the three years (1956, 1957 and 1958), for instance, enabled the packers to continue export shipments of Canadian salmon to traditional customers.¹

6. Distribution - to Retail

Canned salmon is sold through agents or wholesalers, the brokerage rate ranging from 2½% to 5% or 6%. British Columbia Packers maintain their own sales offices in the larger marketing centres. Some of the other firms have exclusive arrangements with brokers, while the canning plants with small volume utilize the services of general food brokerages. A form of field warehousing now generally takes the place of consignment sales, agents being authorized to withdraw specified quantities from stocks held in their area. Sales to chain stores may be direct, or through wholesalers or agents.

Quotations to wholesalers or chain stores are free-on-board plant or warehouse. Some firms give quantity discounts and occasionally special deals are given for promotion, new store openings, and the like. Most processors make co-operative advertising allowances to customers for approved advertising programs, but the amounts so spent are only a fractional percentage of the value of sales.

Average monthly wholesale prices for canned sockeye, per case of 48 "halves", are shown for Vancouver, Toronto and Halifax for the years 1949 to 1958 in Table A4 of the Appendix. From 1953, the Vancouver prices were usually within a dollar or two of the Seattle wholesale price quotations for the same month.² Differences between the Vancouver and Seattle wholesale quotations were often greater in earlier years.

There is not much material available on processors' prices by which the wholesalers' markup can be measured. However, the following season opening prices for canned sockeye were quoted by canning companies, standard case basis, on or about July 1 of each year, unless otherwise specified.³ (See next page.)

Comparison of these quotations for 96 "halves" with the Vancouver average wholesale prices (per case of 48 "halves"), doubled, and lagged two months, indicates a processor to wholesaler markup usually in the range of \$2.00 to \$3.00 a case, or 6% to 10% on the wholesale price.

1 All imported Japanese tinned salmon had to meet Canadian inspection standards, of course. This salmon was sold under Canadian company labels, being designated also a "Product of Japan".

2 Weekly quotations in the Seattle Daily Fishery Report, Market News Services, Bureau of the Commercial Fisheries, U.S. Department of the Interior.

3 From the Salmon Basebook, Table 51, p. 110.

Year	Price in Dollars per Case	
	96 "Halves"	48 "Talls"
1949	33.00	31.50
1950	33.00	31.50
1951	38.00	36.50
1952	35.00	33.50
(September)	33.00	31.50
1953	33.00 ^a	31.50
(November)	30.00	28.50
1954	33.00 ^b	31.50
1955	34.00	32.50
(August)	38.00	36.50

a "Cloverleaf" brand stayed at a price of \$33.00 until the spring of 1954, then dropped to \$31.00.

b In September 1954, brands other than "Cloverleaf" were quoted at \$32.00 per case.

Since September, 1953, the "agreed" freight rate on canned fish from British Columbia to major distributing centres in Ontario and Quebec has been \$2.00 per 100 pounds (minimum carload weight 60,000 lb.). An agreed charge of \$2.00 per 100 pounds from Vancouver or Prince Rupert to Winnipeg (30,000 lb. minimum weight) has also been in effect since February 27, 1956. A schedule of freight rates from British Columbia to various cities in eastern Canada, showing changes since 1949, is given in Table A6 of the Appendix.

Over the past 10 years, freight costs have accounted, in general, for a difference between Vancouver and Toronto or Halifax wholesale prices of 1¢ to 1½¢ per half-pound tin of salmon. Assuming a weight of 30 pounds for a case of 48 "halves" (a tare of 20%), the freight from Vancouver to Toronto or Montreal increased gradually from about 42¢ a case in 1949 to 66¢ in 1953, and has remained at about 60¢ since September, 1953. The freight from Vancouver to Halifax moved from 47¢ to 74¢, approximately, and has remained at 68¢ a case after September, 1953.

As indicated previously, sales of canned sockeye salmon in Canada approximate 300 thousand cases or more than 14 million pounds a year, while an average of 162 thousand cases a year has been sold abroad. Of the very large 1958 pack of 1,079,155 cases of sockeye, presumably about 300 thousand cases would be held for the domestic market and the remainder sold abroad - possibly rationed out over the 1959/60 season, which was expected to be a light production year.¹ Some 550 thousand cases of sockeye were exported in 1958 - all but 7,000 in the last half of the year.

¹ The British Columbia pack of canned sockeye salmon amounted to 256,420 cases in 1959.

7. Retailing, Eating Places, and Consumption

Markups on canned salmon would be expected to be smaller usually than those on fresh and frozen fish because its storage and handling costs are lower. Furthermore, it is a "non-perishable" grocery item and its sales volume would generally exceed that of most fresh or frozen fish items. Retail sales costs are low on canned salmon also because little net advertising cost is incurred. The packers help to finance local advertising and point-of-sale promotions, and much of the advertising is, in fact, brand promotion that is national or at least regional in scope, paid for by the processors.

Average monthly retail prices in Vancouver, Toronto and Halifax for canned sockeye, 1949 to 1958, are shown in Table A4 of the Appendix. Comparison with the wholesale price quotations in the same table shows the retail markup to have been usually in the range of \$1.20 - \$1.60 per case of 96 "halves" from 1949 to 1952, inclusive, but much greater in later years - gradually increasing from \$4.00 to \$6.00. The percentage markup was about 4% in retail price in the first part of the period, and in the vicinity of 11% to 13% afterwards. (See Table A5 of the Appendix.)

The domestic disappearance in Canada of more than 14 million pounds of canned sockeye a year over the 10 years 1949-1958, represents an average consumption of a little less than one pound per person per year. On the same basis, an average domestic disappearance of all species of canned Pacific salmon of 38 million pounds a year amounts to slightly more than 2½ pounds per person. At that rate, canned salmon constitutes about one-fifth of the total annual per capita consumption of fish and shellfish in Canada, in terms of edible weight. The domestic sales of canned British Columbia salmon, all species, and sockeye separately, for the salmon pack-years (July 1-June 30) from 1948/49 to 1955/56 are given on a per person basis in Table 3.

There is some indication that canned salmon constitutes a larger part of family fish purchases in interior cities than in coastal areas where fresh fish is readily available. Sample surveys of family expenditures in five Canadian cities carried out by the Dominion Bureau of Statistics in 1953 and 1955 indicated that, while the 4,500 families reporting in the two surveys spent on canned salmon about 35% of their total expenditures on fish and shellfish products, the proportion in the two surveys was 43% and 48%, respectively, in Toronto, and 38% and 45% in Winnipeg. Vancouver's figures were close to the five-city average of 35%, while family purchases of canned salmon represented, in Montreal, 26% and 31%, and in Halifax, 16% and 23%, of the total expenditures for fish.¹

The large canning companies indicate that intensive national promotion campaigns have been successful in causing a marked increase in

¹ See "Urban Family Expenditures for Fish", Trade News, January, 1957, p. 18, Charts 3 and 4, Department of Fisheries of Canada, Ottawa.

TABLE 3. ANNUAL SALES PER PERSON IN CANADA OF BRITISH COLUMBIA
CANNED SALMON, ALL SPECIES AND SOCKEYE,^a PACK-YEARS
1948/49 TO 1955/56.

Year (July 1-June 30)	Sales in Canada per Person	
	Sockeye (lb.)	All Pacific Salmon (lb.)
1948/49	1.0	2.8
1949/50	0.7	3.2
1950/51	1.1	3.0
1951/52	1.0	2.7
1952/53	1.1	2.7
1953/54	1.3	3.0
1954/55	1.3	2.8
1955/56	0.8	2.4

a Derived from data supplied to the federal Department of Fisheries by the Fisheries Association of British Columbia.

sales of canned salmon in Canada in specific years since the war, when dollar shortages prevented large-scale European buying coincident with heavy pack years. They appear also to believe that consumer demand is price-elastic (temporarily, at least) around the 29-30, 39-40 and 49-50 cent price levels, hence are concerned to maintain the retail price at 29, 39 or 49 cents, as the case may be. However, even if data on changes in sales volume following price changes were available, the evidence would not be conclusive as to demand-elasticity because of other varying factors such as promotion campaigns, seasonal changes in consumption, the changing prices of meats, and changing levels of income.

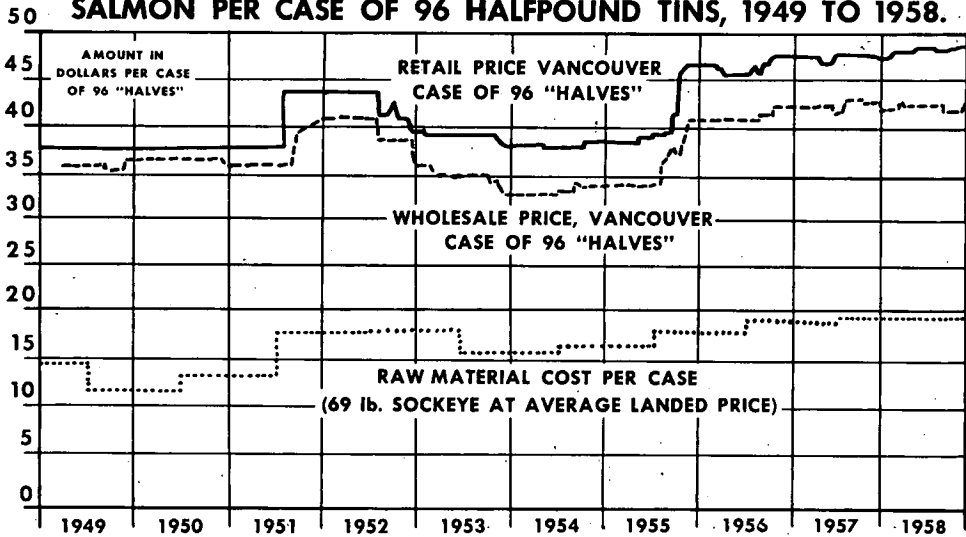
8. Measurement of the Price Spread, 1949-1958

For sockeye salmon, the problem is simplified because it is nearly all canned, and the approximate raw material cost can be computed, therefore, on the basis of 69 pounds of sockeye, landed weight, to the standard 48-pound case of canned sockeye, using the annual average price realized by the fishermen (Table 2) applied from June 1 to May 31 of the following year.

This method of computing the fisherman-to-retail price spread takes no account of any part of the old pack that might be carried over and sold during the new production year. No account is taken either of the (comparatively small) value of salmon offal for the production of meal and oil, which could be considered either as a reduction in the raw material cost to the processor or as a contribution towards his canning costs.

Wholesale and retail prices (from data in Table A4 of the Appendix) and the appropriate raw material cost, all on the basis of the

CHART 1
**RAW MATERIAL COST AND AVERAGE MONTHLY WHOLESALE
 AND RETAIL PRICES AT VANCOUVER OF CANNED SOCKEYE
 SALMON PER CASE OF 96 HALFPOUND TINS, 1949 TO 1958.**



standard 48-pound case, are plotted in Chart 1. These illustrate an increased wholesale-retail spread after the middle of 1953.

The standard 48-pound case is the unit in general use throughout the industry in tabulating production and sales of canned salmon.¹ A different approach is to compute wholesale and retail price-equivalents to one pound of raw salmon as landed by the fishermen, as a basis for the computation of the fishermen's and the retailers' shares of the retail dollar spent in Vancouver for canned sockeye salmon. This was done, and the results appear in Table A5 in the Appendix.

The fishermen's share of the retail dollar varied between 33% and 38% from the beginning of 1949 to the middle of 1951, and it has remained usually near to 40% since, except for some months in 1952/53 and again in 1955/56. The retailers' share of the retail dollar was about 4% until 1953, and has moved between 9% and 12% with some wider variations since that time. Those percentages represent increasing absolute price spreads from 1954, because the retail price was generally rising during the last four years.

The scanty data on packers' season-opening quotations indicate a wholesalers' margin of 6% to 10% on cost, or a slightly smaller percentage of retail price. The retailers' and wholesalers' margins together seldom exceeded 20% of the retail price of canned sockeye, leaving a processors' margin close to the fishermen's share of 40% of the retail dollar. Judging by the (faulty) export value figures per case, the processors received a somewhat smaller markup on export sales.

Data are most scanty on the price realized by the packer, consequently, the estimates of processors' and wholesalers' margins may be wide of the mark. At 1958 prices, a margin to the processor of 35% to 40% of the retail price would be in the range of \$16.50 to \$19.00 a case.

The wholesale and retail margins appear to be small, even with the increases apparent in recent years. Fishermen received large returns from the heavy sockeye catch of 1958, but the average annual net incomes of salmon fishermen may not be higher than the British Columbia average for equivalent skills. There is no doubt that some individual fishermen, through experience and skill or luck, reaped large returns in some years for their labour and capital.

1 Unfortunately, exports are recorded officially in hundreds of pounds, shipping weight, while industry export and production figures are tabulated in numbers of cases for pack years instead of calendar years. Consequently, it is impossible to reconcile the two sets of data within 10% or 15% of variation.

APPENDIX TABLE A1

QUANTITY AND VALUE OF BRITISH COLUMBIA SALMON LANDINGS,
BY SPECIES, 1949 TO 1958

Year	Sockeye	Chum	Coho and Blueback	Pink	Spring Salmon and Steelhead Trout	Total All Species
A. - Quantity in Thousands of Pounds						
1949	19,086	35,907	21,688	55,792	14,895	147,368
1950	29,340	86,036	20,024	35,342	13,958	184,700
1951	29,816	63,491	32,211	60,012	12,064	197,594
1952	30,867	31,862	19,608	51,249	13,379	146,965
1953	35,337	54,425	21,105	61,512	14,535	186,914
1954	47,001	74,399	18,929	25,734	12,799	178,862
1955	16,643	18,178	21,534	63,106	11,549	131,010
1956	21,497	27,427	23,217	28,936	12,451	113,528
1957	15,719	27,238	20,611	56,968	11,361	131,898
1958 ^a	73,182	35,179	21,658	32,746	12,865	175,630
Average						
1949-58	31,849	45,414	22,058	47,140	12,986	159,447
B. - Value in Thousands of Dollars						
1949	3,393	2,568	3,430	3,669	2,596	15,656
1950	5,905	9,000	3,713	2,557	3,161	24,336
1951	7,458	5,999	6,632	5,716	2,591	28,396
1952	7,717	2,349	2,904	4,102	2,483	19,555
1953	7,788	3,782	2,939	4,509	2,830	21,848
1954	10,398	5,453	3,133	1,996	2,599	23,579
1955	4,003	1,799	4,149	5,617	2,913	18,481
1956	5,930	3,317	5,725	2,612	3,772	21,356
1957	4,427	2,426	3,626	5,374	3,032	18,885
1958 ^a	20,181	3,463	5,203	2,995	3,985	35,827
Average						
1949-58	7,720	4,016	4,145	3,915	2,996	22,792

APPENDIX TABLE A1

QUANTITY AND VALUE OF BRITISH COLUMBIA SALMON LANDINGS,
BY SPECIES, 1949 TO 1958 (Cont'd.)

Year	Sockeye	Chum	Coho and Blueback	Pink	Spring Salmon and Steelhead Trout	Total All Species
<u>C. - Average Value in Cents per Pound</u>						
1949	17.8	7.2	15.8	6.6	17.4	10.6
1950	20.1	10.5	18.5	7.2	22.6	13.2
1951	25.0	9.4	20.6	9.5	21.5	14.4
1952	25.0	7.4	14.8	8.0	18.6	13.3
1953	22.0	6.9	13.9	7.3	19.5	11.7
1954	22.1	7.3	16.6	7.8	20.3	13.2
1955	24.1	9.9	19.3	8.9	25.2	14.1
1956	27.6	12.1	24.7	9.0	30.3	18.8
1957	28.2	8.9	17.6	9.4	26.7	14.3
1958 ^a	27.6	9.8	24.0	9.2	31.0	20.4
Average						
1949-58	24.0	8.9	18.6	8.3	23.3	14.4

^a Preliminary figures for 1958.

Source: The Commercial Salmon Fisheries of British Columbia, Statistical Basebook Series, No. 3, Table 5, p. 19; Economics Service, Department of Fisheries of Canada, Ottawa, 1958. Also, the Monthly Review of Canadian Fisheries Statistics and Fisheries Statistics of Canada, Dominion Bureau of Statistics.

APPENDIX TABLE A2

VOLUME OF BRITISH COLUMBIA SALMON LANDINGS, SOCKEYE AND ALL
SPECIES: AVERAGE FOR EACH MONTH, 1949 TO 1958

(Thousands of Pounds)

Month	Sockeye	All Salmon
January	-	14
February	-	24
March	-	75
April	-	464
May	26	1,363
June	958	4,731
July	16,207	34,084
August	9,698	54,600
September	4,934	33,722
October	138	21,350
November	3	5,242
December	-	49

APPENDIX TABLE A3

QUANTITY AND VALUE OF EXPORTS OF BRITISH COLUMBIA CANNED
SALMON, BY SPECIES, 1949 TO 1958

<u>Year</u>	<u>Sockeye</u>	<u>Chum</u>	<u>Coho</u>	<u>Pink</u>	<u>Pacific N.O.P.</u>	<u>Total All Species</u>
<u>A. - Number of Cases (48-lb.)</u>						
1949	69,611	223,727	79,867	397,697	20,794	791,696
1950	76,429	238,853	64,908	237,095	15,552	632,837
1951	44,446	214,109	32,811	312,129	13,281	616,776
1952	7,885	194,503	16,087	333,818	7,728	560,021
1953	114,668	162,539	94,691	573,141	12,284	957,323
1954	374,931	408,848	49,653	487,498	25,070	1,346,000
1955	117,356	308,524	79,605	355,795	12,568	873,848
1956	157,485	66,075	64,711	321,059	9,827	619,157
1957	109,085	56,252	75,106	210,520	9,623	460,586
1958 ^a	552,686	106,685	88,420	418,849	10,398	1,177,038
<u>Average</u>						
1949-58	162,458	198,012	64,586	364,760	13,712	803,528
<u>B. - Value in Thousands of Dollars</u>						
1949	1,729.9	2,678.9	1,593.1	5,512.5	374.3	11,888.7
1950	1,981.1	3,122.1	1,219.0	3,686.1	238.1	10,246.4
1951	1,425.7	3,399.4	792.8	5,629.2	303.5	11,550.6
1952	242.7	2,541.4	272.4	4,994.0	89.6	8,140.1
1953	2,740.5	1,946.2	1,742.8	8,053.0	162.1	14,644.6
1954	10,391.4	4,937.1	993.3	7,175.0	467.8	23,964.6
1955	3,807.5	4,161.1	2,025.0	6,027.3	217.1	16,238.0
1956	5,972.3	1,092.3	1,856.6	5,857.7	199.9	14,978.8
1957	4,084.6	999.4	1,979.9	4,018.4	186.2	11,268.5
1958 ^a	19,259.8	1,570.9	2,111.2	7,528.8	164.4	30,635.2
<u>Average</u>						
1949-58	5,163.5	2,644.9	1,458.6	5,848.2	240.3	15,355.5

APPENDIX TABLE A3

QUANTITY AND VALUE OF EXPORTS OF BRITISH COLUMBIA CANNED
SALMON, BY SPECIES, 1949 TO 1958 (Cont'd.)

Year	Sockeye	Chum	Coho	Pink	Pacific N.O.P.	Total All Species
<u>C. - Average Value in Dollars per Case</u>						
1949	24.85	11.97	19.95	13.86	18.00	15.02
1950	25.92	13.07	18.78	15.55	15.31	16.19
1951	32.07	15.88	24.16	18.03	22.85	18.73
1952	30.78	13.07	16.93	14.96	11.59	14.54
1953	23.90	11.97	18.41	14.05	13.20	15.30
1954	27.72	12.08	20.00	14.72	18.66	17.80
1955	32.44	13.49	25.44	16.94	17.27	18.58
1956	37.92	16.53	28.69	18.24	20.34	24.19
1957	37.44	17.77	26.36	19.09	19.35	24.47
1958 ^a	34.85	14.72	23.88	17.97	15.81	26.03
Average 1949-58	30.79	14.06	22.26	16.34	17.24	19.08

^a Subject to revision.

Source: Trade of Canada, Department of Trade and Commerce, Ottawa; 1949 to 1956 data from Table 47 of The Commercial Salmon Fisheries of British Columbia, Statistical Basebook Series, No. 3, Department of Fisheries of Canada, 1958. Trade of Canada reports quantities in hundredweights: to convert these to cases, a tare factor of 8% was adopted, producing a net weight 92% of the gross reported weight; the net weight was then divided into standard cases of 48 lb. net.

APPENDIX TABLE A4

AVERAGE WHOLESALE AND RETAIL PRICES OF CANNED SOCKEYE SALMON,
GRADE A, BY MONTHS, IN SELECTED CANADIAN CITIES, 1949 TO 1958a

<u>Wholesale Prices</u>				<u>Retail Prices</u>			(\$/case of 96 $\frac{1}{2}$ -lb. "Flats")
	(\$/case of 48 $\frac{1}{2}$ -lb. "Flats")				(\$/ $\frac{1}{2}$ -lb. "Flat")		$\frac{1}{2}$ -lb. "Flats")
<u>Period</u>	<u>Vancouver</u>	<u>Toronto</u>	<u>Halifax</u>	<u>Vancouver</u>	<u>Toronto</u>	<u>Halifax</u>	<u>Vancouver</u>
<u>1949</u>							
Jan.	-	18.12	-	39.0	40.9	-	37.44
Feb.	-	18.08	-	39.0	40.7	-	37.44
Mar.	18.25	18.16	-	39.0	40.6	-	37.44
Apr.	18.25	18.02	-	39.0	40.6	-	37.44
May	18.25	18.10	-	39.0	40.4	-	37.44
June	18.25	19.42	-	39.0	41.0	-	37.44
July	18.25	19.75	-	39.0	42.5	-	37.44
Aug.	17.88	18.47	-	39.0	42.3	-	37.44
Sept.	17.88	18.12	-	39.0	41.1	-	37.44
Oct.	18.12	18.34	-	39.0	40.9	-	37.44
Nov.	18.12	18.75	-	39.0	41.1	-	37.44
Dec.	18.12	19.65	-	39.0	41.4	-	37.44
<u>1950</u>							
Jan.	18.12	20.25	-	39.0	42.1	-	37.44
Feb.	18.12	21.65	-	39.0	42.6	47.3	37.44
Mar.	18.12	22.29	-	39.0	44.1	47.3	37.44
Apr.	18.12	22.56	-	39.0	45.8	47.3	37.44
May	18.12	22.56	-	39.0	46.3	47.3	37.44
June	18.12	22.20	-	39.0	45.7	47.3	37.44
July	18.12	19.86	-	39.0	46.0	47.3	37.44
Aug.	18.00	17.96	-	39.0	42.0	47.3	37.44
Sept.	18.00	17.96	19.17	39.0	40.4	50.0	37.44
Oct.	18.00	18.17	18.98	39.0	40.2	50.0	37.44
Nov.	18.00	18.23	18.86	39.0	40.6	50.0	37.44
Dec.	18.00	18.59	18.86	39.0	41.0	50.0	37.44

APPENDIX TABLE A4

AVERAGE WHOLESALE AND RETAIL PRICES OF CANNED SOCKEYE SALMON,
GRADE A, BY MONTHS, IN SELECTED CANADIAN CITIES, 1949 TO 1958^a
(Cont'd.)

Period	Wholesale Prices			Retail Prices			(\$/case of 96 ½-lb. "Flats")
	(\$/case of 48 ½-lb. "Flats")			(\$/½-lb. "Flat")			
	Vancouver	Toronto	Halifax	Vancouver	Toronto	Halifax	
<u>1951</u>							
Jan.	18.00	19.18	18.86	39.0	41.2	50.0	37.44
Feb.	18.00	20.05	18.86	39.0	42.8	50.0	37.44
Mar.	18.00	20.42	18.86	39.0	43.2	50.0	37.44
Apr.	18.00	20.61	18.83	39.0	42.9	50.0	37.44
May	18.00	20.61	18.83	39.0	42.9	50.0	37.44
June	18.00	19.96	18.83	39.0	44.2	-	37.44
July	18.00	20.01	-	39.0	45.0	-	37.44
Aug.	19.95	20.62	21.74	45.0	45.0	-	43.20
Sept.	19.95	20.71	21.74	45.0	46.2	-	43.20
Oct.	19.95	20.75	21.74	45.0	46.2	-	43.20
Nov.	19.95	20.70	21.74	45.0	46.3	-	43.20
Dec.	20.75	20.70	21.74	45.0	46.2	54.4	43.20
<u>1952</u>							
Jan.	20.75	20.40	21.75	45.0	46.3	54.4	43.20
Feb.	20.75	20.60	21.81	45.0	46.3	-	43.20
Mar.	20.75	20.66	21.81	45.0	46.3	-	43.20
Apr.	20.75	20.56	21.75	45.0	45.6	-	43.20
May	20.75	20.49	21.75	45.0	45.6	-	43.20
June	20.75	20.40	21.80	45.0	45.1	-	43.20
July	19.45	19.01	21.15	45.0	45.3	-	43.20
Aug.	19.38	18.91	20.36	42.0	41.3	-	40.32
Sept.	19.38	17.74	20.11	44.0	42.2	47.7	42.24
Oct.	19.38	17.74	19.59	42.0	40.6	46.5	40.32
Nov.	18.00	17.71	18.98	42.0	40.4	45.0	40.32
Dec.	18.00	17.71	18.98	41.5	40.1	44.6	39.84

APPENDIX TABLE A4

AVERAGE WHOLESALE AND RETAIL PRICES OF CANNED SOCKEYE SALMON,
GRADE A, BY MONTHS, IN SELECTED CANADIAN CITIES, 1949 TO 1958^a
 (Cont'd.)

Period	<u>Wholesale Prices</u>			<u>Retail Prices</u>			(\$/case of 96 ½-"Flats")
	(\$/case of 48 ½-lb. "Flats")			(\$/½-lb. "Flat")			
	Vancouver	Toronto	Halifax	Vancouver	Toronto	Halifax	
<u>1953</u>							
Jan.	18.00	17.76	19.16	41.5	40.3	43.6	39.84
Feb.	18.00	17.82	19.16	41.4	40.1	43.2	39.74
Mar.	17.50	17.76	19.10	40.9	39.8	43.6	39.26
Apr.	17.50	17.76	18.98	40.9	39.6	43.6	39.26
May	17.50	17.90	18.98	40.9	39.5	43.6	39.26
June	17.50	17.96	18.98	40.9	39.6	44.1	39.26
July	17.50	17.96	18.98	40.9	39.5	44.1	39.26
Aug.	17.50	17.84	19.06	40.9	39.8	44.1	39.26
Sept.	17.32	17.84	19.06	40.9	39.8	44.0	39.26
Oct.	17.05	17.84	19.06	39.9	39.8	46.1	38.30
Nov.	16.18	17.18	18.50	39.4	39.3	46.1	37.80
Dec.	16.18	17.18	18.50	39.1	39.0	45.4	37.54
<u>1954</u>							
Jan.	16.18	17.26	18.50	39.1	39.0	45.4	37.54
Feb.	16.18	17.26	18.38	39.1	38.6	45.4	37.54
Mar.	16.18	17.06	18.38	39.1	38.7	45.4	37.54
Apr.	-	17.06	18.38	39.1	38.7	45.4	37.54
May	16.18	17.04	18.06	38.8	38.8	45.5	37.29
June	16.32	16.98	18.22	38.8	38.7	45.5	37.29
July	16.25	16.98	18.22	38.8	38.6	45.5	37.29
Aug.	16.25	16.90	18.36	38.8	38.8	45.0	37.29
Sept.	16.75	18.17	19.26	39.2	39.2	45.2	37.63
Oct.	16.75	17.83	19.11	39.6	39.9	46.0	38.02
Nov.	17.33	17.71	19.11	39.6	40.2	46.0	38.02
Dec.	17.17	17.71	19.11	39.6	40.3	45.8	38.02

APPENDIX TABLE A4

AVERAGE WHOLESALE AND RETAIL PRICES OF CANNED SOCKEYE SALMON,
GRADE A, BY MONTHS, IN SELECTED CANADIAN CITIES, 1949 TO 1958^a
(Cont'd.)

	<u>Wholesale Prices</u>			<u>Retail Prices</u>			
	(\$/case of 48 ½-lb. "Flats")			(\$/½-lb. "Flat")			(\$/case of 96 ½-"Flats")
Period	Vancouver	Toronto	Halifax	Vancouver	Toronto	Halifax	Vancouver
<u>1955</u>							
Jan.	17.17	17.76	19.11	39.6	40.2	45.8	38.02
Feb.	17.17	17.76	19.11	39.6	40.2	45.8	38.02
Mar.	17.00	17.76	19.11	39.6	40.2	45.8	38.02
Apr.	17.00	17.76	19.11	39.6	40.2	46.2	38.02
May	17.17	18.02	19.31	40.0	40.2	46.7	38.40
June	17.17	18.02	19.31	40.0	40.2	46.7	38.40
July	17.33	18.57	19.52	40.5	40.2	46.7	38.88
Aug.	18.20	19.34	19.52	41.2	40.3	47.0	39.55
Sept.	18.87	20.98	22.19	42.8	45.2	49.3	41.09
Oct.	20.32	20.98	22.19	47.0	46.2	50.9	45.12
Nov.	20.32	21.00	22.19	47.8	46.5	50.9	45.89
Dec.	20.32	21.00	22.19	48.0	46.9	51.6	46.08
<u>1956</u>							
Jan.	20.32	21.08	22.19	48.0	47.3	52.4	46.08
Feb.	20.32	20.84	22.19	48.0	47.2	52.4	46.08
Mar.	20.32	21.25	22.19	47.8	47.0	52.1	45.89
Apr.	20.32	21.46	22.19	47.8	47.7	52.1	45.89
May	20.32	21.35	22.19	47.8	48.0	53.1	45.89
June	-	21.30	22.19	47.8	48.2	53.1	45.89
July	-	21.07	22.19	48.0	48.1	53.1	46.08
Aug.	20.40	21.07	22.19	47.8	48.1	53.0	45.89
Sept.	20.73	22.08	23.38	48.0	48.4	53.2	46.08
Oct.	21.47	22.15	23.38	49.2	49.2	53.8	47.23
Nov.	21.47	21.99	23.38	49.5	49.4	53.8	47.52
Dec.	21.47	21.99	23.38	49.5	49.4	53.8	47.52

APPENDIX TABLE A4

AVERAGE WHOLESALE AND RETAIL PRICES OF CANNED SOCKEYE SALMON,
GRADE A, BY MONTHS, IN SELECTED CANADIAN CITIES, 1949 TO 1958^a
 (Cont'd.)

Period	<u>Wholesale Prices</u>			<u>Retail Prices</u>			<u>(\$/case</u>
	<u>($\frac{\\$}{\text{case of 48}}$ $\frac{1}{2}$-lb. "Flats")</u>			<u>($\frac{\\$}{\frac{1}{2}$-lb.</u> <u>"Flat")</u>			<u>of 96</u> <u>$\frac{1}{2}$- "Flats")</u>
	Vancouver	Toronto	Halifax	Vancouver	Toronto	Halifax	Vancouver
<u>1957</u>							
Jan.	21.47	21.99	23.38	49.5	49.6	53.8	47.52
Feb.	21.47	21.89	23.38	49.5	49.5	54.0	47.52
Mar.	21.47	21.73	23.38	49.2	49.7	54.5	47.23
Apr.	21.47	21.73	23.38	48.4	49.7	54.4	46.46
May	21.40	21.73	23.38	48.4	49.7	54.4	46.46
June	21.40	21.86	23.38	49.2	49.7	54.1	47.23
July	21.57	21.86	23.38	49.3	49.7	54.1	47.33
Aug.	21.57	21.86	23.38	49.1	49.7	54.1	47.14
Sept.	21.57	22.06	23.38	49.1	49.7	54.9	47.14
Oct.	21.47	22.06	23.38	49.1	49.7	55.1	47.14
Nov.	21.47	22.06	23.38	48.9	49.7	54.9	46.94
Dec.	21.47	22.05	23.38	48.9	49.3	54.6	46.94
<u>1958</u>							
Jan.	21.13	22.01	22.79	48.9	49.7	54.6	46.94
Feb.	21.13	21.92	22.79	49.6	49.7	54.6	47.62
Mar.	21.13	21.87	22.79	49.6	49.7	54.3	47.62
Apr.	21.20	21.90	22.79	49.6	49.5	53.8	47.62
May	21.20	22.04	22.79	50.5	49.1	55.1	48.48
June	21.20	21.94	22.79	50.5	49.6	55.0	48.48
July	21.20	21.94	22.79	50.2	49.2	54.9	48.19
Aug.	21.20	22.02	22.79	50.0	49.2	55.0	48.00
Sept.	20.87	21.02	22.54	50.1	49.1	55.0	48.10
Oct.	20.20	21.02	22.29	49.1	48.0	54.5	47.14
Nov.	20.20	21.22	22.03	49.2	47.7	54.5	47.23
Dec.	21.20	21.63	22.53	49.8	47.9	54.3	47.81

- a The Commercial Salmon Fisheries of British Columbia, Statistical Basebook Series, No. 3, Department of Fisheries of Canada, Tables 56 and 62; for years after 1956, the Monthly Review of Canadian Fisheries Statistics, Dominion Bureau of Statistics.

APPENDIX TABLE A5

COMPARATIVE WHOLESALE AND RETAIL VALUES OF CANNED SOCKEYE SALMON AT VANCOUVER PER POUND OF RAW SALMON; RETAILERS' AND FISHERMEN'S SHARE OF THE RETAIL DOLLAR FOR CANNED SOCKEYE

Period	Vancouver Retail Price ($\frac{1}{2}$ -lb. tin)	Retail Value of Canned per lb. of Sockeye as Landed ($\frac{1}{2}$)	Wholesale Value of Canned in the Previous Month per lb. of Raw Sockeye ($\frac{1}{2}$)	Average Landed Price of Raw Sockeye ($\frac{1}{2}$ /lb.)	Fishermen -Retail Spread ($\frac{1}{2}$)	Retailers' Share of Retail Value (%)	Fishermen's Share of Retail Value (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>1949</u>							
Jan.	39.0	54.3	-	20.5	18.5	-	38
Feb.	39.0	54.3	-	20.5	18.5	-	38
Mar.	39.0	54.3	-	20.5	18.5	-	38
Apr.	39.0	54.3	52.9	20.5	18.5	3	38
May	39.0	54.3	52.9	20.5	18.5	3	38
June	39.0	54.3	52.9	18.0	21.0	3	33
July	39.0	54.3	52.9	18.0	21.0	3	33
Aug.	39.0	54.3	52.9	18.0	21.0	3	33
Sept.	39.0	54.3	51.8	18.0	21.0	5	33
Oct.	39.0	54.3	51.8	18.0	21.0	5	33
Nov.	39.0	54.3	52.5	18.0	21.0	3	33
Dec.	39.0	54.3	52.5	18.0	21.0	3	33

Explanatory notes on the column headings are given on p. 448.

APPENDIX TABLE A5

COMPARATIVE WHOLESALE AND RETAIL VALUES OF CANNED SOCKEYE SALMON AT VANCOUVER PER POUND OF RAW SALMON; RETAILERS' AND FISHERMEN'S SHARE OF THE RETAIL DOLLAR FOR CANNED SOCKEYE (Cont'd.)

Period	Vancouver Retail Price (\$ $\frac{1}{2}$ -lb. tin)	Retail Value of Canned per lb. of Sockeye as Landed (¢)	Wholesale Value of Canned in the Previous Month per lb. of Raw Sockeye (¢)	Average Landed Price of Raw Sockeye (\$/lb.)	Fishermen -Retail Spread (¢)	Retailers' Share of Retail Value (%)	Fishermen's Share of Retail Value (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>1950</u>							
Jan.	39.0	54.3	52.5	18.0	21.0	3	33
Feb.	39.0	54.3	52.5	18.0	21.0	3	33
Mar.	39.0	54.3	52.5	18.0	21.0	3	33
Apr.	39.0	54.3	52.5	18.0	21.0	3	33
May	39.0	54.3	52.5	18.0	21.0	3	33
June	39.0	54.3	52.5	20.1	18.9	3	37
July	39.0	54.3	52.5	20.1	18.9	3	37
Aug.	39.0	54.3	52.5	20.1	18.9	3	37
Sept.	39.0	54.3	52.2	20.1	18.9	4	37
Oct.	39.0	54.3	52.2	20.1	18.9	4	37
Nov.	39.0	54.3	52.2	20.1	18.9	4	37
Dec.	39.0	54.3	52.2	20.1	18.9	4	37

Explanatory notes on the column headings are given on p. 448.

APPENDIX TABLE A5

COMPARATIVE WHOLESALE AND RETAIL VALUES OF CANNED SOCKEYE SALMON AT VANCOUVER PER POUND OF RAW SALMON; RETAILERS' AND FISHERMEN'S SHARE OF THE RETAIL DOLLAR FOR CANNED SOCKEYE (Cont'd.)

Period	Vancouver Retail Price (¢/½-lb. tin) (1)	Retail Value of Canned per lb. of Sockeye as Landed (¢) (2)	Wholesale Value of Canned in the Previous Month per lb. of Raw Sockeye (¢) (3)	Average Landed Price of Raw Sockeye (¢/lb.) (4)	Fishermen -Retail Spread (¢) (5)	Retailers' Share of Retail Value (%) (6)	Fishermen's Share of Retail Value (%) (7)
<u>1951</u>							
Jan.	39.0	54.3	52.2	20.1	18.9	4	37
Feb.	39.0	54.3	52.2	20.1	18.9	4	37
Mar.	39.0	54.3	52.2	20.1	18.9	4	37
Apr.	39.0	54.3	52.2	20.1	18.9	4	37
May	39.0	54.3	52.2	20.1	18.9	4	37
June	39.0	54.3	52.2	25.0	14.0	4	46
July	39.0	54.3	52.2	25.0	14.0	4	46
Aug.	45.0	62.6	52.2	25.0	20.0	17	40
Sept.	45.0	62.6	57.8	25.0	20.0	8	40
Oct.	45.0	62.6	57.8	25.0	20.0	8	40
Nov.	45.0	62.6	57.8	25.0	20.0	8	40
Dec.	45.0	62.6	57.8	25.0	20.0	8	40

Explanatory notes on the column headings are given on p. 448.

APPENDIX TABLE A5

COMPARATIVE WHOLESALE AND RETAIL VALUES OF CANNED SOCKEYE SALMON AT VANCOUVER PER POUND OF RAW SALMON; RETAILERS' AND FISHERMEN'S SHARE OF THE RETAIL DOLLAR FOR CANNED SOCKEYE (Cont'd.)

Period	Vancouver Retail Price ($\frac{1}{2}$ -lb. tin) (1)	Retail Value of Canned per lb. of Sockeye as Landed (ϕ) (2)	Wholesale Value of Canned in the Previous Month per lb. of Raw Sockeye (ϕ) (3)	Average Landed Price of Raw Sockeye (ϕ /lb.) (4)	Fishermen -Retail Spread (ϕ) (5)	Retailers' Share of Retail Value (%) (6)	Fishermen's Share of Retail Value (%) (7)
<u>1952</u>							
Jan.	45.0	62.6	60.1	25.0	20.0	4	40
Feb.	45.0	62.6	60.1	25.0	20.0	4	40
Mar.	45.0	62.6	60.1	25.0	20.0	4	40
Apr.	45.0	62.6	60.1	25.0	20.0	4	40
May	45.0	62.6	60.1	25.0	20.0	4	40
June	45.0	62.6	60.1	25.0	20.0	4	40
July	45.0	62.6	60.1	25.0	20.0	4	40
Aug.	42.0	58.4	56.4	25.0	17.0	3	43
Sept.	44.0	61.2	56.2	25.0	19.0	8	41
Oct.	42.0	58.4	56.2	25.0	17.0	4	43
Nov.	42.0	58.4	56.2	25.0	17.0	4	43
Dec.	41.5	57.7	52.2	25.0	16.5	10	43

Explanatory notes on the column headings are given on p. 448.

APPENDIX TABLE A5

COMPARATIVE WHOLESALE AND RETAIL VALUES OF CANNED SOCKEYE SALMON AT VANCOUVER PER POUND OF RAW SALMON; RETAILERS' AND FISHERMEN'S SHARE OF THE RETAIL DOLLAR FOR CANNED SOCKEYE (Cont'd.)

Period	Vancouver Retail Price ($\$/\frac{1}{2}$ -lb. tin)	Retail Value of Canned per lb. of Sockeye as Landed (ϕ)	Wholesale Value of Canned in the Previous Month per lb. of Raw Sockeye (ϕ)	Average Landed Price of Raw Sockeye (ϕ /lb.)	Fishermen -Retail Spread (ϕ)	Retailers' Share of Retail Value (%)	Fishermen's Share of Retail Value (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>1953</u>							
Jan.	41.5	57.7	52.2	25.0	16.5	10	43
Feb.	41.4	57.6	52.2	25.0	16.4	9	43
Mar.	40.9	56.9	52.2	25.0	15.9	8	44
Apr.	40.9	56.9	50.7	25.0	15.9	11	44
May	40.9	56.9	50.7	25.0	15.9	11	44
June	40.9	56.9	50.7	22.0	18.9	11	39
July	40.9	56.9	50.7	22.0	18.9	11	39
Aug.	40.9	56.9	50.7	22.0	18.9	11	39
Sept.	40.9	56.9	50.7	22.0	18.9	11	39
Oct.	39.9	55.5	50.2	22.0	17.9	10	40
Nov.	39.4	54.8	49.4	22.0	17.4	10	40
Dec.	39.1	54.4	46.9	22.0	17.1	14	40

Explanatory notes on the column headings are given on p. 448.

APPENDIX TABLE A5

COMPARATIVE WHOLESALE AND RETAIL VALUES OF CANNED SOCKEYE SALMON AT VANCOUVER PER POUND OF RAW SALMON; RETAILERS' AND FISHERMEN'S SHARE OF THE RETAIL DOLLAR FOR CANNED SOCKEYE (Cont'd.)

Period	Vancouver Retail Price (\$ $\frac{1}{2}$ -lb. tin) (1)	Retail Value of Canned per lb. of Sockeye as Landed (\$) (2)	Wholesale Value of Canned in the Previous Month per lb. of Raw Sockeye (\$) (3)	Average Landed Price of Raw Sockeye (\$/lb.) (4)	Fishermen -Retail Spread (\$) (5)	Retailers' Share of Retail Value (%) (6)	Fishermen's Share of Retail Value (%) (7)
<u>1954</u>							
Jan.	39.1	54.4	46.9	22.0	17.1	14	40
Feb.	39.1	54.4	46.9	22.0	17.1	14	40
Mar.	39.1	54.4	46.9	22.0	17.1	14	40
Apr.	39.1	54.4	46.9	22.0	17.1	14	40
May	38.8	54.0	-	22.0	16.8	-	41
June	38.8	54.0	46.9	22.1	16.7	13	41
July	38.8	54.0	47.3	22.1	16.7	12	41
Aug.	38.8	54.0	47.1	22.1	16.7	13	41
Sept.	39.2	54.5	47.1	22.1	17.1	14	41
Oct.	39.6	55.1	48.6	22.1	17.5	12	40
Nov.	39.6	55.1	48.6	22.1	17.5	12	40
Dec.	39.6	55.1	50.2	22.1	17.5	9	40

Explanatory notes on the column headings are given on p. 448.

APPENDIX TABLE A5

COMPARATIVE WHOLESALE AND RETAIL VALUES OF CANNED SOCKEYE SALMON AT VANCOUVER PER POUND OF RAW
SALMON; RETAILERS' AND FISHERMEN'S SHARE OF THE RETAIL DOLLAR FOR CANNED SOCKEYE (Cont'd.)

Period	Vancouver Retail Price (¢/½-lb. tin)	Retail Value of Canned per lb. of Sockeye as Landed (¢)	Wholesale Value of Canned in the Previous Month per lb. of Raw Sockeye (¢)	Average Landed Price of Raw Sockeye (¢/lb.)	Fishermen -Retail Spread (¢)	Retailers' Share of Retail Value (%)	Fishermen's Share of Retail Value (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>1955</u>							
Jan.	39.6	55.1	49.8	22.1	17.5	10	40
Feb.	39.6	55.1	49.8	22.1	17.5	10	40
Mar.	39.6	55.1	49.8	22.1	17.5	10	40
Apr.	39.6	55.1	49.3	22.1	17.5	10	40
May	40.0	55.6	49.3	22.1	17.9	11	40
June	40.0	55.6	49.8	24.1	16.0	10	43
July	40.5	56.3	49.8	24.1	16.5	12	43
Aug.	41.2	57.3	50.2	24.1	17.2	12	42
Sept.	42.8	59.5	52.8	24.1	18.8	11	40
Oct.	47.0	65.4	54.7	24.1	23.0	16	37
Nov.	47.8	66.5	58.9	24.1	23.8	11	36
Dec.	48.0	66.8	58.9	24.1	24.0	12	36

Explanatory notes on the column headings are given on p. 448.

APPENDIX TABLE A5

COMPARATIVE WHOLESALE AND RETAIL VALUES OF CANNED SOCKEYE SALMON AT VANCOUVER PER POUND OF RAW
SALMON; RETAILERS' AND FISHERMEN'S SHARE OF THE RETAIL DOLLAR FOR CANNED SOCKEYE (Cont'd.)

Period	Vancouver Retail Price ($\frac{1}{2}$ -lb. tin) (1)	Retail Value of Canned per lb. of Sockeye as Landed (ϵ) (2)	Wholesale Value of Canned in the Previous Month per lb. of Raw Sockeye (ϵ) (3)	Average Landed Price of Raw Sockeye (ϵ /lb.) (4)	Fishermen -Retail Spread (ϵ) (5)	Retailers' Share of Retail Value (%) (6)	Fishermen's Share of Retail Value (%) (7)
<u>1956</u>							
Jan.	48.0	66.8	58.9	24.1	24.0	12	36
Feb.	48.0	66.8	58.9	24.1	24.0	12	36
Mar.	47.8	66.5	58.9	24.1	23.8	11	36
Apr.	47.8	66.5	58.9	24.1	23.8	11	36
May	47.8	66.5	58.9	24.1	23.8	11	36
June	47.8	66.5	58.9	24.1	23.8	11	36
July	48.0	66.8	-	27.6	20.4	-	41
Aug.	47.8	66.5	-	27.6	20.2	-	42
Sept.	48.0	66.8	59.1	27.6	20.4	12	41
Oct.	49.2	68.4	60.1	27.6	21.6	12	40
Nov.	49.5	68.9	62.2	27.6	21.9	10	40
Dec.	49.5	68.9	62.2	27.6	21.9	10	40

Explanatory notes on the column headings are given on p. 448.

APPENDIX TABLE A5

COMPARATIVE WHOLESALE AND RETAIL VALUES OF CANNED SOCKEYE SALMON AT VANCOUVER PER POUND OF RAW SALMON; RETAILERS' AND FISHERMEN'S SHARE OF THE RETAIL DOLLAR FOR CANNED SOCKEYE (Cont'd.)

Period	Vancouver Retail Price ($\$/\frac{1}{2}$ -lb. tin)	Retail Value of Canned per lb. of Sockeye as Landed (ϕ)	Wholesale Value of Canned in the Previous Month per lb. of Raw Sockeye (ϕ)	Average Landed Price of Raw Sockeye (ϕ /lb.)	Fishermen -Retail Spread (ϕ)	Retailers' Share of Retail Value (%)	Fishermen's Share of Retail Value (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>1957</u>							
Jan.	49.5	68.9	62.2	27.6	21.9	10	40
Feb.	49.5	68.9	62.2	27.6	21.9	10	40
Mar.	49.2	68.4	62.2	27.6	21.6	9	40
Apr.	48.4	67.3	62.2	27.6	20.8	8	41
May	48.4	67.3	62.2	27.6	20.8	8	41
June	49.2	68.4	62.0	28.2	21.0	9	41
July	49.3	68.6	62.0	28.2	21.1	10	41
Aug.	49.1	68.3	62.5	28.2	20.9	8	41
Sept.	49.1	68.3	62.5	28.2	20.9	8	41
Oct.	49.1	68.3	62.5	28.2	20.9	8	41
Nov.	48.9	68.0	62.2	28.2	20.7	8	41
Dec.	48.9	68.0	62.2	28.2	20.7	8	41

Explanatory notes on the column headings are given on p. 448.

APPENDIX TABLE A5

COMPARATIVE WHOLESALE AND RETAIL VALUES OF CANNED SOCKEYE SALMON AT VANCOUVER PER POUND OF RAW SALMON; RETAILERS' AND FISHERMEN'S SHARE OF THE RETAIL DOLLAR FOR CANNED SOCKEYE (Cont'd.)

Period	Vancouver Retail Price ($\frac{1}{2}$ -lb. tin)	Retail Value of Canned per lb. of Sockeye as Landed (ϕ)	Wholesale Value of Canned in the Previous Month per lb. of Raw Sockeye (ϕ)	Average Landed Price of Raw Sockeye (ϕ /lb.)	Fishermen -Retail Spread (ϕ)	Retailers' Share of Retail Value (%)	Fishermen's Share of Retail Value (%)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>1958</u>							
Jan.	48.9	68.0	62.2	28.2	20.7	8	41
Feb.	49.6	69.0	61.2	28.2	21.4	11	41
Mar.	49.6	69.0	61.2	28.2	21.4	11	41
Apr.	49.6	69.0	61.2	28.2	21.4	11	41
May	50.5	70.3	61.4	28.2	22.3	13	40
June	50.5	70.3	61.4	28.0	22.5	13	40
July	50.2	69.8	61.4	28.0	22.2	12	40
Aug.	50.0	69.6	61.4	28.0	22.0	12	40
Sept.	50.1	69.7	61.4	28.0	22.1	12	40
Oct.	49.1	68.3	60.5	28.0	21.1	11	41
Nov.	49.2	68.4	58.6	28.0	21.2	14	41
Dec.	49.8	69.3	58.6	28.0	21.8	15	40

Explanatory notes on the column headings are given on p. 448.

- Column (1): First-of-month average retail prices reported by Dominion Bureau of Statistics in the Monthly Review of Canadian Fisheries Statistics. See Table A4 preceding.
- Column (2): Assuming 69 lb. of raw sockeye are used per standard case of 96 "halves", the retail value equivalent to one pound of raw sockeye is obtained by multiplying the retail price of a half-pound tin by $\frac{96}{69}$.
- Column (3): Average wholesale prices for canned sockeye salmon reported in the Monthly Review of Canadian Fisheries Statistics are for 48 half-pound tins (one-half of a standard case). The wholesale value equivalent to one pound of raw sockeye is therefore obtained by multiplying the wholesale price by $\frac{2}{69}$. Wholesale prices are mid-month quotations, consequently the equivalent wholesale value has been computed for a given month from the wholesale price quotation for the preceding mid-month. In this way the retailers' margin (used to compute the retailers' share of retail value in Column (6)) is determined by deducting from the first-of-the-month retail value (Column (2)), the wholesale value (Column (3)) of the mid-month previous.
- Column (4): Average landed value of sockeye (Table 2 above) applied over the pack year June to the following May.
- Column (5): Landed value deducted from equivalent retail value for a pound of raw sockeye - Column (2) minus Column (4).
- Column (6): "Column (2) minus Column (3)" as a percentage of Column (2).
- Column (7): Column (4) as a percentage of Column (2).

APPENDIX TABLE A6

FREIGHT RATES ON CANNED FISH, BOXED, FROM BRITISH COLUMBIA TO EASTERN CANADIAN DESTINATIONS^a

(Cents per 100 Pounds)

Effective Date	TO: Windsor Toronto Ottawa Montreal Quebec City	St. John, N.B.	Halifax, N.S. Charlottetown, P.E.I.	Sydney, N.S. Yarmouth, N.S.	Port au Basques, Nfld.	St. John's, Nfld.
Oct. 1/49	140	155	157	162	171	204
July 26/51	157	173	176	182	192	229
Feb. 11/52	164	181	184	190	200	239
Mar. 1/52	181	201	203	210	220	262
Apr. 21/52	190	209	212	219	230	274
Jan. 28/53	207	229	231	239	251	312
Mar. 16/53	221	245	247	256	269	320
Sept. 17/53	200	222	227	234	247	293

^a Source: Canada Department of Agriculture, Economics Branch. September, 1953, rates on minimum car-load weight of 60,000 lb. Other rates on 70,000 lb. minimum.

PACIFIC HALIBUT

A. The Raw Material

The halibut¹ belongs to the demersal or groundfish ("bottom-feeding") group of fish species, although it occasionally rises to the surface in quest of food. Female halibut grow faster than males, maturing in eight to 16 years, and may live beyond 35 years and reach a length of more than eight feet and a weight, occasionally, of more than 500 pounds. The males mature earlier and may reach, infrequently, an age of 25 years, a length of 4½ feet, and a weight of 40 pounds.

Being a relatively large fish, halibut can be handled individually at a fast rate in unloading, packing and processing, but the final consumer would seldom be able to use a whole fish; it is marketed as fresh or frozen steaks, fillets or chunks. Fish under 10 pounds (Chix) and grey or damaged fish (No. 2s) bring a lower price per pound. After the fish are caught, quality depends upon rapid chilling or freezing to arrest organic and bacterial deterioration of the flesh and upon care and cleanliness in handling and processing.

B. Disposition of the Catch

Landings of halibut in British Columbia in 1958 amounted to 23.7 million pounds, and a further 5.1 million pounds was landed by Canadian fishing vessels in United States and Alaskan ports. Total landings of Pacific halibut by both Canadian and United States vessels amounted to 65 million pounds. Accordingly, Canadian fishermen accounted for nearly 45% of the 1958 catch.

During the 10-year period, 1949 to 1958, Canadian fishermen landed an average of close to 22 million pounds of halibut a year in British Columbia ports and almost 24 million pounds a year, including deliveries in Alaska and Washington. This was about 39% of the combined Canadian and American average catch of 61.5 million pounds a year. Landings of Pacific halibut by British Columbia fishermen have, in recent years, constituted 80% to 85% of the total Canadian halibut catch. Thus the Atlantic halibut landings are a relatively small part of the total.

The British Columbia processors ship halibut chiefly in the fresh and frozen (headless) dressed forms and as frozen steaks, fillets and flitches. Over the six years, 1952 to 1957, about two-thirds of the halibut landed in British Columbia was sold by processors in the frozen dressed form, and about one-sixth as fresh dressed. Frozen halibut

1 The Pacific halibut, Hippoglossus stenolepis, is distinguished from the Atlantic halibut, Hippoglossus hippoglossus, by certain scale characteristics that have given it its specific name.

TABLE 1. LANDINGS OF PACIFIC HALIBUT, 1949-58: BY CANADIAN VESSELS IN BRITISH COLUMBIA AND IN UNITED STATES PORTS, AND TOTAL BY CANADIAN AND AMERICAN VESSELS

Year	<u>CANADIAN LANDINGS</u>			<u>TOTAL LANDINGS^a</u>			Canadian Landings as Percentage of Total (%)
	<u>In British Columbia Ports</u>		<u>In U.S. Ports</u>	Canadian (thousand lb.)	Canadian and American (thousand lb.)		
	<u>Landings</u>	<u>Value to</u>	<u>Average</u>				
	<u>(thousand lb.)</u>	<u>Fishermen</u>	<u>Value</u>				
		(\$ thou- sand)	(\$/lb.)	(thousand lb.)			
1949	17,997	2,785	15.5	683 ^a	18,746	55,066	34
1950	18,882	3,837	20.3	70 ^a	18,884	57,283	33
1951	20,214	3,429	17.0	561 ^a	21,020	56,078	37
1952	23,488	3,955	16.8	1,129 ^a	24,719	62,333	40
1953	24,882	3,661	14.7	1,091	25,738	59,865	43
1954	25,200	3,984	15.8	2,253	27,526	71,206	39
1955	19,679	2,555	13.0	2,354	22,148	59,110	38
1956	23,316	5,067	21.7	2,045	25,596	67,505	38
1957	22,542	3,673	16.3	2,220	24,714	61,355	40
1958	23,707	4,902	20.7	5,145	29,020	65,034	45
Average (1949-58)	21,991	3,785	17.2	1,755	23,811	61,484	39

^a Pacific Fisherman, Yearbook Number, January 25, 1959, p. 201. It will be observed that there are small differences between the Canadian and the American figures on the Canadian catch.

Source: Economics Service, Department of Fisheries of Canada, Ottawa.

fillets represented about 10% of landings. The production of frozen flitches and chunks, over the six years about half that of fillets, has been increasing, and in 1957 it equalled that of frozen fillets. Processors' output of frozen steaks represented only 3% of landings but, of course, the greater part of fresh or frozen dressed halibut becomes steaks at the wholesale or retail level.¹

Canadian exports of fresh and frozen dressed halibut over the nine years, 1950-58, amounted to an average of 13.1 million pounds a year, of which 9.8 million, or three-quarters, was frozen. (See Appendix Table A1.) Including exports of fillets adjusted to landed weight, the total exports might average about 15.4 million pounds a year (landed weight). This would represent about 63% of the 24.4 million pounds landed by Canadian fishermen, including their landings in United States ports.

The domestic disappearance of halibut is computed as about 8.5 million pounds, landed weight, a year over the nine years, or close to 35% of the total landings by Canadian fishermen, both in home ports and United States ports.

C. Conditions of Production, Organization of the Fishery and Institutional Factors

Halibut are caught with line-gear, for the most part in waters 30 to 250 fathoms deep, but down to 600 fathoms. A few are caught by trollers. A large halibut boat might be 60 to 80 feet long, with a crew of six men, fishing about 60 skates or bundles of gear, each skate consisting of a ground line (long-line) to which the shorter lines bearing the hooks are attached.

Halibut are found on the continental shelf from the Strait of Juan de Fuca to the Aleutian Islands. The principal fishing grounds are west of Vancouver Island and the Queen Charlotte Islands, in Hecate Strait, in Dixon Entrance and off the Alaskan coast. With the growth of the Canadian fleet of big modern long-liners, increasing quantities are being brought in from the Gulf of Alaska and the Bering Sea.

Usually the areas of greatest concentration are heavily fished; these are only a small part of the total area and the stocks are apparently replenished from the other parts. The all-time record trip by a North Pacific long-liner, for instance, was taken by the Silver Bounty in 1958 on the Horseshoe Ground in central Hecate Strait - among the most heavily fished of all halibut banks. The record fare, landed at Prince Rupert, was 153,000 pounds - two-thirds of it large halibut.

¹ Data on the manufactured products, here summarized, are from Table 3 in the annual Fisheries Statistics of British Columbia, published by the Canadian Department of Fisheries in Vancouver. A flitch is merely a long fillet, being the side of a hog or of a halibut, as defined in the Oxford Dictionary. The British Columbia industry generally uses the term "fletch", probably as a corruption of the original term. The Pacific Fisherman (Portland, Oregon) uses "flitch".

Evidently, the Silver Bounty met a newly-arrived stock.¹

Roughly two-thirds of the British Columbia halibut catch in recent years has been landed in the Prince Rupert-Butedale area; the proportion was higher - 75% to 80% - during the early '50's. The balance was landed farther south, viz., at Namu, Vancouver, New Westminster and Vancouver Island points.² Upon occasion, when a glut occurs at Prince Rupert, some fish is brought down to Vancouver by packer boats.

The catch of halibut is regulated by the International Pacific Halibut Commission; quotas are set for each area or sub-area and the season is closed when the quota has been taken. Landings are heaviest in May and June when the season is open in Area 2 - from Willapa Bay off Washington State to Cape Spencer in Alaska. This is the area in which the British Columbia small boat or "mosquito" fleet operates. The season for 1958 in Area 2 opened on May 4 and closed on July 2; a second season for Area 2 opened for seven days from August 31 to September 7. The season was extended in 1958 for Area 3 - all grounds west of Cape Spencer; in particular, vessels were able to fish west of the Shumagin Islands and in the Bering Sea during April and again in a late season until October 16 without quota. The 1958 regulations also opened to fishing the long-closed Area 1 "nursery grounds".³

The monthly pattern of British Columbia halibut landings is shown by the data in Table A3 of the Appendix.

The first treaty for joint Canadian-United States regulation of the halibut fishery was negotiated in 1924, creating the Northern Pacific Halibut Commission. The treaty was revised in 1930, 1937 and 1953; the 1953 convention changed the name of the regulatory body from "The International Fisheries Commission" to "The International Pacific Halibut Commission".

An annual catch quota has been in effect since the beginning of regulation, and there has been an undeniable recovery of halibut stocks in the past 20 years. However, the part played by conservation measures in this recovery is the subject of debate; higher water temperatures and a growth in recruitment resulting from the reduction in density of the stocks may have been important factors.

The regulation of the catch has had among its effects the shortening of the fishing season and the building up of a high capital cost structure in the halibut fishery. Competition among fishermen for

1 Pacific Fisherman, Yearbook Number, January 25, 1959, p. 202. A few days earlier, the Silver Viking landed 141,000 pounds from the Bering Sea.

2 Pacific Fisherman, Yearbook Number, January 25, 1959, p. 201.

3 British Columbia Catch Statistics, 1958, Department of Fisheries of Canada, Pacific Area, p. 2.

a larger share of the quota has brought about a progressive increase in capital investment in more and better boats and gear, so that the quota is now taken in a few weeks of fishing, even with a voluntary arrangement for an eight-day boat lay-up after each trip. The concentration of the catch into a few months has required also the provision of greater capacity in processing, storing and marketing halibut. In addition, a greater proportion of the catch must be sold in the frozen form rather than fresh, and there is inevitably some deterioration in the quality of frozen halibut stored for many months in order to provide a supply over 12 months of the year.

The fishermen are represented by a number of organizations, including the United Fishermen and Allied Workers Union, the Native Brotherhood of British Columbia, the Deep Sea Fishermen's Union of Prince Rupert, the Fishing Vessel Owners' Association of British Columbia, and the Fishing Vessel Owners' Association of Prince Rupert. The Vessel Owners' Associations and the fishing companies negotiate with the fishermen's unions the share arrangements to apply to crews on the various types of halibut boats.

The British Columbia fishermen's organizations in conferences with others representing Washington and Alaskan ports, agreed to adopt a schedule of lay-up rules for the Pacific coast. These were designed to obviate temporary gluts during the peak production periods with their adverse effects on the auction price levels - in effect, to produce a lengthening of the season. According to the rules adopted for 1958, all halibut vessels were required to serve a lay-up time of eight days at home port or plant of sale following each trip. One or two-man halibut boats delivering at camps, scows or packers were designated as "camp boats"; these could fish 12 days, then must tie up for eight days, and for the balance of the season must alternate 10 days' fishing and eight days' tie-up. To avoid hardship to salmon trollers, ice packer trollers were permitted to land 3,000 pounds of halibut at ports or plants in any trip or in any seven-day period without being subject to the eight-day lay-up. Standard travelling times between specified ports were laid down, and vessels travelling from their port of sale to home port after a trip had the standard time added to their eight-day lay-up period if their home port was nearer to the fishing grounds than the port of sale, or subtracted from their lay-up time if their home port was farther from the grounds. Halibut fishermen are required to contribute 50¢ per thousand pounds of halibut landed to the Halibut Curtailment Fund; on vessels owned by members of the Fisheries Association, the deduction is 40¢ per thousand pounds.

Halibut vessels are insured against loss or damage, but the boat insurance does not cover loss of catch or of supplies, and loss of the catch or loss of the season is a considerable risk when the season is so short. Halibut trip insurance was started in Vancouver in 1950; currently, it is operated as the British Columbia Trip Insurance Pool, on a charge of 50¢ per \$100 worth of fish for vessels fishing in Area 3, and 40¢ per \$100 in Area 2, covering loss of catch and supplies from burning, stranding, sinking, collision, and breakdowns of steering gear, propelling machinery, light-plant, gurdy or other machinery

connected with the fishing operations. Administration of the Pool is by a board of eight trustees - representatives of the United Fishermen and Allied Workers Union (3), the Vancouver Vessel Owners (2), the Prince Rupert Vessel Owners (1), the fishing companies (1), and the Deep Sea Fishermen's Union of Prince Rupert (1).

The Prince Rupert Fishermen's Co-operative Association handles an important share (up to one-half) of the halibut landed at Prince Rupert. The Vancouver business of the Co-operative is handled by the British Columbia Ice Company - including one-half to three-quarters of a million pounds of halibut, much of it from camps along the west coast of Vancouver Island. The Co-operative deducts 10% of the gross payments for fish landed, 5% going into share capital (which is now interest bearing) and 5% into the members' Special Loan Fund, bearing interest at 4%. A member can borrow from this Fund at 6%, or withdraw his share from it upon one year's notice. Occasionally the Co-operative Association floats a special debenture issue for an increase in packer boat investment or additions to cold storage or plant facilities. The Association does not finance fishermen now; this service is provided by their credit unions - e.g., the Gulf and Fraser Fishermen's Credit Union.

The Prince Rupert Co-operative puts up its own ice and bait, selling them at cost. It provides good unloading facilities and a good store service. A large sea-water chiller was installed on the dock about two years ago, in which landed fish can be kept at a temperature close to the freezing point.

The United States customs duty rate on fresh or frozen dressed halibut is $\frac{1}{2}$ ¢ a pound (under Tariff Para. 717a), and $1\frac{1}{2}$ ¢ on halibut fillets (Tariff Para. 717b).

The Canadian Most-Favoured-Nation tariff rate on halibut negotiated under the General Agreement on Tariffs and Trade is $\frac{1}{2}$ ¢ a pound (Tariff Item 116). Very little halibut is imported into Canada; landings by United States boats in Canadian ports are for the most part shipped in bond to the United States.

Halibut boats come in many types and sizes; the new large boats are now adaptable for use in other fisheries, being equipped with a seine-table for use on salmon or herring. On others, a seine-table is mounted after the peak halibut season, for use in fishing the later salmon runs. The cost range for a new boat would be \$70,000 to \$100,000 - the latter figure for a combination seiner-halibut boat of, say, 72 feet. A string of halibut gear would cost up to \$5,000 initially. A salmon seine net would cost up to \$15,000; a herring seine, even more. The herring seine net is usually owned by a fishing company.

The 1957 inventory of boats in British Columbia included 36 long-liners averaging about 16 tons in size and \$15,000 in value, 39 seiner-long-liners averaging 29 tons and \$37,400, and 40 long-liner-packers averaging about 33 tons and \$28,400. The value of 10,014 skates

of gear was \$460,000, or about \$46 each.¹

Halibut gear would give about two seasons' wear at the maximum, but losses are sometimes heavy. Out of the equipment of 60 skates of gear, costing about \$60 per skate, the value of seven or eight skates would be charged off to depreciation after each trip. This would be deducted from the gross or boat stock, then a boat share of 20% would be deducted, leaving a net stock against which oil, fuel, food and other trip expenses would be charged. The remainder would be divided equally among the members of the crew.

The share schedule to be applied to each type of boat is agreed between the Vessel Owners' Association, fishing companies and the fishermen's unions. The share schedule is variable according to species fished, e.g., halibut, salmon, herring. A share schedule for herring applies only to members of the Co-operative - the other fishermen operate in the herring fishery on a contract rate per ton.

The number of fishing licences issued is not a satisfactory measure of the number of commercial fishermen because many licence holders may fish only a short time. However, 526 halibut fishing licences were issued in British Columbia in 1957 to fishermen holding only the one licence, and 924 to fishermen holding one or more licences for other fisheries. The figures for 1953, 1955 and 1957 are summarized in Table 2, following.

D. Primary Marketing

Halibut are gutted and iced on fishing vessels and at the dock. The heads are removed before weighing.

The larger boats carry ice and can stay out for two weeks, if necessary, to complete their catch. The small two-man boats carry no ice and these deliver their catch to camps near the grounds, whence the fish are transported by packer boats to the buyer's wharf.

The grades established by custom and applying to gutted head-off fish follow:

<u>Grade</u>	<u>Description</u>	<u>Proportion of Catch</u>
Chicken (Chix)	6 - 10 lb.	8 - 10%
Medium	10 - 60 lb.	60 - 62%
Large	Over 60 lb.	24 - 28%
No. 2	Greys or Culls	2 - 3%

¹ Fisheries Statistics of British Columbia, 1957, Department of Fisheries in Vancouver, Tables 5 and 7.

TABLE 2. NUMBERS OF FISHERMEN LICENSED IN BRITISH COLUMBIA, 1953, 1955 AND 1957^a

	<u>1953</u>	<u>1955</u>	<u>1957</u>
<u>Grand Total of Licensees</u>	12,008	11,860	12,016
<u>One Licence Only</u>			
Total	9,844	8,643	8,819
Halibut	117	539	526
Troll Salmon	3,446	2,861	3,153
<u>Two Licences</u>			
Total	1,904	2,552	2,556
Gillnet Salmon and Halibut	209	383	417
Troll Salmon and Halibut	74	136	88
Captain - Salmon and Halibut	28	77	64
Assistant - Salmon and Halibut	28	267	211
<u>Three or More Licences</u>			
Total	260	665	641
(Assistant - Salmon,			
(Assistant - Herring and Halibut	2	188	144

a Data from Fisheries Statistics of British Columbia, 1957, Table 8.

The greater part of the halibut not handled by the Co-operative is sold at auction in the chief markets - Prince Rupert and Vancouver. "Hailing fares" reported by skippers by ship-to-shore telephone on the way into port are offered and sold at auction on the exchange before the trip arrives, so that the skipper receives notice in advance of where he is to dock to unload the fish. A seat on the exchange is necessary to take part in the bidding and eight or 10 buyers (fishing companies) are represented.

United States ports provide an alternative market. Upon occasion, for instance, skippers on the way to port have refused to accept the highest bid offered on the Vancouver exchange and have landed at Seattle for prices as much as seven or eight cents a pound higher.

The Co-operative Association advances to its members 60% to 70% of the market value on delivery. The final settlement comes on December 1 each year, on the basis of sales and sales prospects. The Co-operative provides other services to its members, such as ice and bait at cost; the saving on ice has been as much as \$2.50 a ton.

Halibut bought at the camps may bring the fishermen a cent or two less than the current exchange price, because of the cost of packing it in to Prince Rupert or Vancouver. Since camp halibut is usually

1 Canadian halibut vessels landing in Seattle in 1958 were reported to have averaged 24.6¢ a pound. Pacific Fisherman, Yearbook, 1958, p. 203.

bought in the gutted head-on state, the price would also reflect the loss in weight that would be incurred in beheading it at the processor's wharf. The weight loss in removing the head is about $12\frac{1}{2}\%$, and the removal of slime and of ice from the poke represents a further $1\frac{1}{2}\%$ - i.e., the recovery rate is about 86%. The grade sizes for halibut sold "head-on" allow for the weight of the head, the size limits at each end of the medium grade being $11\frac{1}{2}$ pounds and 68 pounds respectively instead of the 10-pound and 60-pound limits used for headless dressed halibut as weighed in at the plants.

The average value for each year of all Canadian halibut landings in British Columbia is shown in Table 1 above. The average value for 1958 was 20.7¢ a pound. These figures do not indicate the range of variation in prices during the season nor the variation between grades. The difference between the price of Medium halibut and the price of Chix appears to run around 5¢ to 7¢ a pound. The 1958 range of prices for Medium at Prince Rupert was from 17.2¢ to 23.3¢; for Chix 12¢ to 16¢; the median prices were, therefore, about 20¢ and 14¢ respectively. The price of Large halibut was usually close to that of Medium - sometimes even lower - and the few quotations for No. 2s were about the same as those for Chix.

E. Processing

There are about 25 handlers, some being subsidiaries of larger companies. Halibut comprises 50% or more of the business of one-third of these. Two or three subsidiaries of United States companies operate in Prince Rupert only in the halibut season. Most halibut processors deal in other fish products as well, such as fresh and frozen salmon, cod, and sole; several companies operate salmon canneries.

There has been little change since 1949 in the number of plants processing halibut. There is evidence that, for some, growth or diversification has decreased the importance of halibut in their total output. Halibut requires little processing, for the most part, except freezing, and this has not changed, although there has been some increase in the amount of steaking, filleting and packaging done by the fishing companies.

The introduction of chilled sea-water tanks as a better means of holding fish may help to spread peak processing loads over a longer period. This may be also an effect of the halibut lay-up scheme - although processors claim that, by reducing the supply of fish, it sometimes forces them to operate at low volume and high costs. The yearly catch does not vary widely and apparently there is sufficient freezing and storage capacity in existence to handle it over the six months of the fishing season.¹

¹ There is talk about the need for increased cold storage capacity at Prince Rupert.

Freezing costs for dressed halibut are estimated to be about 2¢ a pound. For the small amounts filleted, production costs of 8¢ per fillet-pound might be a generous estimate; one plant placed the direct labour cost per pound at 6¢. Because there is not much processing involved, plant wage rate increases and productivity changes over the 1949-1958 period probably had minor effects on the margin required by halibut processors for profitable operation.

Computation of the processors' costs must take account of the conversion rates from the landed weight to the weight of the various products. These are generally agreed to be 98% for frozen dressed halibut and 59%-60% for frozen fillets or flitches. Estimates of the recovery rate for steaks vary from 62%-64% up to 78%.

Storage costs are important for halibut, because of the considerable part of the production that is held up to a year before final sale. Public cold storage costs would be in the vicinity of three-quarters of a cent for the first month and one-fifth to one-quarter of a cent per month thereafter. Some of the fishing companies store in their own warehouses at 20°F. below zero.

Most of the halibut is shipped by the fishing companies in the headless dressed form; some outlets want large halibut, others small. Filleting operations usually use small halibut and some culls or No. 2s, although larger fish may be used if the demand for fillets is strong at any particular time. Flitches are produced, four to a fish, from medium and large halibut in the 40- to 80-pound size range. The processors' output of packaged items, such as frozen steaks and fish-and-chip dinners is growing, but is still a small part of the total volume.¹

Dressed halibut as a product is sold mainly on the basis of size. There is some brand differentiation of packaged items.

F. Distribution - Processor to Retail

Some of the larger fishing companies sell through exclusive brokers; the smaller ones are unable to provide the volume, variety or regularity of supply required by an exclusive agent. Brokerage rates are usually in the range of 2½% to 5%, varying presumably according to the services provided by the agent and the competitive situation, type of product, etc. British Columbia Packers have their own sales offices in the chief Canadian and United States market centres (e.g., Toronto, Montreal, Halifax, Calgary, Edmonton, Saskatoon, Winnipeg, Chicago, New York, Los Angeles, and San Francisco), and sell through brokers in other areas. The Canadian Fishing Company sell in the United States through their parent company, the New England Fishing Company. The sales agency for the Prince Rupert Fishermen's Co-operative Association in Canada is the Fishermen's Co-operative Federation of Prince Rupert.

¹ See earlier discussion re proportional utilization of landings.

In the United States, Fishermen's Federation Incorporated sells for its parents, the Fishermen's Co-operative Federation of Prince Rupert and the Halibut Producers' Co-operative of Seattle.

Sales are made to wholesale or chain stores f.o.b. British Columbia. Sales managers express a dislike for shipping on consignment, saying that it leaves their goods "out of position"; instead of consignment sales, an agent may be authorized to withdraw a specified amount from cold storage in his area. The bulk of sales are carload lots shipped on order. Some shipments (of fresh fish, for instance) are trucked to United States Pacific Coast centres.

A considerable saving is possible in shipping via the new large 60,000-pound "reefer" cars. This is apparent in the following schedule of refrigerated carload freight rates from Vancouver:

Rate in dollars per hundred pounds to:

<u>Size of Car</u>	<u>Chicago</u>	<u>Detroit</u>	<u>New York; Boston</u>
30,000 lb.	-	4.13	4.66
36,000 lb.	2.44	3.25	3.80
60,000 lb.	1.65	1.85	2.25

The tare is about 20% for fish packed in boxes, 10% if in fibreboard cartons.

Carload express rates on halibut shipped from Vancouver to New York, Boston or Montreal are as follows:

<u>Carload Minimum (lb.)</u>	<u>Rate/100 lb. (\$)</u>
20,000	6.97
22,000	6.36
24,000	5.89
30,000	5.60

As stated in an earlier part, the domestic disappearance of halibut is computed at about 35% of landings or 8.5 million pounds a year over the past nine years. More precise figures than this "residual" estimate cannot be obtained because halibut fillets and flitches are not segregated in the export statistics; flitches are, in fact, included with dressed halibut when they should more properly be included with fillets. Also data on prices received by the fishing companies for dressed halibut are not available as a series. Consequently, comparison with wholesale price series to determine the processors' and wholesalers' markups cannot be carried out.

The official (Dominion Bureau of Statistics) mid-month

wholesale price averages for frozen halibut in Vancouver and Toronto are listed in Appendix Table A4. The current transportation cost from Vancouver to Toronto is, by carload freight, about 3¢ a pound and by express, about 6¢. Consequently, the Toronto wholesale price should reflect this cost in comparison with the Vancouver price. The difference between the two quotations was 10¢ or 12¢ during 1958 and, in fact, over the past eight years; it was 7¢ to 9¢ in 1950.

The United States official average wholesale price of fresh or frozen halibut is also listed in Table A4. This is not closely comparable with either the Vancouver or Toronto wholesale price series, being an average for the United States for fresh as well as frozen halibut.

The Toronto price series and the United States average wholesale price are contained in Appendix Table A4. A gradual decline in the wholesale prices from 1951 to 1955 is apparent, followed by increasing prices through 1956, and a comparatively stable price, coupled with a somewhat wider wholesale-retail price spread, from the middle of 1957. This wider spread was chiefly the result of a 4¢ drop in the wholesale price during the first part of 1957. The retail price of fresh halibut steaks showed a more or less continuous up-trend, but this series is suspect, particularly because the monthly quotations are continuous, and not far above the price of frozen steaks, until late 1954. Fresh Pacific halibut would not be available in Toronto over 12 months of the year; fresh Atlantic halibut could have been included in the sampling by mistake, since Halifax halibut does not wear the Nova Scotia tartan in the retail store, but a more likely explanation is that frozen dressed Pacific halibut became fresh halibut steaks at the retail level - a type of metamorphosis not unfamiliar to the fish marketing trade in the past.

G. Retail Distribution

Halibut is generally the fish used in fish-and-chip stores and it is also a common item on restaurant menus. These uses may have made their influence felt on processors as a rising demand for fillets and flitches and portion packs. Retailers may do some filleting, but the frozen consumer packs are turned out mainly by the fishing companies. Much of the steaking is done in retail establishments; consequently, much of the costs involved would come out of the retail margin.

There is conflicting evidence concerning the recovery rate in steaking; one industry source placed the rate at 62% to 64%; other figures are as high as 78%. The rate to be used in computing the wholesale-to-retail margin and the fishermen's share of the retail dollar spent for halibut steaks has been set arbitrarily at 75%.

On the basis of Toronto prices, retailers gradually increased their markup on frozen halibut steaks from 15% to 20% of selling price

in the early '50's to 30% to 36% in 1955 (when the retail price was lowest). During late 1956 and early 1957, the markup was below 25%, but it hovered in the vicinity of 30% thereafter. The absolute margin was much less changeable, the percentage markup figures being affected by correlated movements up or down of both wholesale and retail prices.

Consumption is computed as a residual figure: production minus changes in stocks minus exports. Incomplete data on stocks and exports relating to fillets prevent a close estimate of yearly consumption. Over the nine years 1950-58, average domestic disappearance was of the order of $8\frac{1}{2}$ million pounds in terms of landed weight. (See Section B.) Using the June, 1954, population figure for Canada of 15.2 million persons (1954 was the median year), consumption of halibut was less than three-fifths of a pound (0.56 lb.) per person a year. In terms of edible weight (say, 60% of landed weight), the average is much smaller - about a third of a pound per person.

Although little is known about consumer behaviour regarding fish in general, or halibut in particular, it is hard to believe that the current methods of marketing halibut are unrelated to the demand for the product. Halibut that has been in frozen storage for months - particularly if the temperature has not been maintained well below zero Fahrenheit - tends to become dessicated and discoloured. Even so, the halibut evidently retains enough of its original high quality to sell at prices above those obtainable for other groundfish species.

It may be that a considerable part of the halibut marketed goes to the restaurant trade. Surveys of wholesale and retail fish marketing in central Canadian cities made by the Department of Fisheries some 10 years ago indicated that as much as 40% of wholesale fish sales may be made to hotels, restaurants and institutions. It is likely that halibut, because of its use in restaurant menus and in fish-and-chip dinners, would represent a high proportion of fish sales to such outlets. It is likely, too, that frozen halibut going into restaurants is not subject to defrosting before delivery and may, therefore, reach the consumer's plate in better condition than much that is sold through retail stores.

H. Measurement of the Price Spread

Five-pound cellophane wrapped packs of halibut fillets sold for 58¢ to 60¢ at wholesale in Toronto in 1958, according to White Fish Company's price lists. For the first half of 1958, at least, this would have been halibut caught in 1957, at an average landed cost of 16.3¢ a pound. With a recovery rate of 59% in filleting, the landed price would represent a raw material cost of $27\frac{1}{2}$ ¢ per fillet-pound. However, assuming that Chicken or No. 2 halibut were filleted, at a landed cost of about 12¢, the raw material cost of fillets would be about 20¢ a pound. Assuming processing costs of 9¢ or 10¢ a pound and transportation costs Vancouver to Toronto of 6¢, there would remain 23¢ to 25¢, or 40% on the wholesale price, for division between processor and wholesaler.

The major part of the halibut sold at retail would be in the form of steaks, and here there is uncertainty as to the validity of a 75% recovery rate. Be that as it may, the fishermen's price and the wholesale-retail margin have been computed as shares of the retail dollar and the results appear in Appendix Table A5. The average landed price for the year is used from May to the following April in comparison with monthly retail values (the latter obtained by multiplying the Toronto retail price for steaks by 75/100 to determine the retail value equivalent per pound of halibut as landed by the fishermen).

The Toronto price would include a transportation cost of 3¢ a pound (6¢ for express) on dressed halibut - which would become 4¢ (to 8¢) per pound of steaks. There would be also a progressively increasing storage cost attached to sales from the beginning of the production year. Presumably the transportation costs and some part of the storage costs are added at wholesale and retail levels.

From Table A5, the fishermen's share of the retail dollar spent for halibut steaks has varied usually between 30% and 40%, and was about 38% during the last half of 1958. Retailers' margins were around the 30% level in 1958, up to 36.7% in 1955, and as low as 15% in the early '50's.

APPENDIX TABLE A1. CANADIAN EXPORTS OF FRESH AND FROZEN
DRESSED PACIFIC HALIBUT, 1950 TO 1958

Calendar Year	Quantity (thousand lb.)			Value (\$ thousand)		
	Fresh Dressed Halibut	Frozen Dressed Halibut	Total Fresh and Frozen Dressed	Fresh Dressed Halibut	Frozen Dressed Halibut	Total Fresh and Frozen Dressed
1950	2,193	7,666	9,859	605	2,295	2,900
1951	2,354	8,022	10,376	516	2,346	2,862
1952	2,925	9,990	12,915	623	2,797	3,420
1953	2,587	9,484	12,071	511	2,572	3,083
1954	4,268	11,291	15,559	804	3,088	3,892
1955	3,466	10,961	14,427	541	2,416	2,957
1956	3,551	8,876	12,427	858	2,576	3,434
1957	3,549	10,378	13,927	692	2,908	3,600
1958	5,264	11,203	16,467	1,173	3,309	4,482
Average, 1950-58	3,351	9,763	13,114	702	2,701	3,403

Source: Trade of Canada, D.B.S., Department of Trade and Commerce,
Ottawa.

APPENDIX TABLE A2. COLD STORAGE HOLDINGS OF PACIFIC HALIBUT
IN CANADA, YEAR-END, 1949 TO 1958

(Thousands of Pounds)

<u>Year Ending Dec. 31</u>	<u>Dressed</u>	<u>Fillets</u>	<u>Steaks</u>
1949	5,155 ^a	-	-
1950	5,783 ^a	-	-
1951	6,988 ^a	-	-
1952	6,582	940	19
1953	8,556	1,267	24
1954	9,067	1,047	32
1955	5,704	756	38
1956	9,815	1,000	53
1957	6,574	1,587	50
1958 ^b	7,254	1,200	54

a Combined stocks of dressed halibut, fillets and steaks.

b Preliminary figures.

Source: Cold Storage Holdings of Fish, D.B.S., Department of Trade and Commerce, Ottawa (monthly).

APPENDIX TABLE A3. BRITISH COLUMBIA HALIBUT LANDINGS,
BY MONTHS, 1949 TO 1958

<u>Month</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>	<u>1956</u>	<u>1957^a</u>	<u>1958^a</u>
	(thousand pounds)									
Jan.	-	-	-	-	-	-	-	-	-	-
Feb.	-	-	-	-	-	-	-	-	-	-
March	-	-	-	-	-	-	-	-	-	-
April	-	-	-	-	-	-	-	-	488	833
May	11,072	9,519	14,995	11,544	9,016	8,392	7,315	5,336	7,977	8,329
June	4,342	7,447	4,072	7,298	10,060	7,693	5,986	8,149	6,638	9,137
July	1,955	1,450	696	3,033	2,846	3,809	3,072	3,929	4,603	5,952
Aug.	132	35	1,117	1,535	1,956	4,231	3,125	2,716	3,479	2,383
Sept.	71	10	61	38	164	170	26	3,030	1,010	1,839
Oct.	22	13	34	34	14	28	123	155	173	102
Nov.	15	8	2	6	4	4	22	-	8	5
Dec.	-	-	-	-	-	-	10	-	-	-

APPENDIX TABLE A3. BRITISH COLUMBIA HALIBUT LANDINGS,
BY MONTHS, 1949 TO 1958 (Cont'd.)

<u>Month</u>	<u>1949</u>	<u>1950</u>	<u>1951</u>	<u>1952</u>	<u>1953</u>	<u>1954</u>	<u>1955</u>	<u>1956</u>	<u>1957^a</u>	<u>1958^a</u>
	(\$ thousand)									
Jan.	-	-	-	-	-	-	-	-	-	-
Feb.	-	-	-	-	-	-	-	-	-	-
March	-	-	-	-	-	-	-	-	-	-
April	-	-	-	-	-	-	-	-	62	205
May	1,670	1,768	2,477	1,822	1,127	1,175	859	1,014	1,165	1,555
June	722	1,650	785	1,204	1,509	1,231	749	1,711	1,132	1,976
July	346	428	138	607	501	689	442	974	814	1,314
Aug.	22	8	245	307	358	719	478	644	623	536
Sept.	12	2	12	8	27	28	5	688	183	405
Oct.	5	3	8	7	4	5	18	36	32	20
Nov.	3	2	-	1	1	1	3	-	2	1
Dec.	-	-	-	-	-	-	1	-	-	-

^a Landings in United States ports included in 1957 and 1958 figures.

Source: Monthly Review of Canadian Fisheries Statistics, D.B.S.

APPENDIX TABLE A4. SELECTED MONTHLY WHOLESALE AND RETAIL PRICE SERIES
FOR PACIFIC HALIBUT, 1950 TO 1958

(Cents Per Pound)

United States Average Wholesale Price of Fresh and Frozen Halibut <u>(1)</u>	White's Fish Co., Toronto Wholesale Frozen 5-lb. Cello <u>(2)</u>	Mid-Month Wholesale Price Frozen Halibut 10-60 lb. <u>Vancouver</u> <u>Toronto</u> (3) (4)		1st of Month Retail Price of Halibut Steaks <u>Frozen</u> <u>Fresh</u> <u>Vancouver</u> <u>Toronto</u> <u>Toronto</u> (5) (6) (7)		
<u>1950</u>						
Jan.		26.1	33.9	40.0	52.7	58.6
Feb.		26.9	34.2	40.0	54.0	60.0
March		26.3	34.9	40.0	54.2	61.3
April		26.3	34.8	39.0	54.4	61.3
May		28.0	34.8	39.7	53.6	61.3
June		32.0	38.9	-	57.6	62.0
July		33.5	40.6	-	60.1	62.6
Aug.		34.0	40.6	45.6	61.2	62.6
Sept.		34.0	44.6	45.6	64.3	65.4
Oct.		35.3	44.6	46.6	67.6	69.1
Nov.		35.3	44.4	46.6	68.3	71.1
Dec.		35.3	44.4	46.6	68.3	72.8

APPENDIX TABLE A4. SELECTED MONTHLY WHOLESALE AND RETAIL PRICE SERIES
FOR PACIFIC HALIBUT, 1950 TO 1958 (Cont'd.)

(Cents Per Pound)

United States Average Wholesale Price of Fresh and Frozen Halibut	White's Fish Co., Toronto Wholesale Frozen 5-lb. Cello	Mid-Month Wholesale Price Frozen Halibut 10-60 lb.	1st of Month Retail Price of Halibut Steaks			
<u>Frozen Halibut</u> (1)	<u>Cello</u> (2)	<u>Vancouver</u> (3)	<u>Toronto</u> (4)	<u>Frozen</u> <u>Vancouver</u> (5)	<u>Toronto</u> (6)	<u>Fresh</u> <u>Toronto</u> (7)
1951						
Jan.		35.0	44.6	47.6	68.3	71.1
Feb.		39.1	44.6	47.6	68.8	71.1
March		35.0	44.4	47.6	68.5	71.1
April		32.5	43.9	48.0	68.8	71.5
May		-	43.0	46.1	68.8	71.2
June		26.5	42.6	-	68.8	70.8
July		27.2	41.0	-	-	71.6
Aug.		27.2	41.0	-	68.8	71.6
Sept.		27.5	41.1	-	69.0	72.2
Oct.		28.2	40.8	47.6	68.7	72.8
Nov.		28.2	40.9	47.0	68.2	72.8
Dec.		28.2	40.9	47.8	68.2	72.8

APPENDIX TABLE A4. SELECTED MONTHLY WHOLESALE AND RETAIL PRICE SERIES
FOR PACIFIC HALIBUT, 1950 TO 1958 (Cont'd.)

(Cents Per Pound)

United States Average Wholesale Price of Fresh and Frozen Halibut	White's Fish Co., Toronto Wholesale Frozen 5-lb. Cello	Mid-Month Wholesale Price Frozen Halibut 10-60 lb.		1st of Month Retail Price of Halibut Steaks		
<u>(1)</u>	<u>(2)</u>	<u>Vancouver</u> (3)	<u>Toronto</u> (4)	<u>Frozen</u>		<u>Fresh</u>
				<u>Vancouver</u> (5)	<u>Toronto</u> (6)	<u>Toronto</u> (7)
1952						
Jan.	59	28.2	40.9	47.8	69.2	72.8
Feb.	59	28.5	40.9	47.8	69.2	72.8
March	59	28.5	40.0	47.8	69.5	73.7
April 35	59	28.5	39.2	47.8	69.6	73.7
May 35	59	28.5	38.6	47.8	69.0	73.7
June 33	59	-	38.6	-	69.0	72.2
July 35	59	27.2	38.3	-	68.8	72.2
Aug. 31	59	26.9	38.3	-	69.0	72.2
Sept. 53	59	26.6	38.3	47.8	69.0	72.2
Oct. 42	59	26.6	38.1	47.8	68.4	73.0
Nov. 44	59	26.6	38.1	47.8	68.4	73.0
Dec. 34	59	26.6	38.1	47.8	67.6	73.0

APPENDIX TABLE A4. SELECTED MONTHLY WHOLESALE AND RETAIL PRICE SERIES
FOR PACIFIC HALIBUT, 1950 TO 1958 (Cont'd.)

(Cents Per Pound)

	United States	White's Fish Co., Toronto Wholesale Frozen 5-lb. Cello	Mid-Month		1st of Month		
	Average		Wholesale	Retail Price		Fresh Toronto	
	Wholesale		Price	of Halibut Steaks			
	Price of Fresh and Frozen Halibut		Frozen Halibut 10-60 lb.	Frozen	Frozen		
	(1)	(2)	Vancouver (3)	Toronto (4)	Vancouver (5)	Toronto (6)	
1953							
Jan.	33	59	26.6	38.1	47.8	67.1	73.0
Feb.	32	59	26.6	36.2	47.8	67.7	73.0
March	33	-	26.6	36.2	47.8	67.7	73.7
April	31	-	26.6	35.9	47.8	67.7	73.7
May	29	46	25.0	35.3	47.8	68.0	73.6
June	31	-	22.2	34.6	47.8	66.6	72.3
July	33	46	23.2	34.2	44.3	67.3	73.9
Aug.	31	46	23.4	34.2	44.3	64.8	76.4
Sept.	30	-	23.4	34.8	44.3	64.5	75.5
Oct.	30	57	23.6	35.0	43.2	64.5	75.5
Nov.	30	57	24.4	34.7	43.8	64.2	75.9
Dec.	30	-	24.4	34.7	44.2	64.2	74.9

APPENDIX TABLE A4. SELECTED MONTHLY WHOLESALE AND RETAIL PRICE SERIES
FOR PACIFIC HALIBUT, 1950 TO 1958 (Cont'd.)

(Cents Per Pound)

	United States	White's Fish	Mid-Month		1st of Month		
	Average	Co., Toronto	Wholesale		Retail Price		
	Wholesale	Wholesale	Price		of Halibut Steaks		
	Price of	Frozen 5-lb.	Frozen Halibut				
	Fresh and		10-60 lb.		Frozen		Fresh
	Frozen Halibut	Cello	Vancouver	Toronto	Vancouver	Toronto	Toronto
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>1954</u>							
Jan.	31	55	24.3	34.7	44.2	64.6	76.4
Feb.	31	55	24.3	34.6	45.0	64.6	77.5
March	31	55	24.3	35.0	45.0	64.5	76.0
April	31	55	24.4	34.3	45.0	64.5	76.3
May	32	55	24.4	34.4	45.0	64.5	76.3
June	33	55	25.0	34.4	40.0	64.8	76.0
July	34	55	25.0	34.4	45.0	65.3	75.6
Aug.	32	55	25.0	34.4	-	64.1	74.4
Sept.	45	55	25.2	34.1	45.0	64.3	74.4
Oct.	32	55	25.2	34.1	-	64.7	73.0
Nov.	30	57	25.2	34.0	46.0	64.5	-
Dec.	28	57	25.2	34.1	46.0	64.4	77.5

APPENDIX TABLE A4. SELECTED MONTHLY WHOLESALE AND RETAIL PRICE SERIES
FOR PACIFIC HALIBUT, 1950 TO 1958 (Cont'd.)

(Cents Per Pound)

	United States	White's Fish	Mid-Month		1st of Month		
	Average	Co., Toronto	Wholesale		Retail Price		
	Wholesale	Wholesale	Price		of Halibut Steaks		
	Price of	Frozen 5-lb.	Frozen Halibut				
	Fresh and		10-60 lb.				
	<u>Frozen Halibut</u>	<u>Cello</u>	<u>Vancouver</u>	<u>Toronto</u>	<u>Vancouver</u>	<u>Toronto</u>	<u>Toronto</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>1955</u>							
Jan.	28	57	24.5	33.8	45.0	64.4	-
Feb.	26	57	22.2	32.0	45.0	63.2	-
March	24	57	22.1	31.8	44.0	63.0	-
April	22	57	22.1	30.4	44.0	62.2	80.0
May	22	57	22.1	30.4	44.0	61.6	80.0
June	24	57	20.2	29.6	44.0	61.8	77.5
July	29	55	21.9	29.2	44.0	60.2	76.2
Aug.	34	55	21.9	29.4	-	60.2	76.2
Sept.	43	55	22.2	31.0	-	60.5	-
Oct.	32	55	22.2	34.0	-	61.0	-
Nov.	27	-	23.4	34.5	-	61.8	-
Dec.	28	-	23.4	34.8	-	63.3	-

APPENDIX TABLE A4. SELECTED MONTHLY WHOLESALE AND RETAIL PRICE SERIES
FOR PACIFIC HALIBUT, 1950 TO 1958 (Cont'd.)

(Cents Per Pound)

United States	White's Fish	Mid-Month	1st of Month				
Average	Co., Toronto	Wholesale	Retail Price				
Wholesale	Wholesale	Price	of Halibut Steaks				
Price of	Frozen 5-lb.	Frozen Halibut					
Fresh and		10-60 lb.					
<u>Frozen Halibut</u>	<u>Cello</u>	<u>Vancouver</u>	<u>Frozen</u>				
(1)	(2)	(3)	(5)				
		Toronto	Toronto				
		(4)	(6)				
			(7)				
<u>1956</u>							
Jan.	29	25.2	36.0	-	63.3	-	
Feb.	32	59	25.5	37.6	-	65.3	-
March	32	-	26.8	37.7	-	66.6	80.0
April	34	59	26.8	37.7	-	66.7	80.0
May	40	59	27.2	38.5	-	66.7	-
June	34	59	30.5	38.5	-	68.0	80.0
July	40	59	32.0	40.6	-	67.3	80.0
Aug.	44	59	33.0	40.6	-	68.1	81.2
Sept.	45	-	33.5	41.9	-	69.5	88.0
Oct.	43	-	33.5	41.9	-	70.0	88.8
Nov.	37	70	33.5	41.9	-	71.4	-
Dec.	35	70	33.5	42.4	-	71.4	-

APPENDIX TABLE A4. SELECTED MONTHLY WHOLESALE AND RETAIL PRICE SERIES
FOR PACIFIC HALIBUT, 1950 TO 1958 (Cont'd.)

(Cents Per Pound)

	United States Average Wholesale Price of Fresh and Frozen Halibut	White's Fish Co., Toronto Wholesale Frozen 5-lb. Cello	Mid-Month Wholesale Price Frozen Halibut 10-60 lb.		1st of Month Retail Price of Halibut Steaks		
	<u>Frozen Halibut</u> (1)	<u>Cello</u> (2)	<u>Vancouver</u> (3)	<u>Toronto</u> (4)	<u>Frozen</u> <u>Vancouver</u> (5)	<u>Toronto</u> (6)	<u>Fresh</u> <u>Toronto</u> (7)
<u>1957</u>							
Jan.	35	70	33.5	42.4	60.0	71.4	-
Feb.	34	70	33.0	42.4	60.0	71.0	-
March	31	70	31.8	41.2	58.7	71.8	-
April	30	60	29.2	40.0	58.7	71.3	87.5
May	29	-	25.3	39.2	52.3	70.1	87.5
June	33	60	-	38.1	-	69.6	87.5
July	37	60	-	38.8	-	70.4	87.5
Aug.	32	60	24.5	38.1	-	69.1	87.5
Sept.	44	-	25.1	38.4	-	71.0	-
Oct.	35	59	24.8	38.4	-	70.2	87.2
Nov.	31	59	24.8	38.2	-	71.0	87.2
Dec.	31	59	24.8	38.2	-	70.9	-

APPENDIX TABLE A4. SELECTED MONTHLY WHOLESALE AND RETAIL PRICE SERIES
FOR PACIFIC HALIBUT, 1950 TO 1958 (Cont'd.)

(Cents Per Pound)

	United States Average Wholesale Price of Fresh and <u>Frozen Halibut</u>	White's Fish Co., Toronto Wholesale Frozen 5-lb. <u>Cello</u>	Mid-Month Wholesale Price Frozen Halibut 10-60 lb.		1st of Month Retail Price of Halibut Steaks		
	<u>(1)</u>	<u>(2)</u>	<u>Vancouver</u>	<u>Toronto</u>	<u>Frozen</u> <u>Vancouver</u>	<u>Toronto</u>	<u>Fresh</u> <u>Toronto</u>
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
<u>1958</u>							
Jan.	31	60	25.2	38.2	60.0	71.4	-
Feb.	32	60	25.8	38.5	-	72.0	-
March	32	-	25.8	38.5	52.0	72.6	-
April	34	58	25.8	38.8	51.8	72.2	-
May	35	58	-	38.8	53.4	70.4	-
June	40	58	-	38.8	-	71.5	-
July	40	60	-	38.0	-	71.2	-
Aug.	37	60	27.7	38.0	-	72.2	-
Sept.	37	60	28.3	38.8	-	71.8	-
Oct.	34	60	28.3	38.8	-	72.5	-
Nov.	34	60	28.3	38.8	-	72.3	-
Dec.	34	-	28.8	38.8	-	72.0	-

Sources: Vancouver and Toronto wholesale and retail price series as published in the Monthly Review of Canadian Fisheries Statistics, D.B.S., Ottawa. The United States average wholesale price published monthly in the Daily Fishery Report, Market News Services, Bureau of Commercial Fisheries, United States Department of the Interior. White's Fish Company prices by courtesy of the Economics Branch, Department of Fisheries of Canada, Ottawa.

APPENDIX TABLE A5. EQUIVALENT VALUES AT TORONTO OF FROZEN DRESSED HALIBUT
AT WHOLESALE AND FROZEN HALIBUT STEAKS AT RETAIL, PER
POUND OF HALIBUT AS LANDED BY FISHERMEN.

	Dressed Halibut Wholesale Price x 98/100 <u>(¢)</u> (1)	Halibut Steaks Retail Price x 75/100 <u>(¢)</u> (2)	Wholesale- Retail Margin (2)-(1) ^a <u>(¢)</u> (3)	Retail Margin as a % of Retail Value <u>(3) x 100</u> (2) <u>(%)</u> (4)	Yearly Average Landed Value of Halibut <u>(¢/lb.)</u> (5)	Fishermen's Share of the Retail Dollar <u>(5) x 100</u> (2) <u>(%)</u> (6)
1950						
Jan.	33.2	39.5	-	-	15.5	39.2
Feb.	33.5	40.5	7.3	18.0	15.5	38.3
March	34.2	40.7	7.2	17.7	15.5	38.1
April	34.1	40.8	6.6	16.2	15.5	38.0
May	34.1	40.2	6.1	15.2	20.3	50.5
June	38.1	43.2	9.1	21.1	20.3	47.0
July	39.8	45.1	7.0	15.5	20.3	45.0
Aug.	39.8	45.9	6.1	13.3	20.3	44.2
Sept.	43.7	48.2	8.4	17.4	20.3	42.1
Oct.	43.7	50.7	7.0	13.8	20.3	40.0
Nov.	43.5	51.2	7.5	14.6	20.3	39.6
Dec.	43.5	51.2	7.7	15.0	20.3	39.6

APPENDIX TABLE A5. EQUIVALENT VALUES AT TORONTO OF FROZEN DRESSED HALIBUT
AT WHOLESALE AND FROZEN HALIBUT STEAKS AT RETAIL, PER
POUND OF HALIBUT AS LANDED BY FISHERMEN (Cont'd.).

	Dressed Halibut Wholesale Price x 98/100 (¢) (1)	Halibut Steaks Retail Price x 75/100 (¢) (2)	Wholesale- Retail Margin (2)-(1) ^a (¢) (3)	Retail Margin as a % of Retail Value (3) x 100 (2) (%) (4)	Yearly Average Landed Value of Halibut (¢/lb.) (5)	Fishermen's Share of the Retail Dollar (5) x 100 (2) (%) (6)
<u>1951</u>						
Jan.	43.7	51.2	7.7	15.0	20.3	39.6
Feb.	43.7	51.6	7.9	15.3	20.3	39.3
March	43.5	51.4	7.7	15.0	20.3	39.5
April	43.0	51.6	8.1	15.7	20.3	39.3
May	42.1	51.6	8.6	16.7	17.0	32.9
June	41.7	51.6	9.5	18.4	17.0	32.9
July	40.2	-	-	-	17.0	-
Aug.	40.2	51.6	11.4	22.1	17.0	32.9
Sept.	40.3	51.8	11.6	22.4	17.0	32.8
Oct.	40.0	51.5	11.2	21.7	17.0	33.0
Nov.	40.1	51.2	11.2	21.9	17.0	33.2
Dec.	40.1	51.2	11.1	21.6	17.0	33.2

APPENDIX TABLE A5. EQUIVALENT VALUES AT TORONTO OF FROZEN DRESSED HALIBUT
AT WHOLESALE AND FROZEN HALIBUT STEAKS AT RETAIL, PER
POUND OF HALIBUT AS LANDED BY FISHERMEN (Cont'd.).

	Dressed Halibut Wholesale Price x 98/100 (¢) <hr/> (1)	Halibut Steaks Retail Price x 75/100 (¢) <hr/> (2)	Wholesale- Retail Margin (2)-(1) ^a (¢) <hr/> (3)	Retail Margin as a % of Retail Value (3) x 100 (2) (%) <hr/> (4)	Yearly Average Landed Value of Halibut (¢/lb.) (5) <hr/> (5)	Fishermen's Share of the Retail Dollar (5) x 100 (2) (%) <hr/> (6)
1952						
Jan.	40.1	51.9	11.8	22.7	17.0	32.8
Feb.	40.1	51.9	11.8	22.7	17.0	32.8
March	39.2	52.1	12.0	23.0	17.0	32.6
April	38.4	52.2	13.0	24.9	17.0	32.6
May	37.8	51.8	13.4	25.9	16.8	32.4
June	37.8	51.8	14.0	27.0	16.8	32.4
July	37.5	51.6	13.8	26.7	16.8	32.6
Aug.	37.5	51.8	14.3	22.1	16.8	32.4
Sept.	37.5	51.8	14.3	27.6	16.8	32.4
Oct.	37.3	51.3	13.8	26.9	16.8	32.7
Nov.	37.3	51.3	14.0	27.3	16.8	32.7
Dec.	37.3	50.7	13.4	26.4	16.8	33.1

APPENDIX TABLE A5. EQUIVALENT VALUES AT TORONTO OF FROZEN DRESSED HALIBUT
AT WHOLESALE AND FROZEN HALIBUT STEAKS AT RETAIL, PER
POUND OF HALIBUT AS LANDED BY FISHERMEN (Cont'd.).

	Dressed Halibut Wholesale Price x 98/100 (1)	Halibut Steaks Retail Price x 75/100 (2)	Wholesale- Retail Margin (2)-(1) ^a (3)	Retail Margin as a % of Retail Value (3) x 100 (2) (4)	Yearly Average Landed Value of Halibut (¢/lb.) (5)	Fishermen's Share of the Retail Dollar (5) x 100 (2) (6)
<u>1953</u>						
Jan.	37.3	50.3	13.0	25.8	16.8	33.4
Feb.	35.5	50.8	13.5	26.6	16.8	33.1
March	35.5	50.8	15.3	30.1	16.8	33.1
April	35.2	50.8	15.3	30.1	16.8	33.1
May	34.6	51.0	15.8	31.0	14.7	28.8
June	33.9	50.0	15.4	30.8	14.7	29.4
July	33.5	50.5	16.6	32.9	14.7	29.1
Aug.	33.5	48.6	15.1	31.1	14.7	30.2
Sept.	34.1	48.4	14.9	30.8	14.7	30.4
Oct.	34.3	48.4	14.3	29.5	14.7	30.4
Nov.	34.0	48.2	13.9	28.8	14.7	30.5
Dec.	34.0	48.2	14.2	29.5	14.7	30.5

APPENDIX TABLE A5. EQUIVALENT VALUES AT TORONTO OF FROZEN DRESSED HALIBUT
AT WHOLESALE AND FROZEN HALIBUT STEAKS AT RETAIL, PER
POUND OF HALIBUT AS LANDED BY FISHERMEN (Cont'd.).

Dressed Halibut Wholesale Price x 98/100 <u>(¢)</u> (1)	Halibut Steaks Retail Price x 75/100 <u>(¢)</u> (2)	Wholesale- Retail Margin (2)-(1) ^a <u>(¢)</u> (3)	Retail Margin as a % of Retail Value (3) x 100 (2) <u>(%)</u> (4)	Yearly Average Landed Value of Halibut <u>(¢/lb.)</u> (5)	Fishermen's Share of the Retail Dollar (5) x 100 (2) <u>(%)</u> (6)
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1954

Jan.	34.0	48.5	14.5	29.9	14.7	30.3
Feb.	33.9	48.5	14.5	29.9	14.7	30.3
March	34.3	48.4	14.5	30.0	14.7	30.4
April	33.6	48.4	14.1	29.1	14.7	30.4
May	33.7	48.4	14.8	30.6	15.8	32.6
June	33.7	48.6	14.9	30.7	15.8	32.5
July	33.7	49.0	15.3	31.2	15.8	32.2
Aug.	33.7	48.1	14.4	29.9	15.8	32.8
Sept.	33.4	48.2	14.5	30.1	15.8	32.8
Oct.	33.4	48.5	15.1	31.1	15.8	32.6
Nov.	33.3	48.4	15.0	31.0	15.8	32.6
Dec.	33.4	48.3	15.0	31.1	15.8	32.7

APPENDIX TABLE A5. EQUIVALENT VALUES AT TORONTO OF FROZEN DRESSED HALIBUT AT WHOLESALE AND FROZEN HALIBUT STEAKS AT RETAIL, PER POUND OF HALIBUT AS LANDED BY FISHERMEN (Cont'd.).

	Dressed Halibut Wholesale Price x 98/100 <u>(¢)</u> (1)	Halibut Steaks Retail Price x 75/100 <u>(¢)</u> (2)	Wholesale- Retail Margin (2)-(1) ^a <u>(¢)</u> (3)	Retail Margin as a % of Retail Value (3) x 100 (2) <u>(%)</u> (4)	Yearly Average Landed Value of Halibut <u>(¢/lb.)</u> (5)	Fishermen's Share of the Retail Dollar (5) x 100 (2) <u>(%)</u> (6)
<u>1955</u>						
Jan.	33.1	48.3	14.9	30.8	15.8	32.7
Feb.	31.4	47.4	14.3	30.2	15.8	33.3
March	31.2	47.3	15.9	33.6	15.8	33.4
April	29.8	46.7	15.5	33.2	15.8	33.8
May	29.8	46.2	16.4	35.5	13.0	28.1
June	29.0	46.4	16.6	35.8	13.0	28.0
July	28.6	45.2	16.2	35.8	13.0	28.8
Aug.	28.8	45.2	16.6	36.7	13.0	28.8
Sept.	30.4	45.4	16.6	36.6	13.0	28.6
Oct.	33.3	45.8	15.4	33.6	13.0	28.4
Nov.	33.8	46.4	13.1	28.2	13.0	28.0
Dec.	34.1	47.5	13.7	28.8	13.0	27.4

APPENDIX TABLE A5. EQUIVALENT VALUES AT TORONTO OF FROZEN DRESSED HALIBUT
AT WHOLESALE AND FROZEN HALIBUT STEAKS AT RETAIL, PER
POUND OF HALIBUT AS LANDED BY FISHERMEN (Cont'd.).

	Dressed Halibut Wholesale Price x 98/100 <u>(¢)</u> (1)	Halibut Steaks Retail Price x 75/100 <u>(¢)</u> (2)	Wholesale- Retail Margin (2)-(1) ^a <u>(¢)</u> (3)	Retail Margin as a % of Retail Value (3) x 100 (2) <u>(%)</u> (4)	Yearly Average Landed Value of Halibut (¢/lb.) <u>(¢/lb.)</u> (5)	Fishermen's Share of the Retail Dollar (5) x 100 (2) <u>(%)</u> (6)
1956						
Jan.	35.3	47.5	13.4	28.2	13.0	27.4
Feb.	36.8	49.0	13.7	28.0	13.0	26.5
March	36.9	50.0	13.2	26.4	13.0	26.0
April	36.9	50.0	13.1	26.2	13.0	26.0
May	37.7	50.0	13.1	26.2	21.7	43.4
June	37.7	51.0	13.3	26.1	21.7	42.5
July	39.8	50.5	12.8	25.3	21.7	43.0
Aug.	39.8	51.1	11.3	22.1	21.7	42.5
Sept.	41.1	52.1	12.3	23.6	21.7	41.7
Oct.	41.1	52.5	11.4	21.7	21.7	41.3
Nov.	41.1	53.6	12.5	23.3	21.7	40.5
Dec.	41.6	53.6	12.5	23.3	21.7	40.5

APPENDIX. TABLE A5. EQUIVALENT VALUES AT TORONTO OF FROZEN DRESSED HALIBUT
AT WHOLESALE AND FROZEN HALIBUT STEAKS AT RETAIL, PER
POUND OF HALIBUT AS LANDED BY FISHERMEN (Cont'd.).

	Dressed Halibut Wholesale Price x 98/100 (¢) (1)	Halibut Steaks Retail Price x 75/100 (¢) (2)	Wholesale- Retail Margin (2)-(1) ^a (¢) (3)	Retail Margin as a % of Retail Value (3) x 100 (2) (%) (4)	Yearly Average Landed Value of Halibut (¢/lb.) (5)	Fishermen's Share of the Retail Dollar (5) x 100 (2) (%) (6)
<u>1957</u>						
Jan.	41.6	53.6	12.0	22.4	21.7	40.5
Feb.	41.6	53.3	11.7	22.0	21.7	40.7
March	40.4	53.9	12.3	22.8	21.7	40.3
April	39.2	53.5	13.1	24.5	21.7	40.6
May	38.4	52.6	13.4	25.5	16.3	31.0
June	37.3	52.2	13.8	26.4	16.3	31.2
July	38.0	52.8	15.5	29.4	16.3	30.9
Aug.	37.3	51.8	13.8	26.6	16.3	31.5
Sept.	37.6	53.3	16.0	30.0	16.3	30.6
Oct.	37.6	52.7	15.1	28.7	16.3	30.9
Nov.	37.4	53.3	15.7	29.5	16.3	30.6
Dec.	37.4	53.2	15.8	29.7	16.3	30.6

APPENDIX TABLE A5. EQUIVALENT VALUES AT TORONTO OF FROZEN DRESSED HALIBUT AT WHOLESALE AND FROZEN HALIBUT STEAKS AT RETAIL, PER POUND OF HALIBUT AS LANDED BY FISHERMEN (Cont'd.)

	Dressed Halibut Wholesale Price x 98/100 (¢) (1)	Halibut Steaks Retail Price x 75/100 (¢) (2)	Wholesale- Retail Margin (2)-(1) ^a (¢) (3)	Retail Margin as a % of Retail Value (3) x 100 (2) (%) (4)	Yearly Average Landed Value of Halibut (¢/lb.) (5)	Fishermen's Share of the Retail Dollar (5) x 100 (2) (%) (6)
<u>1958</u>						
Jan.	37.4	53.6	16.2	30.2	16.3	30.4
Feb.	37.7	54.0	16.6	30.7	16.3	30.2
March	37.7	54.5	16.8	30.8	16.3	29.9
April	38.0	54.2	16.5	30.4	16.3	30.1
May	38.0	52.8	14.8	28.0	20.7	39.2
June	38.0	53.6	15.6	29.1	20.7	38.6
July	37.2	53.4	15.4	28.8	20.7	38.8
Aug.	37.2	54.2	17.0	31.4	20.7	38.2
Sept.	38.0	53.9	16.7	31.0	20.7	38.4
Oct.	38.0	54.4	16.4	30.1	20.7	38.1
Nov.	38.0	54.2	16.2	29.9	20.7	38.8
Dec.	38.0	54.0	16.0	29.6	20.7	38.3

a The retail price is lagged half-a-month, e.g., the mid-month January wholesale value is deducted from the 1st of February retail value, and so on.

LOBSTERS

1. The Raw Material

The crustacean *Homarus americanus*, or American lobster is much like its fresh-water relative, the crayfish. The upper part of the body is protected by a hard shell or carapace. Attached to the underside of the body are many appendages, including four pairs of walking legs, a pair of large claws for capturing food, five pairs of mouth parts serving to hold the food, a pair of small feelers in which the sense of smell resides, the two long feelers concerned with touch, a pair of swimmerets projecting from each of the five tail segments, and the tail fan on the last segment. The colour varies from greenish-blue to reddish-brown, generally with greenish-black spots on the carapace. The lobster is red only after it has been boiled.

The lobster lives and scavenges for food on the bottom in depths from one to 20 fathoms. Small live fish may be captured, but the usual food consists of dead fish and such fixed or slow-moving animals as shellfish and worms. Feeding and growth are slower in cold water. Maturity is reached at about five years of age and a length of eight or nine inches in warm waters. The lobster grows by "moulting" or shedding its shell. After maturity, the female grows more slowly than the male, because females may moult one year and lay eggs the next, and cannot moult again until the eggs are hatched 11 or 12 months after they are laid.

The eggs when laid are covered with a sticky cement which hardens and holds them firmly attached to the female in a pocket formed by the curve of the tail. An eight-inch female carries about 5,000 eggs, while one of 16 inches carries about 60,000. The taking of such egg-bearing or "berried" lobsters has been illegal in Canada since 1873.

Lobsters must be kept alive up to the time when they are boiled, in the home or restaurant or processing plant, but they will live for long periods after removal from the water if the temperature is kept low. Fresh water is lethal to lobsters, hence they must be kept from direct contact with melting ice during shipment. Lobsters awaiting shipment are usually held in the seawater of the harbour in "floats"; the crates containing 110 to 120 pounds of lobsters are tied to a line to hold them together, floating barely submerged in the water. Sudden heavy rains may cover the harbour with a layer of fresh water, and this may kill many lobsters in the floats if the crates are not weighted down to sink them to the bottom.

A good deal of individual handling of the lobsters by the fishermen is necessary, and the claws have to be banded or plugged if the lobsters are to be shipped alive, to keep them from killing or maiming one another in the crate. Much hand labour is required in producing fresh or frozen or canned lobster meat, because of the work of removing the meat from the shell, claws and legs after the lobsters are

boiled. This work can be passed on to the consumer if the lobsters are sold alive or fresh-boiled, but the cost of shipment alive is increased by the care required to maintain the lobsters in a healthy state and by the loss on dead lobsters.

Lobster is a superior food in the economic sense, limited in supply and selling at prices of sometimes several dollars a pound in terms of edible weight. Weak, maimed or smaller-sized lobsters are bought usually at a lower price for processing into lobster meat - canned or chilled or frozen. The greater part of the fresh and frozen (and perhaps even of the canned) lobster is served in restaurant meals.

Quality in lobsters is a matter of care in processing and in transporting live lobsters to market, since weak lobsters sell at a lower price at the end of the journey. For instance, during the 1953 season, Newfoundland lobsters delivered in Gloucester, Massachusetts, brought prices as shown for three grade classifications:

<u>Grade</u>	<u>Price Range (Cents/Lb.)</u>
Select	45 - 52
Cull	35 - 42
Weak	25 - 32

On the mainland in that year, market size lobsters (those about a pound or more in weight) brought 40¢ to 45¢ a pound over much of the summer season, and canners (those of legal size, but less than a pound) about 10¢ less. Maimed lobsters would go to the cannery. Canadian regulations forbid the canning of weak or dead lobsters. Lobsters dead when they reach market are worse than a total loss; they are not only worthless, but transportation charges have been incurred on them.

2. Disposition of the Catch

The Canadian lobster catch reached a peak of nearly 52 million pounds in 1956, with a value to the fishermen of \$18 million. Over the 10 years 1949-58, the average annual landings figure was 45.4 million pounds, and the average value \$14.3 million. The annual catch data for the Atlantic Coast provinces are given in Table 1.

An approximate idea of the disposition of the lobster catch in the various provinces may be obtained from the annually published product figures.¹ The data for 1956 with accompanying percentage figures are given in Table 2.

A greater proportion of the lobster catch in the Gulf of St. Lawrence is canned or processed into fresh or frozen meat because the lobsters grow more slowly there, the legal size limits are lower and, consequently, more are of the smaller "canner" size, in comparison with

¹ From D.B.S., Fisheries Statistics of Canada, Table 3.

TABLE 1. ANNUAL CANADIAN LANDINGS AND LANDED VALUES
OF LOBSTERS, BY PROVINCES, 1949 TO 1958^a

Year	Canadian Atlantic Coast Total ^b	Newfoundland ^b	Prince Edward Island	Nova Scotia	New Brunswick	Quebec
A. <u>Quantity in Thousands of Pounds</u>						
1949	38,206	5,035	6,843	19,891	9,399	2,073
1950	44,686	5,051	9,098	21,978	11,332	2,278
1951	45,573	4,438	8,342	24,278	10,565	2,388
1952	44,133	3,709	8,375	23,065	10,379	2,314
1953	46,397	4,477	6,998	23,646	8,630	2,646
1954	46,675	5,242	7,358	23,248	8,023	2,804
1955	48,569	5,509	8,329	22,945	9,039	2,747
1956	51,960	4,824	9,701	22,250	11,532	3,653
1957	44,438	4,197	8,534	18,169	10,450	3,088
1958	43,106	4,696	7,970	17,825	9,956	2,659
B. <u>Value in Thousands of Dollars</u>						
1949	10,201	-	1,421	6,217	2,146	418
1950	12,137	-	1,963	7,031	2,640	503
1951	12,206	-	1,702	7,476	2,505	523
1952	13,232	-	1,849	8,016	2,822	545
1953	15,718	1,149	1,998	8,917	2,816	839
1954	15,558	1,331	1,977	8,902	2,590	758
1955	16,470	1,414	2,324	9,064	2,931	738
1956	18,023	1,292	2,726	9,268	3,718	1,019
1957	14,501	1,139	2,456	6,819	3,144	942
1958	15,287	1,273	2,511	7,301	3,371	832

TABLE 1. ANNUAL CANADIAN LANDINGS AND LANDED VALUES
OF LOBSTERS, BY PROVINCES, 1949 TO 1958^a (Cont'd.)

Year	Canadian Atlantic Coast ^b Total ^b	Newfoundland ^b	Prince Edward Island	Nova Scotia	New Brunswick	Quebec
C. <u>Average Value in Cents per Pound</u>						
1949	26.7	-	20.8	31.3	22.8	20.1
1950	27.2	-	21.6	32.0	23.3	22.1
1951	26.8	-	20.4	30.8	23.7	21.9
1952	30.0	-	22.1	34.8	27.2	23.5
1953	33.9	25.7	28.5	37.7	32.6	31.7
1954	33.3	25.4	26.9	38.3	32.3	27.0
1955	33.9	25.7	27.9	39.3	32.4	26.9
1956	34.7	26.8	28.1	41.7	32.2	27.9
1957	32.6	27.1	28.8	37.5	30.1	30.5
1958	35.5	27.1	31.5	41.0	33.9	31.3

a Data from D.B.S., Fisheries Statistics of Canada, 1957. Preliminary figures for 1958 from D.B.S., Monthly Review of Canadian Fisheries Statistics (revised to the end of November, 1958). Figures may not add to totals because of rounding.

b Newfoundland landings not included in the totals for the four years 1949-52.

TABLE 2. LOBSTER PRODUCTS, 1956

Provinces	In Shell		Meat		Canned ^a	
	(thousand lb.)	(%)	(thousand lb.)	(%)	(cases)	(%)
Nova Scotia	18,520	60	512	19	10,069	17
Prince Edward Island	1,908	6	152	5	25,509	43
New Brunswick	8,983	29	1,901	69	17,664	29
Quebec	1,421	5	199	7	6,666	11
Totals	30,832	100	2,764	100	59,908	100

a Canned lobster is reported in standard cases of 36 pounds (96 six-ounce tins or the equivalent). In addition, there were reported for 1956, 2,251 18-pound cases of lobster tomalley (96 x 3 oz.) and 5,736 cases of lobster paste (presumably 36-lb. cases).

the catch in the warmer waters of western Nova Scotia and the Bay of Fundy. Furthermore, the bulk of the catch is obtained in the summer months when landed prices - i.e., the raw material costs in processing - are lowest of the year. Two of the three large Maritime frozen meat processors are located in northern New Brunswick.

For a number of reasons, however, the production and disposition statistics for lobsters may be subject to quite a wide margin of error. Because live lobsters may pass through many hands before being processed or marketed at home or abroad, it is difficult to eliminate double or triple counting from the statistics. Also, it may be that some fresh and frozen meat production is reported as canned, since the same types of tins are used for the three products. Furthermore, because of illegal fishing, a considerable quantity of undersized and out-of-season lobsters may be canned and enter the production and export statistics without having been recorded as landings.

Finally, it is impossible to reconcile production and export statistics with landings figures because of inaccuracies in any conversion factor used to determine the live weight equivalent of lobster meat and canned lobster. The recovery rate for meat from live lobsters varies quite widely according to the condition of the lobsters. For instance, a low yield would be obtained in the moulting period; the lobster fills out his new (soft) shell with water, which is later replaced by meat as the lobster grows to fill the shell. The yield of cooked meat from 100 pounds of live lobsters might vary within the range of 20 to 30 pounds; using a factor of 4.25 to 4.35 in converting meat to live weight represents a yield of about 23%. To obtain a five-ounce drained weight of canned lobster, 6-1/8 ounces of cooked meat (removed from the shell after the lobsters are boiled) are placed in the "six-ounce" can before it is sealed and retorted at 240°F. In processing frozen meat, 12 ounces of cooked meat packed in the tin yield 11-3/8 ounces net of frozen meat after freezing. At 6-1/8 ounces of meat per can, 588 ounces, or 36 3/4 pounds, would be required per standard

case of 96 six-ounce tins of canned lobster, and this might require from 110 to 185 pounds of live lobsters. An average figure of 156 to 160 pounds per case is consistent with the previously mentioned conversion factor of 4.25 to 4.35 pounds live weight per pound of meat.

The Canadian lobster export statistics are shown in Table 3. Practically all lobster exports went to the United States in the 10 years 1949 to 1958. The annual export of fresh or frozen lobster meat increased steadily to more than three million pounds at the end of the period, while the volume of canned lobster fell almost by one-half to about a million pounds yearly in the last six years.

TABLE 3. QUANTITY AND VALUE OF ANNUAL CANADIAN EXPORTS OF LOBSTERS AND LOBSTER PRODUCTS, 1949 TO 1958^a

Year	Lobsters Alive or Fresh- Boiled	Fresh or Frozen Lobster Meat	Canned Lobster	Lobsters Alive or Fresh- Boiled	Fresh or Frozen Lobster Meat	Canned Lobster
	A. <u>Quantity in Thousands of Pounds</u>			B. <u>Value in Thousands of Dollars</u>		
1949	20,109	1,199	1,649	8,594	1,522	2,353
1950	21,634	1,478	2,010	9,621	1,912	2,906
1951	22,394	1,816	1,475	9,437	2,362	2,214
1952	22,743	2,312	1,450	10,915	3,189	2,352
1953	20,571	2,356	977	9,955	3,814	1,967
1954	20,874	2,552	998	9,967	3,730	1,921
1955	22,112	3,459	948	11,207	5,506	1,843
1956	21,327	2,922	1,051	12,048	4,798	2,073
1957	21,417	3,170	1,012	11,226	5,188	2,063
1958	18,971	3,278	918	10,289	5,300	1,821

a Monthly Review of Canadian Fisheries Statistics or Trade of Canada, Dominion Bureau of Statistics, Department of Trade and Commerce, Ottawa.

The export trade data might be expected to indicate fairly well the proportions of the different lobster products going to market, because the domestic lobster market is comparatively small.¹ The proportions for five recent years of the principal products exported, in terms of their live weight equivalents, are indicated in Table 4.

1 It is assumed that exports are reported in terms of net weight. As an indication of the possible statistical error we have mentioned before, exports of fresh and frozen lobster meat, at about three million pounds a year since 1955, were in excess of the reported production for 1956 (in Table 2).

TABLE 4. PRODUCT DISTRIBUTION, LIVE WEIGHT EQUIVALENT, OF
CANADIAN LOBSTER EXPORTS, 1954 TO 1958

Product	Average Annual Exports 1954-58 (thousand lb.)	Live Weight Equivalent (thousand lb.)	Product Distribution (%)
<u>Alive or Fresh and Frozen</u>			
Boiled	20,940	20,940	55
Meat	3,076	13,074 ^a	34
Canned	985	4,186 ^a	11
Total		38,200	100

a Live weight equivalent obtained by using a factor of 4.25 times product weight of fresh, frozen and canned lobster meat.

The average Canadian landings of lobsters were 46.9 million pounds a year for the period 1954-58. Average exports, live weight equivalent, of 38.2 million pounds were, accordingly, 81.5% of landings. The average domestic disappearance was some 8.7 million pounds a year, or about one-half pound (one-eighth of a pound in edible weight) per head of population.

3. Location and Conditions of Production

Lobsters are caught by traps baited with fresh or salted herring or other kinds of fish. A line of traps consists of 10 to 20 traps fastened about 10 fathoms apart to a long rope anchored and buoyed at both ends. The fishermen haul the line each day when weather permits, hauling up the traps in turn, emptying and re-baiting them and dropping them back to the bottom. The Maritime lobster fisherman usually uses an open boat about 30 feet long, powered with an automobile engine, frequently with a power take-off from the engine to haul the line. He may fish 100 to 300 traps, but with the larger numbers, would probably have a son or relative or a hired man in the boat to assist him. Smaller enterprises - for instance, in Newfoundland - might consist of one man fishing up to 40 or 50 traps from a rowboat or dory.

The American lobster is found only on the Atlantic Coast of North America, from North Carolina to southern Labrador. It is most abundant on the coasts of Maine and the Maritime Provinces and on the south and west coasts of Newfoundland. The gradual warming of the Atlantic Coast waters is thought to be a partial cause of the increase in landings since the early 1940's, and if water temperatures begin to decline, as predicted, after 1960, there may be some decrease in yield on

the more northern fishing grounds, at least.

The lobster fishery is intensive, taking perhaps two-thirds of the legal-sized stock each year.¹ Maintenance of even the present level of landings is dependent upon effective management of the fishery, to limit off-season poaching and the taking of undersized and "berried" lobsters. Closed seasons of varying times and lengths have been established in the different fishing districts, more or less to coincide with the periods when moulting occurs (when the water is warmer and growth more rapid), or with the winter months in northern areas where ice and winter weather prevent fishing. The fishing season lasts from 10 to 12 weeks (starting April 20) in Newfoundland, about 10 weeks (from May 1, 10, or 20) in Quebec and the Magdalen Islands, and through the months of May and June for northern and eastern Prince Edward Island. The season is open from August 10 to October 5 for New Brunswick and Prince Edward Island fishermen in the western part of Northumberland Strait. The only winter lobster fishery is in the Bay of Fundy and southwestern Nova Scotia, from Digby to as far east as Halifax.

The seasonal nature of the lobster catch is indicated in Table 5, which presents the five-year average landings and landed values for each month of the year, by provinces, 1954 to 1958. About 60% of the Canadian lobster catch is obtained in the two months of May and June. Landings are heavy also in August and September (from Northumberland Strait) and in December (western Nova Scotia). Government regulation of the lobster fishery is necessary to prevent over-exploitation of the stocks; without public control, the tendency is for such a common property resource, with a relatively high market value, to be ravaged to the point of extinction, because no individual can reap directly the benefits of his own conservation measures or abstinence. Accordingly, the lobster fishing seasons are carefully regulated and minimum legal size limits have been established in each district. Closed-season poaching and the taking of undersized and berried lobsters have not been entirely suppressed, but conservation measures have been more successful where the fishermen have come to see that the government regulations are in their own interest.

Fishermen in some communities have acted together to limit the number of traps each fisherman may use and even to prevent new fishermen from coming in, but a general effect of the season restrictions with unrestricted entry into the fishery has been a multiplication of boats and gear, with many fishermen competing to get a share of the scant supply in the short fishing season allowed. The usual result is that lobster fishermen get good returns during the first week or two of fishing, but greatly diminished catches during the rest of the open season.

The excess gear represents an increased capital cost to the industry, and a lower catch per unit of effort means increased unit operating costs. Capital losses from storm damage are correspondingly

1 The Commercial Fisheries of Canada, Royal Commission on Canada's Economic Prospects, pp. 24-25.

TABLE 5. FIVE-YEAR AVERAGE LANDINGS AND LANDED VALUES
OF LOBSTERS FOR EACH MONTH, 1954 TO 1958,
CANADIAN ATLANTIC COAST, BY PROVINCES.

Month	Canadian Atlantic Coast Total	Nova Scotia	New Brunswick	Prince Edward Island	Quebec	Newfoundland
<u>A. Average Landings in Thousands of Pounds</u>						
Jan.	1,225	1,141	84	-	-	-
Feb.	405	375	30	-	-	-
Mar.	621	606	15	-	-	-
Apr.	2,157	1,931	32	-	-	194
May	16,241	7,119	1,980	4,073	1,460	1,609
June	11,712	4,313	1,418	2,564	1,319	2,098
July	1,721	614	5	22	242	838
Aug.	3,644	236	2,439	969	-	-
Sept.	3,037	126	2,225	686	-	-
Oct.	642	65	466	111	-	-
Nov.	731	58	673	-	-	-
Dec.	4,585	4,258	327	-	-	-

B. Average Value of Landings in Thousands of Dollars

Jan.	638	597	41	-	-	-
Feb.	231	213	18	-	-	-
Mar.	375	366	9	-	-	-
Apr.	1,074	1,008	18	-	-	48
May	4,707	2,230	581	1,082	398	416
June	3,620	1,446	459	758	400	557
July	540	233	2	7	73	225
Aug.	1,127	79	754	294	-	-
Sept.	957	42	702	213	-	-
Oct.	219	32	152	35	-	-
Nov.	292	30	262	-	-	-
Dec.	2,122	1,977	145	-	-	-

TABLE 5. FIVE-YEAR AVERAGE LANDINGS AND LANDED VALUES
OF LOBSTERS FOR EACH MONTH, 1954 TO 1958,
CANADIAN ATLANTIC COAST, BY PROVINCES, (Cont'd.)

Month	Canadian Atlantic Coast Total	Nova Scotia	New Brunswick	Prince Edward Island	Quebec	Newfoundland
C. <u>Average Value in Cents per Pound</u>						
Jan.	52.1	52.3	48.8	-	-	-
Feb.	57.0	56.8	59.6	-	-	-
Mar.	60.4	60.4	60.0	-	-	-
Apr.	49.8	52.2	54.3	-	-	24.8
May	29.0	31.3	29.3	26.6	27.3	25.9
June	30.9	33.5	32.4	29.6	30.3	26.6
July	31.4	37.9	47.1	30.0	30.2	26.9
Aug.	30.9	33.3	30.9	30.3	-	-
Sept.	31.5	33.2	31.6	31.0	-	-
Oct.	34.1	48.8	32.7	31.4	-	-
Nov.	39.9	51.4	38.9	-	-	-
Dec.	46.3	46.4	44.3	-	-	-

increased; more traps are smashed, and the fishermen's lines, set close together, become entangled and the gear sometimes buried in silt beyond hope of recovery.

Costs in the lobster fishery are, therefore, much higher than they would be if the annual volume of landings were taken with fewer boats fishing more or less the year around, or as the weather and biological conditions permitted. However, lobster fishing is to some extent complementary to other fishing and farming activities. To the extent that this is so, a somewhat larger entry of fishermen and fishing capital into the lobster fishery may be justified beyond the optimum suggested by the economics of the fishery by itself.

Even in summer, occasional Atlantic storms take a heavy toll of lobster traps and lines. Not only must the fisherman replace lost gear, but before he is able to do so, he may lose valuable fishing time during the short open season. In 1953, the federal Department of Fisheries instituted a scheme to insure lobster traps, calling for a premium of 7½¢ a trap in areas with a fishing season of less than 90 days, and 15¢ a trap where the season was 90 days or more. The indemnity was set at \$1.50 per trap for losses in excess of 25% of the total number being fished. Wooden traps have an average life of four or five years, so the "25% deductible" clause was included to allow for normal wear and tear. Later adjustments provided for an indemnity and premium varying according to the average value of the fisherman's traps and the length of the season. Currently, the premiums range from 5¢ to 22¢ per trap for the short season, and 10¢ to 35¢ for the long season, the coverage ranging from 90¢ to \$3.75 per trap. The actual cost of traps with the requisite rope lines might amount to more than double these figures.

Only a small part of the total number of lobster fishermen make use of the plan, although participation may be nearly complete among fishermen whose losses are consistently heavy because of their location or season of fishing. During the fiscal year ending March 31, 1958, the premium income received under the plan for the entire Atlantic Coast was nearly \$18,000, while the claims paid for damaged traps came to over \$61,000; for fiscal year 1958/59, net premiums were more than \$25,000 and indemnities paid more than \$96,000. The cumulative total of premium income from the inception of the plan in 1953 to the end of March, 1959, was more than \$97,000; of claims paid, nearly \$304,000.

4. Sale by Fishermen

Lobsters are sorted into canning and market sizes, usually by the fishermen on the boat or at the wharf, and the claws are corked unless the lobsters are to be processed immediately. The live lobsters are put into crates, which are fastened to a line and left floating submerged in the water if they are not immediately hauled to market by boat or truck. Delivery is made by the fishermen to the cannery wharf

or to the buyer or co-operative agent on the wharf. In some areas, such as western Newfoundland, fishermen may ship through a pool, delivering their catch to the pool agent at some central point and receiving payment, less handling and transportation costs, pro rata, after the shipment has been marketed.

Grading at the wharf is a comparatively simple procedure. The fisherman has a small rule to use in measuring from the rear of either eye socket to the rear of the body shell, to ensure that the lobster is of the minimum legal size or larger ($2\frac{1}{2}$, $2\frac{3}{4}$, 3, or 3-3/16 inches, according to the district). The smaller lobsters - those less than about a pound in weight - are sold to meat processors. Shipments are inspected and graded again upon arrival at market and these grades, of course, directly determine the returns that will be realized by the fishermen in a pool or co-operative. Independent buyers on the wharf assume the risk of downgrading or loss on market deliveries, and presumably, the price they offer to fishermen is lower on that account.

In outright sale to a processor or exporter or buying agent, the fisherman receives full settlement, less any deductions for gear, gasoline, or other supplies obtained on credit from the buyer. Co-operatives make an initial advance to the fisherman when he delivers his catch, and a final settlement at the end of the season, when all lobsters have been sold. The pronounced seasonal variation in the prices received by the fishermen is apparent from Table 5 C., average unit values being lowest during the summer period of heavy landings and highest in the winter when the supply is light.

The lobster market is competitive, with many buyers and with publicity given daily to prices in the principal markets, such as Boston and New York. Fishermen in more remote areas, particularly those who are forced to ship on consignment, may be in a less favourable position. The fisherman may also face fewer buyers for his "canner" grade lobsters, but prices for these usually vary up and down with the price of "market" lobsters, and the local cannery may have to compete with buyers for other processors who are ready to truck their lobsters from the point of sale.

5. Processing

Annual returns for 1956 to the Dominion Bureau of Statistics were submitted by 188 lobster processors in the Canadian Atlantic provinces. Some 166, or 88% of them, sold lobsters in the shell, but it is likely that many of them were merely selling boiled lobsters; lobsters sold in the shell would not have been processed, strictly speaking, unless they had been boiled, whether or not chilled or frozen, before sale. However, some might have been selling live lobsters in conjunction with the processing of one or more products, such as boiled lobster, fresh or frozen, lobster meat, and canned lobster. The numbers by provinces were as follows:

TABLE 6. CANADIAN ATLANTIC LOBSTER PROCESSORS, 1956

Province	Total Number	Number Selling Lobster		
		In the Shell	Meat	Canned
Newfoundland	10	10	-	-
Quebec	10	9	2	7
Prince Edward Island	30	22	9	23
Nova Scotia	89	84	7	14
New Brunswick	49	41	26	26
Total	188	166	44	70

There is a small Newfoundland pack of canned lobster, probably from small family canning plants. The annual pack estimates for recent years are 300 to 600 cases.

A lobster canning plant does not represent a very large capital investment; the equipment required is essentially a boiler, a can sealing machine, and one or two retorts capable of maintaining the tinned meat at 240°F. for the required time. Consequently, entry into this type of processing is relatively easy. A dealer in live lobsters might find it advantageous to process maimed, weak, or undersized lobsters that could not be shipped alive, or that could be shipped only at a considerable risk of loss. A cannery utilizes liver, roe, and bits of meat from the legs and other edible parts to produce canned lobster paste or lobster tomalley. The lobster processor might also pack fruit, vegetables and fish products in season.

There are few plants packing frozen lobster meat, because freezers and frozen storage capacity require a relatively heavy investment. The three largest frozen lobster processors are E.P. Melansson at Cocagne, New Brunswick, E. Paturel Ltd. at Shediac, New Brunswick, and Maritime Packers at Pictou, Nova Scotia. There are a few smaller operators; some make use of custom freezing and public cold storage facilities. A great deal of lobster meat is sold fresh (not frozen) and this does not require expensive, specialized machinery in the processing.

Lobster processing is necessarily geared to the peak capacity requirements and a short season. Some processors lengthen their operating season by use of holding tanks, through which seawater is pumped. Conley's Lobster Ltd. at St. Andrews, New Brunswick, have improved on this idea still further, with a lobster pound capable of holding a million pounds of live lobsters at Deer Island, sheltered on the inside of the bay facing St. Andrews. For ready availability, some lobsters are held in tanks at the Conley plant. Conley's principal business is the year-around shipment of live lobsters; their meat freezing and canning are done by E. Paturel Ltd. at Shediac.

Lobster processors use local workers, many of them women, whose manual dexterity is an asset in removing the boiled meat from the

shell and packing it in tins. Much hand labour is required, but the prevailing wage rates for women are low in many areas, and the labour cost is small in comparison with the high value of the product.

Probably the improvement of facilities for the production and distribution of fresh and frozen lobster meat has constituted the principal advance during the past decade. The more important improvements in canning techniques were made in an earlier period. Lobster poaching gives some small "backwoods" canneries the advantage of cheap lobsters, purchased at perhaps less than half of the usual market price.

It is not apparent that the lobster industry has become much more concentrated during the past 10 years. Packing lobster meat is still a hand operation, which cannot be replaced by automatic machinery. Consequently, any economies of scale in lobster canning would be small. Because of the large investment required, the larger plants control most of the production of frozen lobster meat, and there may be some advantage to larger firms in the flexibility and complementarity achieved in carrying out different types of processing, as well as some economies in marketing.

Canned lobster requires only dry storage like most grocery items. Fresh and frozen lobster products require low temperature storage and transportation, and a more rapid turnover because of their limited shelf life.

Products, other than live lobster, are boiled lobsters in the shell, chilled and frozen meat, lobster tomalley, and lobster paste. "In the preparation and canning of tomalley, only the liver (green), roe, meat from the legs, thumbs and body, and other edible parts of the lobster that are fresh, clean, and sound, shall be used."¹ Lobster paste is made from the same ingredients as tomalley, with the addition of spices and artificial colouring, and may contain filler not exceeding 2% by weight of the finished product.²

Canned lobster is packed in three sizes of cans: three, six, and 12-ounce sizes containing, respectively, 2½, five, or 10 ounces drained weight of lobster meat. The standard case of canned lobster is one of 96 six-ounce tins, or the equivalent. Much of the fresh and frozen meat is packaged in the 12-ounce tin, but larger and smaller packs are also produced.

Lobster canneries must have a permit to operate, issued after federal Department of Fisheries inspectors have certified that certain minimum standards are met in respect to construction and equipment of the cannery and operating methods and sanitation. A processor of fresh or frozen lobster meat must comply with the sanitary requirements prescribed by the Meat and Canned Foods Act and the regulations, and is

1 Meat and Canned Foods Act - Canned Fish and Shellfish and Cannery Inspection Regulations, SOR/54-694, Section 19(6).

2 Ibid., Section 19(7).

subject to daily inspection to ensure that the requirements are carried out.

Standards for four grades of canned lobster are set out in the regulations,¹ the first three being "Extra Fancy Quality", "Fancy Quality", and "Standard Quality". All parcels or lots of canned lobster falling below Standard Quality, but found to be wholesome and fit for human food are designated "Sub-Standard" and so labelled. The size of sample by the fish inspection laboratory, necessary to establish these grades, is laid down in the regulations, and "Government Inspected" labels showing the grade so established can then be used on each can in the lot.

Average values of the principal products f.o.b. plant are shown in Table 7. Proximity to United States markets and higher winter prices are the principal explanations for the higher average values obtained in Nova Scotia and New Brunswick for lobsters marketed in the shell. Average values for fresh and frozen lobster meat were in the vicinity of \$1.60 a pound, and were, of course, greatly influenced by New Brunswick's production, which amounted to 70% of the total over the five years 1952 to 1956, and 80% in 1957. The average f.o.b. values of more than \$65.00 per standard case of canned lobster represent gross values of about \$1.78 a pound for the meat, canning cost included.

TABLE 7. AVERAGE VALUES AT PLANT OF LOBSTER PRODUCTS, QUEBEC AND THE MARITIME PROVINCES, 1952-56 AND 1957^a

Province	In Shell		Meat		Canned	
	1957	1952-56	1957	1952-56	1957	1952-56
	(\$/lb.)		(\$/lb.)		(\$/case)	
Nova Scotia	47.1	45.8	2.02	1.63	64.22	65.00
Prince Edward Island	33.6	37.3	1.35	1.60	64.00	66.75
New Brunswick	42.7	49.2	1.52	1.59	65.00	64.01
Quebec	41.0	39.5	1.96	1.96	74.65	64.21
Maritimes and Quebec	44.0	46.1	1.58	1.62	65.36	65.43

^a Computed from quantity and value data in D.B.S., Fisheries Statistics of Canada, 1957, Table 3.

Among the provinces there were, undoubtedly, considerable differences in the raw material cost in processing, arising out of the varying production conditions and market requirements. Some United States markets (for example, the state of New Hampshire) require fresh

¹ Op. cit., Section 74.

or frozen lobster meat to be processed from "market" sized lobsters. At times and places, the price paid for "canners" may be as high as that for "market" lobsters, and in some areas where the minimum legal size is three or 3-3/16 inches carapace measurement, the lobsters landed may be nearly all "markets". Lower summer prices are, of course, a major factor in processing costs - accounting for the concentration of processing in the northern areas of the Maritimes.

6. Distribution - to Wholesale, Hotels and Restaurants

Canadian dealers and processors sell to wholesalers and through brokers in the United States and Canada. Some shipments are made directly to hotels and restaurants without the intermediary services of a broker or wholesaler. Canned lobster is sold like other canned goods to wholesalers, or directly to chain stores. Some restaurants in central Canada order live lobsters from Boston, claiming that Canadian suppliers cannot, or will not, assure quick and scheduled delivery.

The chief markets for lobsters are in the large cities. Montreal and Toronto probably account for the greater part of Canadian consumption. Western cities have to meet high transportation costs from the Atlantic seaboard.

The Canadian customs tariff rates on lobster products are as follows:

<u>Tariff Item</u>	<u>Tariff Rates</u>		
	<u>BP</u>	<u>MFN</u>	<u>GEN</u>
128 Lobsters, fresh	Free	Free	25%
128a Lobsters, prepared or preserved	17½%	22½%	30%

Lobsters and lobster meat, canned or not canned, are admitted free of duty into the United States under U.S. Tariff Paragraph No. 1761.

Live lobsters are valuable enough to bear the cost of air freight, particularly when speedy delivery is required, or when air transport reduces considerably the risk of loss. Efforts have been made with some success to develop packaging that will admit air to the lobsters and keep them moist without direct contact with fresh water, while keeping gross weight to a minimum. Recently, air shipments to Europe have been made using dry wood shavings as packing material.

A special commodity rate on Trans-Canada Airlines brings lobsters from Stephenville, Newfoundland, to St. John, New Brunswick, at \$5.50 per cwt. (100 pounds minimum) or to Toronto at \$10.50 per cwt. General air cargo rates apply from Maritime centres, e.g., from St. John, New Brunswick, to Montreal, \$4.70 per cwt., and to Toronto, \$8.00 per cwt.

Following are examples of railway express rates on less-than-carload shipments of lobsters and lobster products, effective from July 31, 1957:

LOBSTERS - LIVE OR COOKED (NOT IN GLASS OR SEALED CANS)

(In Cents per 100 Pounds)

TO	From		
	St. Andrews, N.B. St. John, N.B.	Digby, N.S.	Halifax, N.S. Yarmouth, N.S.
	Rate	Rate	Rate
Montreal	315	345	375
Ottawa	370	400	430
Toronto	495	530	555
Windsor	600	-	-
Quebec	-	-	345

(Rates from St. John, New Brunswick, and Halifax, Nova Scotia, are mostly competitive rates, which do not apply from, to, or between intermediate points.)

SPECIAL LOCAL TARIFF RATES ON LOBSTER MEAT IN CANEX CONTAINERS (IN CENTS, FOR CONTAINER CONTAINING NOT MORE THAN 105 LB. NET WEIGHT OF LOBSTER MEAT).

TO	FROM Shediac, N.B.	
	In Glass or Sealed Cans	Not in Glass or Sealed Cans
Quebec, P.Q.	765	660
Montreal	850	725
Toronto or Hamilton	1,255	1,050
Sarnia, Ont.	1,360	1,130
Windsor, Ont.	1,390	1,150
Fort William, Ont.	2,055	1,675
Winnipeg, Man.	2,190	1,780

Assuming a weight of about 40 pounds per standard case of canned lobster, the first-quoted rates above represent a transportation cost of \$1.25 to \$1.50 per case from Maritime centres to Montreal.

Wholesale and retail price series are available only for canned lobster, Fancy Quality. Unweighted year averages of the monthly

quotations are given in Table 8 following. In some years in which substantial price changes took place, the unweighted averages give an unsatisfactory picture of the wholesale-retail spread because of lags in the adjustment of retail prices to changing wholesale prices.

TABLE 8. UNWEIGHTED YEAR AVERAGES OF MONTHLY WHOLESALE AND RETAIL PRICES OF CANNED LOBSTER, FANCY GRADE, IN MONTREAL AND TORONTO, 1949 TO 1958^a.

(Case = 48 x 5-oz. and Tin = 5-oz.)

Year	Montreal			Toronto	
	Wholesale		Retail	Wholesale	Retail
	(\$/case)	(\$/tin)	(\$/tin)	(\$/tin)	(\$/tin)
1949	32.37	67.4	71.9	66.6	72.3
1950	32.97	68.7	74.2	66.4	71.1
1951	32.94	68.5	74.7	67.7	73.8
1952	34.32	71.5	76.0	69.6	74.4
1953	33.45	88.2	88.7	86.3	86.2
1954	38.09	79.3	92.5	81.8	87.3
1955	33.70	70.2	82.8	71.0	80.6
1956	36.53	76.1	87.6	77.4	84.3
1957	37.79	78.7	89.3	79.4	88.7
1958	40.65	84.7	94.7	86.6	94.1

a Computed from mid-month wholesale prices and first-of-month retail prices published in D.B.S., Monthly Review of Canadian Fisheries Statistics.

The Montreal wholesale price may be compared with the average values at plant of \$65.36 and \$65.43 shown in Table 7. The 1957 average price in Montreal (\$37.79-doubled) represents a price of \$75.58 for a standard case of 96 five-ounce tins, compared with an average f.o.b. plant value of \$65.36. The indicated processor-to-wholesaler spread of \$10.22 (about 10¢ a tin) would include railway transportation costs in the neighbourhood of \$1.50 per case. Computed on the basis of the 1952-56 averages, the markup was only about \$5.00 per case.

7. Retail and Restaurant Distribution

Lobsters are served usually in the more-expensive eating places, where the meal charge includes a heavy service loading. The price-elasticity of demand for lobster under these conditions may be relatively low; it is a derived demand and lobster price changes need not alter proportionately the price of the meal. On the other hand, one would expect the income-elasticity of demand for lobsters, a luxury food, to be relatively high. The demand for lobster meals is usually strong in prosperous times.

The markups on the live and fresh and frozen forms are greater than on canned lobster because of the special care required in handling and the greater risks involved in dealing with these forms. Also, canned lobster can be easily stored to level out the supply in accordance with demand; consequently, it is not subject to the wide seasonal price variations that characterize the market for live lobsters and, probably, fresh and frozen lobster meat.

8. Measurement of the Price Spread

Previous discussion of the local and seasonal variations in the landed prices of lobsters has indicated the impossibility of accurately determining the raw material cost of canned lobster even for one region, hence measurement of a fisherman-retail spread can only be on a sample basis. No comparisons can be made for the other lobster products because price series are lacking. However, sample price spread computations are presented in Table 9, based on landed prices in June of each year in Souris, Prince Edward Island, and Montreal wholesale and retail price quotations one or two months later.

The Montreal retailers' margin on selling price evidently increased during the decade, ranging from 8% to 16%. Based on somewhat theoretical estimates of raw material cost, the fishermen's share of the retail dollar spent for canned lobster in Montreal was of the order of 42% or 43%.

TABLE 9. FISHERMEN'S SHARE OF THE RETAIL DOLLAR SPENT FOR CANNED LOBSTER AT MONTREAL, BASIS JUNE 15 LANDED PRICES FOR LOBSTERS AT SOURIS, P.E.I.^a

Year	Aug. 1 Retail Price (at Montreal) (¢/5-oz. tin)	Mid-July Wholesale Price (¢/5-oz. tin)	Landed Price (¢/lb.)	Raw Material Cost ^b (¢/5-oz. tin)	Retailer's Markup on Selling Price (%)	Fishermen's Share of Retail Value (%)
1949	70.6	65.1	24	30	8	42
1950	74.2	68.6	22	27	8	36
1951	73.9	68.4	28	34	7	46
1952	79.4	71.4	22 ^c	27	10	34
1953	88.8	90.6	43	52	-	59
1954	86.9	75.7	30	37	13	43
1955	80.6	69.0	30	37	14	46
1956	88.1	74.0	30	37	16	42
1957	89.6	78.3	30 ^c	37	13	41
1958	96.6	81.5	33	41	16	42

a Price quotations from D.B.S., Monthly Review of Canadian Fisheries Statistics.

b The five-ounce tin requires 26 ounces of live lobsters (6-1/8 ounces meat multiplied by 4.25). It is assumed that "canner" grade lobsters were sold for three-quarters of the price quoted (presumably for "market" grade). Computed raw material cost is, therefore:

$$\text{Landed Price} \times \frac{3}{4} \times \frac{26}{16}$$

c May quotations.

COD FILLETS

1. Characteristics of the Raw Material

The Common Atlantic or Rock Cod (*Gadus callarias*) constitutes about two-thirds of all of the known Atlantic resources of demersal or groundfish species, which include, as the most important commercially, cod, haddock, hake, pollock, cusk, redfish, halibut, and the various smaller flatfish species.¹ A large Atlantic cod may be 25 to 50 pounds or more in weight. (One more than six feet long, weighing 211 pounds, was caught in New England waters in 1895.) Modern long-liners and draggers use powered hauling gear, but to the small-boat fisherman, using hand-lines, hauling his catch up from the depths can be laborious. The fish must be handled individually in gutting and beheading, washing and stowing with ice in the hold; hand methods are used in forking the fish into the unloading bucket or on to the wharf and, too often, inside the plant in carrying or wheeling tubs or trays of fish or fillets or offal from one place to another.

Automatic machinery, such as filleting and skinning machines, operates more effectively if the fish are fairly uniform in size. This is often the case if the boat has made all or most of its catch in one place; apparently one "year-class" may be predominant in a school. Usually, too, the fish are culled into standard size groups when being weighed in on the plant wharf. Modern filleting plants use continuous production line techniques, moving the fillets along the line from filleters to candlers to weighers and packers by conveyor belt. Offal from the filleting line also moves by chute and flume or conveyor to the exit loading point or directly to the fish meal plant.

While fresh and frozen fillets and lightly smoked fillets represent the higher-valued use of cod, sold principally in the high-income North American market, dried salted cod is still produced in quantity for the traditional markets in the tropical and semi-tropical countries of the Caribbean and southern Europe. Salting and drying to a considerable extent represents a marginal use for cod, to be resorted to only when the catch cannot be marketed in the fresh or frozen form. To some extent, also, the cured and fresh or frozen forms are joint products of the fishery; large cod are unsuitable for filleting (except for smoked fillets); some quantity can be marketed fresh or frozen whole as steak cod, but much of it must be split and salted for later drying - the larger, thicker fish are preferred in dried salted cod. In areas such as the Gulf of St. Lawrence where winter hinders or prevents fishing operations, filleting plants may reduce their peak loads and provide for winter employment of some of the plant facilities and staff by splitting and salting the large fish, later processing it into boneless salted or ordinary cures after fish landings have ceased for the season.

1 Halibut and other flatfish, although true "bottom-feeders", are not classed as groundfish in commercial usage.

Very little codfish is canned. A possible future extensive use is in the form of "fish flour". This can be made from cod or other species, five times as rich in protein as beefsteak per pound of weight, to be used as an additive to cereals, wheat flour, milk, etc., for the enrichment of human diets. The residue from filleting, constituting about two-thirds of the total landed weight of the fish (as well as any fish found to be unsuitable in quality for filleting), is usually processed into a protein meal used as a feed supplement for livestock and poultry. Glue is made from fish skins and heads.

If there have been any recent improvements in the quality of cod landed, these have been mainly the result of experimentation, research and education in better techniques in handling, stowage and icing on board the fishing vessel. Use of larger mesh sizes in trawl nets by international agreement through the International Commission for the Northwest Atlantic Fisheries has increased the average size of fish caught in certain areas (and there is evidence that the chief purpose - an increase in the basic stocks - has been achieved in some degree).

2. Areas and Conditions of Fishing

The principal cod fishing grounds are the Grand Bank of Newfoundland and numerous other banks off the coasts of Maine, Massachusetts, Nova Scotia and Newfoundland, and in the Gulf of St. Lawrence, but stocks of cod are found from Cape Hatteras to Greenland and Baffin Island.

Although the cod typically stays near the bottom, it may come to the top in pursuit of small fish or squid, hence may be found anywhere from the surface to a depth of 250 fathoms. During a short summer season, cod are taken in great numbers in trap-nets on the northwest coast of Newfoundland when they follow the capelin, a small fish which comes inshore to spawn. At other times they congregate somewhat less densely over sandy or rocky, pebbly ground in the comparatively shallow water of the banks and inshore areas. Cod prefer cooler water and, although they frequent water in the temperature range from 32°F. to 50°F., the best catches are made in the lower half of this range.

Cod spawn, for the most part, during the early spring months. The female lays from three to nine million eggs, depending upon her age and size. The growth of the cod depends upon water temperature and available food supply. Cod from the banks off Nova Scotia enter the fishery at about four years of age. A 10-pound cod, 30 to 32 inches in length, would be about nine years of age on the Grand Bank, or about six years in the Bay of Fundy.

The various cod stocks do not intermix to any great extent because they apparently do not often cross the "deeps" that separate various banks from each other and from the mainland. The movements onshore and offshore, and from bank to bank, are caused by the search for food, suitable water temperatures and proper spawning conditions. There is a

movement of cod stocks out of the Gulf of St. Lawrence to the banks off Nova Scotia in the fall and back again in the spring. The gradual warming of Atlantic waters in recent years has been accompanied by a northward movement of cod stocks. A gradual cooling trend, predicted to begin about 1960, might be expected to bring about a reversal of this movement and increase the density of stocks on the nearer Maritimes fishing grounds.

Present exploitation of the northwestern Atlantic cod stocks by all nations is of the order of 1,100 million pounds a year, of which Canadian landings constitute about two-thirds.¹ This rate of exploitation is estimated to be only about 16% of current stocks. The more distant stocks will be at best only lightly fished for some years to come, but a considerable increase in cod landings from the nearer banks could be expected to follow a rise in the demand for cod products.

The annual quantities and values of cod landed in the Canadian Atlantic Provinces are shown in Table 1. The annual totals in recent years have not fluctuated widely (less than 10% from the average), but there has been a gradual decline in cod landings for the past five years in the provinces of Newfoundland and Nova Scotia, the largest producers.

Fluctuations in annual cod landings could be caused in part by differences in availability; trips will be lengthened and catches smaller when the fish are difficult to find. Fishing effort is, to a considerable extent, directed to or from other species such as haddock and flatfish in accordance with market demand and resultant price differentials; the processing plant may be expected, for instance, to supply a proportion of sole, haddock and redfish fillets along with cod fillets. Cod landings might, of course, share in a general reduction in fish landings resulting from unusually difficult weather or from adverse changes in cost-price relationships for the fishing industry.

Cod, in fact, varied only between 43% and 49% as a proportion of the landed weight of all species for the east coast during the five years 1954-1958. The importance of Newfoundland among the provinces as a producer of cod is indicated by the following figures: east coast cod landings 1954-1958 averaged 610 million pounds yearly, of which Newfoundland contributed 63%, Nova Scotia 20%, Quebec 10%, New Brunswick 6%, and Prince Edward Island 1%. Roughly one-third of the east coast cod landings in the past five years went into the production of fresh and frozen fillets. The proportion was much smaller (about one-quarter) for Newfoundland, where the production of saltbulk and dried salted cod was correspondingly important.

The seasonal nature of cod landings is indicated by the monthly data available in Tables 1 to 6 of the Appendix. The freeze-up puts an end to fishing from ports on the Gulf of St. Lawrence in Quebec, northern New Brunswick, Prince Edward Island and western Newfoundland, and stormy winter weather restricts fishing operations from other ports that remain open. Landings are also affected by the seasonal movements

¹ See The Commercial Fisheries of Canada, Royal Commission on Canada's Economic Prospects, p. 13.

TABLE 1. QUANTITY AND VALUE OF ANNUAL LANDINGS OF ATLANTIC COD,
CANADIAN EAST COAST PROVINCES,^a 1949 TO 1958

Year	Canadian Atlantic Coast ^b	Nova Scotia	New Brunswick	Quebec	Prince Edward Island	Newfoundland
<u>A. Landed Weight in Thousands of Pounds</u>						
1949	240,589	147,616	26,114	60,755	6,104	b
1950	232,922	145,110	24,021	59,447	4,344	b
1951	217,222	142,259	23,942	46,806	4,215	b
1952	232,610	150,129	24,265	54,766	3,450	b
1953	524,157	115,588	19,416	44,792	3,060	341,301
1954	651,971	129,324	25,320	32,247	4,700	460,380
1955	582,966	129,473	29,455	41,324	6,063	376,651
1956	647,559	125,473	38,957	76,353	8,525	398,250
1957	642,494	115,345	38,814	79,172	7,588	401,575
1958	527,270	110,548	39,176	69,664	7,749	300,133
<u>B. Landed Value in Thousands of Dollars</u>						
1949	7,127	4,902	603	1,455	167	b
1950	6,496	4,613	530	1,272	83	b
1951	6,650	4,705	626	1,222	97	b
1952	7,356	5,356	559	1,343	98	b
1953	12,560	3,795	414	855	75	7,421
1954	16,263	4,529	722	714	125	10,173
1955	14,206	4,035	818	938	163	8,252
1956	16,149	4,185	972	1,861	249	8,882
1957	15,030	3,581	946	1,638	156	8,709
1958	13,110	3,711	1,154	1,708	177	6,360
<u>C. Average Value per Pound, Landed Weight, in Cents</u>						
1949	3.0	3.3	2.3	2.4	2.7	b
1950	2.8	3.2	2.2	2.1	1.9	b
1951	3.1	3.3	2.6	2.6	2.3	b
1952	3.2	3.6	2.3	2.5	2.8	b
1953	2.4	3.3	2.1	1.9	2.5	2.2
1954	2.5	3.5	2.9	2.2	2.7	2.2
1955	2.4	3.1	2.8	2.3	2.7	2.2
1956	2.5	3.3	2.5	2.4	2.9	2.2
1957	2.3	3.1	2.4	2.1	2.1	2.2
1958	2.5	3.4	3.0	2.5	2.3	2.1

a Annual data from the December issues of D.B.S., Monthly Review of Canadian Fisheries Statistics. 1958 figures are preliminary.

b Newfoundland landings were not included for the years 1949 to 1952, inclusive.

of cod stocks, the most notable example being the summer trap-net fishery of northeastern Newfoundland, when the inshore waters teem with cod.

Thus, the unit cost of cod landings may be lower in the summer, but processing equipment adequate to handle the summertime peak load would be much greater than the capacity requirements during the balance of the year. Fish in excess of filleting and freezing capacity can be split and salted and held for later processing into dried fish; hence, the production of dried salted cod may be essential to economic operation of the cod fishery in areas forced to depend upon heavy summer landings. Any receipts from the sale of dried salted cod in excess of its direct processing and marketing costs and the marginal cost of the additional cod landings, would contribute to reduce the joint or overhead costs of production in the fishery - however, those joint costs and the returns from the various products might be shared between the fishermen and the processors in the industry.

3. Preparation and First Sale by Fishermen

The official statistics purport to show the quantity of landings in the state most commonly landed or first sold for each species of groundfish. For codfish the landing statistics are given in terms of gutted head-on weight. While this is the predominant form, first sales by fishermen present many variations from this form, both geographically and over seasonal and longer periods of time. The variations range from the whole round form, the state in which the fish is taken from the sea, to salted and smoked forms, ready for retail sale, which have been prepared by the fisherman himself.

The description of fishermen's selling or primary marketing which follows is limited to the transactions associated with the transfer of codfish from fishermen to buyers mainly for use as fillets. Attention has been called, however, to the variations in form in which the fish is sold, because this point is pertinent in later discussion on the prices to be used in measuring the fishermen-retail price spread.

The cod are dumped on the deck of the fishing vessel from the drag net as it is hauled, or taken from the line or gill-net as it is brought in. The fishermen gut the fish and stow them below in the pens, packed with ice to cool them rapidly and maintain them at close to freezing temperature, as well as to minimize contact of the fish with the wood or metal of the pens and with each other. The fishermen must work fast to get the fish gutted and stowed below-decks before the next haul and to minimize its exposure to the heat and sun on deck. They must work long hours when on the fishing grounds to complete the trip and get the fish back to port before the earliest part of the catch is too old.

Vessels from Halifax or Lunenburg might travel 500 or 600 miles to fishing grounds on the Grand Banks and a trip might entail four or five days' time en route to and from the fishing grounds in addition to fishing time. The larger draggers in 1956 averaged five to seven

days at sea per trip from Nova Scotia ports, four to five days in the other provinces; an occasional trip lasted 15 or 16 days. Long-liners were at sea on the average about one day per trip in Newfoundland, a day-and-a-half in Quebec, and more than three days in Nova Scotia.¹

The inshore fisherman typically lands his fish at the plant wharf the day it is caught. Quality would be improved if he carried ice in which to pack his catch, but this is seldom done; ordinarily the price received would be the same whether he used ice or not.

As the cod are unloaded from the vessel and weighed in on the plant wharf, they are usually culled into size groups for which specified prices are paid, and there is some grading for quality insofar as damaged fish or fish fit only for reduction into fish meal are segregated and paid for at a lower price. The usual grade sizes are scrod, market and steak; the size divisions vary somewhat according to local practice or the use to be served, but the intermediate grade, "market" cod, is usually from about four to 10 or 12 pounds weight.

Plant competition for fish may be competition for fishermen; the small-boat inshore fisherman may be unwilling or unable to operate far from home, but the larger vessels can change their base of operations. Hence, the presence of only one buyer - one fish plant - at a given location does not preclude a considerable degree of competition for the fishermen's catch. But price is not the only consideration influencing the fisherman's sale; others may be extension of credit for gear and supplies by the buyer and provision of facilities for storage of bait. A large and efficient plant may be able to establish leadership in the setting of prices effective over a large extent of coastline - an ability likely to be enhanced if the firm can ensure itself a considerable volume of supply by owning or controlling a fleet of fishing vessels.

Fishermen engaged in the groundfishery on the Canadian Atlantic coast, perhaps through tradition, seem to have accepted a relatively stable "season" price for cod. There is some variation between winter and summer seasons with a premium of as much as a cent a pound or more being paid in the winter to ensure a greater volume of supply during the more difficult fishing season. Although cod is marketed by processors in various fresh, frozen and cured forms, each with a specific market value, in general the same price is paid to fishermen at any particular port of landing regardless of the final utilization of the fish.

This is, in part at least, the explanation for the considerable differences in landed cod prices existing at the same time in different localities. For example, cod prices at mid-June, 1958, were, at Caraquet, New Brunswick, 2 $\frac{3}{4}$ ¢ a pound for market and 1 $\frac{1}{2}$ ¢ for scrod; at Louisbourg, Nova Scotia, market and steak cod brought 3¢ to 3 $\frac{3}{4}$ ¢ and

¹ See John Proskie, Operations of Modern Long-Liners and Draggers, Atlantic Seaboard, 1956, Economics Service, Department of Fisheries of Canada, Ottawa, 1957, Table 9, p. 17.

scrod 1 $\frac{3}{4}$ ¢; at Halifax and Lunenburg, Nova Scotia, steak, market and scrod brought 3 $\frac{3}{4}$ ¢, 3 $\frac{1}{4}$ ¢ and 1 $\frac{3}{4}$ ¢, respectively. At St. John's, Newfoundland, the price was 2 $\frac{1}{4}$ ¢ for steak and market and 1 $\frac{3}{4}$ ¢ for cod in the round, and at Harbour Grace, the price was 2¢ for ungraded cod. Much of the cod landed in Nova Scotia ports is marketed as fresh fillets, whereas the Newfoundland catch is processed, some into the lower-valued frozen fillets, but most into salted cod for low-income markets in Caribbean and Mediterranean areas.

The division of the proceeds of the sale of fish among the members of the fishing enterprise is made according to a share or "lay" system, which varies according to locality, type of vessel, etc. Certain expenses are deducted from the gross receipts; the remainder is divided into boat and crew shares, and the latter into individual crew shares.

Settlement by the plant buyer will include deductions for supplies such as ice and fuel oil obtained by the fishermen. In the outports, dependence upon the local merchant for gear and supplies on credit is probably somewhat less than it used to be, but may be still considerable, with the fisherman accordingly obligated to sell his catch to the merchant who has given him credit.

In recent years, the trend has been away from the complete processing of dried salted cod by outport fishermen, although some still spread salted fish to dry on the "flakes" or on the beach. These may now have a filleting plant within reach as a market for at least part of their catch, or may sell split fish to a local buyer who has large "pickling" facilities for the production of saltbulk ("green-salted" cod), or may process their catch to the saltbulk stage themselves. The saltbulk is then sold to commercial driers for final processing into dried salted fish. A large part of Newfoundland codfish landings is now sold as saltbulk to Nova Scotia drying plants.

As for the filleting plants, the major portion of their raw material is now obtained from offshore fishing vessels - trawlers or draggers or long-liners - which ensure a more regular and predictable large volume of supply than inshore fishermen. The offshore vessels also offer more flexibility in supply; they can, to a considerable extent, direct their fishing efforts towards species in greatest demand, whereas the small-boat fisherman must take whatever is available to him reasonably close to shore.

4. The Filleting Industry

In spite of a recent trend towards concentration of processing activities, a large number of small independent filleting plants are still to be found in the Atlantic coast provinces, particularly in the production and sale of fresh fillets in Nova Scotia and New Brunswick. Freezing operations require a greater investment in plant and equipment, and present greater technical management problems; therefore, frozen fish plants tend to be larger in size, and at the same time,

more diverse in products and more specialized in management, with separate production, sales, and cost accounting divisions. There is also some horizontal expansion in the form of branch plants and vertical integration of fishing, processing and marketing operations through divisions of the same company.

Notwithstanding the large number of small filleting plants, and because frozen fillets are produced in three times the quantity of fresh fillets, about 30 plants in the Maritime Provinces - some of them branches of one firm - account for more than three-quarters of the annual Maritimes production of fresh and frozen fillets. Frozen fillet production is even more concentrated in Newfoundland. There, government policy has favoured the establishment of large plants in suitable locations and the movement of fishermen and their families from the outports into these centres, where they may sell their catch to the filleting plant and where community services can be more easily provided.

Products of the fresh and frozen industry include fresh and frozen fillets, frozen blocks and slabs (for conversion into fish sticks), breaded, cooked or uncooked fish sticks, lightly smoked fillets, and fresh and frozen dressed (whole) fish. By-products include fish meal and liver and other oils. There may be also some degree of specialization in certain species; for instance, a plant may concentrate much of its vessel and processing activity on redfish (ocean perch). If a plant also engages in canning or curing operations, this may be the result of special circumstances - possession of the necessary equipment, and the need to provide a market for local fishermen or to achieve year-around use of plant labour and facilities.

The wide seasonal fluctuations in the supply of fish and its perishability impose on the processing plant the need for rapid processing, and capacity adequate to handle the peak seasonal loads. This may entail much idle capacity at other seasons of the year. The establishment of a profitable operation may, therefore, require a close forecast of the regularity and volume of supply of fish, as well as of market demand and local labour supply, in their relation to the best size of plant.

Filleting plants, if located in one of the larger ports, will have a reserve supply of labour to draw upon, but the availability of other types of employment means that the fish plant will have to pay approximately "the going wage" to secure workers. The establishment of a plant in a more isolated fishing settlement may be accompanied by an influx of workers as fishermen and their families move in to be closer to the plant. However, wage rates tend to be lower in such centres with few alternative employment opportunities. Usually, one-third or more of the workers in a filleting plant are women, paid at much lower rates than the men. If the head of the family provides the main support, wives and daughters may be hired at wage rates lower than they would require if fully self-supporting.

Most of the larger filleting plants are now unionized and pay wages on an agreed union scale. Current Nova Scotia rates range from \$1.05 to \$1.16 an hour for cutters and skimmers, \$0.92 to \$1.08 for

general labour, and 77¢ to 81¢ for the women who carry out candling, inspecting, weighing and packing duties on the production line. Newfoundland rates, except at St. John's, are lower: 80¢ to 89¢ for filleters and 52¢ to 62¢ for women, for example.¹ Wage rates in northern New Brunswick, Quebec, and Prince Edward Island plants are for the most part not far different from the Newfoundland rates.

The cost of labour is determined, of course, not only by wage rates, but by the productivity of that labour. In recent years productivity has been increasing, at least in some filleting plants, as a result of improved equipment, greater mechanization of operations, and the growth of worker and management skills. Without data on comparative costs and outputs over the past 10 years, it is impossible to say whether physical productivity increases in filleting plants have been more than sufficient to balance the effects on costs of rising wage levels and heavy investments in plant and equipment.

Labour productivity is closely related to the size and condition of the fish being filleted. A skilled cutter might, for instance, achieve a rate of 400 pounds of raw cod (say, 135 pounds of fillets) an hour on four- or five-pound cod, compared with double the amount on 12-pound cod at the upper limit of the "market" classification. But greater speed in filleting might be at the cost of a lower recovery rate of fillets from the raw material; the speed and recovery rate are both related to the operator's skill.

The generally accepted figure for the yield of cod fillets from head-on dressed cod as landed is 33%, but skilled cutters may achieve up to 37% or 38%, depending upon the condition of the fish. The yield in cutting for blocks is lower, usually around 30% or 31%.

Overhead cost per unit of product might be minimized by around-the-clock or three-shift operation of the plant to achieve "capacity" output, at least during the summertime period of peak landings. If not sufficient workers are available to operate two or three shifts a day, it may be necessary to keep the staff at work for extra hours, paying overtime rates one-third or one-half greater than the standard rate, in order to process an accumulated stock of fish before it becomes unfit. Apart from the likelihood that workers' productivity declines when they are tired, the overtime rates mean an increase in production costs per unit of output, incurred only because the alternative is a loss through spoilage of fish or the dissatisfaction of the fishermen if they are forced to restrict their landings to what the plant can accommodate in a one-shift daily operation. Of course, there should be some reduction in unit overhead costs, as a result of fuller use of plant facilities, to set against the increase in unit labour costs arising out of overtime operation.

The use of mechanical skinning machines and, latterly, of filleting machines in east coast plants has increased greatly during the

1 See Appendices C, D, E, F and G, Brief of the Newfoundland Federation of Labour, Proceedings of the Royal Commission on Price Spreads of Food Products at St. John's, Nfld., May 3, 1958.

past 10 years. The growth of quick-freezing capacity began somewhat earlier, keeping pace more or less with the growth in filleting production. Multiple plate contact freezers are in general use for freezing fillets and blocks, although air blast freezers offer more flexibility in the size and shape of packages to be frozen, along with, possibly, a lower initial cost.

Frozen cod fillets are packed in one-pound "consumer" packs and in five-pound bulk packs containing about six cellophane-wrapped fillets for the restaurant and institutional trade. Fillets are also frozen into larger blocks or slabs for the production of breaded, cooked or uncooked fish sticks. Fresh cod fillets are packed, 20 pounds in a wooden box, in layers separated by parchment paper.

The one-pound cartons are machine-wrapped in a printed coloured wrapper before going into the freezer. After freezing, the cartons are packed 12 in a container and four containers (48 cartons) in a strong fibreboard shipping carton, and these are placed in the cold storage room until the shipping time arrives. The shipping carton holds 10 of the five-pound cello packs.

There is some differentiation by grade of pack, according to the quality of the raw material. Fish of indifferent quality is not packaged under a "premium" label, but may be wrapped under another brand name. In other instances, where there is no second grade label, a few hundred pounds a day of broken or torn fillets may be packaged and sold at a discount of 2¢ or 3¢ a pound. This special sale price represents a salvage value for the torn fillets. When they are frozen into a one-pound piece, the fragments and tearing may not be noticeable to the consumer.

Greater care in filleting fish for blocks is required to ensure that the small bones at the nape are cut out, but ragged fillets and fragments can be included in the block without difficulty. The production of fish sticks is carried out by a few plants with the necessary specialized equipment, in the quantities required for domestic sale, but the level of United States import duties on fish sticks is designed to preclude Canadian sales on that market. However, American fish stick processors get much of their supply of cod and haddock blocks from Canadian plants.

The principal species filleted by Atlantic coast plants are cod, haddock, redfish (rosefish or ocean perch), wolf fish (ocean catfish), hake, cusk, halibut and other flatfish, including plaice, witch, flounders and yellowtail (which are all marketed as "sole" fillets). Production figures for the years 1949 to 1958, inclusive, appear in Table 2 below.

It may be observed that cod fillets comprised nearly one-half of the annual fillet output, and that frozen fillets in total for the region were produced in five or six times the quantity of fresh fillets. The proportion of fresh fillets was much higher for Nova Scotia. Of the 65 million pounds of frozen cod fillets and blocks produced in 1958, it is estimated that slightly more than one-half was blocks and slabs

TABLE 2. CANADIAN EAST COAST PRODUCTION OF FRESH AND FROZEN FILLETS
AND BLOCKS, BY SPECIES, 1949 TO 1958

(Thousands of Pounds)

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
<u>Frozen</u>										
Cod	24,182	33,745	31,943	41,396	30,906	55,819	55,279	59,915	62,919	65,849
Haddock	12,967	12,470	9,466	12,466	15,926	30,150	35,715	39,921	30,917	24,733
Rosefish	4,998	7,514	10,537	10,643	12,855	12,713	11,833	16,086	13,198	16,821
Flatfish	3,256	5,269	10,653	12,136	10,094	9,630	16,532	15,245	17,961	17,949
Other	530	1,494	1,664	2,408	2,063	2,027	2,095	2,324	3,688	6,853
Total	45,933	60,492	64,263	79,049	71,844	110,339	121,454	133,491	128,683	132,205

TABLE 2. CANADIAN EAST COAST PRODUCTION OF FRESH AND FROZEN FILLETS
AND BLOCKS, BY SPECIES, 1949 TO 1958 (Cont'd.)

(Thousands of Pounds)

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
<u>Fresh</u>										
Cod	10,507	12,511	14,919	12,082	11,766	9,564	9,854	11,692	10,827	9,397
Haddock	7,463	7,564	8,873	6,960	7,448	7,121	7,855	8,287	8,347	7,390
Rosefish	-	-	-	-	72	72	33	31	39	13
Flatfish	579	1,100	2,049	1,898	3,062	2,003	2,901	1,513	2,364	1,625
Other	522	1,412	1,819	2,137	1,567	1,666	1,551	1,544	951	1,521
Total	19,071	22,587	27,660	23,077	23,915	20,426	22,194	23,067	22,528	19,946

TABLE 2. CANADIAN EAST COAST PRODUCTION OF FRESH AND FROZEN FILLETS
AND BLOCKS, BY SPECIES, 1949 TO 1958 (Cont'd.)

(Thousands of Pounds)

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
<u>Fresh and Frozen</u>										
Cod	34,689	46,256	46,862	53,478	42,672	65,383	65,133	71,607	73,746	75,246
Haddock	20,430	20,034	18,339	19,426	23,374	37,271	45,570	48,208	39,264	32,123
Rosefish	4,998	7,514	10,537	10,643	12,927	12,785	11,866	16,117	13,237	16,834
Flatfish	3,835	6,369	12,702	14,034	13,156	11,633	19,433	16,758	20,325	19,574
Other	1,052	2,906	3,483	4,545	3,630	3,693	3,646	3,868	5,639	8,374
Total	65,004	83,079	91,923	102,126	95,759	130,765	143,648	156,558	152,211	152,151

Source: Canadian Fisheries Annual, Gardenvale, P.Q., 1957 and 1959, Appendix, Section Five.

for fish stick production.

The landed weight equivalent of Canadian east coast cod fillet production (fillet weight multiplied by three) represents 34% of total cod landings (Table 1 above) for the years 1956 and 1957, and 43% of those for 1958. More than one-third of cod landings, therefore, is currently processed into fresh and frozen fillets and blocks.

The chief by-product of filleting plants is fish meal, a high-protein supplement for livestock and poultry feeds. When the fillets are removed from the fish, about two-thirds of the landed weight remains and this offal is reduced to fish meal by grinding, cooking and drying processes, about five tons of offal being required to produce a ton of meal.

The value of the offal to the meal plant is difficult to determine; filleting plants sell the offal at various prices - frequently about \$7 or \$8 a ton, or sometimes at a nominal charge of only \$2 or \$3 a ton if the meal plant is part of the same establishment. One instance is recorded of a meal plant paying \$13.50 a ton to its major supplier. Fishermen usually receive $\frac{1}{4}\phi$ or $\frac{2}{3}\phi$ a pound for spoiled fish that has to be consigned to the meal plant (i.e., \$5 to \$10 a ton). An assumed average price of \$7.50 a ton would represent a raw material cost of about \$38 per ton of meal, which is less than one-third of the f.o.b. price - around \$125 a ton - received for meal by the plant. (The price is based on the protein content, which is usually 60% to 65% - 60 to 65 units at a current price of about \$2 per unit for "whitefish" meal.)

Because the offal from most plants is directed into fish meal production, this joint product is an important factor in the economics of fish filleting and should be taken into account in the measuring of the price spread. An offal value of \$7.50 a ton would represent a reduction of three-quarters of a cent in the raw material cost of a pound of cod fillets - the value of the two pounds of waste per pound of fillets.

Fish sticks were introduced about eight years ago in the United States and production grew rapidly to a level of more than 50 million pounds a year in recent years. Canadian production began a little later and is currently about one-tenth that of the United States. The statistics are as follows:

TABLE 3. CANADIAN FISH STICK PRODUCTION, 1954 TO 1958^a

(Thousands of Pounds)

	1954	1955	1956	1957	1958
Cooked	-	4,046	3,912	3,838	4,740
Uncooked	-	1,144	498	1,578	1,544
Total	1,880	5,190	4,410	5,416	6,284

^a Economics Service, Department of Fisheries of Canada.

The fish stick trade grew by a displacement of ordinary fillets and other varieties, rather than by a net increase in the consumption of fish. A considerable part of the final product weight consists of breading materials and the oil absorbed in cooking. The frozen blocks are cut by multiple band saws into sticks of the required size, and these are breaded, cooked in oil, packaged, and refrozen - or breaded, packaged and frozen without cooking. During the last quarter of 1958, the Toronto wholesale price of cod fish sticks was quoted at \$3.70 per dozen eight-ounce packages. This represented, accordingly, a price of about 62¢ a pound in comparison with frozen cod fillets (cello 5's) quoted around 29¢ and 30¢ a pound in the same period.

The scale of fillet output is dictated by the seasonal fluctuations in fish landings. Fresh fillet output may be regulated for the plant also producing frozen fillets, in accordance with the market situation; presumably the fillets may be frozen if that use promises the better returns. Peak supplies in the summer usually mean lower market prices; part of the economics of freezing fillets is related to taking advantage of higher prices in the winter period of reduced supply, because frozen fillets can be held in storage until that time.

The larger plants may fillet 50 million pounds of raw fish in a year; the smallest fresh fillet operations may involve only packing and shipping a few thousand pounds of fillets a year, purchased as fillets from fishermen. The most efficient size of plant is related to the volume and regularity of raw material supplies and the availability of labour. Fresh filleting does not require very heavy capital investment, but even the smaller freezing operations require a considerable scale of output to achieve the maximum economies in indirect processing costs per unit of output.¹ The large firm may also secure considerable advantages in marketing. The upper limit of economic size would be determined by the difficulties of management and co-ordination of plant operations, as well as by the limitations of labour and raw material supplies. For this reason, company expansion might take the form of branch plants and subsidiary operations - vertical or horizontal integration, or both.

5. Distribution to Retail

Brokers and commission agents operate as independent buyers and/or as agents for one or more processors. Brokerage fees or commissions range from 2½% to 12% of sale value, differing according to location, the volume and regularity of supply, dependability of the supplier, and so on. Brokers' services are of use to the wholesaler in maintaining a continuing supply of fish in the varieties and volume required.

Wholesale outlets may be regular fish wholesale houses, specialty fish wholesale-retail stores, or "frosted foods" wholesalers

¹ Perhaps an output of five million pounds or more a year (15 million pounds "capacity" in landed weight), according to Mr. H. Connor's evidence at the Halifax hearings of the Commission. See Proceedings, Vol. 13, p. 2066.

providing quick-frozen packaged fish items along with their other lines of frozen fruits and vegetables and juices. Meat wholesalers may carry fish as a side line or as a service to customers.

The wholesale markup is difficult to document in the absence of reliable prices f.o.b. plant. The published mid-month wholesale prices¹ for Halifax, Montreal, Toronto, Winnipeg and Vancouver, perhaps tend to be on the high side. The price for each city is computed as an average of quotations from several wholesale firms in the particular city, and no allowance is made for the scale or variety of discounts that may be offered on the published prices of the firms.

As one approximation, the f.o.b. plant value may be taken as 15¢ a pound for fresh cod fillets, based on a raw material cost of 9¢ (3¢ on landed weight to the fisherman), and a processor's margin of 6¢. Less-than-carload express to Toronto would add about 4¢ a pound, and brokerage at 7% about 1 $\frac{1}{2}$ ¢, making a total cost to the wholesaler of 20 $\frac{1}{2}$ ¢. The wholesale price on fresh cod fillets in Toronto in October, 1957, was 30.7¢. The wholesaler's margin on the basis of these figures would be about 10¢ a pound, or 33% on his selling price. For comparison, the Toronto retail margin on fresh cod fillets in October, 1957, was about 16¢, the average retail price being 46.8¢.

Processing costs would be somewhat higher on frozen fillets; addition of another cent for cost of freezing would bring the f.o.b. plant cost to 16¢. On the other hand, transportation costs might be cut in half, because frozen fillets could move in carload lots. Hence, the cost to the wholesaler in Toronto might be in the vicinity of 19¢ (allowing 1 $\frac{3}{4}$ ¢ for rail express and 1 $\frac{1}{4}$ ¢ for brokerage). On frozen cod fillets the Toronto wholesale price quotation for October, 1957, was 24.5¢ for cello 5's, and the retail price 29.7¢ for packaged fillets. The wholesaler's margin would be about 5 $\frac{1}{2}$ ¢, or 22% on his selling price, compared with a retailer's margin of 5¢ or 6¢.

These figures represent a "thin" processor's margin; moreover, it is probable that many would have higher costs, particularly those with comparatively new and undepreciated plants. Another approach to f.o.b. plant value can be made via company financial reports giving the breakdown of the sales dollar. In evidence before the Commission at Halifax on May 2, the sales dollar was divided, 53.3% for raw material (fish), 22.7% for wages and salaries, 22.4% for plant overhead and some variable costs including taxes, and 1.6% for distributed and undistributed profits.² Use of these figures and a raw material cost of 9¢ a pound for cod fillets results in an f.o.b. plant value of about 17¢ a pound, viz.:

1 In the Monthly Review of Canadian Fisheries Statistics, D.B.S.

2 Proceedings, Vol. 13, pp. 2030-31.

	<u>Per Cent of Sales Dollar</u>	<u>Cost per Pound in Cents</u>
Raw Material	53.3	9.0
Wages and Salaries	22.7	3.8
Overhead, etc.	22.4	3.8
Profits	1.6	0.3
	<u>100.0</u>	<u>16.9</u>

The addition of 3¢ for transportation and brokerage would bring the cost to the wholesaler in Toronto to about 20¢. The wholesaler's margin on frozen cod fillets in October, 1957, would have been 4½¢, or 22½% on cost, 18½% on his selling price, compared with a retail margin of 5¢.

Over the past five years, some 78% of the Canadian east coast production of fresh and frozen seafish fillets has been exported to the United States. For cod fillets and blocks, the proportion exported to the United States was 82%, and for haddock, 64%. Canada supplied 70% (102.8 million pounds) of the 146.6 million pounds of "groundfish" fillets and blocks imported by the United States in 1958. Included in the totals were 36.3 million pounds of Canadian cod fillets representing 75% of the 48.6 million pounds of cod fillets imported and 34.8 million pounds of blocks out of the total imports of 51.1 million pounds of frozen blocks of cod, haddock and other groundfish.¹

Cod fillets and blocks enter the United States under U.S. Tariff Paragraph 717 (b) "Fish, filleted, skinned, boned, sliced or divided, n.s.p.f.: ocean perch (rosefish), cod, haddock, hake, pollock and cusk", subject to a customs duty of 2½¢ a pound, or 1-7/8¢ a pound for a limited quota.² The quota in 1958 was 35,892,221 pounds, but there is no available information on the quantity of Canadian fillets and blocks that entered under the quota.

An additional impost on Canadian exports to the United States market is imposed by the current premium on Canadian funds in the exchange of United States dollar receipts. The buying rate on July 14, 1958, of 104-3/32 U.S. for the Canadian dollar would reduce by approximately one cent the returns on Canadian fillets sold at 24¢ U.S. in Boston.

1 United States Imports of Merchandise for Consumption, Calendar Year 1958, Report No. FT 110, U.S. Department of Commerce, Bureau of the Census.

2 The annual quota under which the lower customs duty rate is applicable is set at ... 15% of the average aggregate apparent annual consumption of such fish during the three calendar years preceding the year in which the imported fish are entered. Not more than one-quarter of the quota shall be admitted during the first three months of the year, one-half during the first six months or three-quarters during the first nine months. ("Apparent annual consumption" is computed without reference to changes in storage stocks.)

Frozen cod fillets from Canada were quoted at 21¢-23¢ for 5's in mid-October, 1957, sales by original receivers at Chicago, when the Toronto wholesale average was 24½¢ for cello 5's. The quotation on domestic 5's in Chicago was 22¢-24¢ on the same date - apparently a cent higher than the Canadian pack. The Boston quotation on domestic and Canadian 5's was 21¢-22¢. The one-pound pack was quoted 2¢ to 5¢ higher than the five-pound at different times in both Chicago and Boston, but sample wholesale price quotations indicate little difference between Canadian and domestic frozen cod fillets in the principal United States markets.¹ Canadian fillet plants package much of their output under the labels of their United States customers, affiliates or parent companies; consequently, such fish would be to all intents and purposes the same as domestic fish in United States marketing channels.

While frozen cod fillets from Canada, therefore, may sell only a cent or two below the prices of New England fillets in the United States, the situation is different for fresh cod fillets, as shown by the following sample quotations from the New York Daily Fisheries Report (sales by original receivers at New York in wholesale quantities):

Cod Fillets Fresh

(Prices in Cents per Pound)

<u>Date</u>	<u>Domestic</u>	<u>Canada</u>
October 15, 1957	42 - 45	25 - 26
May 13, 1958	38 - 40	28 - 30
June 17, 1958	40 - 42	28

Occasionally, low quotations represent discounts on lots held over from the previous day or days, or on low quality of other sorts, but the differential shown here has existed continuously for many years. The trade explanation - one explanation, at least - is that fillets are counted as fresh from the knife, consequently, fillets cut in Boston or New York are "fresher" than Nova Scotia fillets, even if cut from fish that were 10 days on the boat. Of course, the domestic fillets came from high-priced landings, compared with Halifax landings of cod at 3¢ or 3½¢. Prices at Boston (ex vessel for first sales) were, for example:

<u>Date</u>	<u>Large Cod</u>	<u>Medium Cod</u>	<u>Scrod</u>
(dollars per 100 lbs.)			
May 12, 1958	14.00	12.00	-
June 16, 1958	11.60	9.75	9.00
June 30, 1958	6.50	7.60	6.55-6.60

At these prices, most New England cod must be sold in the fresh market and could not be sold, moreover, at the price for Canadian

¹ See Daily Fishery Reports (from Boston, New York, or Chicago), Market News Service, Bureau of Commercial Fisheries, U.S. Department of the Interior.

fresh cod fillets. It is not known to what extent the market differentiation between domestic and Canadian fillets prevails at the retail level. The United States consumer, probably, seldom knows if she is buying a Canadian or a New England product.

Cod prices at all levels have reflected the relative amplitude and accessibility of Atlantic cod stocks in comparison with other groundfish species, as well as a considerable degree of consumer preference for the other species. The trade frequently requests a proportion of haddock, rosefish and flatfish fillets along with cod fillets in placing orders, and this puts at a disadvantage those filleting plants forced to rely principally upon cod. Over the past decade, much of the growth in Canadian filleting capacity has been in regions such as Newfoundland and the Gulf of St. Lawrence where cod is the major catch. Furthermore, frozen cod fillets from Canada have had to compete on the United States market with heavy import entries of cod fillets and blocks from Iceland, Norway, Denmark and West Germany.

6. Domestic Consumption: Retail Distribution and Restaurants and Institutions

Fresh cod fillets are sold by weight from the display case or box, but the greater part of frozen cod fillets are retailed in the one-pound consumer pack from refrigerator counters in chain and independent retail outlets. The five-pound cellophane pack is mainly for hotels and restaurants, hospitals and other institutions, which buy wholesale and in quantity. As we have suggested in previous discussion, many retail stores no longer handle fresh fish and now sell only frozen items through frozen food cabinets.

Domestic disappearance of fresh and frozen cod fillets (annual production less exports, with allowance for changes in stocks) amounts to less than one pound per head of population per year. The annual estimates are as follows:

TABLE 4. DOMESTIC DISAPPEARANCE OF FRESH AND FROZEN
COD FILLETS AND BLOCKS, 1950 TO 1958

Year	Thousands of Pounds	Pounds per Capita
1950	16,115	1.17
1951	12,761	0.91
1952	15,474	1.07
1953	12,729	0.86
1954	14,303	0.94
1955	11,052	0.71
1956	14,915	0.93
1957	11,621	0.70
1958	11,584	0.68

For comparison, the Canadian per capita consumption of fisheries products in 1957 was 13.5 pounds (edible weight), of which 6.9 pounds was fresh and frozen shellfish, including 2.7 pounds of fillets. These per capita consumption figures have not varied greatly in recent years. Cod fillets, therefore, comprised one-third (or less) of the average consumption of fillets.

7. Measurement of the Price Spread

The available cod price statistics for the 10-year period 1949-1958 are somewhat less than satisfactory. Official retail price quotations were given on "fresh and frozen" cod fillets until the end of 1954, when a series of monthly quotations on fresh cod fillets began. Retail price quotations on "frozen packaged" cod fillets for Toronto are available from 1952, but these are not closely comparable with the wholesale price quotations, which are for "cello 5's".¹ However, un-weighted averages of the Toronto monthly wholesale and retail quotations are used as year-averages in Table 5 for the purpose of measuring the Toronto wholesale-to-retail spread. Inasmuch as wholesale quotations for cello 5's may have been a few cents lower than those for the packaged fillets to which the retail series applies, the wholesale-retail spread may be exaggerated by the data in the table.

Computation of a fisherman-to-retail price spread faces even greater difficulties. The great differences among the provinces in the annual average landed values of cod are apparent in Table 1. The monthly weighted average values of landings show even more marked differences, resulting from varying seasonal price changes from one province to another. Beyond this, even regional and seasonal price spread measurements would be subject to inaccuracies because of the necessity to use imputed average landed values for finished and semi-processed products such as dried salted cod and saltbulk produced and sold by the fishermen themselves. Such products are arbitrarily converted to a raw fish equivalent, to which the alternative opportunity price, that prevailing for head-on gutted fish, is applied. Landed cod values are, therefore, somewhat theoretical in areas in which fishermen market some part of their catch in other than the dressed head-on form.

To compute a price spread for cod fillets, it was necessary first to recognize that fresh and frozen fillets are different products, to be considered separately, and to select a larger market centre, Toronto, for which reasonably complete wholesale and retail price series for each product are available. As the basis for the computation of the fishermen-retail price spread in Table 5, landed cod prices at Halifax²

1 Mid-month average wholesale prices and first-of-month average retail prices for various cities, collected and published by the Dominion Bureau of Statistics in the Monthly Review of Canadian Fisheries Statistics.

2 Landed fish prices are collected by the area offices of the federal Department of Fisheries and published by the Dominion Bureau of Statistics.

TABLE 5. SUMMARY OF FISHERMAN-RETAIL SPREAD, FRESH AND FROZEN
COD FILLETS, 1952 TO 1958

Year	Average Retail Price at Toronto (¢/lb.) (1)	Retail Equivalent Value per lb. of Market Cod Landed Weight (¢) (2)	Average Wholesale Price at Toronto (¢/lb.) (3)	Average Landed Price of Market Cod at Halifax Less Value of Offal (¢/lb.) (4)	Fisherman -Retail Spread (¢) (5)	Retailer's Share of Retail Value (%) (6)	Fisherman's Share of Retail Value (%) (7)
1952	38.6	12.9	30.4	3.5	9.4	21	27
1953	34.8	11.6	27.0	3.0	8.6	22	26
1954	33.5	11.2	25.6	3.2	8.0	24	30
1955	30.8	10.3	24.4	3.0	7.3	21	29
1956	29.8	9.9	24.8	3.2	6.7	17	32
1957	30.2	10.1	24.9	3.0	7.1	18	30
1958	31.4	10.5	27.9	3.0	7.5	11	29

A. Frozen Packaged Cod Fillets, 1952-1958

Column (1): The year average is an unweighted average of monthly quotations in D.B.S., Monthly Review of Canadian Fisheries Statistics.

Column (2): Retail price (Column (1)) divided by 3.

Column (3): The D.B.S. wholesale series until July, 1954, is headed "Cod fillets, frozen, packaged", and after that date "Cello 5's". A different series entitled "Cod fillets, frozen, not packaged" was used for 1952 and 1953 in preparing Table 69 (p. 261) of Volume II of this Report, consequently the wholesale average price figures for those two years are different in Table 69.

TABLE 5. SUMMARY OF FISHERMAN-RETAIL SPREAD, FRESH AND FROZEN
COD FILLETS, 1952 TO 1958 (Cont'd.)

Year	Average Retail Price at Toronto (¢/lb.) (1)	Retail Equivalent Value per lb. of Market Cod Landed Weight (¢) (2)	Average Wholesale Price at Toronto (¢/lb.) (3)	Average Landed Price of Market Cod at Halifax Less Value of Offal (¢/lb.) (4)	Fisherman -Retail Spread (¢) (5)	Retailer's Share of Retail Value (%) (6)	Fisherman's Share of Retail Value (%) (7)
1955	44.8	14.9	28.2	3.0	11.9	37	20
1956	44.9	15.0	29.2	3.2	11.8	35	21
1957	45.5	15.2	30.3	3.0	12.2	33	20
1958	51.4	17.1	33.4	3.0	14.1	35	18

B. Fresh Unwrapped Cod Fillets, 1955-1958

Column (4): One-quarter of a cent is deducted, as the value of offal for fish meal production.

Column (5): Column (2) minus Column (4).

Column (6): The difference between wholesale and retail price (Column (1) minus Column (3)) as a percentage of retail price (Column (1)).

Column (7): Landed price (Column (4)) as a percentage of equivalent retail value (Column (2)).

were used because these are representative of raw cod prices at Halifax and Lunenburg, where the greater part of the catch is processed by filleting plants, and which are, moreover, major suppliers of the Canadian fresh and frozen fillet market. An approximate average of the winter and summer season prices for market cod at Halifax is used, reduced by one-quarter of a cent as representative of the value of offal for fish meal production. So computed, the raw material cost of cod used in filleting is exaggerated to the extent that some scrod is filleted, for which a lower price is paid to the fisherman.¹ The landed price paid by many filleting plants is lower, of course, than that at Halifax.

The retail price of fresh cod fillets at Toronto was about 50% higher than that of frozen cod fillets during the years 1955 to 1958. The raw material cost at Halifax was the same for fresh and frozen fillets, consequently the fisherman's price represented a higher proportion of the retail value of frozen fillets - about 30%, compared with 20% in the case of fresh fillets. The retailer's markup was about 35% of the retail value on fresh cod fillets, reflecting in part, of course, the risk of loss through spoilage. The retail markup was about half as great on frozen cod fillets and has apparently been declining over the past five or six years.

¹ As a compensating factor, the labour cost in filleting small fish would be higher, per pound of fillets. The recovery rate may not be much different between larger and smaller fish.

APPENDIX TABLE A1

MONTHLY LANDINGS OF ATLANTIC COD, CANADIAN EAST COAST, 1949 TO 1958^a

(Landed Weight in Thousands of Pounds)

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Jan.	6,108	5,283	7,692	7,717	13,052	14,070	10,890	10,501	6,483	12,817
Feb.	3,697	3,368	6,834	7,411	10,283	14,284	11,546	9,119	6,296	10,454
Mar.	7,783	10,161	8,147	11,584	9,556	15,294	13,376	14,352	14,269	13,571
Apr.	12,277	14,579	14,373	20,528	16,490	18,670	21,805	21,183	14,752	20,351
May	19,601	21,608	20,269	17,031	18,520	20,389	24,135	28,443	28,868	31,304
June	43,545	33,184	36,535	33,556	63,551	76,591	67,439	92,128	64,752	111,498
July	49,120	46,762	37,116	51,496	193,928	221,221	183,165	198,516	200,098	152,948
Aug.	33,302	40,238	28,423	25,979	90,212	126,872	117,226	120,686	167,548	80,746
Sept.	29,531	26,686	27,383	29,558	55,701	82,770	66,794	66,122	68,903	45,625
Oct.	16,882	12,463	14,305	11,459	26,338	31,541	37,311	41,875	44,341	26,053
Nov.	9,456	11,560	8,380	8,112	17,312	18,012	22,000	14,879	18,037	13,519
Dec.	9,287	7,030	7,764	8,179	9,320	12,221	7,156	12,145	7,692	5,422

^a Newfoundland landings are not included for the years 1949 to 1952, inclusive.

Source: D.B.S., Monthly Review of Canadian Fisheries Statistics. Data for 1958 are preliminary.

APPENDIX TABLE A2

MONTHLY LANDINGS OF ATLANTIC COD, NOVA SCOTIA, 1949 TO 1958

(Landed Weight in Thousands of Pounds)

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Jan.	6,094	5,246	7,623	7,662	9,340	10,624	7,403	8,164	5,873	9,752
Feb.	3,679	3,329	6,768	7,279	6,273	9,442	7,887	6,955	2,726	8,371
Mar.	7,726	10,119	8,095	11,532	5,399	9,391	8,703	9,772	8,345	8,293
Apr.	12,080	14,385	14,168	20,471	11,836	12,847	14,376	14,111	9,304	13,548
May	14,859	18,614	16,882	14,739	9,498	11,096	12,667	14,583	15,853	12,424
June	25,247	19,186	17,966	17,866	11,444	10,849	13,545	11,886	13,962	8,374
July	25,395	21,666	21,271	23,185	17,418	14,612	15,416	15,306	13,867	11,457
Aug.	9,309	15,196	9,700	9,922	6,634	7,664	8,452	9,358	9,423	9,026
Sept.	15,926	13,064	15,878	16,656	16,244	16,488	12,771	10,467	12,295	8,920
Oct.	10,460	7,500	9,100	6,157	6,972	7,180	8,828	9,324	8,597	7,418
Nov.	7,878	9,942	7,175	6,674	8,056	9,959	13,382	5,922	9,914	8,524
Dec.	8,963	6,863	7,633	7,986	6,474	9,172	6,043	9,625	4,922	4,442

Source: D.B.S., Monthly Review of Canadian Fisheries Statistics. Data for 1958 are preliminary.

APPENDIX TABLE A3

MONTHLY LANDINGS OF ATLANTIC COD, NEW BRUNSWICK, 1949 TO 1958

(Landed Weight in Thousands of Pounds)

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Jan.	14	37	69	55	111	56	62	60	26	15
Feb.	18	39	66	132	63	64	50	70	16	3
Mar.	57	42	53	52	41	80	62	26	11	25
Apr.	197	194	99	57	123	129	114	32	31	12
May	275	705	605	596	471	567	1,483	1,194	1,241	1,159
June	4,464	3,498	5,112	5,148	3,464	2,878	4,646	5,164	5,324	6,848
July	7,703	7,350	5,382	6,955	5,389	4,039	4,086	6,713	9,355	9,011
Aug.	6,680	6,160	5,854	5,514	3,696	4,970	5,796	10,424	9,102	8,972
Sept.	3,921	3,598	3,970	3,395	2,591	7,516	5,062	6,496	6,991	6,804
Oct.	2,099	1,469	2,118	1,832	2,888	4,372	4,843	6,692	5,275	4,443
Nov.	639	858	538	456	503	596	3,160	2,018	1,360	1,717
Dec.	47	71	76	73	77	53	91	68	81	132

Source: D.B.S., Monthly Review of Canadian Fisheries Statistics. Data for 1958 are preliminary.

APPENDIX TABLE A4

MONTHLY LANDINGS OF ATLANTIC COD, QUEBEC, 1949 TO 1958

(Landed Weight in Thousands of Pounds)

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Jan.	-	-	-	-	-	-	-	-	-	-
Feb.	-	-	-	-	-	-	-	-	-	-
Mar.	-	-	-	-	-	-	-	-	-	-
Apr.	-	-	106	-	8	8	11	34	-	29
May	3,884	2,142	2,434	1,543	2,458	1,674	2,625	5,023	3,165	7,002
June	12,665	9,692	12,592	9,932	7,462	8,726	6,962	12,982	15,827	16,685
July	13,987	16,460	9,140	20,401	13,519	5,934	8,464	15,375	19,655	18,999
Aug.	16,113	17,624	11,985	9,550	10,399	5,261	10,102	15,435	20,156	11,527
Sept.	8,882	9,403	7,030	9,062	5,822	7,676	7,055	12,559	12,205	7,908
Oct.	4,125	3,327	2,898	3,286	3,540	2,463	4,780	7,618	7,028	3,874
Nov.	850	705	578	889	1,444	484	1,299	1,271	1,129	711
Dec.	249	94	43	103	140	21	26	22	7	1

Source: D.B.S., Monthly Review of Canadian Fisheries Statistics. Data for 1958 are preliminary.

APPENDIX TABLE A5

MONTHLY LANDINGS OF ATLANTIC COD, PRINCE EDWARD ISLAND, 1949 TO 1958

(Landed Weight in Thousands of Pounds)

	1949	1950	1951	1952	1953	1954	1955	1956	1957	1958
Jan.	-	-	-	-	-	-	-	-	-	-
Feb.	-	-	-	-	-	-	-	-	-	-
Mar.	-	-	-	-	-	-	-	-	-	-
Apr.	-	-	-	-	-	-	5	-	-	219
May	583	147	348	153	416	413	668	853	575	361
June	1,169	808	865	610	501	575	420	652	1,176	1,516
July	2,035	1,286	1,323	955	667	1,120	1,832	2,353	1,223	1,438
Aug.	1,200	1,258	884	993	683	1,004	1,890	2,563	3,752	2,943
Sept.	802	620	505	445	400	947	900	1,512	718	803
Oct.	198	167	189	184	196	428	240	345	76	342
Nov.	89	55	89	93	167	138	56	145	32	106
Dec.	28	2	12	17	30	75	52	103	74	21

Source: D.B.S., Monthly Review of Canadian Fisheries Statistics. Data for 1958 are preliminary.

APPENDIX TABLE A6

MONTHLY LANDINGS OF ATLANTIC COD, NEWFOUNDLAND, 1953 TO 1958

(Landed Weight in Thousands of Pounds)

	1953	1954	1955	1956	1957	1958
Jan.	3,469	3,390	3,434	2,277	584	3,050
Feb.	3,947	4,778	3,609	2,094	3,554	2,080
Mar.	4,116	5,823	4,611	4,554	5,913	5,253
Apr.	4,523	5,686	7,299	7,007	5,417	6,543
May	5,677	6,639	6,692	6,790	8,034	10,358
June	40,680	53,563	41,866	61,444	28,463	78,075
July	156,935	195,516	153,367	158,770	155,998	112,043
Aug.	68,800	107,973	90,986	82,906	125,115	48,278
Sept.	30,644	50,143	41,006	35,088	36,694	24,176
Oct.	12,742	17,098	18,620	17,896	23,592	11,869
Nov.	7,142	6,835	4,103	5,522	5,602	2,496
Dec.	2,599	2,900	944	2,328	2,608	826

Source: D.B.S., Monthly Review of Canadian Fisheries Statistics. Data for 1958 are preliminary.

HADDOCK FILLETS

1. The Raw Material

Haddock (*Melanogrammus aeglefinus*) usually frequent warmer water than codfish, and are found from the Grand Bank and southern Newfoundland to Cape Cod. Stocks in the Gulf of St. Lawrence are comparatively small, hence the haddock catch is small in Quebec, northern New Brunswick and Prince Edward Island.¹ The growth of the fish is slow, particularly in northern waters, and the current heavy rate of exploitation is expected to reduce the total stocks and eventually the annual catch. The Canadian average annual catch during the past five years has been about 129 million pounds. This, along with an annual catch by other nations of about 100 million pounds in North American waters, represents nearly one-half of the estimated stocks - a very high rate of utilization.²

Haddock fishing and processing is subject to the same seasonal and technical factors as in the case of cod. Most of the catch is taken with drag nets. The production pattern is one of summer peaks and winter lows, while the price pattern is the opposite. Haddock are of smaller average size than cod, consequently the labour cost of filleting is usually somewhat higher per pound of fillets. Automatic filleting machinery, however, has made it economic to fillet very small haddock (sometimes termed "ping-pongs"), often in the round just as they come from the water, for the production of frozen blocks or slabs for fish sticks.

The flesh of haddock is so much like that of cod that many American buyers prefer to have the skin left on the fillet as a means to be sure that it is haddock. The yield of fillets from the head-on dressed weight of haddock as landed is perhaps two percentage points higher than that on cod, and above 40% if the skin is left on the fillets. However, in some recent years landings have included a large proportion of very small haddock, which would have lowered the average recovery rate - particularly taking into account the "ping-pongs" landed in the round. An average recovery rate of 35% is arbitrarily chosen for the purposes of this study.

2. Disposition of the Catch

The quantity and value figures for annual landings of haddock in the Atlantic coast provinces over the past decade are shown in Table

1 Of course, little fishing takes place in the Gulf in winter months.

2 Compare with the groundfish utilization table in The Commercial Fisheries of Canada, p. 13, Royal Commission on Canada's Economic Prospects, 1956.

1. The greater part of the catch is marketed as fresh or frozen fillets and blocks - the latter eventually as fish sticks or portions. Some is sold in the fresh and frozen dressed forms and a small amount of smoked dressed haddock is produced - the true "finnan haddie". The residue from filleting, or offal, like that of other groundfish, is ground and dried into "whitefish" meal, a high-protein feed supplement.

Canadian landings of haddock averaged 128.8 million pounds a year for the five years 1954 to 1958, inclusive. Fresh and frozen haddock fillet production averaged 40.1 million pounds during the same period.¹ Assuming a recovery rate of 35%, fillet and block production would account for landings of about 115 million pounds a year. For the Maritimes, smoked dressed haddock production might take more than a million pounds a year, and fresh and frozen dressed nine or 10 million pounds, landed weight.² The utilization figures for Newfoundland are not known, and the Quebec catch of haddock was of minor importance in the total.

About two-thirds of the total Canadian production of fresh and frozen haddock fillets and blocks in recent years was exported to the United States. The proportion of fresh haddock fillets retained in Canada, however, was quite high - about 85% for the five years 1954 to 1958, compared with 25% of the production of frozen fillets and blocks. The domestic disappearance of haddock fillets and blocks has, in fact, doubled during the past decade, and the apparent consumption per head of population is now around nine-tenths of a pound per year. Annual figures for production, changes in stocks, exports and (the residual) domestic disappearance are presented in Table 2.

3. Conditions of Production and Sale by Fishermen

Haddock, like cod, are gutted on the deck of the trawler or dragger and then stowed, packed with ice, in the pens below-decks.³ When landed, they are culled or graded according to size, usually in two price classifications - "haddock" or "large haddock" and "scrod". In July, 1957, for instance, the price paid in Lunenburg, Nova Scotia, was 5¢ a pound for haddock and 2½¢ for scrod haddock, while in Halifax, large haddock brought 4½¢, scrod 2½¢, and "shack haddock" 2¼¢. In the

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- 1 The yearly figures appear in Table 2 of the cod study, and are included in Table 2 following.
- 2 The conversion figures used are: 170 lb. head-on gutted weight to 100 lb. smoked dressed; 130 lb. to 100 lb. fresh and frozen dressed.
- 3 As described in the study on cod, this is the most common form in which haddock are landed. Other forms in which the fish are landed or sold by fishermen range from the round to processed forms, but the major part of the catch is sold to filleting plants in the head-on gutted state.

TABLE 1. ANNUAL CANADIAN LANDINGS AND LANDED VALUES
OF HADDOCK, BY PROVINCES, 1949 TO 1958^a

Year	Canadian Atlantic Coast Total ^b	Newfoundland ^b	Prince Edward Island	Nova Scotia	New Brunswick	Quebec ^c
<u>A. Landed Weight in Thousands of Pounds</u>						
1949	46,580	-	76	45,404	1,100	-
1950	47,319	-	128	46,213	978	-
1951	55,990	-	299	53,355	2,332	4
1952	54,902	-	1,153	51,198	2,544	7
1953	72,969	14,489	2,329	52,794	3,345	12
1954	117,989	42,817	3,014	67,867	4,251	40
1955	135,573	51,597	1,787	78,389	3,351	44.9
1956	155,390	62,264	1,978	87,756	3,113	27.9
1957	131,638	44,007	1,662	83,764	2,055	15.0
1958	103,358	30,760	2,655	66,798	3,092	5.3
<u>B. Landed Value in Thousands of Dollars</u>						
1949	2,123.0	-	2.0	2,065.6	55.4	-
1950	2,365.6	-	6.3	2,294.0	65.3	-
1951	2,668.6	-	13.5	2,521.7	133.3	0.1
1952	2,722.6	-	53.1	2,524.0	145.3	0.2
1953	3,000.8	455.2	95.0	2,306.7	143.6	0.3
1954	4,243.5	1,189.7	142.3	2,729.8	180.7	1.0
1955	4,325.2	1,392.0	54.1	2,726.9	136.2	16.0
1956	4,861.9	1,649.8	70.9	2,999.0	134.3	7.9
1957	4,209.9	1,000.0	64.2	3,040.3	101.1	4.3
1958	4,091.0	713.0	118.0	3,068.0	190.0	3.0
<u>C. Average Value per Pound, Landed Weight, in Cents</u>						
1949	4.6	-	2.6	4.5	5.0	-
1950	5.0	-	4.9	5.0	6.7	-
1951	4.8	-	4.5	4.7	5.7	2.5
1952	5.0	-	4.6	4.9	5.7	2.9
1953	4.1	3.1	4.1	4.4	4.3	2.5
1954	4.4	2.8	4.7	4.0	4.3	2.5
1955	3.2	2.7	3.0	3.5	4.1	3.6
1956	3.1	2.6	3.6	3.4	4.3	2.8
1957	3.2	2.3	3.9	3.6	4.9	2.9
1958	4.0	2.3	4.4	4.6	6.1	4.7

a D.B.S., Fisheries Statistics of Canada. Preliminary figures for 1958 from the D.B.S., Monthly Review of Canadian Fisheries Statistics.

b Newfoundland landings not included until 1953.

c Quebec haddock landings included with other species in 1949 and 1950. Because of the rounding of the small annual quantity and value figures, the average value per pound for Quebec is not necessarily accurate to tenths of a cent.

TABLE 2. CANADIAN PRODUCTION, EXPORTS AND DOMESTIC DISAPPEARANCE OF FRESH AND FROZEN HADDOCK FILLETS AND BLOCKS, 1949 TO 1958^a

Year	Annual Production of Filletts and Blocks			Change in Frozen Stocks during Year		Amount Marketed ^b
	Fresh	Frozen	Total	Increase	Decrease	
	(1)	(2)	(3)	(4)	(5)	
	(millions of pounds)					(6)
1949	7.5	13.0	20.4	-	0.3	20.7
1950	7.6	12.5	20.0	0.1	-	19.9
1951	8.9	9.5	18.3	0.3	-	18.0
1952	7.0	12.5	19.5	0.7	-	18.8
1953	7.4	15.9	23.4	0.3	-	23.1
1954	7.1	30.2	37.3	3.9	-	33.4
1955	7.9	35.7	43.6	-	2.6	46.2
1956	8.3	39.9	48.2	0.1	-	48.1
1957	8.3	30.9	39.2	-	2.3	41.5
1958	7.4	24.7	32.1	0.4	-	31.7

Year	Exported				Domestic Disappearance ^c	
	Fresh	Frozen Filletts	Frozen Blocks	Total	Total	Per Person
	(7)	(8)	(9)	(10)	(11)	(12)
	(millions of pounds)					(pounds)
1949	-	13.6	-	13.6	7.1	.53
1950	-	13.0	-	13.0	6.9	.50
1951	1.3	6.8	-	8.1	9.9	.71
1952	1.3	9.1	-	10.4	8.4	.58
1953	.9	12.3	-	13.2	9.9	.67
1954	.8	21.3	-	22.1	11.3	.74
1955	.9	17.5	13.0	31.4	14.8	.94
1956	1.8	18.1	11.0	30.9	17.2	1.07
1957	1.0	20.2	6.1	27.3	14.2	.86
1958	1.3	14.0	2.9	18.2	13.5	.79

a Production data from D.B.S., Canadian Fisheries Statistics and from Canadian Fisheries Annual, 1959, Gardenvale, P.Q., Appendix, Section Five. Stocks and export data from D.B.S., Monthly Review of Canadian Fisheries Statistics. 1958 data are preliminary.

b A decrease in stocks represents a flow into the market, hence "Amount Marketed" is the sum of production plus a decrease in stocks, or of production minus an increase in stocks.

c Domestic disappearance (Column (11)) is the amount marketed (Column (6)) less total exports (Column (10)). The total is divided by the Canadian population figure, June 1 of each year, as reported in the Canada Yearbook, to yield a per capita domestic disappearance figure.

same month at Glace Bay, Petit de Grat and Louisbourg, Nova Scotia, large haddock brought the fishermen 4¢ and scrod 2½¢; at North Sydney, "haddock" was 3½¢. Round haddock at Glace Bay were sold for 2¼¢, less 10% (being ungutted). Ungraded haddock at St. John's, Newfoundland, were quoted at 3¢ a pound.

Monthly weighted average prices of haddock landings in 1957 and 1958 are presented in Table 3. Prices were generally higher in 1958, which was a low production year for haddock. New Brunswick prices were higher in part because much of the New Brunswick catch is in the Bay of Fundy area, where it goes predominantly into the fresh fillet trade. The average values for some winter months are 1¢ to 2¢ higher than summer values in New Brunswick and Nova Scotia, reflecting the influence on price of relatively small winter landings. Winter prices for haddock in Halifax have been as high as 6¢ in late 1957 and 1958, 6¼¢ in 1952-53, and 6½¢ in 1950.

Some indication of the seasonal pattern of landings is given by the monthly landings and landed value figures in Table 4, from which the average values in Table 3 were derived.

4. Processing

A large proportion of the haddock catch is landed by draggers and trawlers. On this account the greater part of fresh haddock fillets is produced in plants which also produce frozen fillets. Filleting is carried out with the same equipment and personnel used in filleting the other groundfish species; in fact, it is common practice to change from haddock to cod or flatfish in the same day, according to the supply situation. Consequently, it is difficult to allocate indirect costs among the different species filleted. The direct labour cost of candling haddock fillets would be somewhat less than on runs of cod or plaice, because only a few candler-inspectors are needed; many of these may be put on the packaging line when the filleting line shifts to haddock. On the other hand, the filleters would have a lower production rate on haddock than on larger cod. Some estimates of plant operators place the labour-cost of filleting haddock about half-a-cent higher than that for cod: e.g., 4½¢ compared with 4¢ per fillet-pound. As suggested in previous discussion, the recovery rate is higher for haddock than cod: perhaps an average of 35% from all sizes for fillets and blocks combined, 38% in filleting large haddock, and 41% if the skin is left on the fillets.

Haddock fillets are packed for market like cod fillets: fresh fillets separated by parchment paper and packed in 20-pound boxes; frozen fillets for the most part in one-pound cartons, 48 to the master carton.

Haddock offal going into fish meal production would approximate two pounds for every pound of fillet-weight. A slightly higher recovery rate than one-third for haddock would mean a slightly lower

TABLE 3. MONTHLY WEIGHTED AVERAGE VALUES OF HADDOCK LANDINGS, FOR THE CANADIAN ATLANTIC COAST AND SELECTED PROVINCES, 1957 AND 1958^a

(Average Value in Cents per Pound)

Month	Atlantic Coast		Nova Scotia		New Brunswick		Prince Edward Island		Newfoundland	
	1957	1958	1957	1958	1957	1958	1957	1958	1957	1958
Jan.	3.2	4.6	3.6	5.2	b	b	-	-	2.5	2.3
Feb.	3.0	3.9	3.7	4.7	-	-	-	-	2.3	2.4
Mar.	3.1	3.8	3.8	4.6	-	-	-	-	2.3	2.4
Apr.	3.1	3.3	3.7	4.0	-	-	-	-	2.2	2.4
May	2.9	3.5	3.4	4.1	5.7	b	b	b	2.2	2.2
June	3.3	4.3	3.4	4.2	4.4	5.5	3.8	4.0	2.1	-
July	3.3	4.4	3.3	4.2	4.4	5.6	b	4.3	b	b
Aug.	3.3	4.5	3.2	4.6	b	5.9	3.7	4.0	b	b
Sept.	3.4	4.3	3.5	4.6	b	5.6	3.8	4.5	2.5	2.4
Oct.	3.5	3.7	3.6	4.8	b	6.1	b	5.0	2.0	2.2
Nov.	3.6	4.8	4.0	5.1	b	6.9	-	b	2.3	2.1
Dec.	4.1	4.5	4.8	5.5	b	10.4	b	b	2.3	2.1

a Computed from data in Table 4.

b The smallness of the totals when rounded prevents obtaining an average value figure within a significant range of accuracy.

TABLE 4. MONTHLY LANDINGS AND LANDED VALUES OF HADDOCK,
CANADIAN ATLANTIC COAST AND SELECTED PROVINCES,
1957 AND 1958^a.

Period	Canadian Atlantic Coast	Nova Scotia	New Brunswick	Prince Edward Island	Newfoundland
A. <u>Quantity in Thousands of Pounds</u>					
<u>1957</u>					
Jan.	11,195	6,006	48	-	5,141
Feb.	16,985	8,678	4	-	8,303
Mar.	17,106	9,142	-	-	7,964
Apr.	22,303	12,779	5	-	9,519
May	15,013	7,942	230	26	6,809
June	11,145	8,903	549	320	1,276
July	6,516	5,973	362	44	102
Aug.	7,826	6,894	198	602	132
Sept.	6,232	4,814	201	390	827
Oct.	5,399	4,455	187	166	591
Nov.	5,903	4,361	161	-	1,377
Dec.	5,434	3,660	108	113	1,553
<u>1958</u>					
Jan.	3,623	2,879	12	-	732
Feb.	14,703	9,424	4	-	5,275
Mar.	23,724	15,310	7	-	8,407
Apr.	12,779	7,406	1	8	5,364
May	7,168	4,487	140	30	2,489
June	4,915	4,231	421	248	9
July	4,067	3,185	550	254	76
Aug.	4,822	3,128	589	766	339
Sept.	5,887	3,681	463	712	1,031
Oct.	9,689	4,741	394	440	4,114
Nov.	5,886	4,496	347	165	855
Dec.	5,883	3,650	164	32	2,037

TABLE 4. MONTHLY LANDINGS AND LANDED VALUES OF HADDOCK,
CANADIAN ATLANTIC COAST AND SELECTED PROVINCES,
1957 AND 1958a (Cont'd.).

Period	Canadian Atlantic Coast	Nova Scotia	New Brunswick	Prince Edward Island	Newfoundland
B. <u>Value in Thousands of Dollars</u>					
<u>1957</u>					
Jan.	353	218	4	-	131
Feb.	517	323	b	-	194
Mar.	526	346	-	-	180
Apr.	682	471	b	-	211
May	435	270	13	1	151
June	371	305	24	12	27
July	215	195	16	2	1
Aug.	258	223	9	22	4
Sept.	215	170	9	15	21
Oct.	190	162	9	7	12
Nov.	215	174	9	-	32
Dec.	225	176	8	6	35
<u>1958</u>					
Jan.	168	150	1	-	17
Feb.	567	443	b	-	124
Mar.	901	700	b	-	201
Apr.	422	294	b	b	128
May	248	182	8	1	56
June	211	178	23	10	b
July	177	133	31	11	2
Aug.	216	144	35	31	6
Sept.	253	170	26	32	25
Oct.	362	226	24	22	90
Nov.	283	231	24	9	18
Dec.	262	200	17	2	43

a Data from D.B.S., Monthly Review of Canadian Fisheries Statistics.

b Less than one-half of the specified unit.

proportion of offal than in the case of codfish, but the difference is not great enough to warrant changing from the $\frac{3}{4}$ -cent allowance off the raw material cost per pound that was used for cod fillets, based on an offal value of \$7.50 a ton.

5. Distribution: Processor to Retail

The marketing chain is that described for cod fillets: from processor to commission agent or broker to wholesaler to retailer, restaurant or hospital. The wholesaler or retailer may buy directly from the processor.

Canadian official wholesale and retail price quotations are available only for fresh unwrapped haddock fillets. Taking October, 1957, quotations for Toronto as an example, the wholesale price was 40¢ and the retail price 60¢. At that time the fishermen received 5¢ a pound for haddock on the wharf at Halifax; the raw material cost of fillets was, therefore, in the neighbourhood of 15¢ a pound, less three-quarters of a cent for the offal - say 14¢. Processing costs of, say, 6¢ would bring the f.o.b. plant price to 20¢ and the Toronto wholesaler's cost to about 25¢ after allowing for transportation and brokerage. In this case, his markup would be 15¢, or 37½% on his selling price.

The average value at plant of the production of fresh haddock fillets in Maritime plants as reported to the Dominion Bureau of Statistics, was about 26¢ for 1955 and 1956 - considerably above the f.o.b. plant value of 20¢ used in this illustration.

The average Maritime plant value of frozen haddock fillets, from plant reports, was 23½¢ a pound for 1954, 22½¢ for 1955, and 18½¢ for 1956. The 1956 reported plant values per pound can be compared with the wholesale price quotations in Table 5.

Taking the f.o.b. plant value of frozen haddock fillets to be the same as that of the fresh fillets, 20¢, the Toronto wholesaler's cost might be about 22½¢, carload express and brokerage paid, and his markup about 10¢, or 31% on a selling price of 32¢.

6. Retailing

The section of the study on cod fillets, describing the retail marketing system, is applicable also to haddock fillets. The problem of a relatively small volume of product in the domestic distribution system is illustrated by the domestic disappearance figures in Table 2. It is apparent, however, that the Canadian consumption of haddock fillets has been increasing during the past 10 years, while cod fillets have been losing ground.

TABLE 5. WHOLESALE PRICES, FROZEN HADDOCK FILLETS

(Cents per Pound)

	October 1956	October 1957	April 1958
<u>Boston</u> (Canadian and Domestic Fillets)			
Skin-off, 1 lb.	-	30-33	36-38
5 lb.	26-28	28-31	33-35
Skin-on, 1 lb.	-	27-30	34-36
5 lb.	23-25	25-28	31-33
<u>Toronto</u> (White's Fish Co.)			
		(April, 1957)	
Skinless, 1-lb. tray	-	-	38
5-lb. cello	32	32	37

7. Measurement of the Price Spread

The data are presented in Table 6. The raw material cost is an unweighted rough average for the year, calculated by inspection from the monthly landed prices for large haddock at Halifax, and adjusted to allow for an offal value of \$7.50 a ton (one-quarter of a cent a pound off the raw material cost). The (unweighted) average wholesale and retail prices of fresh haddock fillets at Toronto were divided by the factor 2.86 to obtain the wholesale and retail values equivalent to a pound of haddock, head-on gutted weight.¹

The Halifax fishermen's share of the consumer dollar paid for fresh haddock fillets in Toronto was highest in 1950. In that year, the landed price was 6¢ during most of the summer and 6½¢ in late fall and winter months. The fishermen's share was lowest in 1955, when the landed price of haddock remained at 4¢ from May to October, and was 5¢ in the other months, while Toronto retail prices were 5¢ to 12¢ above those for corresponding months in 1950. For the past six years the fishermen's share has not varied far from 22%.

On frozen haddock fillets, the fishermen's share of the retail dollar is somewhat larger, because the retail price is lower. A complete series of retail prices is not available to us, but taking,

¹ A recovery rate of 35% is equivalent to a recovery of one pound of fillets from 2.86 pounds of haddock as landed.

TABLE 6. FISHERMAN-RETAIL SPREAD ON FRESH UNWRAPPED HADDOCK FILLETS, BASIS HALIFAX LANDED PRICES AND TORONTO RETAIL PRICES, 1950 TO 1958^a

Year	Average Retail Price at Toronto (¢/lb.) (1)	Retail Equivalent Value per lb. of Haddock Landed Weight (¢) (2)	Toronto Wholesale Value per lb. Landed Weight (¢) (3)	Raw Material Cost of Filletts per lb. Landed Weight (¢) (4)	Fisherman -Retail Spread (¢) (5)	Retailer's Share of Retail Value (%) (6)	Fishermen's Share of Retail Value (%) (7)
1950	49.3	17.3	12.3	6.0	11.3	29	35
1951	55.6	19.5	14.2	5.5	14.0	27	28
1952	60.6	21.2	14.6	5.5	15.7	31	26
1953	58.8	20.6	13.7	4.8	15.8	34	23
1954	59.1	20.7	13.9	4.8	15.9	33	23
1955	57.9	20.3	12.9	4.3	16.0	36	21
1956	59.7	20.9	13.6	5.0	15.9	35	24
1957	61.1	21.4	13.9	4.8	16.6	35	22
1958	67.8	23.7	15.6	5.3	18.4	34	22

^a Halifax landed prices reported by the Department of Fisheries were used for computation of the raw material cost, and the annual wholesale and retail prices used were unweighted averages of the monthly quotations in the D.B.S., Monthly Review of Canadian Fisheries Statistics. A recovery rate of 35% (100 lb. of filletts from 286 lb. of haddock as landed) was assumed in calculating the wholesale and retail equivalent values per pound of haddock, landed weight. Average landed price per pound (raw material cost) was reduced by one-quarter of a cent to allow for the value of offal.

for example, a retail quotation of 41¢ a pound at Toronto in April, 1958, the spread on a raw material cost of 17¢ for the previous month¹ was 24¢, and the fishermen's share of the consumer dollar was about 41%.

¹ The landed price in Halifax was 6¢ for haddock in March, 1958. It was 5¢ in April.

WHITEFISH FILLETS AND DRESSED WHITEFISH

1. The Raw Material

The common or lake whitefish (*Coregonus clupeaformis*) is related to the salmon and trout families, and is one of several varieties of whitefish, but the only one of commercial importance in Canadian fisheries. The mature whitefish averages 18 inches in length and 2½ to three pounds in weight, although larger ones are not uncommon. Maturity is reached in three or four years, but may take as much as eight years in cold water lakes, such as Great Slave Lake. Whitefish frequent the colder, deep water in the summertime, moving into shallower water in the spawning season, which begins usually in October and continues until as late as January in the colder lakes.

It is not known to what extent the ravages of the sea lamprey have reduced the numbers of whitefish in the Great Lakes; the Ontario catch has fallen off in recent years, but whitefish stocks are subject to random or cyclic fluctuations. In any case, the lake trout has been the lamprey's chief victim. Scientists have developed electric fences or weirs to kill the lampreys ascending tributary streams from the lakes to spawn, and two chemicals (phenols) have been discovered that will, in proper concentration related to the stream flow, poison most of the young lampreys in the mud of the stream bed (where they live for three or four years) without much damage to fish in the stream. This control work is being continued under the international Great Lakes Fishery Commission.

Whitefish are sold mainly in the fresh or frozen, head-on dressed or filleted forms. The head is small, hence recovery rates in filleting are high in comparison, for instance, with codfish. The current recovery figure at Great Slave Lake is 50%. The rate varies widely, being lower at spawning time. Water temperatures in the different lakes are important factors, since the colder water presumably delays development of the gonads. Fisheries Research Board of Canada data, for example, show a yield of edible flesh (skinless fillets) of 39.2% for whitefish from Lac La Ronge in February, 49.3% from Great Slave Lake in January, 51.4% from Lake Winnipeg in June, and 43.4% from some Saskatchewan lakes in March. For fillets with the skin left on, the yield figure would be nine to 12 percentage points higher. Under the circumstances, an average recovery rate of 45% for skinless fillets is a conservative estimate.

Usually about 17% of the round weight is lost in gutting and less than 25% in beheading and gutting. However, glazing adds 8% to 12% to the frozen dressed weight. Consequently, 110 pounds round weight to 100 pounds frozen dressed, head-on (91% yield) might be an appropriate conversion ratio. The average yield of fresh dressed whitefish from the round would be near to 83%.

2. Disposition of the Catch

In the catch statistics for the inland fisheries of Ontario, the Prairie Provinces and the Northwest Territories, there are wide ranges of reliability, arising out of the different methods and conditions under which they are collected, particular circumstances of government administration, and the different forms in which the catch is marketed. In general, the user of statistics for these fisheries, apprised of the possible biases and aberrations, appropriately reserves and qualifies any conclusions he may base upon the statistics.

However, the difficulties faced by the respective provincial government administrations and the heavy cost that would be entailed in establishing and maintaining a flow of accurate information concerning the catch from the hundreds of lakes on the Prairies and in Ontario should not be underestimated. The statistical reporting of the Northwest Territories catch is simple by comparison, because Great Slave Lake is the only important centre of production, the number of fishermen and buyers is small, and practically the entire catch passes through the port of Hay River on its way to market.

Landings and landed values of whitefish in Canada are reported to be as shown in Table 1 following. The annual average for the nine years 1949-57 was 24.6 million pounds of whitefish, worth \$4.1 million. This was about 23% by weight, and 32% by value of landings of all freshwater species. The proportions have been lower in recent years, viz., 18% by weight, and 26% by value in 1956, and 21% by weight, and 27% by value in 1957.

Whitefish exports for the same nine years averaged 17.5 million pounds of fresh or frozen dressed and nearly one million pounds of fresh or frozen fillets. These figures combined (using as conversion rates to landed weight 100/85 and 100/45, respectively) represent as annual average export of 22.8 million pounds of whitefish as landed - viz., 93% of landings. Domestic disappearance, then, would have been about 1.8 million pounds a year, or half as much in terms of edible weight - about one-fifteenth of a pound per head of population. This is a figure too low to merit confidence. Since export figures are reasonably accurate, the obvious conclusion is that the catch figures may be too low.

The annual whitefish export figures for the decade 1949-58 appear in Table 2, including computed average export values per pound. (It may be noted that the average export value per pound of whitefish fillets is not greatly different from that of dressed whitefish.) In the absence of production data, the export figures may be used as an indication of the trend in the production of whitefish fillets, showing some increase over the 10 years. In terms of the landed weight equivalent, fillets represented about 10% of Canadian whitefish exports over the decade, and about 12% in the last four years.

TABLE 1. ANNUAL CANADIAN LANDINGS AND LANDED VALUES
OF WHITEFISH, BY PROVINCES, 1949 TO 1957^a

Year	Total ^b	Ontario	Manitoba	Saskatchewan	Alberta	Northwest Territories
<u>A. Quantity Landed in Thousands of Pounds</u>						
1949	22,509	7,063	4,220	3,542	1,828	5,757
1950	24,776	6,589	6,217	4,389	2,411	5,071
1951	26,506	7,180	6,125	5,852	2,703	4,580
1952	27,894	9,426	5,758	5,639	3,159	3,831
1953	25,571	10,214	4,539	3,889	3,021	3,866
1954	24,577	6,844	5,297	5,196	3,180	4,019
1955	21,990	4,451	5,184	5,008	2,686	4,600
1956	22,884	4,049	5,524	5,234	4,063	3,972
1957	24,395	3,226	6,482	6,423	3,962	4,302
<u>B. Value of Landings in Thousands of Dollars</u>						
1949	3,510	2,086	593	282	205	327
1950	4,021	1,922	980	404	291	408
1951	4,530	2,471	878	486	342	337
1952	4,749	2,628	859	407	414	426
1953	4,352	2,704	690	304	373	274
1954	4,425	2,290	878	417	428	404
1955	3,726	1,624	808	428	378	475
1956	3,636	1,403	724	474	538	488
1957	3,604	1,069	844	596	592	503
<u>C. Average Landed Value in Cents per Pound</u>						
1949	15.6	29.5	14.0	8.0	11.2	5.7
1950	16.2	29.2	15.8	9.2	12.1	8.0
1951	17.1	34.4	14.3	8.3	12.6	7.4
1952	17.0	27.9	14.9	7.2	13.1	11.1
1953	17.0	26.5	15.2	7.8	12.3	7.1
1954	18.0	33.5	16.6	8.0	13.5	10.1
1955	16.9	36.5	15.6	8.5	14.1	10.3
1956	15.9	34.6	13.1	9.1	13.2	12.3
1957	14.8	33.1	13.0	9.3	15.0	11.7

a Fisheries Statistics of Canada, 1957, Dominion Bureau of Statistics, Ottawa.

b Totals include additional small amounts landed in Quebec and New Brunswick.

TABLE 2. CANADIAN WHITEFISH EXPORTS, 1949 TO 1958^a

Year	Quantity (thousand pounds)			Value (thousand dollars)			Average Value per Pound (cents)		
	Fresh Whole or Dressed	Frozen Whole or Dressed	Fresh or Frozen Filleted	Fresh Whole or Dressed	Frozen Whole or Dressed	Fresh or Frozen Filleted	Fresh Whole or Dressed	Frozen Whole or Dressed	Fresh or Frozen Filleted
1949	14,816	2,091	575	4,300	528	157	29.0	25.3	27.3
1950	13,732	3,276	821	4,514	893	266	32.9	27.3	32.4
1951	14,980	3,965	1,062	4,867	1,142	348	32.5	28.8	32.8
1952	16,176	3,592	1,225	4,991	1,052	385	30.9	29.3	31.4
1953	16,663	3,467	708	4,942	1,066	202	29.7	30.7	28.5
1954	14,832	2,302	901	4,902	799	273	33.1	34.7	30.3
1955	13,149	2,988	1,162	4,351	1,115	370	33.1	37.3	31.8
1956	12,896	2,386	1,180	4,655	875	397	36.1	36.7	33.6
1957	13,489	2,922	1,235	4,839	969	428	35.9	33.2	34.7
1958	13,959	2,548	1,161	5,240	849	383	37.5	33.3	33.0
Average 1949-58	14,469	2,954	1,003	4,760	929	321	32.9	31.4	32.0

^a Monthly Review of Canadian Fisheries Statistics or Trade of Canada, Dominion Bureau of Statistics.

3. Location and Conditions of Production

The bulk of Canadian fresh-water fish landings are made in Ontario, the Prairie Provinces, and Great Slave Lake in the Northwest Territories. Quebec, New Brunswick, and the Yukon have commercial inland fisheries on a smaller scale. Whitefish occur in all of the provinces and are the most important species in the commercial fresh-water catch.

An indication of the volume of production in each of the provinces is afforded by the quantities examined by federal Department of Fisheries inspectors, who are responsible for the inspection of all whitefish shipments to United States markets. Table 3 shows the amounts of whitefish inspected from the different provinces, and the districts in which inspection took place, during the four years ending March 31, 1957. Evidently, substantial amounts of Prairie fish are inspected in Ontario and Quebec, en route to eastern United States centres.

In Table 4 are shown the percentages of the total volume of inspected whitefish contributed by the various provinces in those four years. The three Prairie Provinces supplied about one-half of the volume moving into the United States or into other provinces, Ontario a little more than one-quarter. An average of about 19 million pounds of whitefish a year was inspected during the four-year period - fillets being combined with dressed whitefish in the total weight. Canadian exports of dressed whitefish and whitefish fillets together averaged a little more than 18 million pounds a year for an approximately corresponding four- (calendar) year period - either 1954-1957 or 1953-1956. Since re-inspected lots were not included in the statistics, no doubt the difference between inspections and exports represented inspected shipments that went into the domestic market.

The seasonal nature of the fresh-water fisheries is reflected by the data in Table 5, which presents the monthly totals of whitefish inspected in all of the inspection districts during the four years to March 31, 1957. The peak production periods are July and August in the summer, and January to March in the winter. Winter weather seriously restricts fishing activities on the Great Lakes, but where the lakes freeze over on the Prairies and in the Yukon and Northwest Territories, winter and summer fishing are distinctly different operations. No fishing takes place during the fall freeze-up or in the spring while the ice is breaking up, but winter fishing operations get into full swing when the ice becomes thick enough to bear the weight of men and vehicles. The summer fishery begins when the boats can operate, provided there are passable roads, or other means, to take the catch out to market.

Some fishermen may engage in the one fishery, but not in the other. The gear in general use is the gill-net, set from boats in the summer, and through holes in the ice in the winter. The winter fishery is carried on with horse- or tractor-drawn sleighs or cabooses, tracked snowmobiles called "bombardiers", and motor trucks. From some of the remote lakes, a tractor train of sleighs, with a heated caboose for the crew, may haul the catch 60 or 70 miles to the railway over routes that

TABLE 3. QUANTITIES OF WHITEFISH INSPECTED, BY PROVINCE OF ORIGIN AND DISTRICT OF INSPECTION, FOR THE YEARS 1953/54 TO 1956/57^a

(Thousands of Pounds)

Year Apr. 1-Mar. 31	Province of Origin	District of Inspection			Total
		Ontario & Quebec	Prairie Provinces	Northwest Territories	
1953/54	N.W.T.	9	-	2,814	2,823
	Alberta	1	2,359	-	2,360
	Sask.	681	1,499	-	2,180
	Man.	1,274	3,017	-	4,291
	Ontario	8,127	181	-	8,308
	Quebec	21	-	-	21
Grand Total		10,113	7,056	2,814	19,983
1954/55	N.W.T.	1	-	3,831	3,832
	Alberta	39	2,449	-	2,488
	Sask.	654	2,419	-	3,073
	Man.	1,124	3,536	-	4,660
	Ontario	4,117	620	-	5,737
	Quebec	39	-	-	39
Grand Total		6,974	9,024	3,831	19,829
1955/56	N.W.T.	20	18	3,774	3,812
	Alberta	18	2,301	-	2,319
	Sask.	798	2,495	-	3,293
	Man.	1,215	3,814	-	5,029
	Ontario	2,992	713	-	3,705
	Quebec	42	-	-	42
Grand Total		5,085	9,341	3,774	18,200
1956/57	N.W.T.	2	-	3,784	3,786
	Alberta	36	2,482	-	2,518
	Sask.	375	3,128	-	3,503
	Man.	772	3,951	-	4,723
	Ontario	2,318	1,030	-	3,348
	Quebec	57	-	-	57
Grand Total		3,560	10,591	3,784	17,935

^a Data summarized by the Economics Service from reports prepared by the Inspection and Consumer Service, Department of Fisheries, Ottawa.

TABLE 4. QUANTITIES AND PROPORTIONS OF INSPECTED WHITEFISH FROM THE DIFFERENT PROVINCES, 1953/54 TO 1956/57

Province of Origin	Four-Year Total (thousand lb.)	Annual Average	Per Cent of Total (%)
N.W.T.	14,253	3,563	18.8
Alberta	9,685	2,421	12.7
Sask.	12,049	3,012	15.9
Man.	18,703	4,678	24.6
Ontario	21,098	5,275	27.8
Quebec	159	40	0.2
Total	75,947	18,987	100.0

TABLE 5. MONTHLY AMOUNTS OF WHITEFISH INSPECTED IN ALL INSPECTION DISTRICTS, APRIL, 1953 TO MARCH, 1957^a

(Thousands of Pounds)

Month	Year (April 1-March 31)				Annual Average 1953-57	Per Cent of Annual Average (%)
	1953/54	1954/55	1955/56	1956/57		
April	848	605	480	398	583	3.1
May	1,538	903	772	652	966	5.1
June	1,900	1,677	1,714	1,215	1,627	8.6
July	2,850	2,721	2,864	2,109	2,636	13.9
August	2,055	2,526	2,350	3,272	2,551	13.4
September	1,427	1,752	1,366	1,150	1,424	7.5
October	1,197	851	688	1,135	968	5.1
November	1,422	1,177	642	779	1,005	5.3
December	1,586	1,559	1,410	1,311	1,467	7.7
January	1,496	2,144	2,122	2,142	1,976	10.5
February	1,878	1,914	1,783	1,866	1,860	9.8
March	1,786	2,000	2,009	1,906	1,925	10.1
Total	19,983	19,829	18,200	17,935	18,987	100.0

^a Source of data as given for Table 3.

would be impassable in summer. In some instances, particularly for the fresh fish trade, aircraft may be the only practicable method of transporting the fish, using pontoons or skis, according to the season, for landing on the lakes.

An ingenious device called a "jigger" is used in setting the net under the ice. A hole is chopped and the jigger, with a line attached, is inserted and by jerking on a cord, is made to crawl along the underside of the ice. A second fisherman follows it by sound and another hole is cut to bring it out, drawing the line with it, perhaps a hundred yards from the hole where it went in. The line is then used to draw the gill-net under the ice until it extends from one hole to the other.

The fishing boats in use on the Great Lakes are mainly closed-in steel-hulled steam or motor-driven "fishing tugs" 50 to 70 feet long, but there are lesser numbers of motor-driven launches and sailboats or rowboats. On the Prairie lakes, motor-driven boats are used, usually about 32 feet long, and 20-foot skiffs, but the recent trend on Great Slave Lake has been towards larger boats 35 to 45 feet long, powered with a 30 to 70 h.p. gasoline engine, with a deckhouse to shelter the crew, and capable of carrying up to five tons of fish.

The scale of capital investment per fisherman, in fishing boats and gear, is generally low in the Prairie fisheries, and much of the equipment is provided by the fish company or buyer at the lake, particularly when the fishermen - Indians or whites - are part-time trappers, hunters or farmers. On some lakes, the most successful fishermen finance their own operations and may even buy or, at least, pack and ship the catch of other fishermen. Great Lakes fishing enterprises using steel tugs require a heavy investment; fishermen may be owners or partners in the enterprise, or use boats and gear provided, all or in part, by a processing company.

Licensing and other administrative provisions differ considerably among the provinces. In Ontario, licence fees are generally graduated, according to the maximum yardage of nets they permit, and are also an administrative aid in limiting the number of fishermen to previous licence-holders, or to one individual or one Indian band on small lakes. Generally, a fee of \$10 permits the fisherman to use up to 3,000 yards of gill-net, \$20 up to 6,000 yards limit, and \$30 up to 9,000 yards. On Lake Erie, two rates are in effect: at the east end of the lake, the licence fee is \$125 (equivalent to about 36,000 yards of gill-net), and the other rate is \$50, for smaller operations. On important species - blue and yellow pickerel, lake trout, whitefish, and sturgeon - a royalty is also paid by fishermen, amounting to a quarter-cent a pound on production over and above five tons per 3,000 yards of net. (The exemption is 60 tons on a \$125 licence.) Different systems are in effect on Lake Nipigon and on small inland lakes, and for pound nets.

In Saskatchewan, Co-operative Fisheries Limited became, in the early months of 1959, the central selling and financing agent for 13

local co-operatives.¹ It has taken over processing plants from the Government of Saskatchewan on long-term payment arrangements. The local co-operatives are autonomous in production, but do not engage directly in packing or filleting operations. These are contracted out to private operators at specified rates for the different operations - dressing and boxing, filleting, packaging, etc. The contractor must get a specified yield in filleting and meet quality standards, subject to a penalty if the recovery rate or quality standards are not maintained.

In Alberta, a system of lake leases has been instituted, somewhat similar to the leasing of timber limits. Alberta Fisheries Products has been given a lease on certain lakes, calling for payment of a specified royalty on production (1¢ a pound for whitefish). The lease runs for five years with the option of renewal at the end of each five-year period. The lessee must take a minimum amount of fish yearly to hold his lease, and a maximum is set, also, for each lake. There is no limit on the number of fishermen, nor on the yardage of nets they use, but all fishermen must be licensed and legal mesh sizes must be used.

4. Assembly and First Sale

Regional marketing patterns differ considerably. The fishermen may sell to consumers, particularly in well-settled areas, or to pedlars who do so, but the larger part of the fresh-water catch is sold to dealers or processors, who may be also the exporters. Much of the frozen fish from the Prairie lakes is bought from the fishermen by traders, who put the fish into cold storage and sell to wholesalers or exporters as the demand arises. The dealers may be also wholesalers and exporters. Fishermen sell to a packer on the lake, who may be an independent buyer, but more often an agent for a company which finances his operations and guarantees a fixed return (of, say, 4¢ a pound on whitefish).

On Lake Winnipeg, for instance, whitefish, after being packed with ice in boxes, is transported by barge and rail to Winnipeg, where it might be filleted or re-packed and exported as fresh dressed fish. The costs might include \$1 to \$2 a hundred pounds for freight by tug on the lake, and a dollar a hundred for handling charges at Winnipeg. From more remote lakes, aircraft are used to bring the fish in to railhead, for instance, at The Pas, Lynn Lake, or Flin Flon, at a cost of, perhaps, \$5 to \$8 per cwt., and shipment is by rail the rest of the way to Winnipeg, at from \$2 to \$3 per cwt. in carload lots.

When transportation costs are high, savings may be effected by carrying out filleting operations close to the source of supply. As an example of this type of operation, the Northland Fishing Company has a filleting plant at Island Lake, Manitoba, and operates its own fleet of

¹ Thus, the situation changed somewhat from that described in Volume II, p. 264, of the Report of the Royal Commission on Price Spreads of Food Products.

aircraft. Fish from Island Lake and fish flown in from surrounding territory are filleted, and the fillets are flown out to Riverton and moved thence by truck or rail to Winnipeg.

In Ontario, a number of fishermen's local co-operatives are active, packing, and in some instances, filleting fish for domestic sale or export. Processors and wholesalers buy from the fishermen and pack or fillet the fish for shipment, likewise, to the principal Canadian and United States markets. Some firms buy exclusively for customers or parent companies in the United States. Some Toronto wholesale-retail specialty fish stores prefer to buy directly from fishermen, and these may then smoke or otherwise process some of the fish before re-sale.

On Great Slave Lake, half-a-dozen companies buy from the fishermen on the ice or at his icehouse, or at the company dock or barge. Company boats in summer, and trucks and bombardiers in winter, bring supplies to the fishermen and haul the fish back to Hay River, the northern terminus of the Mackenzie Highway. From this point, transportation is by truck to Grimshaw or Peace River, Alberta, and thence by train to Chicago, Detroit or New York. Few shipments are made directly from Hay River to United States centres by refrigerated truck, because of the scarcity of return loads.

In the summer fishery on Great Slave Lake, an average day's catch for two men might be 3,000 pounds, mainly lake trout and whitefish. The fish are stowed below in ice as soon as they are caught. The boat is unloaded at the company barge, a floating factory moored to the shore at the temporary summer base camp, where the fish are cleaned and dressed or, at some points, filleted, and packed again in ice in shipping boxes for the journey to market. The boxes are lowered into the refrigerated hold of a freight boat for the trip across the lake to Hay River.

Handling of the winter catch depends upon whether it is to be sold as "fresh" or "frozen". Fresh fish are cleaned as quickly as possible on the ice and loaded into a heated caboose or snowmobile; more often they are taken back to Hay River and dressed under more comfortable conditions. Care has to be taken to prevent the fish from freezing during transportation in sub-zero weather. Fish for the frozen trade are dressed immediately on the ice and allowed to freeze. The holding and transportation of frozen fish presents fewer problems, except those entailed by mild weather.

The price paid to the fishermen is influenced by a number of factors, including the market demand-supply situation and the degree of competition among local buyers, quality differences or market preferences for fish from certain lakes, differences in transportation costs, and differences in the form in which the fish is to be marketed. As indicated by the monthly inspection data for whitefish in Table 5, the supply varies quite widely from month to month. Variable supply, in conjunction with uncorrelated peaks in the demand for fresh-water fish during Lent and the Jewish religious holidays, results in wide seasonal, weekly, or even daily variations in market prices. Also the Jewish preference for fresh whole fish results in premium prices for fresh

dressed whitefish, and although that preference is declining, the price of whitefish fillets still tends to range below what would be a comparable price in terms of edible weight and the cost of filleting.

Quality differences are exemplified by the United States market preference for whitefish from Lake Erie, Georgian Bay, or Lake Superior.¹ Lake Erie fishermen get higher prices for whitefish than other Ontario producers, in part because of this market preference, in part because practically all Lake Erie whitefish are sold in the fresh dressed market, rather than frozen. Similarly, Lake Winnipeg whitefish are sold at premium prices in the fresh form, whereas whitefish from some of the northern Prairie lakes have flesh of a darker hue and rate much lower in consumer preference.

Regional advantages in transportation costs are important, and so is the time element in marketing fresh fish. The lakes that are inaccessible by road or railroad have to depend on air freight, or possibly on snowmobiles or tractor trains in the winter. Fish destined for the fresh market would have to bear the cost of air transportation at least part way. Because of distance, poor transportation facilities, and the necessity for extra handling (e.g., in trans-shipment), the fresh fish market is closed to some lakes.

For these reasons, fishermen receive low prices for their fish in remote areas. However, filleting at the lake may reduce the shipping weight and consequently, the transportation costs, by one-half, and this, in conjunction with a low raw material cost, may make a filleting operation financially practicable, even though the fillets may be sold for little more per pound than dressed fish.

The strong influence on the price of fresh-water fish exercised by seasonal demand and supply factors is not shown in the annual average price figures in Table 1, but is evident in the seasonal catch data for the Northwest Territories (Great Slave Lake) in recent years (Table 6). Great Slave Lake fishermen sell their whitefish for much higher prices in winter than in summer. The summer fishery there has to sell fresh fish in competition with heavy production from the Great Lakes and other areas, but Great Lakes landings are small in winter and the Great Slave industry is probably better organized to ship out fresh fish in winter than many of the Prairie producers. Then, too, because of its relatively heavy production of lake trout, it has the advantage of tied sales; it is easier to sell a 20,000-pound (minimum) carload of fresh fish containing, say, 5,000 pounds of lake trout and 15,000 pounds of whitefish, than a carload of whitefish only.

Another example of price variation, according to location and season, is provided by the average landed values at different Manitoba lakes, shown in Table 7. Quotations are for the summer season, unless otherwise specified. The Northland Fishing Company filleting plant is

¹ See price quotations in the Chicago Daily Fishery Report, Market News Services, Bureau of the Commercial Fisheries, U.S. Department of the Interior.

TABLE 6. QUANTITY, TOTAL VALUE, AND VALUE PER POUND OF WHITEFISH LANDINGS, BY SEASONS, IN THE NORTHWEST TERRITORIES, 1954 TO 1958^a.

Year	<u>Winter Season</u> <u>December to March^b</u>			<u>Summer Season</u> <u>May or June to September</u>		
	Quantity (thousand lb.)	Value (\$ thousand)	Value per Pound (\$)	Quantity (thousand lb.)	Value (\$ thousand)	Value per Pound (\$)
1954	1,591	255	16.0	1,127	78	6.9
1955	1,980	258	13.0	2,401	156	6.5
1956	1,789	232	13.0	2,275	147	6.5
1957	1,868	307	16.4	2,681	268	10.0
1958	1,527	249	16.3	1,846	194	10.5

a D.B.S., Monthly Review of Canadian Fisheries Statistics.

b For 1954, January to March landings only are included.

TABLE 7. PRODUCTION, LANDED VALUE AND MARKETING VALUE OF WHITEFISH FROM SELECTED MANITOBA LAKES, YEAR 1957/58^a

Source	Production (thousand lb.)	<u>Value to Fishermen</u>		<u>Marketed Value</u>	
		Total (\$)	Average (\$/lb.)	Total (\$)	Average (\$/lb.)
All Lakes	6,481	843,946	13	1,729,056	27
Lake Winnipeg					
- Summer	1,097	274,200	25	438,720	40
- Fall	268	53,540	20	107,080	40
Lake Winnipegosis					
- Summer	14	1,420	10	2,840	20
Island Lake	432	19,445	4½	77,778	18
Moose Lake	58	7,008	12	14,016	24
Sipiwek Lake	34	4,107	12	8,214	24

a Preliminary data by courtesy of Fisheries Branch, Manitoba Department of Mines and Natural Resources. See also Annual Report for Period Ending March 31st, 1958, Fisheries Branch, which shows larger landings for Lake Winnipeg and Lake Winnipegosis.

located at Island Lake. The production at South Indian, Sipiweesk and Moose Lakes is fresh dressed fish.

5. Processing

Not much processing is required in packing frozen dressed whitefish; as previously stated, the winter fishermen may dress and freeze the fish on the ice, and it may be kept under natural refrigeration until shipped to a central distribution point, such as Winnipeg. Naturally-frozen fish is, however, of poorer quality than quick-frozen fish. Glazing the frozen fish by dipping it in water is necessary to prevent desiccation during storage. The frozen fish is placed in shipping boxes for movement by rail or truck to market or into cold storage.

More plant facilities, including ice storage, are required for packing fresh fish, although many of the existing establishments are small, being little more than a shed in which the dressing and packing is done. Still more equipment is needed for producing fillets, particularly freezers if the product is to be frozen. Consequently, there are relatively few filleting plants, and some of these also produce fish sticks and other specialties marketed through display freezer cabinets. The Canadian Fisheries Annual in its directory of fishing companies lists about 20 companies producing fresh-water fish fillets. About a third of these are in Ontario, and another third in Manitoba. Some plants may produce little or no whitefish fillets, but may fillet other species in more plentiful local supply, such as pike, pickerel, lake herring, or fresh-water perch.

A small but increasing proportion of the whitefish catch is filleted. The preference of Jewish customers has been for fresh whole fish, used for making "gefilte fish" in the home - a mixture of minced fish of several varieties with added spices, served in a ball or "patty". There is a trend, however, towards the marketing of ready-made gefilte fish, and for this fillets of pickerel, pike, whitefish and other fresh-water species may readily serve as the raw material. Some increase in the marketing of whitefish fillets may be explained on this basis, and the making of gefilte fish by processor, wholesaler or retailer represents another service added in the marketing chain, as required by changing consumer demands.

The greater part of the production of whitefish fillets is in the frozen form. It would usually be uneconomic to fillet fish that could be sold in the fresh dressed form, because the fillets, whether fresh or frozen, would command a price little higher, or perhaps even lower, than the fresh dressed fish. For example, whitefish for which the fishermen received 14¢ a pound might be put on the Chicago market as fresh dressed for an additional 11¢, including 3¢ for boxes and materials and 8¢ for transportation, duty ($\frac{1}{2}$ ¢), brokerage and profit - i.e., a cost to the Chicago wholesaler of 25¢. If this fish were filleted, a 50% recovery rate would mean a 28-cent cost for raw material (per fillet-pound), an estimated processing cost of 12 $\frac{1}{2}$ ¢ for filleting,

skinning, candling, packaging (including materials), and freezing, $4\frac{1}{2}\text{¢}$ for transportation, $1\frac{1}{2}\text{¢}$ duty, and perhaps 5¢ for commission and profit - making a laid-down cost of about 52¢ a pound. By the same rough method of calculation, fish for which the fishermen received 6¢ a pound could be filleted and delivered in Chicago or Detroit for about 35¢ a fillet-pound.

The rule-of-thumb trade estimate of $12\frac{1}{2}\text{¢}$ for filleting costs may be wide of the mark, of course, for many processors. Filleting would reduce the weight for transportation by one-half, but the economy in transportation would be easily outweighed by a failure of the market price to reflect the gain in edible weight over the dressed form.

Generally, fresh-water fish filleting plants are not able to utilize the offal in fish meal production. Keystone Fisheries Limited of Winnipeg is the only one listed in the Canadian Fisheries Annual directory of fish meal producers.

6. Distribution - Assemblers and Processors to Retail

The speculative buying of frozen fish by dealers or traders is important in getting the fish off the ice and into cold storage before the spring breakup, and in regulating the supply, in accordance with market demand. Brokers or commission agents likewise serve to smooth and adapt the market flow - an important function in a market as variable as that for fresh-water fish. In most domestic markets, because of the small volume handled, the wholesale and retail markups could be expected to be high; a slow turnover means greater losses through deterioration on fresh fish items, particularly if consumption is predominantly a one-day-a-week (Friday) occurrence.

No official Canadian wholesale price series is available for whitefish fillets, and no retail price series, either for Canada or the United States, presumably because the bulk of the trade is in fresh and frozen dressed whitefish. Some of the available series are brought together in Table 8, limited for the sake of brevity to the two years 1957 and 1958. For comparison, monthly quotations on frozen whitefish fillets, five-pound cello pack, by a Toronto wholesale house were stable at 45¢ a pound throughout 1957 and 1958, and ranged from 42¢ to 38¢ and 40¢ for most of the intervening time, until the 45-cent level was reached in the spring of 1956.¹ Evidently, the wholesale price of frozen whitefish fillets was 3¢ to 7¢ lower in Toronto than in Chicago. It is also apparent that the prices of frozen whitefish products fluctuated much less widely than the price of fresh dressed whitefish, through the month or through the year.

The Chicago wholesale quotations for "Alberta or Canadian" fresh dressed whitefish range much below those for the "Lake Superior"

¹ Quotations by White's Fish Company, Toronto, Division of National Sea Products Ltd., through the courtesy of the Economics Service, Department of Fisheries, Ottawa.

TABLE 8. DRESSED WHITEFISH AND WHITEFISH FILLETS: MONTHLY WHOLESALE PRICE RANGE AT CHICAGO AND AVERAGE WHOLESALE AND RETAIL PRICES AT TORONTO, 1957 AND 1958.

(Cents per Pound)

Period	TORONTO ^a			CHICAGO ^b			
	Fresh		Frozen	Dressed		Frozen	
	Dressed		Dressed	Fresh		Filletts	
	Whitefish		Whitefish	Whitefish		Canadian	
				Alberta			
	Retail	Wholesale	Wholesale	Lake Superior	or Canada	1-lb.	5-lb.
<u>1957</u>							
Jan.	59.5	40.5	29.2	53-70	33-45	50-52	48-50
Feb.	57.5	40.0	29.2	68-75	40-53	50-52	48-50
Mar.	48.0	42.5	29.0	75-80	35-53	50-52	48-50
Apr.	58.0	-	27.2	73-95	48-65	50-52	48-50
May	63.9	-	25.8	62-68	40-45	50-52	48-50
June	59.8	37.5	25.9	58-63	38-45	50-52	48-50
July	57.4	34.2	25.9	40-54	32-40	56-58	50-52
Aug.	56.9	30.0	25.6	56-62	30-37	56-58	50-52
Sept.	55.7	33.7	26.9	62-75	30-45	55-57	50-52
Oct.	56.4	35.0	26.9	60-74	38-50	55-57	50-52
Nov.	55.4	-	27.5	43-75	30-35	55-57	50-52
Dec.	58.2	37.5	28.2	48-72	23-55	55-57	50-52
<u>1958</u>							
Jan.	58.2	34.5	27.2	50-60	30-42	55-57	50-52
Feb.	58.2	33.5	27.2	60-75	30-43	55-57	50
Mar.	61.2	35.8	26.2	75-85	38-55	55-57	50
Apr.	63.7	-	26.2	58-100	-	54-56	48-50
May	62.0	-	26.2	50-78	-	54-56	48-50
June	58.3	-	26.8	47-55	35-40	54-56	48-50
July	54.4	31.0	26.8	45-54	30-35	54-56	48-50
Aug.	54.4	30.3	26.8	53-55	36-38	54-56	48-50
Sept.	57.0	33.3	26.8	56-85	35-55	54-56	48-50
Oct.	55.8	36.2	26.8	60-70	32-48	54-56	48-50
Nov.	55.3	35.7	26.8	68-75	40-58	54-56	48-50
Dec.	58.3	36.5	26.8	58-78	23-45	54-56	48-50

a Averages of mid-month wholesale quotations and first-of-the-month retail quotations at Toronto, from Monthly Review of Canadian Fisheries Statistics, Dominion Bureau of Statistics, Department of Trade and Commerce.

b Prices for sales in wholesale quantities by original receivers at Chicago, from Chicago Daily Fishery Report, Market News Services, Bureau of the Commercial Fisheries, U.S. Department of the Interior.

classification. Quotations under the latter heading occasionally are nominated "Ontario", and it is possible that the classification loosely includes all Great Lakes whitefish, as distinct from shipments from the Prairies - in recognition of a strong market preference for whitefish of Great Lakes origin.

Winnipeg and Toronto wholesale prices include, of course, transportation costs into those markets, and export values similarly include some part of the freight costs, at least to the United States border. The cost of moving Great Slave Lake fish by truck from Hay River to railhead at Grimshaw, Alberta, has been reported as \$35 a ton, net, and the railway carload express rate from Grimshaw or Peace River to Chicago is \$5.15 per hundred pounds, or \$5.65, duty paid, on dressed fish. Fresh dressed whitefish from Great Slave Lake can therefore be laid down in Chicago at a cost of about 7¢ a pound for freight.

Sample rates from Winnipeg are as follows:

	Rate per 100 lb.	
	L.C.L.	Carload
<u>TO</u>		
Toronto	\$5.25	\$4.40
Windsor	5.63	4.82
Montreal	5.50	4.70
Chicago	4.80	3.82
Detroit	6.47	4.82
New York	7.69	5.08

The minimum weight per carload is usually 15,000 pounds, net, where there is competing highway transport. On less-than-carload shipments, the express rate is charged on net weight, plus 25% for ice.

Very little fish goes by railway express from Winnipeg to New York; it is cheaper to ship to Montreal by rail and by truck the rest of the distance. Likewise, it is cheaper to ship L.C.L. lots to Windsor and truck the fish across the river to Detroit.

The United States customs duty is $\frac{1}{2}$ ¢ a pound on dressed fresh-water fish, and $1\frac{1}{2}$ ¢ a pound on the fillets. The discount on United States funds in converting them into Canadian dollars would also represent a cost to the Canadian exporter ranging up to 5% on the price received in the United States.

Inspection by inspectors of the federal Department of Fisheries is, by arrangement with provincial jurisdictions, compulsory for whitefish destined for export. Inspection of other fresh-water species may be obtained by request, but is not compulsory. Canadian inspection standards are purposely stricter than the American, but probably because of sample variations, occasional lots of Canadian whitefish are pronounced unfit for human consumption by United States Health Department

authorities under the Food and Drug Act. Such shipments are usually seized and destroyed; sometimes they may be returned to the Canadian exporter, but the situation is apparently more complicated if the product has moved into interstate commerce.

There is nothing at present to prevent whitefish that has been returned to the Canadian exporter, or whitefish that has been rejected for export by Canadian inspectors, from being sold on the Canadian market.

7. Retail Distribution, Restaurants and Institutions

There is little data on the distribution pattern of whitefish in Canada, nor on the volume of consumption in the various regions - but it is in total, as stated in Section 2, very small - apparently somewhat less than two million pounds a year. Much of the fresh whitefish is sold through wholesale-retail specialty stores in the larger cities. Fresh and frozen fillets are sold, like those of other species, through display cabinets in retail stores. A considerable volume of frozen dressed fish, including whitefish, may be sold by dealers or peddlars by house-to-house delivery on the Prairies - a similar method of distribution, the extensive so-called "mail-order" fish trade, is used in the American mid-west. Much local consumption by Indian bands and white fishermen and even some local sales may have been omitted from the statistics.

8. Measurement of the Price Spread

According to the Toronto price quotations, the monthly wholesale-to-retail price spread on fresh dressed whitefish has ranged between 25% and 55% of the retail price. Based on three-month moving price averages (the wholesale average centred, and the retail average lagged) the wholesale-retail spread was somewhat narrower - usually in the range of 30% to 40% - but higher markups were registered in the summer months, reflecting the increased risk of spoilage in handling fresh fish in warm weather.

A few price quotations obtained by special investigations indicate that the Toronto retail price for fresh dressed western whitefish was 43¢ to 45¢ in January, 1959, compared with a wholesale price of 15¢ to 25¢. The markup was therefore 42% to 67% of the retail price. The retail price in Winnipeg ranged between 25¢ and 59¢ a pound during 1958, the average being about 33¢ in the last four months of the year, and somewhat higher in the spring. Railway freight or express rates from Winnipeg to Toronto would represent a cost of from 4½¢ to 6½¢ a pound.

Wholesale price quotations in Toronto for Great Lakes whitefish ranged from 60¢ to 90¢ a pound in late January, 1959. However,

comparison of landed values of whitefish from Lake Erie or other Ontario sources with the Toronto average wholesale price quotations indicates the futility of trying to measure price spreads without specific information as to the origin of the fish and the price paid to the fishermen; the Toronto wholesale price was frequently less than the landed value reported for Lake Erie whitefish. In the absence of adequate information, it may be surmised that most of the whitefish sold in Toronto was of western origin.

A sample fishermen price-retail price spread for Manitoba fishermen can be computed, assuming the average retail price in Toronto to have been near to 45¢ a pound for western whitefish in late 1957, and assuming that Moose Lake fresh dressed whitefish was shipped to Toronto. Moose Lake whitefish brought the fishermen 12¢ in the summer of 1957, which was close to the Manitoba average of 13¢. (See Table 7.) Accordingly, the Moose Lake fisherman received about 27% of the Toronto retail value of his product.