ANNEX TO THE **WORLDWIDE FISHERIES MARKETING STUDY:** PROSPECTS TO 1985

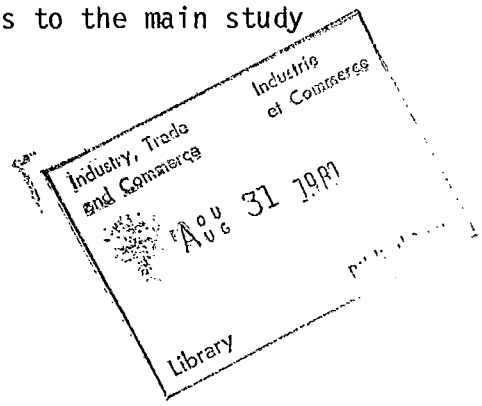
JAPAN

REVISED 1980

Government of Canada
Fisheries and Oceans

Gouvernement du Canada
Pêches et Océans

(This Report is one of a series of country and species annexes to the main study - entitled the Overview).



D R A F T

Annex to the
Worldwide Fisheries Marketing Study:
Prospects to 1985

JAPAN (V.1)

ORIGINAL STUDY TEAM:

D.B. McEachern
Department of Fisheries and Oceans

D. White
Department of Fisheries and Oceans

K Torrie
Department of Industry, Trade and Commerce

S. Ishiguro
Department of Industry, Trade and Commerce

J.N. Spitz
Fisheries Association of B.C.

W.R. Parkinson,
Embassy of Canada, Tokyo

S. Matsuura
Embassy of Canada, Tokyo

UPDATE STUDY TEAM:

D.B. McEachern
Department of Fisheries and Oceans

S. Matsuura
Embassy of Canada, Tokyo

December 1980

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The views expressed in this Study, however, are ours alone and reflect the Canadian perception of worldwide markets.

With regard to the overall Study, we would like to acknowledge:

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E. Wong
November, 1980

FOREWORD

As a consequence of global extension of fisheries jurisdictions, a radical shift has taken place in the pattern of worldwide fish supply and demand. This change is still going on and will continue for many years before a new dynamic equilibrium situation is reached. However, in the midst of this re-adjustment, a new trade pattern is emerging -- some net exporting countries are now importing and vice versa. In the longer term, some countries will experience shortages of supply and others will have a surplus. Fortunately, Canada is amongst the latter group.

The implications for the marketing of Canadian fisheries products arising from the worldwide introduction of the 200-mile limit are extensive. With our vastly improved supply position relative to world demand, government and industry are understandably concerned about ensuring that the bright promise of increased market opportunities are real and can be fulfilled. One of the steps in this process is the publication of the Worldwide Fisheries Marketing Study which assesses the global potential on a country and species basis.

Specifically, the purpose of the Study is to identify the longer term market opportunities for selected traditional and non-traditional species in existing and prospective markets and to identify factors which may hinder or help Canadian fisheries trade in world markets. To date, over 40 country markets and 8 species groups have been analyzed. It should be noted that while the information contained in the Reports was up-to-date when collected, some information may now be dated given the speed with which changes are occurring in the marketplace. In this same vein, the market projections should be viewed with caution given the present and still evolving re-alignment in the pattern of international fisheries trade, keeping in mind the variability of key factors such as foreign exchange rates, energy costs, bilateral fisheries arrangements and GATT agreements which have a direct effect on trade flows.

Notwithstanding, the findings contained in these Reports represent an important consolidation of knowledge regarding market potential and implications for improvements in our existing marketing and production practices. The results of the Study should, therefore, usefully serve as a basis for planning fisheries development and marketing activities by both government and industry in order to capitalize on the identified market opportunities.

This draft report is published for discussion purposes and as such we invite your critical comments.

Ed Wong

Marketing Services Branch
Economic Development Directorate
Fisheries Economic Development and Marketing
Department of Fisheries and Oceans
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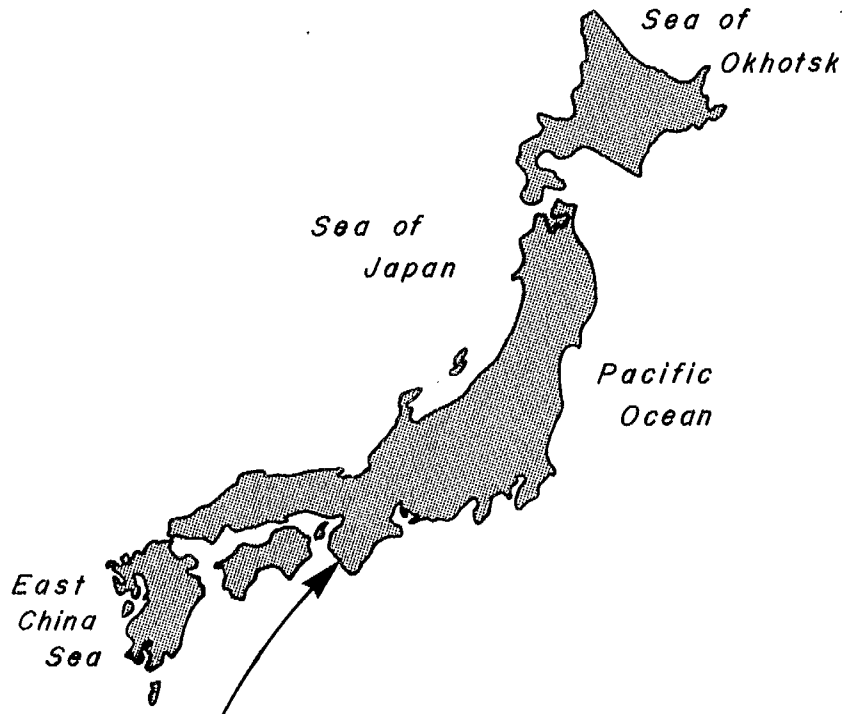

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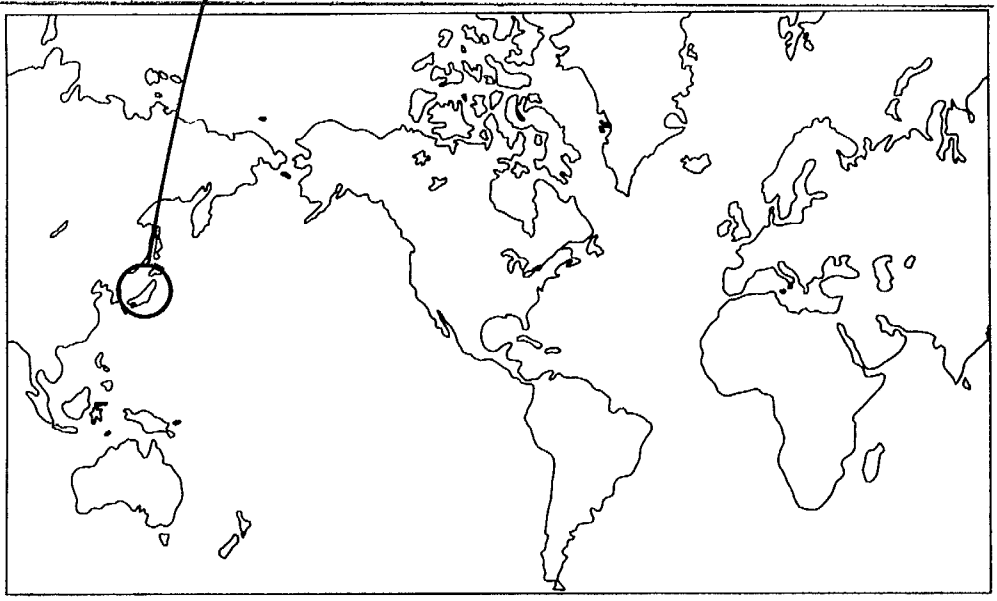

A. DEMAND FOR FISH[1]

1. The Market in General

Japan's population on October 1, 1979 totalled 116 million - up by nearly 1 million from the previous year - and by 5.4 million over the period from 1974 to 1979. The growth in population has been slowing since 1973 when a 1.4 percent increase was recorded. In 1985, the population is projected to be 122 million. In 1979, 24% of the population was under 15 years old, 67% was 15 to 64 years while 9% was over 64 years. The percentage in the older age categories is increasing, although the younger age groups (under 40 years) constitutes a higher percentage of the population than in most other industrialized countries.

The average monthly income of all Japanese wage earning households stood at 326 013 yen (C$811) in 1979/1980, up 3.3% in real terms over the previous year. The average monthly cash earnings of regular workers was 247 933 yen (C$377). Consumer spending rose by 6.8% in 1979/80, a fairly high rate compared to previous years. Expenditures for services rose significantly due to the growing popularity of eating-out, among other factors. Restaurant spending grew by 7.7% in real terms. Eating out expenses accounted for 13.5% of all food expenses in the 1979/1980 fiscal year. Personal consumption in the 1981 fiscal year is expected to rise 5% from the sluggish 2% recorded in 1980/1981.

2. The Economy

The Japanese economy has exhibited a surprisingly stable growth in recent years, despite sharp rises in crude oil prices, worldwide inflationary trends and high interest rates. Japan's gross national product in the fiscal year

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1. The information in this section is taken largely from the Oriental Economist's Japan Economic Yearbook, 1980/81.

1979/1980 of C$1 249 billion was 6.1% higher in real terms than in 1978. The rate of economic growth has been close to 6% in real terms annually since 1976, but for 1980/81, it has been estimated at 4.8% and for 1981/82 is projected to be 5.2%.

The overall average of wholesale prices in 1979 rose by only 7.3%, whereas the consumer price index rose by a moderate 3.6%.[1] The government estimates the rise in consumer prices in fiscal year 1980 be 6.4% and 5.3% for 1981. Starting in April 1979 the official discount rate was pushed up by 5.5 percentage points to 9% matching the previous postwar high set in December 1973 following an OPEC oil embargo. This rise was a preventative tightening of monetary policy to combat inflation caused largely by the fast rise in cost of imports.

Japan recorded surpluses of more than US$10 billion in international balance of payments in both 1977 and 1978. In 1979 however, this surplus changed to a US$13.9 billion deficit, and this situation was expected to continue for the fiscal years 1980 and 1981. As Japan is forced to make up a deficit in its trade balance with oil producing contries by piling up surpluses in its transactions with other nations, adjustments in future trade relations may take place[2]. However, at present, the performance of the economy is seen to be satisfactory in that a good rate of economic growth is being achieved, while inflation is being controlled.

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1. The consumer price index for all products in Japan in the 1970's was as follows: 1970: 100.0, 1971: 106.0, 1972: 110.9, 1973: 124.0, 1974: 154.1, 1975: 172.4, 1976: 188.4, 1977: 203.7, 1978: 211.4, 1979: 219.0, 1980: 237.6.

2. Energy shortages are the most serious potential obstacle to Japan's hopes of maintaining rapid growth during the coming decade. Japan ranks second to the United States on the list of oil importing nations, and imported oil constitutes far more of its total supply than in any other major industrial nation - 90% 1978, with 55% of this coming from the Persian Gulf area. Japan's oil bill in the 1980 fiscal year, ending March 31, 1981 is expected to amount to nearly US$60 billion, roughly half of its total imports.

The price of fish rose rapidly in Japan prior to 1979. According to various price indices, over the four year period of 1975 to 1979 prices of all commodities increased 27% while the prices of foods increased 23%. On the other hand, the price index of marine products for the same period increased 46% (Figure 1). Sharp increases in fish prices relative to other prices resulted from the extension of fisheries jurisdictions by many nations after 1976. The cutback in Japan's foreign fishing operations caused a decline in domestic landings and a sharp increase in imports necessary to supply the fish market in Japan. Prices in some instances rose more rapidly than necessary because of speculation and fear of supply shortages. Increases in fish prices subsided in 1979 and the overall supply situation stabilized.

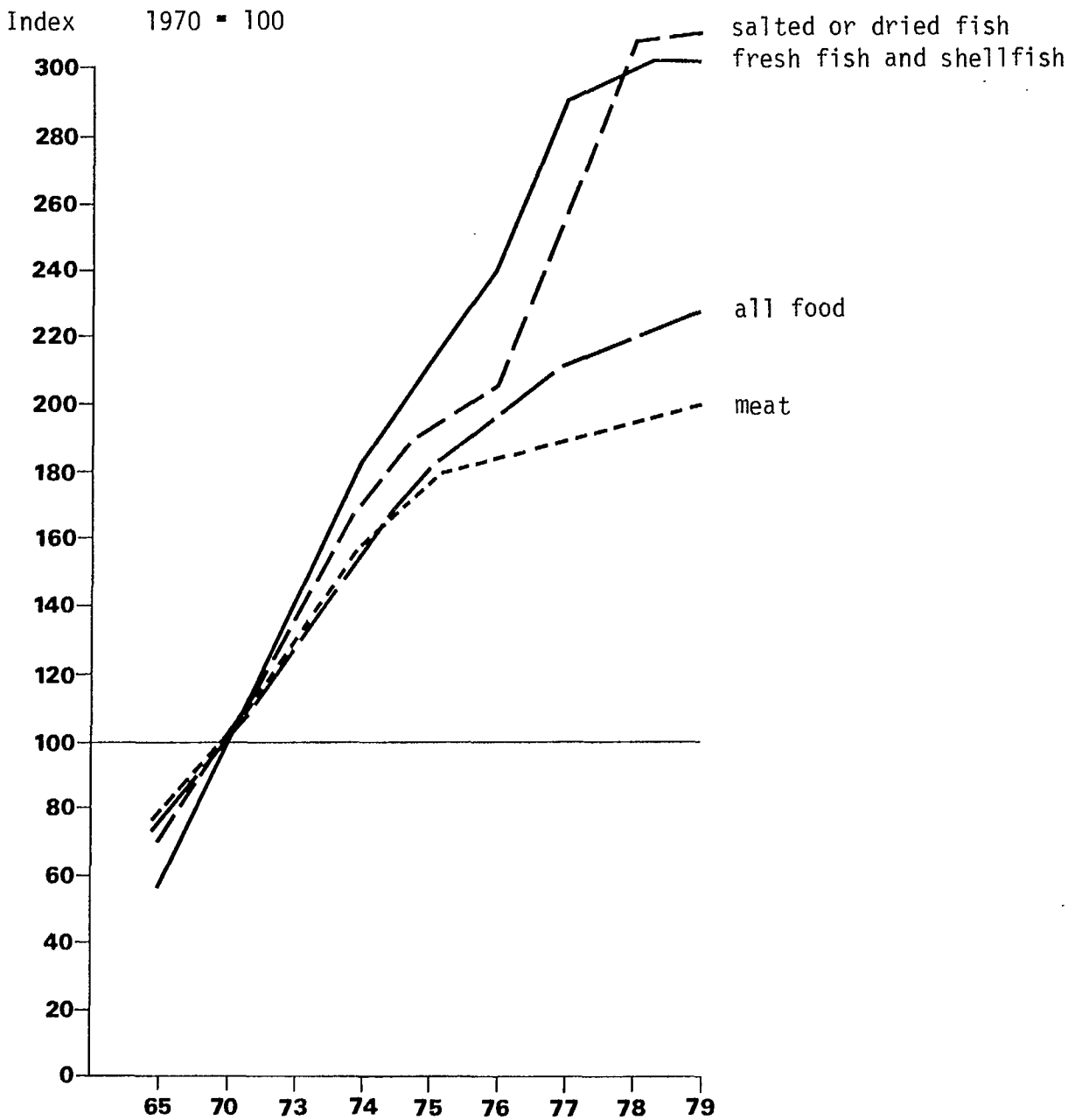
3. Fish Consumption

A principal difference between the diets of Japanese and those of Westerners is the high level of starch and low level of protein as a source of calories. In the past two decades, however, the typical Japanese diet has undergone a marked change toward increasing total caloric intake, reducing starch and increasing animal/fish protein along with larger fat consumption. In future, total caloric intake is expected to level off while decreases in starch (rice) consumption will be balanced by further increases in protein. By 1985 total annual per capita protein intake is expected to be 83.3 grams, of which animal (including fish) intake will be 48%.

In the 1970s the proportion of animal protein accounted for by fish declined slightly from 51% to 47% (Table A-1). This gradual change is attributed to the "westernization" of peoples' tastes and has been reinforced by the more rapid rise in fish prices than other animal protein. It has been reinforced by the growing popularity of Western fast food outlets in large Japanese cities. There is a tendency in Japan for younger people to prefer meat to fish but as they grow older they often change their preference to fish because they become more conscious of the effects of diet on health. A recent survey concluded that 62% of those interviewed liked fish dishes compared with 16% who disliked fish. The under-20 age group is most resistant to fish with almost 30% of those surveyed registering a dislike for fish, while only 13%

Figure 1

Consumer price indices - Japan, 1965-1979.



Source: 1. Canadian Embassy, Tokyo, Japan
2. Worldwide Fisheries Marketing Study: Japan; Phase I. Dept of Fisheries and Oceans, Ottawa, 1979.

Table A-1

Japan: changes in nutritional supply and prospects, 1960-1990.

	1960	1973	1974	1975	1976	1977	1985 (projected)	1990 (projected)
Caloric intake (calories)								
Total intake	2 290	2 522	2 489	2 466	2 483	2 490	2 593	2 500
Starch	1 580	1 308	1 294	1 283	1 285	1 264	1 203	1 060
Animal	177	353	353	360	372	382	406	na
Other	533	861	842	823	826	844	984	na
Protein (grams)								
Total protein	69.5	79.2	79.1	79.1	79.7	19.5	83.3	85
Animal	21.2	34.9	35.1	35.7	36.6	36.9	40.4	46
(Fish, etc.)	(15.6)	(17.7)	(18.0)	(18.1)	(18.2)	(17.5)	na	na
Vegetable	48.3	44.3	44.0	43.4	43.1	42.6	42.9	39
Fats	29.1	59.4	60.0	60.4	61.7	62.9	70.0	82
Share of starch in calorie intake (%)	69	52	52	52	52	51	46	42
Share of animal in protein intake (%)	31	44	44	45	46	46	49	54
Share of fish, etc. in animal protein intake (%)	74	51	51	51	50	47	na	na

Source: Canadian Dept. of Industry, Trade and Commerce, Canadian Embassy, Tokyo, Japan.

of those under 60 years were like-minded (Table A-2). Another survey revealed that 42% of housewives interviewed wanted to increase their use of meats while only 26% wished to eat more fish.

Table A-2

Japan: preference for fish by age groups in 1977.

	All Age Groups (%)	Under 10	Under 20	Under 30	Under 40	Under 50	Under 60	60 and Over
Like fish	61.9	52.6	46.1	57.2	74.6	71.2	69.7	81.4
Don't know	21.6	32.8	24.5	24.0	14.9	15.6	17.4	10.5
Dislike fish	16.5	14.6	29.4	18.9	10.5	13.2	12.8	8.1

Source: Worldwide Fisheries Marketing Study: Japan; Phase I. Dept. of Fisheries and Oceans, Ottawa, 1979.

The per capita consumption of fish products in Japan, although one of the highest in the world, has declined slightly and continues to decline after attaining a peak in 1973 of 69.3 kilograms (live weight) per year. By 1985 the Japanese are expected to be consuming 65 kilograms of fish per year as total animal protein consumption increases moderately but with a continuing moderate decline in the proportion accounted for by fish and shellfish (Table A-3).

Overall fish consumption in Japan increased between the years 1971 to 1976 to 7 763 000 tonnes but in 1977 dropped back as prices increased. While fish consumption declined, pork and poultry consumption rose sharply. In 1978, some fish prices declined, resulting in a slightly higher consumption. The Japanese government reports that in 1979 consumption was 2% lower than it was in 1978. Because of the activities of speculators, imports of fish and fish products to Japan increased in 1979, but in many cases importers found it difficult to recover costs. As a result, imports of fish in 1980 were only about 80% of the levels of the previous year.

In future there could be some change in the makeup of fish consumption, with a shift back toward products caught by Japanese fishermen, rather than imported, because of the past experience of high prices of imported fish products. But for this to occur the Japanese fishing fleet will have to control costs and continue to obtain access to foreign waters.

Table A-3

Japan: domestic consumption of fisheries products, 1965-1985.

	1965	1970	1971	1972	1973	1974	1975	1976	1977	1978	1985
Population (thousands)	98 275	103 270	105 014	107 332	108 710	110 573	111 940	113 089	114 154	115 000	122 333
Total domestic demand ('000 tonnes)	6 477	8 631	9 187	9 693	10 431	9 889	10 016	10 097	10 380	10 850	11 010
Less inedibles ('000 tonnes)	1 429	2 275	2 166	2 429	2 895	2 405	2 467	2 334	2 815	3 096	3 058
Net edible ('000 tonnes)	5 048	6 356	7 021	7 264	7 536	7 484	7 549	7 763	7 565	7 754	7 952
Per capita domestic demand (kg)	65.9	83.2	87.5	90.3	96.0	89.4	89.5	89.3	90.4	94.3	90.3
Per capita consumption of net live weight of edible fish (kg)	51.4	61.3	66.9	67.7	69.3	67.7	67.4	68.6	66.3	67.3	65.0

Source: 1. Fisheries Statistics of Japan,1978. Government of Japan, MOAFF.
2. Worldwide Fisheries Marketing Study: Japan; Phase I. op.cit.

Given uncertainties over consumer response to higher prices, a reappraisal of anticipated fish eating habits has been made. A 1975 Japanese White Paper had optimistically forecast a healthy jump in per capita consumption to 129 kilograms round weight in 1985 compared with 89 in 1975, - a 45% increase over the 10 year-period. Based on the historical record of a 35% increase in consumption between 1965 and 1975, the projection did not seem out of line. Now, instead, more modest gains to 90 kilograms are forecast. This figure is equivalent to the total demand per capita of all fish in Japan in live weight. When only edible fish are considered the per capita forecast (live weight) is 65 kilograms. Actual product weight per capita consumption is about 53% of that figure at 34.4 kilograms.

Curiously, although higher prices have been a deterrent to overall demand, there is a definite leaning among consumers toward more expensive "preferred" species. There are several informal categories of choice among fish buyers. Highly preferred species include yellowtail, tuna, crabs, sea bream, salmon, skipjack, bastard halibut and squid; least-preferred fish include mackerel, cod, sardines and saury. All Japanese appear to differentiate the various species in this way although there are regional differences. As a result, classification is largely by convention with no well-defined price or quality criteria.

A review of household purchasing patterns reveals that in 1963 the quantity of preferred species accounted for about 30% of the total fish and fish products purchased while the least-preferred species accounted for 40%. By 1975, the proportion had shifted markedly; preferred species represented 41% of fish purchases by quantity, while least-preferred fish accounted for 29% of the total. Implicit in this trend is an apparent consumer desire to eat more preferred species even if, because of rising prices, one is forced to decrease the total quantity consumed. The trend is shown in Table A-4. Perhaps of greatest significance to market analysts is the demand shown for high-priced preferred species by both high and low income groups.

Table A-4

Japan: ratio of fish purchases by income groups for selected species - 1975.

	Price (yen/100g)	H_Q/L_Q
Tuna	189.7	1.64
Salmon	99.6	1.63
Yellowtail	174.5	1.91
Shrimps & Crabs	147.3	1.88
Jack Mackerel	69.9	1.25
Mackerel	35.1	0.95
Sardines	35.0	1.32
Saury	55.3	1.09

H_Q - Purchase quantity of high income group.
L_Q - Purchase quantity of low income group.

Source: Worldwide Fisheries Marketing Study: Japan; Phase I. op. cit.

However, even if consumers remain loyal to higher-priced species, they compensate by reducing the amount they purchase. Thus, in the trade-off between price and taste preference, overall demand for fish is lower than anticipated. Obviously, there is an upper limit to prices beyond which consumers switch to meat or cheaper fish. In 1977, for instance, spiralling fish prices depressed the demand even for preferred species.

Among fish species, tuna, snapper, flatfish, shellfish, shrimps, prawns, lobster and crabs have been shown to have high income elasticities indicating expected growth in consumption for these items as incomes increase. In terms of price increases, consumption of shrimps, prawns, lobsters, crabs, skipjack and mackerel will increase or decrease substantially as price decreases or increases. Consumption of tuna and fresh fish generally have been shown to be fairly insensitive to prices indicating that substitution between species is infrequent for those products.

It has been shown that as fish prices have increased more than meat prices, consumption of meat has increased. In addition as certain fish products become more costly, consumption has increased for lower-priced fish.

B. SUPPLY

1. Domestic Landings

Total fish and marine catches (excluding whales) by Japanese fleets have remained at just over the 10.5 million tonne level in the past six years, showing no decline after extended fishing jurisdictions. In 1978, these landings were valued at 2 463 414 million yen or C$13 700 000 000. Landings had increased consistently during the postwar period, levelling off in the years from 1974 to 1978. Between 1973 and 1978 there was a decline in landings from distant water fisheries which were dependent on waters inside the 200-mile zone of foreign countries, but this was offset by an increased catch closer to home.

The two major traditional areas fished are now within the zones of the Soviet Union and the United States. In the US zone, Japanese landings were 1 348 000 tonnes in 1976 including 826 000 tonnes of Alaska pollock, 61 000 of yellowfin sole and 218 000 tonnes of other species. In waters of the USSR, the Japanese caught 1 229 000 tonnes in 1976 including 111 000 tonnes of squid, 68 000 tonnes of flounder, 38 000 tonnes of cod, 43 000 tonnes of atka mackerel, 39 000 tonnes of saury and 21 000 tonnes of crab. The overall Japanese catch in the USSR zone and the US zones in 1976 was 2 579 000 tonnes of which 72% was Alaska pollock. Japan also fished in other areas - notably off West Africa. In 1976, catches in that area were 185 000 tonnes, including 6 700 tonnes of cape hake, 26 000 of cape horse mackerel and 30 000 of various tunas. Catches in the west-central Pacific were 226 000 tonnes in 1976, most of which was tuna in international waters. Tuna fisheries also extended into the east-central Pacific off the coasts of Central America and the Pacific Islands, though again generally in international waters. Japan has, however, signed tuna agreements with several small island nations and trust territories. With respect to salmon, Japan's catch prior to 1977, on the high seas, was over 80 000 tonnes. In 1977, this catch declined to 60 000 tonnes and in years subsequent to 1977, a quota of 42 500 tonnes has been allowed (under the Japanese-Soviet fishery agreement). Actual high seas catches by Japan are said to be higher than the quotas allocated by the USSR as some salmon destined for North America are taken and not reported.

The other major distant water fishery of Japan was in the northwest Atlantic, which yielded an average of 31 000 tonnes from 1972 to 1976. Squid and and butterfish were the important species (at 16 000 and 12 000 tonnes respectively in 1973).

The total Japanese catch from distant water fisheries was 3 070 000 tonnes in 1976. Within foreign zones, the catch was 3 506 000 tonnes, including 118 000 tonnes taken from the waters of the People's Republic of China and 207 000 tonnes from waters of North and South Korea. In 1976, the catch within foreign 200-mile zones represented 33% of the total Japanese catch. Two years earlier, in 1974, the Japanese catch within 200 miles of foreign coastlines was 4 300 000 tonnes or 40% of the total Japanese catch. The decline from 1974 to 1976 was largely caused by lower landings of Alaska pollock.

In 1977, both US and the USSR established their respective 200-mile zones, causing Japan's foreign landings to decline to 2 902 000 tonnes or 27% of their total catch. Landings from the USSR zone declined to 700 000 tonnes while in the US zone, the catch went to 1 190 000 tonnes. Alaska pollock catches were affected most severely. From 1977 to 1979, Japanese distant water fisheries landings declined a further 23% . The catch in the US zone has not declined significantly as the unprofitable species have been left for the Japanese. In the USSR zone, catches have declined further. Under the 1979, 1980 and 1981 agreements, Japanese fishermen have been allowed to catch a total of 750 000 tonnes each year - a reduction of 100 000 tonnes from 1978.

The Japanese catch off West Africa continued to decline after 1976 falling from 256 000 tonnes to 131 000 tonnes in 1978. The cape hake catch was the most affected. In the northwest Atlantic, the Japanese catch declined to 17 000 tonnes (mostly squid) in 1978. Japan declared a 200-mile fishing limit in 1977 and since that time has significatnly expanded landings in offshore waters within that zone - especially of sardines and mackerel. Catches on the high seas beyond the 200-mile zone have also expanded.

Since 1976 Japanese landings of salmon, herring, anchovy, jack mackerel, atka mackerel, rockfish, sandlance and Alaska pollock have declined while compensating increases are apparent for tuna, skipjack, mackerel and sardines. Mackerel and sardines alone increased by 1 218 000 tonnes - more than the decline in Alaska pollock of 899 000 tonnes (Table B-1). The production of marine products from culture has been increasing steadily in recent years, reaching a level of over 900 000 tonnes in 1978, consisting of seaweeds, 480 000 tonnes; shellfish, 300 000 tonnes; and other fish, 140 000 tonnes. Shellfish produced by culture include oyster, scallops and prawns. Seaweeds include kelp, undava and laver, while fish include sea bream and yellowtail.

Inland fisheries production accounts for some 100 000 to 140 000 tonnes per year with fish accounting for one half and shellfish accounting for nearly 40%.

In the shellfish category substantial declines in landings since 1975 were apparent for king crab, while moderate reductions were noticed for common squid and octopus, to 1978.

For the future, it is expected that distant water fisheries should stabilize at 1979 production levels. The United States is following a policy of using fishing quotas as an export development tool vis-à-vis Japan, and therefore will probably not phase out, substantially, the existing Japanese fishing activity[1]. Japan and the Soviet Union fish in each other's zones on a reciprocity principle. Japan permits the Soviet Union to catch 650 000 tonnes and licence fees are paid for fishing privileges by both countries. A recent bill in the United States called the "Breaux Bill" initiated by US fishermen, would shut out foreign fishing vessels from American waters. It is unlikely that this bill will be enacted soon because of the increased level of co-operation between the United States and Japanese fisheries officials and the current policy of trading market access for fishery allocations.

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1. The US fishery allocation to Japan from the Bering Sea, the Aleutians and the Gulf of Alaska increased by 65 000 tonnes in 1981 over 1980.

Table B-1

Japanese fish and marine catches, 1973-1978.
Quantity in '000 tonnes

	1974	1975	1976	1977	1978	1979
TOTAL[1]	10 808	10 545	10 656	10 757	10 827	10 587
Marine fisheries	9 749	9 573	9 605	9 688	9 681	9 477
Fishes	8 446	8 243	8 269	8 335	8 298	8 107
Bluefin tuna	50	41	42	52	47)	
Albacore	97	69	107	54	88)	363
Bigeye tuna	102	113	115	128	128)	
Yellowfin tuna	76	72	86	83	98)	
Swordfish, marlin & sailfish	49	51	45	42	47	43
Skipjack, frigate mackerel	374	274	352	323	385	347
Sharks	430	42	44	49	42	42
Salmon	133	159	126	116	103	131
Herring	76	67	66	20	7	7
Sardine	352	526	1 066	1 420	1 637)	
Round herring	46	44	52	45	51)	866
Anchovy	288	245	217	245	152	135
Jack mackerel	216	235	207	186	153	184
Mackerel	1 331	1 318	979	1 355	1 626	1 414
Saury	135	222	105	253	360	278
Yellowtail	41	38	43	27	37	45
Flounder, halibut, sole, etc.	357	348	352	288	314	289
Cod	108	92	90	85	89	92
Alaska pollock	2 856	2 677	2 445	1 931	1 546	1 551
Atka mackerel	114	115	229	235	135	119
"Menuke" rockfish	111	82	77	52	32	40
"Nibe" and "Guchi" croakers	52	45	39	40	37	39
Sea bream	29	29	29	30	30	29
Sand lance	300	275	224	137	99	110
Crustaceans	169	145	127	125	141	133
Spiny Lobster	1	1	1	1	1	1
"Kuruma" prawn	3	3	3	2	3	2
Other prawns, shrimps	75	65	57	50	56	49
King crab	5	2	1	1	1	1
Queen crab	30	24	22	21	23	23
Other crabs	55	50	43	50	57	57
Molluscs	856	884	905	927	932	939
Common squid	335	378	301	264	257	213
Other squids, cuttlefishes	135	153	190	248	263	316

Table B-1 (continued)
Quantity in '000 tonnes

	1974	1975	1976	1977	1978	1979
Octopuses	77	74	67	68	65	52
Abalones	5	5	6	5	5	5
Short necked clams	138	122	136	156	154	133
Common scallop	25	30	30	44	60	80
"Mogai" clam	37	18	11	6	4	7
Other clams, shellfishes	104	103	164	136	124	133
Echinodermata, etc.	78	66	77	92	146	12
Sea urchins	24	22	23	27	26	27
Sea cucumbers	11	9	11	10	10	9
Other marine animals	43	35	43	55	110	76
Marine mammals	2	2	2	1	2	2
Seaweeds	198	231	226	206	163	186
"Kombu" tangle	119	158	159	138	109	na
Cultures in marine water	880	773	850	861	917	879
Yellowtail	93	92	102	115	122	155
Oyster	211	201	226	213	232	206
"Nori" laver	339	278	291	279	350	326
"Wakame" seaweed	154	102	127	126	103	100
Inland fisheries	112	127	124	126	138	136
Salmon, trout	5	9	6	6	6	9
Sweet fish	12	14	13	13	13	15
Common carp	9	10	10	10	11	19
Freshwater clams	43	47	47	48	51	51
Cultures in inland water	67	72	77	82	90	84
Eel	17	21	26	28	32	37
Trout	18	17	17	18	19	18
Common carp	26	28	26	29	29	29
Whales[2]	14 277	13 427	9 632	9 299	5 924	4 918

Table B-1 (continued).
Value in million yen

	1974	1975	1976	1977	1978	1979
TOTAL	1 741 134	1 920 668	2 207 736	2 565 646	2 463 585	2 657 996
Marine Fisheries	1 378 903	1 520 345	1 770 243	2 051 325	1 890 953	2 055 936
Fish	1 003 731	1 098 346	1 302 713	1 530 142	1 346 818	1 499 662
Bluefin tuna	61 962	50 166	63 500	76 859	65 917)	
Albacore	25 529	18 715	41 972	24 691	28 766)	336 479
Bigeye tuna	71 172	86 114	82 297	111 860	102 021)	
Yellowfin tuna	34 027	41 385	48 963	56 314	46 089)	
Swordfish, marlin & sailfish	26 718	29 537	30 694	32 143	26 510	30 491
Skipjack, frigate mackerel	74 022	74 116	86 747	103 870	78 790	85 765
Shark	2 936	3 518	4 576	5 622	5 402	7 351
Salmon	78 157	103 958	96 800	111 084	121 991	116 709
Herring	9 943	9 307	13 479	4 872	1 856	2 015
Sardine	15 569	16 256	40 105	57 568	42 464)	
Round herring	4 170	4 083	5 285	4 998	4 720)	59 860
Anchovy	17 966	16 910	18 038	20 851	12 925	14 204
Jack mackerel	71 788	46 699	58 780	68 525	48 405	58 671
Mackerel	63 885	57 090	70 710	79 494	57 905	69 784
Saury	9 989	25 232	21 585	41 117	35 591	19 542
Yellowtail	27 380	29 480	36 685	28 140	32 614	35 097
Flounder, halibut, sole, etc.	57 320	70 328	80 608	93 865	96 290	104 358
Cod	12 016	12 476	14 630	16 766	18 319	17 657
Alaska Pollock	99 566	99 466	111 457	147 261	124 040	125 899
Atka mackerel	4 738	3 565	8 014	10 996	6 134	6 702
"Menuke" rockfish	14 260	13 007	12 528	12 990	9 501	18 328
"Nibe" and "Guchi" croakers	6 814	7 177	8 235	8 910	7 071	8 347
Sea bream	31 492	34 437	42 549	47 223	53 405	50 215
Sand lance	9 771	11 714	13 181	15 321	8 944	7 724
Crustaceans	90 601	90 071	97 380	103 475	108 996	114 662
Spiny lobsters	4 712	4 142	4 858	5 081	5 388	5 681
"Kuruma" prawn	8 546	10 017	9 119	10 482	11 294	10 650
Other prawns, shrimps	45 752	44 210	50 961	50 685	53 704	57 711
King crab	4 257	865	731	178	94	248
Queen crab	12 680	12 851	13 027	15 117	18 005	18 005
Other crabs	14 654	17 986	18 684	21 932	20 511	22 367
Molluscs	231 237	274 103	308 052	349 634	370 636	367 157
Common squid	111 361	130 169	119 884	125 603	122 313	120 351
Other squids, cuttlefishes	50 666	59 459	80 490	101 886	124 705	110 996

Table B-1 (continued).
Value in million yen

	1974	1975	1976	1977	1978	1979
Octopuses	21 807	26 496	29 330	32 786	27 339	28 740
Abalones	10 305	13 848	16 029	16 136	18 082	16 981
Short necked clam	8 178	8 683	11 969	17 236	23 003	23 121
Common scallop	4 086	5 353	8 203	10 551	11 327	17 567
"Mogai" clam	1 662	2 241	1 413	1 016	736	1 112
Other clams, shellfishes	23 172	27 854	40 734	44 420	43 131	48 289
Echinodermata, etc.	19 196	20 621	28 874	36 845	36 120	40 095
Sea urchins	9 591	10 437	14 313	17 203	16 418	19 200
Sea cucumbers	3 238	3 411	5 064	4 349	4 470	5 167
Other marine animals	6 367	6 773	9 497	15 293	15 232	15 728
Marine mammals	330	175	293	186	302	129
Seaweed	27 453	31 044	32 926	31 043	28 081	34 261
"Kombu" tangle	18 782	22 193	23 594	20 969	19 752	na
Cultures in marine water	232 494	253 612	293 343	352 156	401 325	422 236
Yellowtail	72 705	85 617	91 159	120 313	116 484	132 318
Oyster	16 511	19 897	24 455	27 803	24 694	23 138
"Nori" laver	88 068	83 546	94 089	108 267	166 950	157 694
"Wakame" seaweed	11 134	8 538	11 271	9 232	8 478	9 699
Inland fisheries	34 843	41 704	41 479	48 627	50 912	52 705
Salmon, trout	2 163	3 972	3 177	3 445	3 625	4 001
Sweet fish	14 767	17 377	16 124	19 148	20 070	20 814
Common carp	2 332	2 686	2 728	2 915	2 492	6 392
Freshwater clams	2 603	4 095	4 822	6 434	6 924	6 634
Cultures in inland water	61 168	71 285	81 082	92 986	107 622	116 415
Eel	33 556	41 913	51 452	56 863	66 748	71 465
Trout	6 115	8 230	9 008	10 764	11 743	14 347
Common carp	11 536	11 954	10 635	13 001	13 935	12 664
Whales	32 725	33 722	21 589	20 552	12 605	10 704

1 Includes pearls and other fishes but excludes whales.
2 Quantity refers to actual numbers.

Source: Statistical Yearbook, Japan. Gov't. of Japan, MOAFF.

It is thought that losses from Mainland China and Korean waters could be offset by increased catches taken from Australian and New Zealand coastal waters and around some Pacific Islands.

Table B-2

Japanese landings by categories 1976-1979.

	1976 '000 tonnes	%	1977 '000 tonnes	1978 '000 tonnes	1979 '000 tonnes
Total Landings	10 656	100.0	10 760	10 827	10 630
Marine Fishery - Total	9 650	90.1	9 700	9 681	na
Foreign zone landings	3 506	26.9	2 900	2 138	2 100
Own-zone landings	5 682	59.1	6 360	na	na
High seas	417	4.1	440	na	na
Freshwater Fishery	124	1.2	133	na	na
Aquaculture	927	9.0	990	na	na
Marine	850	8.4	900	na	na
Freshwater	77	0.7	90	na	na

Source: 1. Review of Fisheries in OECD Member Countries -- 1979. OECD, Paris, 1980.

2. Worldwide Fisheries Marketing Study: Japan; Phase I. op. cit.

3. Dept. of Industry, Trade and Commerce (telex communications with Tokyo).

It is obvious that projecting future foreign zone landings is very precarious, however the weight of the evidence would suggest that the present level will be maintained to 1985. (Table B-3).

Table B-3

Japanese landings in foreign zones.
1975-1979
('000 tonnes)

	1975 Estimated catch	1976 Estimated catch	1977 Estimated catch	1978 Allocation	1978 Catch	1979 Allocation
USA	1 410	1 348	1 190	1 260	1 100	1 210
Canada	21	25	18	25	13	16
USSR	1 369	1 229	700	850	775	750
Mainland China	152	118	178	na	na	na
North & South Korea	241	207	173	na	na	na
Australia	12	18	9	na	250	na
New Zealand	80	166	244	na	na	na
Others	432	395	390	na	na	na
TOTAL	3 744	3 506	2 902	2 138	na	na

Source: 1. Review of Fisheries in OECD Member Countries -- 1979. OECD, Paris, 1980.
2. Worldwide Fisheries Marketing Study: Japan; Phase I. op. cit.
3. Dept. of Industry, Trade and Commerce (telex communications with Tokyo).

Another important variable in calculating total landings is the catch from Japan's own 200-mile zone. It is a component in the forecast which, while often overlooked, is nonetheless of great importance. As shown in Table B-2, landings within 200 miles of Japan's coast exceed 6 million tonnes and have been increasing. Much of the increase, however, is due to an expanded catch of such species as sardines, for which landings jumped in volume more than 200% between 1974 and 1976. Since the catch of sardines and other pelagic species are subject to wide fluctuations, projections are difficult but it appears that an expanding trend has emerged in landings of sardine and mackerel. As a result, landings in the Japanese zone in the 1980s will likely hover around 6 million tonnes, perhaps slightly lower than the present level.

Judging from current trends, increases are forecast for aquaculture production, perhaps to over 1 million tonnes by 1985; the high seas catch up to about 500 000 tonnes; and freshwater fish landings stabilizing at 100 000 tonnes for a total from these sources of 1.6 million tonnes. The total Japanese landings from all sources for 1985 are estimated at 10.5 million tonnes.

2. Products

Fish products consumed in Japan are variously raw, boiled, dried, cured, frozen, kneaded, salted, smoked and canned. Non food products include fish meal, feed, oil and fat. Total processed weight has increased since 1974. Increases are noted for products from saury, sardine and mackerel. Declining production is apparent for pollock roe, salted trout, whale, frozen minced fish meats, other frozen fish, and canned salmon (Table B-4). It should be noted that the volume of kneaded products has not declined, despite the drop in landings of Alaska pollock.

In the boiled and dried category, the main species utilized is anchovy while herring is the main product in the dried category. For cured products, mackerel and skipjack are important while for salted products mackerel and salmon are most important, followed by pollock, herring and salmon roe. Frozen production depends most on mackerel, followed by sardine, saury, squid and tuna. Salted and dried products are produced from sardines, jack mackerel, mackerel and saury. In the canned category, mackerel is the most significant species followed by tuna and sardines.

As in most countries, the largest product category is fresh fish, but statistics on quantities are difficult to obtain. In the six largest central wholesale markets in 1976 about 625 000 tonnes of fresh fish were sold.

Many of the methods for processing fish in Japan were developed long before refrigeration was available, and involve preserving and flavouring. The flavour of products that have been dried, salted and/or fermented are very important in diet preference. Much of Japanese fish consumption is therefore in product forms and fish parts that are not generally eaten in other parts of the world, and varies according to locality and type of fish available. The following table gives a detailed breakdown of fish products in Japan.

Table B-4

Japan: processed fish products.
1974-1978 (000 tonnes)

Processed products[1]	1974	1975	1976	1977	1978	1979
Total All Products	5 587.2	5 683.2	5 773.4	5 870.1	5 820.1	5 395.7
Boiled and dried	81.8	79.9	84.2	86.9	82.4	99.9
Anchovy	62.5	60.9	63.9	62.9	63.2	78.4
Jack mackerel	3.7	3.2	2.9	1.9	1.7	1.1
Sand lance	7.2	7.6	9.5	11.8	7.7	9.3
Others	8.4	8.2	7.9	10.7	9.8	11.1
Dried	45.8	47.7	42.7	39.9	37.5	30.6
Herring	19.2	19.9	19.2	17.4	18.9	14.4
Squid	8.7	12.2	8.6	9.4	7.6	5.9
Others	17.9	15.6	14.9	11.0	11.0	10.3
Cured	118.8	120.3	121.0	126.9	130.7	126.5
Mackerel	26.2	25.7	25.9	35.0	28.9	31.0
Skipjack	29.8	32.3	37.2	35.7	38.2	32.4
Others	62.9	62.4	57.9	56.2	63.6	63.1
Salted	215.5	255.5	199.7	227.5	242.7	250.9
Alaska pollock roe, cod roe	46.6	44.8	40.6	36.4	23.0	25.0
Cod, Alaska pollock	14.7	18.0	15.0	17.4	19.0	18.4
Herring roe, salmon roe	13.1	12.9	14.1	12.8	12.5	10.4
Mackerel	41.7	46.5	26.2	44.1	75.1	62.0
Salmon	55.4	73.9	55.5	53.0	61.7	78.2
Trout	23.7	37.6	22.6	38.0	11.0	17.5
Others	20.3	21.8	25.7	25.8	40.4	39.4
Dressed frozen	112.2	126.3	122.6	126.0	116.1	145.5
Frozen	2 965.6	2 980.6	3 111.1	3 200.1	3 153.2	3 148.1
Albacore, tuna	221.3	191.7	224.2	191.4	210.2	202.1
Cod, Alaska pollock	125.4	75.3	95.6	129.1	114.2	101.0
Halibut, flounder	161.2	148.2	143.1	103.0	136.2	112.3
Mackerel	286.6	299.0	336.0	414.2	518.3	574.3
Marlin	34.8	28.8	29.0	20.3	22.9	23.5
Sardines, anchovies	243.8	311.0	401.2	420.5	434.1	475.2
Saury	131.0	183.5	101.7	230.5	281.7	230.6
Skipjack	161.7	145.0	164.8	159.9	164.1	148.7
Squid, cuttlefish	224.4	231.1	221.4	205.0	254.3	251.5
Whale	87.5	74.6	40.6	38.4	18.2	15.4
Minced fish meats	384.3	387.7	424.2	413.4	365.6	367.7
Others	903.6	904.6	929.3	874.4	633.4	668.9
Kneaded	1 148.7	1 155.0	1 136.7	1 087.0	1 037.2	976.2
"Chikuwa"[2]	250.9	258.9	235.3	214.4	190.9	177.2
Fish sausage	120.5	111.3	112.6	116.9	107.2	106.8
"Kamaboko"[3]	437.6	447.0	451.5	428.2	427.1	402.4
Others	339.7	337.8	337.3	327.5	312.0	289.8

Table B-4 (continued).
(000 tonnes)

Processed products[1]	1974	1975	1976	1977	1978	1979
Salted and dried	228.6	242.7	250.9	242.1	246.0	255.3
Jack mackerel	42.2	47.5	53.3	48.7	50.2	52.4
Mackerel	32.4	29.7	35.6	26.7	28.6	30.0
Sardine, anchovy	59.7	61.6	72.6	78.2	74.8	71.0
Saury	26.7	29.7	11.2	18.4	28.1	32.2
Others	67.6	74.2	78.2	70.1	64.3	69.7
Smoked	9.7	8.3	10.3	10.0	12.1	11.3
Salmon, trout	1.0	1.3	1.6	1.4	1.4	1.7
Squid, cuttlefish	0.5	0.6	1.2	1.8	3.8	4.0
Whale meat	1.6	1.4	1.6	1.0	1.1	1.1
Others	6.6	5.0	5.9	5.8	5.8	4.5
Others	283.0	292.1	308.2	314.5	352.2	351.4
Canned[4]						
Standard number of cases[5] x 000	17 316	17 192	17 707	18 771	18 810	na
Actual number of cases x 000	(35 725)	(34 407)	(35 882)	(38 540)	(37 441)	(36 689)
000 tonnes	377.5	374.8	386.0	409.2	410.0	na
Shellfish	981	580	698	588	521	na
Crab	158	94	130	104	132	na
Jack mackerel	3	94	7	2	-	na
Mackerel	9 555	9 778	8 545	9 772	10 284	na
Prawn, shrimp	8	1	1	2	1	na
Salmon, trout	1,089	921	1,125	825	77	na
Sardine, anchovy	303	422	1 630	2 107	2 367	na
Saury	384	510	327	449	492	na
Squid, cuttlefish						
Tuna, skipjack	2 831	3 852	4 316	3 902	4 054	na
Whale	230	228	240	345	266	na

Notes: 1. Excluding dried seaweeds, feeds, oils and fats and over 625 000 tonnes of fresh fish.
2. Baked products of kneaded fish meat with seasonings.
3. Steamed products of kneaded fish meat with seasonings.
4. Surveyed by the Canners Association of Japan.
5. Converted to 450 g x 48 cans in net weight for one case.

Source: Fisheries Statistics of Japan. Gov't. of Japan, MOAFF, 1978 and 1979.

In the paragraphs that follow, the major types of products favoured in the Japanese market are described in some detail.

a. Surimi

Surimi is a type of fish paste, used for kneaded products. It is processed by filleting, fleshing and mincing, bleaching in water and dewatering, followed by crushing and grinding, adding of seasonings such as sugar, salt and sodium glutamate, and finally thickened with starch. The kneaded products produced from surimi include items known locally as Kamaboko, Chikuwa, "fish ham" and sausage.

The producers of surimi require large volumes of fresh fish at low cost, but with good quality. Frozen fish can be used if the surimi is sold fresh for immediate consumption, as it cannot be frozen again without loss of quality.

The major species used in Japan for surimi are Alaska pollock, shark, croaker, sea eel and lizard fish. Smaller quantities are produced from sand borer, big-eye tuna, sea bream, amadai, cuttlefish, minnow, barracuda, jack mackerel, cutlass fish, flying fish, sea robin, wrasse, flounder, sea bass, marlins, atka, mackerel and squid. Price and availability are important influences on the industry's choice. Alaska pollock is considered mediocre in quality but has scored well because of its price and availability. It is a general rule that the longer the fish is held prior to processing, the lower the quality of the product, and thus nearly all surimi has been processed on factory ships instead of shore-plants.

b. Dried Fish

In the processing of plain, dried products, squid, herring, cod, pollock, anchovy, sharkfin, octopus, sardine, shrimp, flounder and soles are dried in the wind, or recently machine-dried for varying periods. Yields range considerably from 10% to 30% of round weight.

For roasted and dried products fish are scaled, butted through the gill slit, washed and skewered on sticks, then broiled and dried. Species prepared in this manner include sea bream, sole and flounder, sardine, blue mackerel, snapper and eel. Yields are about 18 to 20% of round weight.

Salted and dried products are salted and/or soaked in brine for varying periods and then half or fully dried. The main species used include jack mackerel, blue mackerel, saury, sardines, cod, pollock, flatfish, atka mackerel, sea bream and saury. Yields range from 12-20% for Alaska pollock to 50-80% for jack mackerel.

A frozen dried product is produced primarily from Alaska pollock, which consists of gutting, splitting and soaking the fish and hanging it outside during freezing temperatures for 70 days. It is then brought indoors and stacked in one-metre piles to equalize moisture content.

For smoked dried products, fish is filleted and smoked for two or three months (hard product), one week or two days. The main species include salmon, herring, squid, cod, sardine, mackerel, octopus and various shellfish, sea cucumber (visceral mass), crab (roe), abalone (visceral mass) and other shellfish meat, roe or viscera.

c. Salted

Two main salting processes are used, and they are known as hard-salting and slack-salting. For the hard-salted product, around 20-25% salt is added to the prepared fish, which are placed in a tank and cured for three to ten days or longer. Extra salt (5%) is added during packing. For slack-salting around 15% salt is used for a period of one to three days. Many species are salted, including sardines, mackerel, saury, cod, pollock, salmon, trout, herring, squid, soles, flounder, shark, jellyfish, herring roe, salmon roe, cod roe, pollock roe, trout roe and sea urchin roe.

d. Fermented

Plain fermented products are produced by placing fish in tanks with salt added, 10-14% by weight, to prevent spoilage. When flesh alone is used, liver is added to encourage a proteolytic action. Fermention can take place for periods from one week to four months. Species used for plain fermenting are squid meat, bonito, shark, scallop, oyster, mussel and pilchard.

There are a number of traditional variations to producing cured fermented products according to species and medium of fermentation (pickle). Processing includes cured in boiled rice, cured in koji, cured in rice bran, or vinegar pickling.

e. Packaged, frozen and other

There are many packaged frozen fish including crab croquettes, shrimps and prawns, battered scallops and other shellfish, and vacuum packed fish cuts which are usually kirimi cuts. A kirimi cut is a slice taken (diagonally) across a fillet, and is produced from cod, hake, flatfish, eel, salmon and trout, redfish, etc.. Fillets are packaged frozen from Pacific mackerel, jack mackerel and hake, while whole fish such as sardines, saury, flatfish, trout, capelin, are also packaged and frozen.

Canning in Japan has been largely export oriented. Canned products are sometimes boiled in water, canned in oil, smoked and canned in oil, canned in tomato sauce, seasoned and kneaded products. Other processing methods include boiling and soy seasoning, drying and seasoning.

3. The Distribution of Fish Products in Japan

The distribution of fish products in Japan is a complex procedure that involves a number of intermediaries. It has evolved over many years and developed its structure partly because of government regulations, which licence wholesale markets and protect domestic producers by tariff and non-tariff barriers.

Most fish products go through two wholesale markets before they reach the consumer. The first is at the producing (or landing) district and the second at a central wholesale market in the larger cities (see Figure 2). There are about 900 producing district markets. Central wholesale markets are established in cities with more than 200 000 population. In 1980, there were 48 wholesale markets in 42 cities, and 601 local wholesale markets. There is a trend toward shifting from fresh products at wholesale markets to frozen and processed products[1]. In addition there is a growing tendency for off-market transactions, particularly for frozen products of high value like tuna, shrimp, prawns, lobster and low value fish used directly by processors. In each case, prices at the Tsukiji market in Tokyo influence prices paid.

In the case of imported, air freighted chilled tuna, the importer sells mainly to the primary wholesalers in the main central wholesale markets. With salmon, the major fishing companies dominate the distribution, selling off-market to wholesalers and to in-market sub-wholesalers. There is considerable recirculation of frozen salmon as buyers store the product and resell on a rising market. Numerous brokers and secondary resellers are involved. Since roe (herring, salmon and cod) processing is centred in northern Japan, distribution is dominated by off-market wholesalers, several of which are affiliated with large trading companies. In addition there are some 10 500 registered wholesalers of marine products, many of which are sub-wholesalers or off-market brokers. The main fishing and trading companies have developed their own distribution networks primarily by lining up companies at various levels through equity participation, exclusive agreements and financing. Therefore these companies are able to exert considerable influence on the markets for

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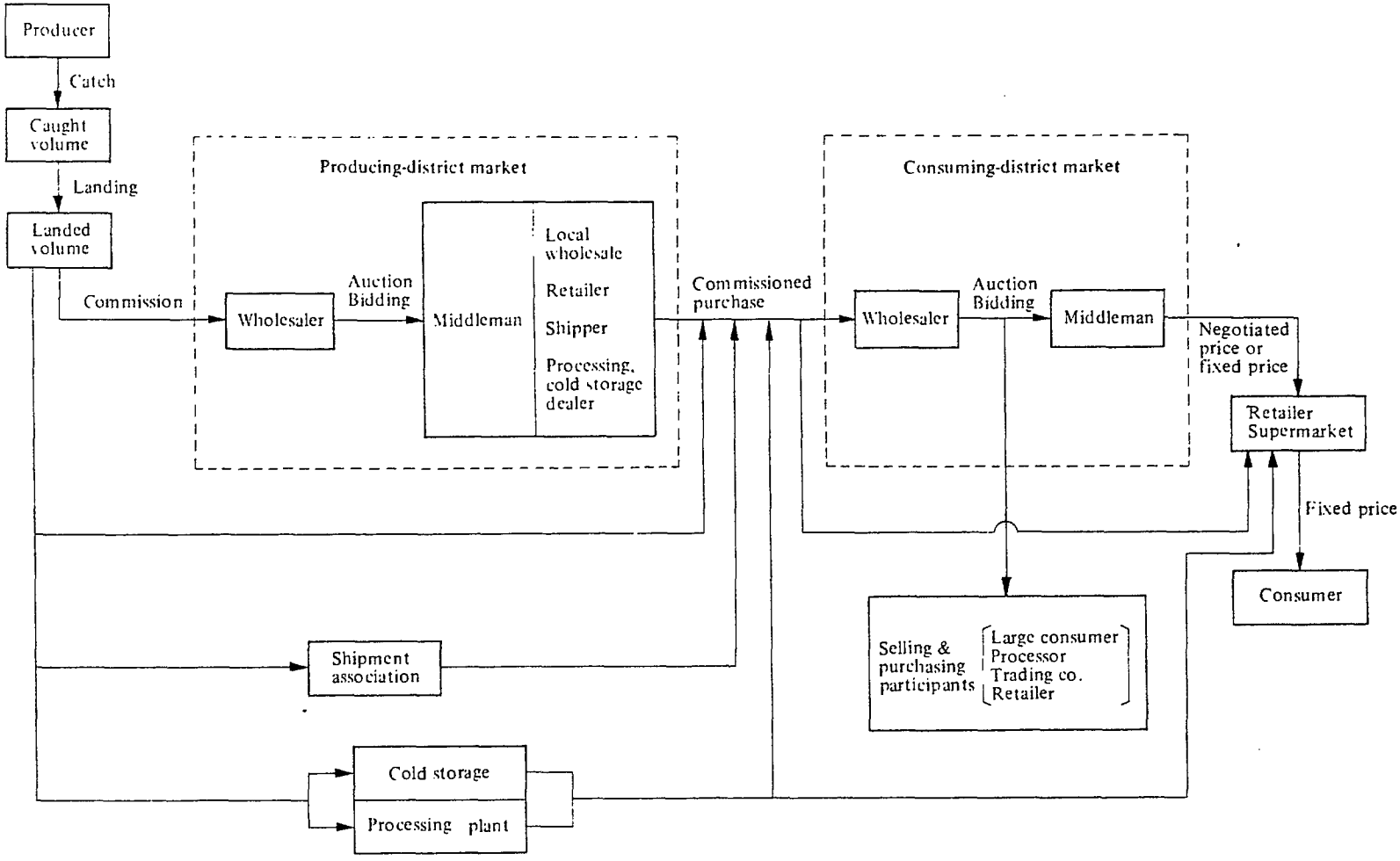
1. In 1978 the Tokyo Central Market handled the following volumes of marine products:

	tonnes
Fresh fish	234 969
Frozen fish	338 869
Processed	267 589
Shellfish	47 316
Freshwater fish	4 175
Whale	2 735
	846 770

Figure 2. The main marketing route of marine products in Japan.



Reference: Annual Report on Marine Products Marketing Statistics by the Ministry of Agriculture & Fisheries.

certain species. It is evident that many of the major companies take a commodity trading approach to the purchasing and marketing of marine products. In the price rise boom of 1977 it was reported that steel companies and other new traders moved into the fisheries commodity markets.

Some large fishing companies are integrated to the point where they own vessels and processing plants, have their own import and export divisions, storage facilities and connections with supermarkets and catering companies.

Most importing into Japan is done by general trading companies. These are conglomerate companies, which are associated with financial institutions, and have offices throughout the world. In some instances they take ownership of goods and sell through their own distribution lineups, and in others they act as agents for processors or other companies in Japan. The largest companies in Japan have found it to their advantage to replace the functions of the trading houses. Some large department stores and supermarket chains now own their own importing companies.

The main retail distribution of fish to consumers is through fresh fish shops, supermarkets, consumer co-op stores, department stores and commercial and institutional buyers. The best quality high priced fish is purchased by specialty restaurants, sushi shops, high class restaurants, hotels and some supermarkets and retail shops. Retail shops account for 65-70% of the fish sold, while supermarkets are the second largest outlet, at 20-25% of retail sales. Institutional buyers account for about 30% of total fish sales, serving mainly restaurants and hotels. Work-place cafeterias account for some 10% of institutional sales.

Fish sections of several supermarkets are leased by outside retailers, while many large chains purchase from wholesalers, brokers or import directly. Large stores do much of their own packaging and preparing (such as kirimi cuts).

The food service industry is still small in Japan and is expected to double in size by 1985. Both Western-style fast foods and Japanese-style foods are growing in popularity. McDonald's Co. (Japan) was the third largest

fast-food service business in Japan in 1977 with sales from 127 outlets of C$125 000 000. This firm is one of the few users of fillet blocks in Japan.

In the Japanese primary schools lunch program in 1977, fish consumption was only one-third that of meat. Mackerel, tuna, hake and squid are the main species consumed.

4. Prices

Overall average prices received on the Tokyo central wholesale market for various processed products in 1978 are provided in Table B-5. As indicated, there is a wide range of prices according to type of product and species. In general, mackerel, sardines, saury, marine plants and kneaded products are low priced, while roe, viscera, salmon and various shellfish are more expensive. Factors that influence prices include the season, the quality and the level of sale in the distribution system. Examples of seasonal dishes include jack mackerel for grilled cooking in summer, and herring roe for the New Year season. With fresh fish, the price also varies according to the time of day, with the highest prices being paid for the top quality fish in the early morning.

According to a 1977 survey by the Japanese government, there was a large variation in margins at most distribution levels. In general, there were higher mark-ups on low valued species. The usual range of gross margins added for fresh fish in 1978 was: primary wholesale 5.5%, sub-wholesaler 8-12% and retailer 30-50%. With frozen fish (sold more off market) primary wholesaler margins were lower than for fresh fish.

In respect to individual species the most substantial price rises between 1970 and 1977 occurred for jack mackerel, Alaska pollock, bastard halibut, other flatfish, crab, saury, surume squid and shark.

Table B-5

Japan: average wholesale price for selected fish products - Tokyo Central Market, 1978.

	Y/kg	$/lb[1]		Y/kg	$/lb
1) Marine plants:	327	0.83	Split saury	320	0.80
Kelp	625	1.58	Barracuda	539	1.36
2) Processed salted:	1681	4.24	Capelin	566	1.43
Mackerel	202	0.51	Cod fillets	577	1.45
Herring	365	0.92	4) Boiled & dried:	981	2.48
Saury	439	1.10	Sardine	481	1.21
Sardine	117	0.29	Jack Mackerel	621	1.57
Cod	498	1.26	Shrimps	1159	2.93
Chum salmon (autumn)	1051	2.65	5) Roasted & dried:	1536	3.88
Trout	690	1.74	Flatfish	526	1.33
Salmon roe (unseparated)	4625	11.68	Eels	2386	6.00
Salmon roe (separated)	7353	18.57	6) Plain dried:	1491	3.76
Cod roe	2472	6.23	Polished herring	727	1.84
Herring roe	5272	13.31	Flatfish	547	1.38
Squid	629	1.59	Squid	2480	6.26
Jellyfish	1206	3.04	Herring roe	18849	47.59
Sea urchins	1513	3.82	Shrimp	2078	5.24
Sea cucumber (viscera)	6694	16.90	7) Kneaded Products:	378	0.95
Silver salmon	1655	4.17	Chikuwa	384	0.96
Sockeye salmon	1726	4.36	Kumboko	453	1.14
Chum salmon	1531	3.86	Sausages	285	0.72
3) Salted & dried:	426	1.07	Hams	725	1.83
Sardine	264	0.67	8) Boiled Products:	946	2.39
Whole jack mackerel	420	1.06	Squid	682	1.72
Split jack mackerel	533	1.34	Shrimp & lobster	1052	2.65
Split cods	1017	2.57	Tanner crab	1024	2.59

1. Converted to Canadian dollars at 180 yen to the dollar.

Source: Calculated from information provided by The Department of Trade & Industry, Wellington, New Zealand.

5. Fisheries Trade

a. Imports

Japanese fish imports declined in 1980 after a decade of increases, with the most significant rise being from 1975 to 1977. In 1979 imports were valued at 931 billion yen, representing a 140% increase from the 1975 level. Prior to 1976, the increase in imports was taking place in the shrimp and prawn and frozen fish categories with smaller increases in the volumes of salted, dried, smoked products. In 1976 imports began to rise sharply because of the prospects of supply shortages due to reduced Japanese catches in foreign economic zones, thereby triggering increasing prices. Increases have recently been apparent again in the shrimp and prawn category and the frozen fish category. Most imports composed of high-value species. In 1978 the major import items to increase from the previous year were cod roe, salmon, spiny lobster, crab, squid and cuttlefish, octopus, snapper and shrimp and prawns. In the canned category a dramatic increase occurred in the imports of salmon from 1 351 kilograms in 1975 to 274 192 kilograms in 1978. In 1979 noticeable increases occurred from the previous year in imports of herring, salmon, capelin, shrimp and prawns, cuttlefish, crab, abalone, hard clams and horse mackerel (Table B-6).

During the first half of 1980, imports of seafoods was 20% below the previous year. Salmon was down by 30%, crab by 8% and herring roe by 59%. This has been caused by reduced demand following the speculative boom in fish prices in 1979 and the large world supply in 1979 and 1980.

Table B-6

Japanese imports of marine products, 1977-1980.
(tonnes)

	1977	1978	1979	1980
Live:	20 259	16 672	18 850	20 593
Eel	15 515	12 198	13 332	15 479
Shrimp & lobster	186	223	354	337
Other	4 558	3 996	5 154	4 777
Fresh, chilled or frozen:	716 706	783 581	890 652	735 004
Herring	30 634	6 926	13 742	30 144
Tara (cod,pollock,hake)	10 216	9 002	13 607	9 346
Yellowtail	1 437	1 407	452	639
Saba (sardine)	10 625	14 610	5 680	211
Cod roe	3 318	4 062	8 651	7 124
Fillets1	641	276	2 528	2 977
Skipjack	11 803	6 321	8 872	5 297
Albacore	13 361	2 035	2 646	730
Yellowfin	43 525	39 274	43 428	35 511
Bluefin	1 410	1 209	1 366	1 042
Bigeye	46 892	47 015	44 261	40 329
Tuna nes	6	87	13	
Swordfish	19 995	21 486	21 048	16 054
Salmon	19 333	49 780	54 698	39 345
Spanish mackerel	13 138	11 629	11 087	8 997
Hair tails	3 309	3 784	2 626	1 627
Croaker	2 695	3 122	2 740	2 341
Sea breams	20 798	21 982	17 538	14 651
Shark	1 766	1 491	1 484	1 303
Capelin	18 612	7 701	37 268	31 604
Fish nes	75 731	78 270	71 562	58 481
Fillets2	2 177	1 842	5 164	1 602
Lobster	3 502	5 789	5 610	4 621
Shrimp and prawns	124 780	143 962	158 673	143 256
Cuttlefish	74 732	118 142	155 867	94 375
Octopus	63 430	78 476	62 399	63 466
Crab	18 338	31 830	40 516	33 756
Abaloni	3 347	2 849	4 443	1 724
Hard clam	12 584	13 436	18 906	17 781
Scallops	810	422	234	135
Whale meat	36760	34 006	27 449	25 378
Horse mackerel3			18 995	5 878
Other	27 200	21 160	27 099	36 279

1. Not identified.
2. Tuna and swordfish.
3. Included in other for 1977 and 1978.

Table B-6 (continued)
(tonnes)

	1977	1978	1979	1980
Salted, dried or smoked:	31 002	36 417	44 762	33 077
Salmon roe	6 682	7 803	7 791	8 600
Cod roe	985	2 711	7 781	3 311
Herring roe on kelp	426	356	507	544
Herring roe	10 275	9 616	7 724	5 416
Fish roe nes	333	318	228	398
Sea urchin	2 458	2 315	2 502	2 207
Jellyfish	6 388	6 415	10 913	4 941
Other	3 454	6 883	7 316	7 660
Prepared or preserved:	34 893	34 024	34 165	40 679
Other marine:	236 122	136 313	157 308	204 779
Other (oils & agar)	2 185	5 347	5 437	3 218
Total quantity (tonnes)	1 041 167	1 012 354	1 151 174	1 037 350
Total value (million yen)	656 210	674 791	930 739	764 272

Source: Japan Marine Products Importers Association.

In value terms the United States moved into first place among suppliers of fishery products to Japan in 1978 followed by the Republic of Korea, Taiwan, Canada, Indonesia and India. The 1980 ordering places the United States in second place (Table B-7).

Table B-7
Japan's main import sources, 1977-1980.
(Percentage share of value)

Country	1977	1978	1979	1980
Republic of Korea	19.7	14.0	12.6	12.8
Taiwan	10.3	9.8	12.2	7.5
USA	9.5	15.5	9.8	12.2
Indonesia	7.4	7.0	6.3	6.8
Canada	6.8	8.0	5.6	3.8
Australia	3.9	3.6	3.9	2.9
Thailand	3.6	3.6	1.8	3.6
Spain	3.0	3.6	4.3	5.0
China	3.0	4.8	4.1	5.3
Hong Kong	2.9	2.4	2.0	1.8
USSR	2.2	2.1	1.0	2.0
Others	22.3	19.4	36.4	36.3
Total	100.0	100.0	100.0	100.0

Source: Japan Marine Products Importers Association.

b. Exports

Exports of marine products from Japan have remained relatively steady in recent years, in value terms, amounting to 201 billion yen in 1974 compared to 196 billion yen in 1979. Canned products make up the largest category of exports consisting mostly of mackerel, tuna, sardines and salmon. Canned mackerel have dominated the volume and value of exports. Frozen tuna and pearls are the second and third most important products exported. Exports of canned salmon from Japan have shown a marked decline from 1976 going from 2 188 859 cases to 501 082 cases in 1978, as a result of the cutback in Japan's high seas salmon fishery.

In the groundfish category, exports from Japan to the US in 1980 were reported for Greenland turbot fillets (8 176 tonnes), flounder fillets (2 410 tonnes), cod fillets (2 517 tonnes) and Alaska pollock blocks (596 tonnes[1]).

1. Source: Seafood Packers Representatives Inc., Florida, Dec. 31, 1980.

C. DEMAND-SUPPLY BALANCE

The volume of imports Japan will require in future years is difficult to project as it depends on many variables, the most important of which are the rate at which fish consumption declines, and the level of future domestic landings.

The decline in fish consumption will be affected by an increase in annual protein consumption and the change in the proportion of animal protein that is accounted for by fish. Since fish consumption is related to rice consumption, one could conclude that as rice makes up a smaller part of the Japanese diet, fish will also decline in favour of beef and poultry. It is possible therefore that the per capita consumption of fish products forecast for 1985 of 34 kilograms may be on the high side.

With respect to domestic production, catches from the foreign zones will play a significant role. In the near future (to 1985), it is likely that recent success in developing new fisheries will continue and thus help to maintain catches at present levels. Over a longer period, however, foreign zone landings are likely to decline as fish processing capacity is developed in countries having jurisdiction over those resources.

If predictions of fish consumption and landings hold true, Japan will be importing about 18% more fish in 1985 than in 1979 - at 1.315 million tonnes, representing a growth in imports of some 3% per year (Table C-1).

Table C-1

Japanese fisheries demand-supply balance, 1974-85.

Year	Population	Demand		Supply		Per Capita Consumption (Product Weight[2])
		Per Capita Consumption (live weight of edible fish)	Domestic Consumption	Food Catch (live weight of edible fish)	Imports	
	millions	kg	kg	000t	000t	kg
74	110.6	67.7	7 484	6 822	662	35.9
75	111.9	67.4	7 549	6 797	752	35.7
76	113.1	68.6	7 763	6 897	866	36.4
77	114.1	66.3	7 565	6 566	999	35.1
78	115.0	67.3	7 754	6 672	1 082	35.5
79	116.0	67.0	7 772	6 697	1 095	35.5
80	117.0	66.7	7 803	6 615[1]	1 188	35.3
81	118.0	66.4	7 835	6 615[1]	1 220	35.2
82	119.0	66.0	7 854	6 615[1]	1 239	35.0
83	120.0	65.7	7 884	6 615[1]	1 269	34.8
84	121.0	65.4	7 913	6 615[1]	1 298	34.7
85	122.0	65.0	7 930	6 615[1]	1 315	34.4

1. At 63% of total catch (projected at 10 500 000 tonnes), excluding catch for exports and non edibles.

2. Estimated at the 1978 level of 53 percent of per capita consumption live weight of edible fish.

Sources: Fisheries Statistics of Japan. Gov't of Japan, MOAFF, 1978; and

Japan's Agriculture Review. Gov't of Japan, MOAFF, Dec. 1980, p. 6.

D. POTENTIAL FOR CANADIAN SALES

The Japanese market holds out considerable potential for Canadian fish exports. In 1979 fish product imports to Japan from Canada were 44 000 tonnes valued at C$274 million, representing a near six-fold increase since 1974.

This rapid increase can probably not be sustained; in fact the 1980 figures show a substantial reduction in Canadian exports to Japan. As was explained earlier, the sharp rise in imports to Japan following the extension of fishing jurisdictions not only reflected true supply shortages, but also fear of future shortages and price speculation. Nonetheless, promising developments for Canadian exporters are clearly possible even though constraints of the 200 mile fisheries zone on Japanese supply will not be as severe as predicted earlier. Some of the potential losses may be minimized by successful Japanese negotiations to regain access to foreign fishing waters. In addition more control of their own waters may result in higher sustained Japanese production. On the demand side a combination of factors, including Westernization, urbanization and price advantages for meat all work against increased demand for fish.

However, in the next decade Canada is in a good position to take advantage of Japan's growing reliance on specialized imports. In this respect recent multilateral trade talks have laid the base for wider entry of Canadian fish products to Japan. Tariff cuts over the priod from 1979 to 1987 have been achieved for:

- frozen herring and cod, frozen hard roe, from 10% to 6%;
- dried and salted herring roe, from 15% to 12%; and
- frozen and fresh squid, from 10% to 5%.

The largest items exported from Canada to Japan have been herring and herring roe, salmon and salmon roe, squid and smelts. Other opportunities are apparent for various groundfish and shellfish.

1. Herring

Herring landings in Japan were over 150 000 tonnes annually in the early 1950s but have declined steadily to a low in 1978 of 6 708 tonnes. Prior to

1976, the decline in landings was attributed to overfishing, changes in water currents and the closure of the Sea of Okhotsk by the USSR. Further declines occurred after 1976 as a result of extended fishing jurisdictions in the North Pacific. At present the Japanese herring fishery is concentrated in the Hokkaido area and the Eastern China Sea. Very little change is expected to occur in the landing level in future years.

a. Herring Roe

Import quotas and a decline in Japan's traditional herring supplies produced a shortage of herring roe. In the 1960s the tight supply situation caused prices to rise as high as 6 500 yen per kg at the Tokyo central wholesale market, placing it in the luxury product category. The import quota was removed in 1972 and importing of roe began on a large scale. Up to 1974, China was the main supplier to the market but this source dried up to a large extent in that year. It is reported that earthquakes caused permanent damage to Chinese herring stocks.

Coinciding with the liberalization of import quotas for herring roe in Japan, the herring fishery off British Columbia was allowed to expand to capitalize on the lucrative market. In the years from 1975 to 1979, British Columbia (BC) was the largest supplier of roe to the market, accounting for 73% of Japanese imports. Japanese importers turned to BC as prices were favourable compared to consumer demand, and the roe was easily accessible. The BC roe herring catch increased from 34 605 tonnes in 1972 to a peak of 78 860 tonnes in 1976. After 1976, landings were steadily cut back by fisheries management, to a catch of 37 294 tonnes in 1979 because of declining stock. The average landed price to BC fishermen increased gradually over the period from 1972 to 1977 from C$56 per short ton to C$350 per short ton. In 1978, this price more than doubled to C$732 and in 1979 it quadrupled from the previous year to an average of C$2 975 per short ton, in the face of frantic competition among Japanese buyers.

In Japan, imports of herring roe reached a high of 12 867 tonnes in 1976, and have declined since then to 8 220 tonnes in 1979 and 6 000 tonnes in 1980, reflecting a reduced catch off Canada's Pacific Coast. As the supply of herring roe declined in Japan, prices moved up gradually in 1976, 1977 and 1978, and then nearly doubled from 1978 to 1979[1].

The dramatic increase in the price of BC herring roe was caused not only by the shortage in Japan, but also by the decline in the value of the Canadian dollar vis-à-vis the yen, which dropped in value from an average of 300 yen per dollar in 1976, to 251 yen per dollar in 1977 and 182 yen in 1978[2].

The fierce competition for BC herring roe appeared to be caused by movement on the part of the major buyers to corner a larger share of the market by obtaining control over supplies. It was heightened by the lack of an industry guideline price. Before the 1979 season, a guideline price for roe had been established through auction by one of the large BC processors. This practice terminated in 1979 when the company signed an exclusive sales arrangement with a single Japanese firm[3].

Meanwhile in Japan, wholesale prices for large-size roe increased from 8 500 yen per kilogram in April to a peak of 14 000 yen per kilogram in December 1979 (Figure 3). This sharp rise was caused, among other things, by the bidding practice of Hokoshu, a trading company, acting in concert with Mitsubishi Corporation. Severe criticism of this speculation appeared in the Japanese press; consumers boycotted herring roe during the New Year buying season, causing prices to plummet and forcing nearly 4 000 tonnes to be carried over to the 1980 year. Coinciding with the speculative debacle, the Japan Ministry of Health announced in December of 1979 that the hydrogen peroxide used in the colouring of roe could be carcinogenic and that steps would be taken in the coming year to prevent its use.

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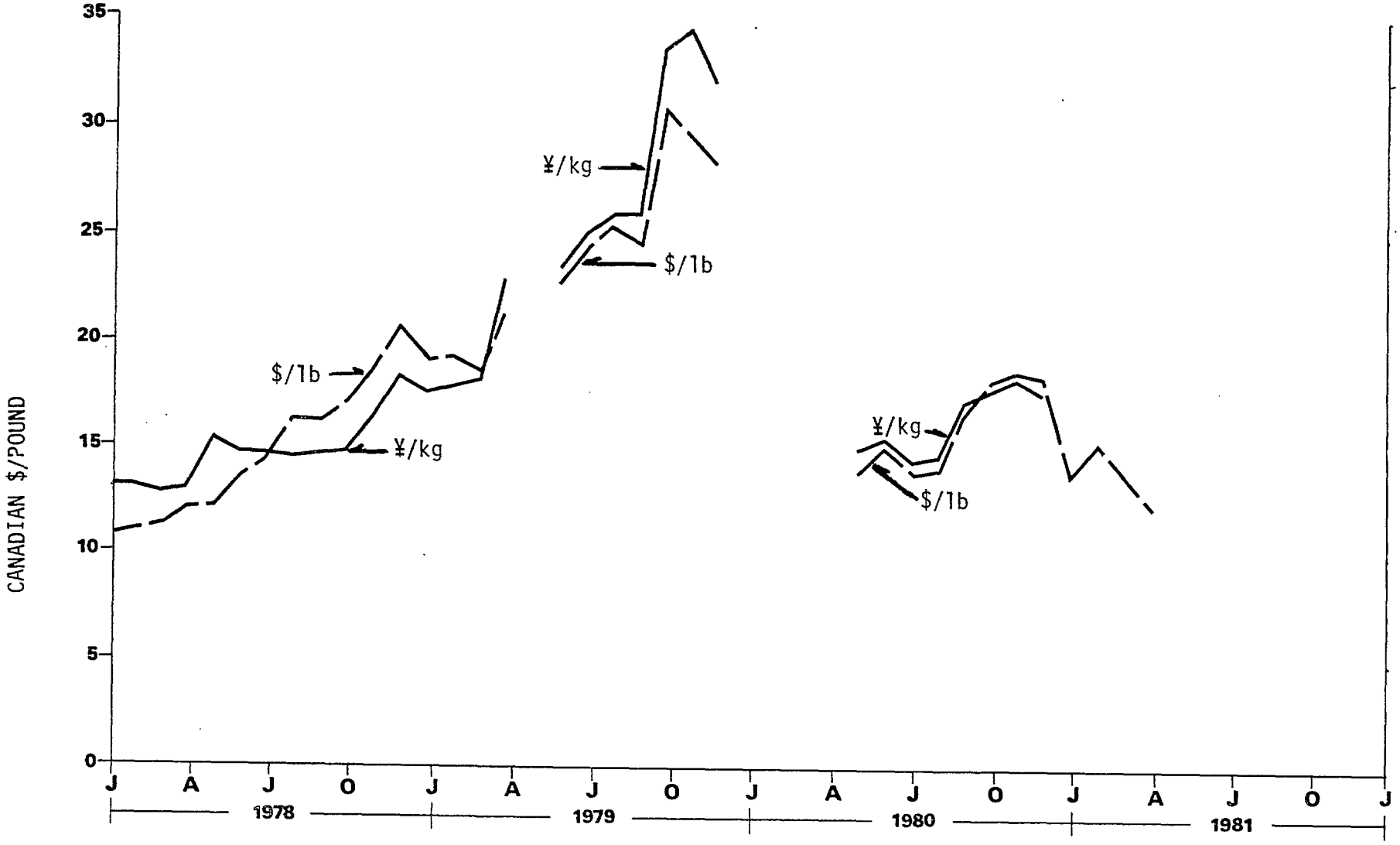
1. As an example the overall average annual import price of herring roe as reported in Japanese official trade statistics was as follows: 1976 = 2 473 yen/kg, 1977 = 2 848 yen/kg, 1978 = 3 661 yen/kg, 1979 = 6 975 yen/kg.

2. In February 1981, this value had declined to 165 yen to the Canadian dollar.

3. For the 1981 roe season it is reported that this company signed agreements with two or more Japanese firms.

Figure 3. Mid-month producer/wholesaler selling price of herring roe, Tokyo Central Market.

(Wholesale price after reprocessing and consumer packaging. Large size 10-12 cm, unbroken, 20/30 g per piece)



In 1980, faced with a large carryover of roe in Japan and a drop in consumer demand, Japanese buyers would offer BC producers only C$6.00 per pound for the top-quality product, down from C$16.00 the previous year. This led to a strike by large numbers of BC fishermen, causing landings in 1980 to decline to 17 540 tonnes. Prices for roe in Japan remained steady from March through August at about 6 000 yen per kilogram but later in the year began increasing, reaching 73 000 yen per kg in October. The demand for roe was running at a normal pace in early December 1980, but on December 18 prices began declining again, going from a range of 6 800-9 400 yen per kg to 3 500-5 500 yen per kilogram (for large size at the Tokyo central wholesale market). A decline in price is normal in the final days of the gift buying season, but the 1980 decline was unusually pronounced, reflecting consumer resistance. The actual consumption of roe in 1980 was approximately 9 000 tonnes - up about 3 000 tonnes from the previous year but substantially lower than in years prior to 1979 (Table D-1).

In projecting the quantity of herring roe to be exported from BC to Japan in future years, one must conclude that resource restrictions will be the deciding factor. The herring catch for 1981 is projected at 30 000 tonnes, which will result in a roe yield of about 3 300 tonnes. Resource managers are currently faced with signs of a declining resource, coupled with growing opposition to the roe fishery from the general public in BC. A possible future development is the packaging of whole frozen female roe herring in consumer packs, with scales intact. This type of product may be more acceptable in BC because it involves a total use of the herring.

For a number of years there has been a small scale export market in Japan for herring roe from Atlantic Canada,[1] obtained from herring caught in the spring and autumn spawning seasons. Atlantic herring roe is not as much in demand as that from Pacific herring, as the membrane is very thin, allowing for easy breakage and loss of shape. Furthermore, it is not as "crunchy" as Pacific herring roe, and is used mostly in the preparation of products which contain loose herring eggs. There is a large potential for this type of product

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1. In 1977 production of roe in Atlantic Canada was 48 tonnes valued at C$274 000. In 1978 this figure increased to 79 tonnes valued at C$609 000.

Table D-1

Japan: herring and herring roe supply, 1976-1985.

(000 tonnes)

	1976	1977	1978	1979	1980	1985
1. Herring:						
Total Catch	66	20	7	6	8	8
Foreign zone landings	49	6	2	2	na	0
Imports						
Total	6	31	7	14	30	30
Canada	4	21	1	6	8	10
USA	1	7	5	6	21	20
Total supply	72	51	14	20	38	38
Year-end stock	14	30	19	7	7	na
Domestic Disappearance	80	35	25	32	38	38
2. Herring roe:						
Imports (tonnes)						
Canada	7 810	9 162	7 960	5 599	2 673	4 000
USA	1 202	719	670	1 090	1 440	2 000
China	1 445	397	700	858	855	1 000
S. Korea	1 360	377	636	569	656	-
Total	12 867	10 679	9 988	8 220	5 809	7 000
Domestic production	1	1	1	1	2	2
Total supply	14	12	11	9	8	9
Year end stock	3*	3*	1	4	3	2
Domestic Disappearance	13	12	13	6	9	9
Average price (yen/kg) (Tokyo central wholesale)						
Frozen herring:						
Nominal	243	423	378	538	720	
Real (in 1976 yen)	243	392	337	464	571	
Herring roe:						
Nominal	2 473	2 848	3 661	6 957	6 550	
Real (in 1976 yen)	2 473	2 544	3 269	5 997	5 198	

* Estimated

Sources: 1. Japan Marine Products Importers Association.
2. Worldwide Fisheries Marketing Study: Japan; Phase I, op. cit.

but the price is much lower, - perhaps one-half that of Pacific roe. One company is currently preparing a consumer pack using Atlantic herring roe, which has been seasoned, and this product may have market success. For the near future it is unlikely that a large trade will develop from Atlantic Canada because it is more profitable to use the Atlantic herring for fillets and other foods, which precludes marketing the roe.

Coinciding with the decline in availability of herring roe from BC, the roe fishery is expanding in US waters of the Bering Sea and southeast Alaska. By the end of October 1980, imports of herring roe from the United States to Japan stood at 2 248 tonnes, compared to 1 090 tonnes in 1979. At the same time the import of roe-bearing herring in 1980 from the US to the end of October was around 20 000 tonnes compared to only 3 749 tonnes for 1979. It is therefore possible that the United States will become the main roe supplier to the Japanese market. Prior to the 1980 season, it was thought that there was considerable potential for expanding the US catch, particularly in Alaska's Bristol Bay where a potential catch of 50 000 tonnes had been projected[1]. In 1980 however, biologists restricted the Bristol Bay catch to 20 000 tonnes because the stocks were not that extensive and were not supported by strong year classes of younger fish. The 1981 outlook is for a catch of only 4 000 to 12 000 tonnes from Bristol Bay, but other areas in Alaska could produce larger volumes.

The total market in Japan for roe will be governed by available supplies, principally from the US and Canada, assuming Chinese production does not recover. The consumption of herring roe in Japan was estimated at 12 000 to 13 000 tonnes annually, from 1976 to 1978. With the price increase in 1979 consumption declined to 6 000 tonnes. In 1980, consumption increased again to the 9 000 tonnes. The carryover to 1981 is estimated at 3 000 tonnes, some of which is 1979 roe which will be used in the mixed product trade. For 1981, total supply to the market is projected to be 12 000 tonnes including 3 500 from Canada, 5 000 from the US, 800 tonnes from China, Korea and other countries.

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1. The roe herring catch in Alaska has increased significantly from the 1978 quantity of 12 241 tonnes to the 1980 quantity of 33 029 tonnes.

The total market is projected to remain at about 9 000 tonnes per year (Table D-1). However, as proven in the past two years, the roe market is sensitive to prices. The threshold price beyond which consumers will be reluctant to buy has been estimated to be about 8 000 to 9 000 yen per kilogram at the retail level. It is reasonable to conclude that the herring roe market is at present very precarious, with demand declining in Japan. Since the product is not an essential food item but one largely purchased for gifts at New Year's, it could very easily fall further out of favour. Efforts should be directed to increasing consumption throughout the year. The "year around" market presently accounts for about one-third of the sales but is more stable than the year-end gift market.

b. Food Herring

The food herring market in Japan has traditionally been a large one. Prior to the extension of fishing jurisdictions when Japan's domestic catch was over 66 000 tonnes (1976) this was used mostly for migaki or dried herring. In 1977 when Japan's catch was reduced sharply, imports climbed to 30 600 tonnes compared to 5 910 tonnes in 1976 (Table D-1). A principal cause of the sudden jump in imports was a threat by the USSR to close its herring grounds to the Japanese. While a partial closure did indeed occur, causing a drop in landings to 20 000 tonnes, a sharp increase in prices dampened domestic demand so that a significant quantity of imported herring remained unused. In 1978, imports fell to a more traditional level of 7 000 tonnes.

The USSR herring incident is a lesson for Canadian exporters eyeing the Japanese market. Consumer reaction to sharp price inceases, as well as supplies from traditional sources, can shift dramatically from one year to the next creating unstable market opportunities.

Nonetheless, exporters have the opportunity to see increasing quantities of food herring, especially as raw material for migaki, but also for other end uses.

Traditionally, the raw material for migaki came from Japan's domestic herring landings and imported roe herring carcasses. But declining domestic landings and restrictions on foreign supplies, including the BC reduction of allowable round roe herring exports from 25% of landings to 5%, severely restricted the available supply[1]. Consumption of herring declined from 80 000 tonnes in 1976 to 25 000 tonnes in 1977 (Table D-1) as a result of increasing prices which caused large carryovers into 1978. Imports in that year, came to only 7 000 tonnes and consumption remained at 25 000 tonnes. In 1979, imports increased to 12 742 tonnes to make up for low domestic landings. Wholesale prices of herring increased in 1979 and 1980 (Figure 4) causing consumption to drop again.

In 1979, the price being offered by the Japanese for food herring reached C$700 per short ton, enough to attract considerable quantities from BC's fishery in December. In 1980, a total 5 680 tonnes were imported from Canada prior to the November and December food fishery in BC. Roe herring imported from Alaska made up the largest supply in 1980 - about 20 000 tonnes.

The entry of frozen herring into Japan has traditionally been governed by an import quota system. Only herring for processing could be imported, and the quota was allocated to the Hokkaido Federation of Fishermen's Co-operatives, which, in turn, gave quotas to various importers and processors. In late 1980, the Japanese government announced it would change this system to allow frozen herring to be imported for direct consumption and to remove 25% of the quota from the control of HFFC[2]. The quota for the second half of 1980 was to be 22 500 tonnes, of which 20 000 tonnes was for the HFFC and 2 500 for other trading companies. It is expected that this change will produce greater demand for imported herring.

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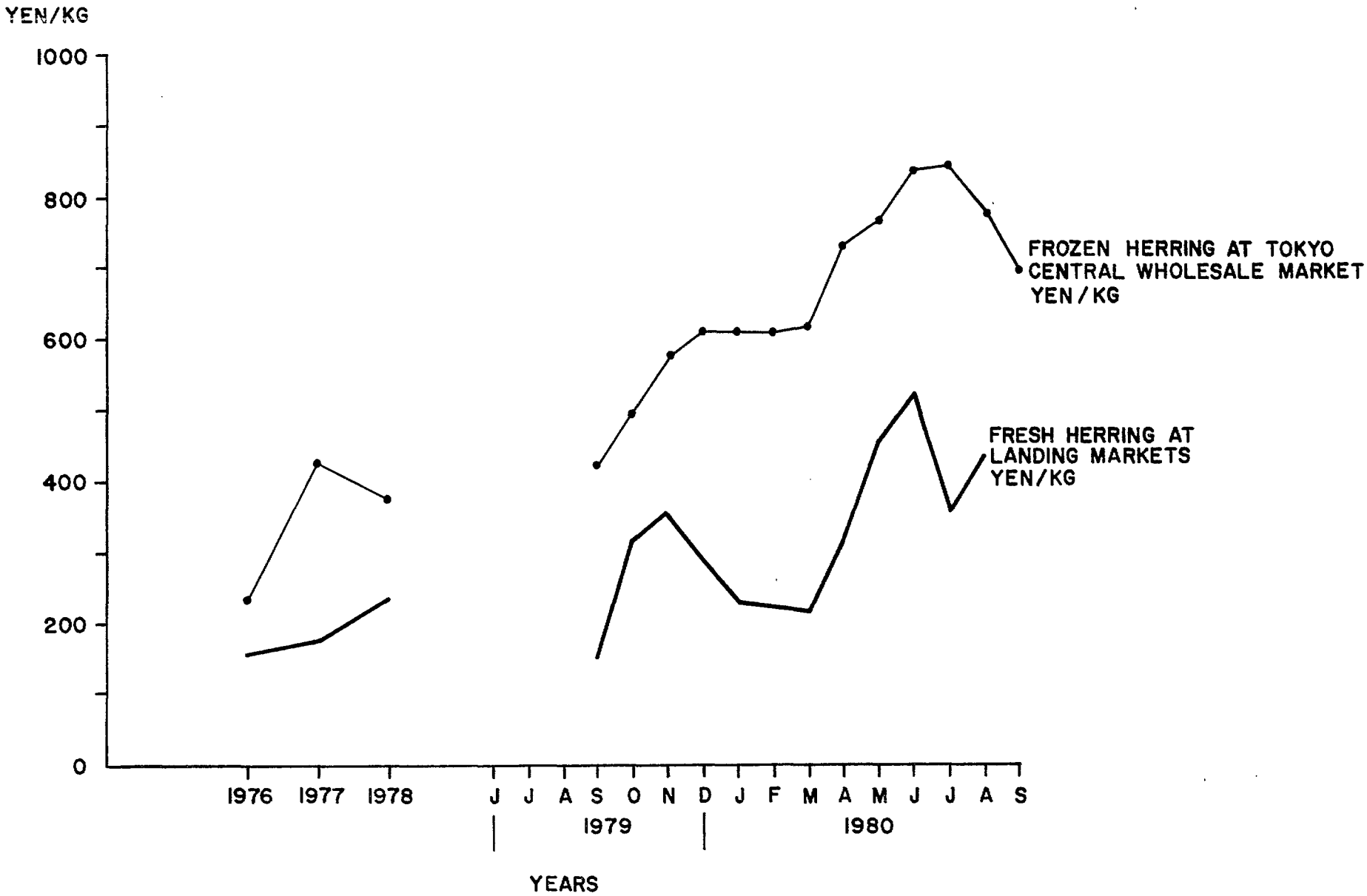
1. For 1981, a regulation will be in effect preventing the export of roe-herring except in consumer packages.

2. The change was initiated by the US in exchange for fishery allocations for Japanese fishermen in the US zone. The quota for direct consumption is to be allocated to importers of record which are under government administrative guidance to source a significant volume from US firms.

FIGURE 4. HERRING PRICES IN JAPAN - 1976-1980.



SOURCE: GOVERNMENT OF JAPAN, M.O.A.F.F., MONTHLY STATISTICS OF AGRICULTURE, FORESTRY AND FISHERIES, DEC. 1980.

It is possible that Atlantic herring could find a larger market in Japan because of the general shortage of supplies. It is reported by the Japanese that Atlantic herring is not as good as Pacific herring for producing migaki because the fat content is higher than desirable. They say that the best herring for migaki is from Bristol Bay, followed by herring caught off southeast Alaska and BC. For other uses it is thought that a good potential exists. A new Atlantic herring product being sold is a type of hot smoked bloater. So far sales of this product have been small but show some potential.

For the future, it is projected that food herring imports from Canada will be at least 10 000 tonnes per year. This quantity could increase significantly if resource managers in BC decide to further reduce the roe herring catch in favour of the food catch, or if Canadian Atlantic herring are found to be acceptable in Japan. According to some sources, however, Canada will be the second supply choice for herring, as roe is available in herring from US waters. However, if herring becomes scarce in Alaska, imports from Atlantic Canada might make up a substantial deficit in supply.

c. Herring Spawn on Kelp

Spawn on kelp was first imported to Japan in 1962 from Alaska. The market in recent years has ranged from 357 tonnes to 544 tonnes (Table D-2). Of the basic market segments, the restaurant trade requires top quality products, while the home consumption segment consumes more of the lower grades of product. The restaurant demand is estimated at 200 tonnes while the home consumption trade is much larger. Canadian West Coast production has traditionally gone mainly to the luxury trade because the quality has been better than that of the product from Alaska. The reason for the better quality is that all of the product is produced under controlled conditions in ponds where the spawn is layered onto the kelp.

Table D-2

Japanese imports of herring spawn on kelp, 1977-1980.

	1977	1978	1979	1980
Korea	0	27	0	0
USA	312	185	292	304
Canada	113	145	214	240
Total	425	357	506	544

Source: Japan Marine Products Importers Association.

The luxury market expanded through the late 1970s at a rate of about 10 tonnes per year. A sudden increase in exports of this product to Japan would probably result in lower prices. The lower quality market is much more elastic and could be supplied with larger quantities without affecting prices significantly. The price of herring spawn on kelp usually reflects the herring roe price, although this was not the case during the speculative price boom for herring roe in 1979. Prices to BC processors in that year averaged about C$11.00 per pound, but in 1980 dropped to an average of about C$6.00.

Production in BC has been held at existing levels since 1979, largely because of opposition to the issuance of any additional permits. This situation is likely to continue in future years unless fisheries managers decide to trade herring roe licences for spawn on kelp licences. This could result in less pressure on the herring resource as the herring could be set free after spawning on the kelp.

2. Salmon

Japanese salmon landings declined from 159 000 tonnes in 1975, to 103 000 tonnes in 1978. Sockeye or red salmon landings were only 5 000 tonnes in 1978, the bulk of the catch being made up of pink and chum salmon. Then a dramatic increase in landings occurred in 1979 as a result of a record catch around Hokkaido in Northern Japan. Unofficial trade estimates place the total Japanese catch, including the high seas landings, at between 130 000 and 140 000 tonnes. In 1980 the domestic catch within Japanese territorial waters totalled 62 000 tonnes compared to 87 686 tonnes for 1979 (the largest haul since 1915).

Fishery officials attribute the increase in catches to stocking rivers with young salmon and the recent success of hatchery production. In addition to the domestic catch within Japan's territorial waters, the Japanese have negotiated a quota from the USSR for salmon on the high seas. In the past three years this quota has been set at 42 500 tonnes and officials say that future quotas will depend on their negotiating success. They have paid high fees to the USSR for the privilege of fishing those salmon. The 1979 catch was reported at 22 348 tonnes of pink, 11 278 tonnes of chum, 5 000 tonnes of sockeye and 270 tonnes of cohol.

Japan's imports of salmon increased from 4 000 tonnes in 1976, to 49 780 tonnes in 1978, and still further to 54 698 tonnes in 1979, despite the increase in domestic catches. In late 1979 however, the market was overstocked, the total supply reaching about 230 000 tonnes compared with 190 000 tonnes in 1978[2] (Table D-3). As of June 1980, there remained 40 000 tonnes of frozen salmon in inventory. The large imports of salmon into Japan in 1979 were also influenced by the near-record salmon catch in Bristol Bay off Alaska, which caused prices for frozen salmon to drop on world markets. Of the total salmon imports to Japan in 1979, sockeye accounted for 70%. These fish were being sold in early 1980 at substantially below cost. Later in 1980, markets improved because of a general increase in consumer demand coupled with a smaller than expected catch in Bristol Bay and lower domestic catches (Figure 5). The 1980 import statistics show an increase in quantities from the USSR.

The total annual market for salmon in Japan is estimated to be about 200 000 tonnes, so there will be considerable scope for imports in future - especially for red salmon, which is the favourite for steaking and restaurant consumption. The total annual import requirement for the market to 1985 is projected at 50 000 tonnes (even though 1980 imports are running substantially below 1979). Assuming Canada's share of the imports expands to 16%, there is a potential market for 8 000 tonnes but this will require a levelling of imports from the USSR and North Korea.

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1) According to industry sources the Japanese catch on the high seas is much greater than this because large quantities of salmon destined for North America are caught and not reported.

2) Source: S. Tomita (Mitsui & Co., Canada Ltd.) presentation at the 1980 Fisheries Council of Canada Annual Meeting.

Table D-3

Japan: total supply of salmon by source, 1978-1985.

('000 tonnes)

YEAR	DOMESTIC LANDINGS	USA	CANADA	NORTH KOREA	USSR	TOTAL IMPORTS	TOTAL SUPPLY*	STOCK	DOMESTIC DISAP-PEARANCE
1978	103.0*	40.9	7.0	1.9	--	49.7	152.7	27.0	151.7
1979	135.0*	48.0	4.7	1.4	0.4	54.6	189.6	28.0	188.6
1980	115.0*	33.0	2.6	1.7	2.0	39.3	182.3	25.0	157.3
1985	150.0	38.0	8.0	2.0	2.0	50.0	200.0		200.0

* Note: These figures reported do not include Japanese catches on the high seas of fish which are destined for North America. Industry sources say these landings are at least 40 000 tonnes per year.

Source: 1. Worldwide Fisheries Marketing Study: Japan; Phase I, op. cit.
2. Canadian Department of Industry, Trade and Commerce

Table D-4

Salted salmon production in Japan, 1972-1979.

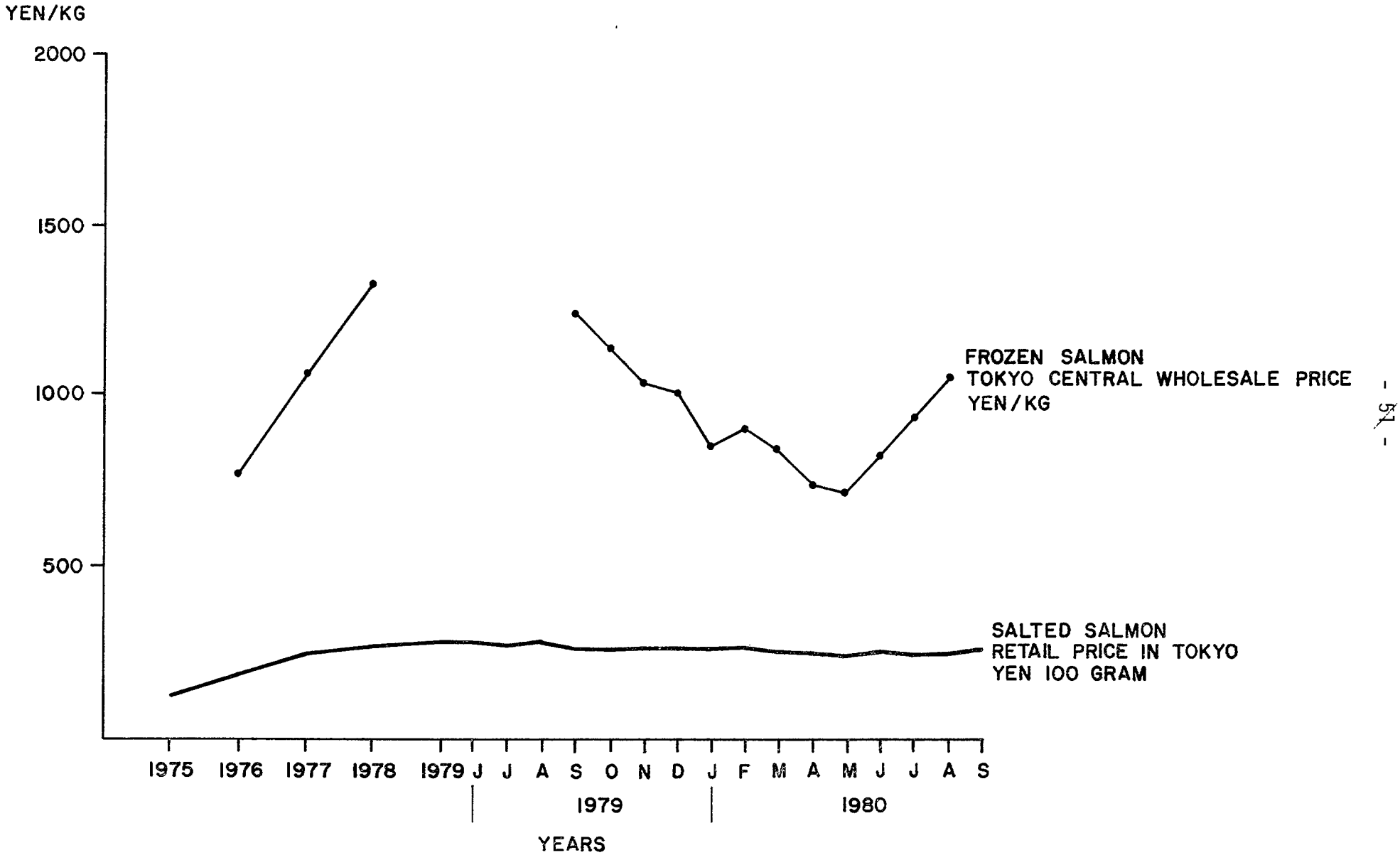
(tonnes)

	Shore based plants	Factory ship production	Total
1972	40 326	42 315	86 641
1973	60 084	35 724	95 808
1974	52 216	26 828	79 045
1975	71 757	39 705	111 462
1976	57 123	20 973	78 096
1977	na	na	na
1978	56 615	16 046	72 660
1979	74 719	20 281*	95 000*

* Estimated

Source: 1. Worldwide Fisheries Marketing Study: Japan; Phase I, op. cit.
2. Canadian Embassy, Tokyo, Japan.

FIGURE 5. SALMON PRICES IN JAPAN - 1975-1980



SOURCE: GOVERNMENT OF JAPAN, M.O.A.F.F., MONTHLY STATISTICS OF AGRICULTURE, FORESTRY AND FISHERIES, DEC. 1980.

Another bright sign for Canadian salmon exporters is the recent introduction of salted salmon into the Japanese market (see Table D-4). Potential opportunities for Canada should not be overlooked. Chum and pink salmon are the species most often salted.

The total market appears to be between 80 and 110 thousand tonnes per year, and the share of output from factory ships and shore-based plants reversed as domestic supplies of salmon dwindled through the late 1970s. Quite obviously there is a limit to the extent the shore-based plants can continue to offset the decline in factory-ship production. If the output of factory-ships were to be eliminated, it appears there could be a potential import requirement of 20 000 tonnes of salted salmon.

The salt content added by Japanese processors on offshore vessels reportedly varies between 10% and 30%. On offshore vessels without freezers, the salmon is salted relatively more at the beginning of the voyage and less so at later stages. Shore-based plants produce two types: about 50% of the output is a very lightly salted product known as aramaki and the rest is a more heavily salted product known as yama-zuke. Both are frozen after salting to preserve flesh colour and to prevent over-curing.

There is also an expanding opportunity for exporting canned, smoked and pickled salmon to Japan.

a. Salmon Roe

Unlike pollock and herring roe, salmon roe is imported in finished form. Both domestic production and imports have been increasing and, as a result, total supply has risen from 7 600 tonnes in 1976 to an estimated 10 800 in 1979. The US (Alaska) is the principal source of imports, accounting for 6 800 tonnes out of total imports of 7 800 in 1979. Canada was second largest supplier, with sales of 983 tonnes (12.6%). In 1980, imports were around 8 000 tonnes, with Canada accounting for about 13%. This volume should continue in the foreseeable future (Table D-5).

Table D-5

Japan: salmon roe supply, 1972-1980.

(tonnes)

	Shore based plants	Factory-ship production	Total domestic production	Imports	Total Supply
1972	1 782	219	2 001	4 852	6 853
1973	1 327	287	1 614	4 868	6 482
1974	2 519	243	2 762	4 335	7 097
1975	3 521	241	3 762	3 486	7 248
1976	1 808	260	2 068	5 773	7 841
1977	na	na	na	6 682	na
1978	na	na	na	7 803	na
1979	na	na	3 009	7 791	10 800
1980	na	na	4 500	8 500	13 000

Source: 1. Worldwide Fisheries Marketing Study: Japan; Phase I, op. cit.
2. Canadian Embassy, Tokyo, Japan.

3. Groundfish

In the groundfish category the main items that show some potential for Canadian export to Japan are Alaska pollock, cod, sablefish, flatfish and rockfish.

a. Alaska Pollock

Alaska pollock landings in Japan declined from over 3 million tonnes in 1973 to 1.5 million tonnes in 1978. The future for pollock depends a great deal on the status of Japanese fisheries in foreign zones (mainly the USSR and USA). It is projected that in the foreseeable future, the catch from foreign zones will stabilize at present levels.

In Japan, Alaska pollock is used fresh, dried, salted, pickled and made into fish paste products, or surimi. This product "in turn" is used for "kamaboko", which is a groundfish preparation cooked by steaming, and "chikuwa" which is a groundfish preparation cooked by roasting or baking. Fish paste is also used for fish "ham" and sausage. Japanese consumption of fish paste or

kneaded products is currently about 1 million tonnes. The product volume of kneaded products has not declined in recent years, despite the drop in landings of Alaska pollock, indicating that substitute species are being utilized. Imports of frozen cod, including pollock and hake, were 13 607 tonnes in 1979 with an import value of 246 yen per kilogram. The USSR supplied over 90% of these imports.

Another major product of the Alaska pollock fishery is the roe (tarako). From 1972 to 1976 Japanese production was 40 000 to 47 000 tonnes per year, but by 1978 output declined to 23 000 tonnes, opening up a considerable market for imports. Pollock roe is a lower-priced product in Japan and as such faces considerable competition from substitutes such as capelin roe, flyfish roe, hake and cod roe. Therefore prices have not increased in proportion to the decline in supplies. In 1978 and 1979 Japanese buyers showed interest in BC pollock roe, but the prices they offered did not allow for a large scale development. There is a potential market, however, that may develop in the future.

b. Cod

Japan's largest catch of cod in recent years, was 108 000 tonnes in 1973. Japanese cod landings depend almost entirely on access to foreign fishing zones, with all the attendant risks of depending on foreign governments. Japanese allocations in the US and USSR zones declined from 70 000 tonnes in 1976 to 39 000 tonnes in 1979. Since Pacific cod can be marketed in both the US and USSR, it is conceivable that the Japanese catch may be forced down to zero by 1985, thus generating a shortfall of 90 000 to 100 000 tonnes.

There is little solid information available on the consumption of cod in Japan, but most of it is sold fresh at the retail level and consumed in chowder-type dishes. The demand is highly seasonal, peaking in winter and falling-off in the warmer months. As cod is one of the less preferred species, consumption levels are not expected to increase. However, there are still some opportunities for Canadian exporters because cod, Alaska pollock and hake are considered interchangeable. The latter two relatively unfamiliar species, which the Japanese now appear to be promoting, may replace cod in future.

The landed price of cod in Japan in 1978 was over C$1.14 per kilogram indicating that there is scope for cod products to be exported to Japan from Canada, especially for the expanding fast-food business. In addition there appears to be potential for kirimi-cut sales. White-fleshed groundfish were on display in supermarkets in Japan in October 1980 in kirimi cuts priced at more than 230 yen per slice.

Obvious potential also exists in the market for other white-fleshed groundfish, particularly the lower-priced species that can compete with domestically-caught cods. There is at present some minor demand for hake, generally for filleting and slicing, by institutional buyers and cheaper class restaurants. Smaller sizes of hake are used in producing surimi mixed with other fish. Hake used in Japan comes mainly from South Africa, although the New Zealand variety (merluccus australis) is being accepted. Competing species are Japanese cod (madara), northern Pacific cod and hoki from New Zealand.

c. Sablefish (Black cod)

Japanese fishermen recorded substantial sablefish catches off North America in the 1950s and 1960s - as much as 40 000 tonnes. After the extension of fishing jurisdictions by the United States and Canada, Japan had to withdraw from those fisheries within 200 miles of North American shores phasing out their operations with small quotas from 1977 to 1979.

Japanese imports of sablefish expanded considerably from 1977 through to 1979 from both the US and Canada's West Coast. From BC the quantity went from 43 tonnes in 1978 valued at C$85 454, to 640 tonnes in 1979 valued at C$1.9 million. In 1980 the market for this product slumped as it did for most other marine products. The Tokyo central wholesale price remained constant at 820 yen per kilogram for several months - a decline from the previous year. Despite the market slowdown, BC exported nearly 1 190 tonnes of product in the first half of 1980, with an overall average export price of C$0.95 a pound. In the previous year the average export price was C$1.37 per pound.

Sales of sablefish in Japan are mainly in filleted and sliced form packaged in a tray. Consumers boil the fish, soak it in soya sauce seasoning and then bake it.

The potential for exporting sablefish from BC to Japan is apparent when one considers the consumption level that was attained at one time. Competition will no doubt come from Oregon and Alaska.

d. Flatfish and Rockfish

Flatfish are consumed in very large quantities in Japan. There are numerous varieties, but the Japanese only distinguish two - bastard halibut and other types which include sole, flounder and turbot. Landings declined from 1976 to 1977 from 352 000 tonnes to 288 000 tonnes, but increased in 1978 to 314 000 tonnes.

Uses of flatfish and the prices they command vary according to species and quality. Flatfish bearing roe can sell at 10% to 20% more than others. Small sizes are usually sold round as single fish. Some of the best quality fish is used for sashimi. Lower quality flatfish are sold to cheaper-class hotels, restaurants and retailers. Supermarkets often do their own cutting and packaging.

In 1976 one third of Japan's flatfish catch was from foreign zones off the US (81 000 tonnes) and the USSR (26 000 tonnes). Neither of these countries have cut back flatfish allocations. Assuming that the Japanese can continue to land about 200 000 tonnes in their own waters, significant shortfalls in supply are not expected. Japanese turbot (arrowtooth flounder) is a low-quality fish, which is exported in filleted form to the United States and other price-conscious markets, such as Australia, and competes with groundfish fillets from North America. Landings of this species in Japan are currently at about 50 000 tonnes.

Rockfish catches in Japan have been declining, from 89 810 tonnes in 1976 to 32 239 tonnes in 1978. Much of this decline is thought to be in landings of species from the North Pacific - sebastus and sebastiscus species.

Small-sized rockfish are used in the dried fish trade, while large sizes are used for kirimi cuts sold through retail outlets and institutionally. It is known that reddish rockfish are much more in demand than those of other colours. In 1978, the average landed price overall for rockfish was 297 yen per kilogram compared to 137 yen in 1976. In the fall of 1979 Japanese importers would pay only C$0.23 a pound for Canadian frozen, dressed, head-off rockfish, so no trade developed at that time. However, if Japanese catches continue to decline it is thought that an export potential could exist for Canadian rockfish.

4. Shellfish

a. Squid and Cuttlefish

Japan's catch of squid declined over the years from 774 000 tonnes in 1968 to 502 000 tonnes in 1976. Common (Japanese) squid landings declined still further in 1977 and 1978 while other varieties increased resulting in an overall increase in total catch in 1977 and 1978 (see Table D-6). The decline in common squid landings occurred in spite of catches made in New Zealand waters that began in 1972.

Consumer demand for squid remained strong in the 1970s at some 550 000 to 608 000 tonnes per year causing prices to increase. As of 1977, the average price was 562 yen per kilogram at the wholesale level, or 171% higher than in 1972.

With the decline in domestic landings and the increase in price, imports of frozen squid and cuttlefish increased to 156 000 tonnes in 1979 from 58 000 tonnes in 1975. Between 1977 and 1978, Canadian squid exports to Japan rose by 366% to 27 156 tonnes, putting Canada in second place behind South Korea as a supplier of frozen squid. Traditionally, Japanese squid imports were of high

Table D-6

Japanese catch of squid by species, 1970-1980.

(tonnes)

	Japanese squid	Cuttlefish	Other squid	Total
1970	412 240	14 740	91 937	518 917
1971	364 349	15 413	102 756	482 518
1972	464 365	15 090	119 995	599 450
1973	347 566	12 225	126 496	486 287
1974	335 018	17 190	117 759	469 967
1975	385 255	15 517	137 066	537 838
1976	312 144	19 750	169 975	501 869
1977	264 239	20 415	227 925	512 579
1978	257 117	18 772	243 824	519 713
1979*	246 000			480 000
1980*	346 000			600 000

Source: Canadian Embassy, Tokyo, Japan.

* Preliminary

value such as mongo cuttlefish (sepia officinalis) and ko cuttlefish (sepia esculenta). Atlantic squid (illex illecebrosus) was first imported in 1976 to meet growing shortages, but it is recognized to be of different quality to mongo and ko.

In 1978 and 1979 the total supply of squid to the Japanese market increased, although their landings fell from nearly 520 000 tonnes in 1978 to 480 000 tonnes in 1979. This decline was more than offset by a rise of squid imports from 118 142 tonnes in 1978 to 155 868 tonnes in 1979. In 1980 the estimated squid catch increased to 600 000 tonnes because of abundant resources in the Pacific Ocean around northern Japan plus good catches in New Zealand waters. Common (Japanese) squid catch showed a 100 000-tonne increase in 1980 from previous years.

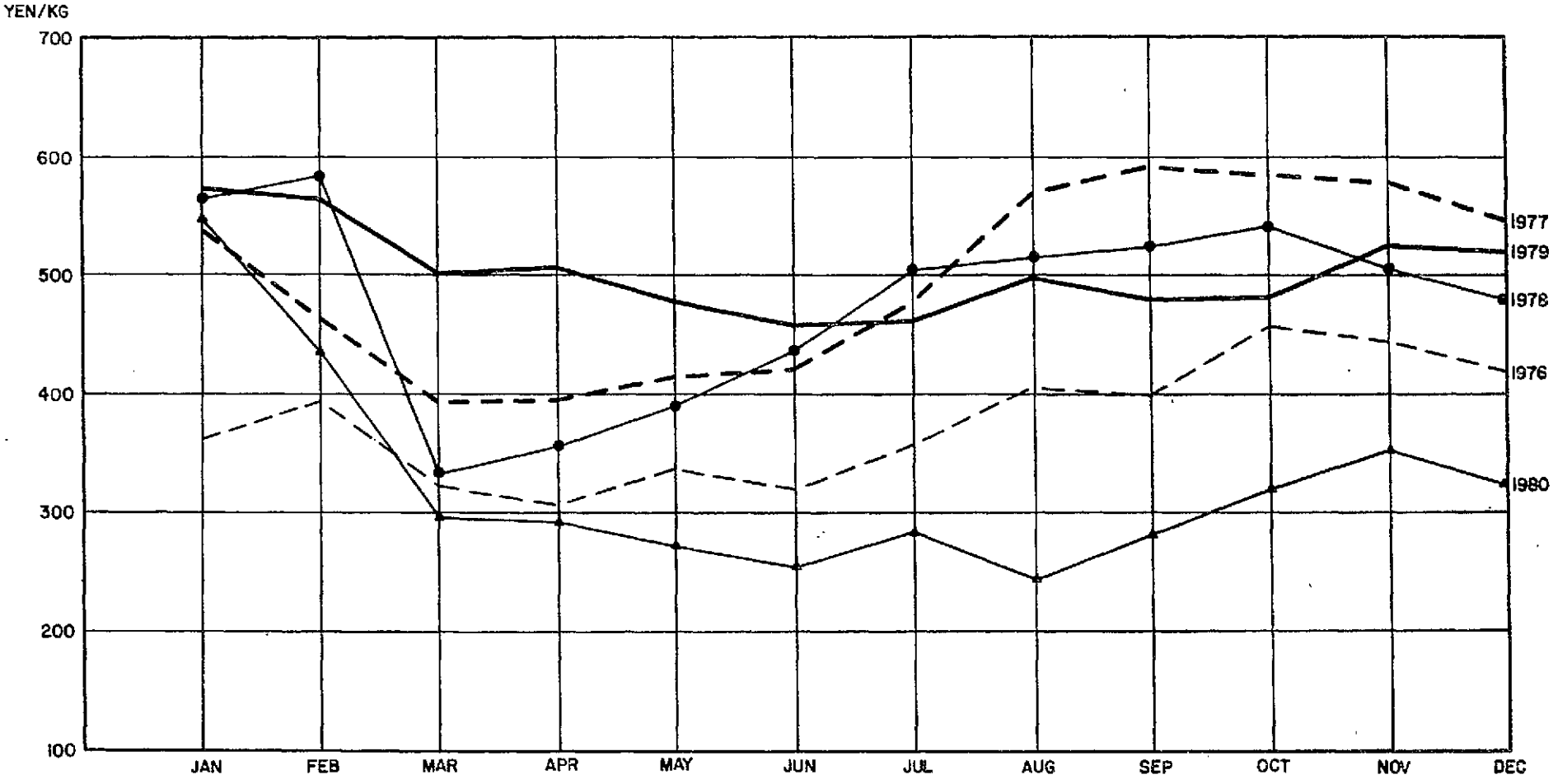
With squid being a glut on the market in 1980, the price dropped to a half of 1979 levels. The landed price had been constant at 400 to 500 yen per kilogram since 1977, as shown in Figure 6. Other factors cited as contributing to the price drop were the high level of squid imports in 1979, an increase in bankruptcies among distributors causing hesitation in the trade, and the decline in demand for processed squid.

Japanese common squid inventories in the Fall of 1980 were 72% higher than the previous year while for cuttlefish the figure was estimated to be 10% lower. Imports in the January to August period of 1980 were 72% of those in 1979 during the same period, although the quantity from Canada was more than twice the 1979 imports to the same date, at 18 000 tonnes. Even at that level, Canadian suppliers and fishery officials were dismayed as a fishing allocation had been given to Japanese companies to fish in waters off Newfoundland within Canadian fishing jurisdiction in return for market access. Faced with the market glut, Japanese fishery officials were compelled by pressure from Japanese coastal fishermen to reconsider the grant of "market access" and were pressured to allow no further import quotas. In October 1980, the Japanese government had announced that there would be no first-half import quota and were considering the supply and demand situation before deciding on a second-half quota. The announcement of a quota for 18 000 tonnes did come on Nov. 28, 1980 after completion of the squid fishery in Japan and recess of the Japanese parliament.

With lower squid prices in Japan, consumption increased by 20% in 1980, thus helping to mop-up most of the fresh-caught domestic catch. The market in early 1981 is improving, in spite of large inventories.

The total consumption of squid in Japan in 1980 was estimated at 640 000 tonnes - an increase of over 5% from the previous year's consumption of 607 995 tonnes (Table D-7). Since 1975, consumption in Japan has increased at an overall average rate of 2.4% per year. If this level of growth continues, consumption could be 702 000 tonnes by 1985. Under catch conditions similar to those of 1980, imports would have to be 132 000 tonnes. If Canada supplied 25% of that requirement, our imports to Japan would amount to 33 000 tonnes. For 1981 a projection has been made that exports from Canada to Japan will range from 10 000 to 40 000 tonnes.

FIGURE 6.
JAPANESE PRICE OF FROZEN COMMON SQUID, PORT OF LANDING.



SOURCE: GOVERNMENT OF JAPAN, M.O.A.F.F.

Table D-7

Japanese squid and cuttlefish consumption, 1975-1985.
(tonnes)

Year	Previous year-end inventory	Total Japanese landings[1]	Imports[2]	Total squid available	Current year-end inventory	Exports	Domestic consumption
1975	42 000	537 838	58 580	638 418	62 000	15 075	561 343
1976	62 000	501 869	68 533	632 402	60 000	16 123	556 279
1977	60 000	512 665	74 732	647 397	67 500	7 463	572 434
1978	67 500	519 713	118 142	705 355	93 900	6 076	605 388
1979	93 900	480 000	155 868	729 768	101 200	20 573	607 995
1980[3]	101 200	600 000	100 000	800 000	130 000	30 000	640 000
1985[3]	100 000	600 000	132 000	832 000	100 000	30 000	702 000

N.B. 1. Cuttlefish landings are between 16 000 and 20 000 tonnes per annum.
2. Average cuttlefish imports over past few years have been approximately 40% of imports.
3. Estimated.

Source: E. Wiseman, 1980 Squid Market Assessment, Department of Fisheries and Oceans Canada, Sept. 1980 (Revised Edition).

With respect to the supply of squid in Japanese waters, there are conflicting opinions among biologists as to the level of fishing that can be sustained. One theory is that the increased catch in 1980 had to do with environmental conditions such as changes in water temperatures, while another theory is that the stocks recovered because of declining fishing effort.

As for the demand for squid in Japan, total household and institutional consumption amounts to 40% of the total. About 200 000 tonnes is consumed in homes, while 30 000 tonnes is used for bait and the remainder is processed. In processed products the highest demand is for shredded squid, but consumption is fairly constant or may even be declining due to increased competition from items such as peanuts and popcorn.

In order to predict the potential for squid exports to Japan from Canada it is necessary to consider the availability of squid from various alternative sources. The Japanese have stepped up fishing activities in foreign waters. They have promoted squid fisheries off Canada, New Zealand, Argentina, Australia and Mexico. Catches from New Zealand waters increased to 61 135 tonnes in 1980, nearly double the 1979 level, while from Australian waters, landings increased from 3 600 tonnes to 7 200 tonnes in 1980. From Argentina waters, landings dropped to 15 000 tonnes from 40 000 tonnes the previous year. Landings from Canadian and US waters also declined in 1980 (Table D-8). It is apparent that the supply options are numerous, and it is likely that those options which employ Japanese fishermen will be pursued first.

Table D-8

Japanese squid catches, 1979 and 1980.
(tonnes)

		1980	1979
Catches (actual)	- New Zealand	61 135	32 600
	- Australia	7 200	3 600
	- Argentina	15 000	40 000
Anticipated catches	- US	9 000	12 000
	- Canada	17 000	30 000
	- Domestic surume[1]	346 000	260 000
	- Domestic red	144 665	102 000
		600 000	480 000

[1] The figures for domestic surume landings may actually include some of the distant water catches.

Source: E. Wiseman, Squid Market Assessment, Department of Fisheries and Oceans Canada, Sept. 1980 (Revised Edition).

b. Molluscs

Mollusc species, including scallops and oysters, are under cultivation in Japan and being exported. The Japanese scallop is the common scallop while the oyster is the Pacific oyster - the same variety that is found off BC. Scallops are exported to France while oysters go to the United States, France and Canada.

Consumption of clams is heavy in Japan, as evidenced by landings of nearly 158 000 tonnes in 1978. These are primarily shortneck clams, with small quantities of moga clams. There has also been a clam (called hard clam) imported into Japan, at the rate of nearly 19 000 tonnes in 1979 with an average price of 209 yen per kilogram. The bulk of these imports are from North Korea and China.

The adductor muscle of certain molluscs is in good demand in Japan. Imports in 1979 were 234 tonnes valued at an average price of 1 125 yen per kilogram. The largest quantity was from the Philippines.

Off Canada's West Coast, the large clam-like geoduck has been fished commercially since 1977, primarily because of Japanese demand for the siphon. Increases in this fishery are not anticipated because of the small size of the resource. Landings in 1979 were 2 463 tonnes (round weight) valued at nearly C$1.7 million.

c. Shrimps and Prawns

The largest category of crustaceans consumed in Japan is shrimps and prawns. Domestic landings of these species decreased from 75 000 tonnes in 1974 to 56 000 tonnes in 1978[1]. The average landed price of the catch in 1978 was 969 yen per kilogram. In addition shrimp and prawn imports in 1979 were

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1 This figure does not include kuruma prawns amounting to 2 673 tonnes in 1978.

158 673 tonnes representing an increase of 27% from the 1977 level and a substantially greater increase from previous years. The market for these products is growing at a good pace and will increasingly rely on imports.

There is a wide range in types of shrimp and prawn products being sold in Japan from the reasonably-priced varieties of southeast Asia to the more expensive prawn species.

BC has recently supplied some prawns to Japan and this trade can be expected to grow to the extent that the resource will allow (to possibly 1 000 tonnes per year). Opportunities are apparent for consumer packs from Canada.

d. Crabs

The total supply of crab products to the Japanese market has expanded in recent years to over 110 000 tonnes although landings have not increased. King crab and blue crab landings have declined, while tanner crab landings have remained comparatively stable. Exports have only amounted to about 500 tonnes (round weight) in recent years, consisting mainly of canned product. In 1979 imports of crab products amounted to 40 516 tonnes, of which the United States supplied 85%. South Korea supplied 4 237 tonnes, mostly blue swimming crab. China accounted for 649 tonnes of blue and rock crab (very cheap). Some quantities of Pacific dungeness crab were imported from the US and Canada.

King and snow crab prices are graded into four large grades and one medium grade. Some snow crab is imported in shrink packs (whole crab and sections) and shucked meat. Crab prices are determined by size and freshness. Canadian Atlantic snow crab is at something of a disadvantage because of its small size. In 1980, the price of crab to Alaskan packers was US$2.00 to US$2.30 per pound for large snow crab and US$1.90 to US$2.10 for small size. The Tokyo wholesale price of Alaska snow crab in bulk was around 1 100 yen per kilogram. For shrink packed snow crab size 3L this price was 1300-1400 yen per kilogram. For medium size this price dropped to 900-950 yen per kilogram. The average price of frozen crab imported in 1979 from the United States was 1 085 yen per kilogram. From Canada, in that year, 173 tonnes were recorded, valued at an average import price of 925 yen per kilogram.

Although the overall average import price for products imported to Japan has been lower than the price Canadian producers have obtained in other markets, the potential of the Japanese market should not be overlooked. From the West Coast of Canada, supply restrictions would prevent any significant trade but from the Atlantic, a larger trade could develop.

e. Lobster

The main variety of lobster consumed in Japan is the spiny lobster. Supplies come from a limited domestic fishery (1 000 tonnes in 1979) and through imports amounting to 5 610 tonnes in 1979 with an average import price of 2 139 yen per kilogram. Imports of lobster products were higher in 1978 and 1979 than in previous years, but have dropped back somewhat in 1980. Fresh or frozen lobster imports are recorded from 23 different countries. The largest suppliers are Cuba, Australia and New Zealand. The Australian product is highly regarded because of colour and size uniformity.

Canada supplied 57 tonnes of product to Japan in 1979, recording an average import price of 1 121 yen per kilogram. This quantity increased to 92 tonnes (by August 1980) but was substantially less than the 336 tonnes recorded in 1977. Lobster from Canada is a relatively new product in Japan, and could have a good potential if consumers were more familiar with it. A problem is presented by the claws, because the largest consumption of the spiny lobster is at weddings, and anything that suggests a "cut-off" is regarded as a bad omen. Nonetheless, there is a slowly expanding market for live lobster in Japan.

f. Sea Urchin

The roe of sea urchin uni is a delicacy in Japan. Japanese landings have increased moderately in recent years from 23 573 tonnes in 1974 to 25 930 tonnes in 1978. In 1978, the average landed value of this product was 633 yen per kilogram. In addition to domestic landings, imports of sea urchin (product weight) have been close to 2 500 tonnes with an average import price in 1979 of 2 137 yen per kilogram. The largest quantities in 1979 came from the United States, South and North Korea, followed by Chile.

Uni is called a "perfect" food in Japan, high in protein and vitamins and thought to promote virility. The domestic species is in greatest demand, and brings prices about 50% higher than the product from North America.

Nevertheless exports of sea urchin from BC and the US west coasts have been increasing with the more favourable exchange rates in recent years. In 1979 sea urchin landings off BC were 317 tonnes valued at C$76 000 while imports of sea urchin roes from BC to Japan were 20 tonnes valued at about C$300 000. The sea urchin resource in BC will be the limiting factor for this trade in future, currently projected to be about 500 tonnes.

g. Abalone

Abalone landings in Japan have ranged from 4 971 tonnes in 1974 to 5 377 tonnes in 1978, with an average landed value in the latter year of 3 363 yen per kilogram. Fresh and frozen abalone imports were 4 443 tonnes in 1979 compared to 3 348 tonnes in 1977. The average import price in 1979 was 8 540 yen per kilogram. The main suppliers were Chile and Australia. It is reported that Chilean supplies have undercut the Australian product on price and taken the volume market even though Australian abalone is considered superior. Abalone is consumed in a number of ways, including boiled, dried, cured, fermented and canned. In addition to fresh and frozen imports, canned imports ranged from 623 tonnes to 757 tonnes from 1974 to 1978.

Abalone catches off the BC coast reached peak levels in 1977 and 1978 of about 430 tonnes valued at C$1.8 million but have since declined due to resource restrictions. Future increases in exports from BC are doubtful as the resource is expected to be able to sustain a fishery of only 50 tonnes per year.

h. Sea Cucumber

Japanese landings of sea cucumber ranged from 9 000 to 11 000 tonnes in the years from 1974 to 1978. The major species are genera stichopus, thelenota and holothuria. Bag type cucumber species are minor. The genus cucumaria frondosa var japonia is the only cucumaria species in Japan which is palatable for human consumption. Production of boiler-dried cucumber in Japan is 50-75 tonnes per year which at a five percent recovery is 1 500 tonnes round weight.

Japanese consumption of cucumber is in winter months only. Most is sold fresh and consumers slice and marinate before eating. The largest use of the dried product is in Chinese dishes. In the past, dried products have been exported to Hong Kong, Singapore and China. Imports of this product to Japan have been very insignificant in the past.

i. Octopus

Octopus landings in Japan have declined since 1974 from 76 731 tonnes to 65 441 tonnes in 1978. The average landed price of this product in 1978 was 420 yen per kilogram. Octopus imports have ranged between 62 400 tonnes and 78 500 tonnes in recent years, from 27 different countries. Spain is by far the largest supplier, followed by the Republic of Korea, Thailand and Morocco. Canada supplied 7 tonnes of octopus in 1979 valued at 435 yen per kilogram. In Japan, octopus is boiled and eaten in dishes such as sashimi or pickled in vinegar. The acceptability of octopus in Japan depends on the species. Low value species are suitable for pickling but not for sashimi. A common species caught in Japan is madako, octopus vulgaris.

5. Freshwater Fish

The largest freshwater item exported from Canada to Japan is smelt, amounting to 2 677 tonnes in 1977, declining slightly to 2 092 tonnes valued at C$1 781 000 in 1979 but increasing to over 3 000 tonnes in 1980. Smelt also comes into Japan from the United States. Imports are mainly in IQF form but some are in blocks. Japan also produces small quantities of smelt. The market is reported to be very small and demand fluctuates extensively according to what is available from domestic supply. The lower-class restaurant trade uses most of the product for a soy-seasoned preparation. The average price of Japanese smelt (hypomesus obdus) was reported to be 618 yen per kilogram in 1977 at the Tokyo central market.

Since the market for this product is growing slowly, it may be possible to increase exports from Canada by perhaps 5% per year. The resource in the Great Lakes is somewhat underutilized since small fish are required (less than five inches) in contrast to North American markets which use larger fish.

The inland catch and cultured production of salmon and trout in Japan amounted to 25 000 tonnes in 1978. This is adequate for the Japanese market and some is exported to North America and other countries. Rainbow trout sells fresh in Japan at around 800 yen per kilogram and the market is fully supplied.

There is significant consumption of eels in Japan, mostly from farmed production - amounting to 32 106 tonnes in 1978 - in addition to a further 2 068 tonnes caught from inland waters. Imports of live eels amounted to 13 205 tonnes in 1979 with an average price of 1 688 yen per kilogram. Taiwan supplied 99%. It is reported that Canadian eels are not the variety in demand in Japan, but further investigation of the potential may be worthwhile.

6. Other Fish

a. Capelin

The Japanese catch of capelin disappeared when that country was phased out of the capelin fishery off Canada's Atlantic coast. The volume caught in 1976 off Canada was 5 114 tonnes and in 1977 was 4 828 tonnes. In 1978, the last year that an allocation was given to Japan, the catch was only 858 tonnes[1]. Most of the world's capelin landings (of 315 000 tonnes in 1978) are used for reduction to fish meal and oil.

Capelin imports to Japan declined over the years from 1976 to 1978 but took a decided jump in 1979 to 37 268 tonnes valued at an average import price of 242 yen per kilogram (Table D-9). The largest suppliers in 1979 were the USSR, followed by Norway, Iceland and Canada. In 1980, the market is expected to import 34 000 tonnes, of which Canada will supply 9 000 tonnes or 25%. The total value of capelin exports from Canada to Japan to October 1980 was worth C$8.5 million, compared to C$7 million in 1979. Supply shortages in 1978 were attributed to lower catch volumes of capelin with roe in Norway and Iceland fisheries while in 1980, Iceland's fishery was again reported to be poor.

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1. In 1979, the USSR caught 8 600 tonnes of capelin in the Canadian Atlantic fishing zone, declining to 4 800 tonnes in 1980. For 1981, an allocation of 10 650 tonnes is proposed by the USSR.

Table D-9

Japanese imports of frozen capelin 1976-1980.
(tonnes)

FROM	1976	1977	1978	1979	1980
Norway	6 203	4 733	1 375	9 232	11 271
Iceland	5 263	4 654	183	8 852	2 493
USSR	10 099	7 284	4 040	13 697	9 917
Canada	92	369 (2%)	1 292 (17%)	3 764 (10%)	7 848 (25%)
Total*	22 877	18 612	7 701	37 268	31 529

*Includes imports from other countries - non-additive.
Source: Japan Marine Products Importers Association.

The Japanese are only interested in capelin with roe, which are caught in Canadian waters in May and June and, in the North Sea, during March and April. The total market (for female only) at present is about 30 000 tonnes but is growing and could attain a level of 35 000 tonnes by 1985. The USSR is the only country currently supplying ocean-run capelin (both male and female). Prices paid are reported to depend on percentage of females in catches and quality factors such as colour and size. Male capelin are very low-priced and are used largely for bait. Capelin with roe are processed to make a mild dried product with roe inside, and are sold fresh or frozen in consumer packs for broiling. The market prefers larger capelin - less than 40 fish per kilogram. Canada is supplying fish which are a little smaller at 41-45 fish per kilogram. There is also a market for capelin roe itself, for use in manufacturing products or mixing. This is a low-valued roe compared to that of herring or salmon.

It appears that the market in Japan for capelin from Canada is growing but is highly variable, depending on supplies available from countries such as Norway, Iceland and the USSR. Traditional suppliers are reported to have resource availability problems. In 1979, Norway instituted capelin quotas for the first time and Iceland has imposed fishing bans and an export levy to discourage capelin exploitation. The long-term potential for capelin catches in Canadian Atlantic waters is estimated at 200 000 tonnes. However, large fluctuations in stock levels result in substantial variations in potential catches. The Canadian catch in 1980 was 21 300 tonnes.

b. Tuna

Japanese landings of southern bluefin tuna have ranged from 40 000 to 52 000 tonnes since 1973. The average landed price in 1978 was 1 402 yen per kilogram - nearly the same as in 1977. Southern bluefin (thunnus maccoyi) is a large fish and therefore competes in Japan with the other large tuna which have similar flesh characteristics (red flesh with high fat content). The other varieties of large tuna are bigeye (thunnis obesus) and yellowfin (thunnus albacores). Domestic catches of all of those varieties in 1978 came to 273 000 tonnes, compared to 243 000 tonnes in 1976.

Imports of tuna to Japan, including yellowfin, bluefin and bigeye (not albacore) were 89 000 tonnes in 1979 compared to 91 000 tonnes in the two years previous. Most of the category called bluefin comes from the United States and Canada, so is assumed to be northern bluefin. Imports of that category have been less than 1 500 tonnes in recent years. From Canada the average import price was 3 097 yen per kilogram while from the United States it was 1 790 yen per kilogram.

The principal use of the large tuna in Japan is for sashimi or consumption in raw form. Southern bluefin tuna is sold almost entirely to restaurants with the highest quality going to the top-class sushi establishments. Retailers handle very little southern bluefin but do handle some of the lower-quality northern bluefin. Bigeye and yellowfin tuna are sold both to retailers and restaurants. Large tuna are also used for cured and kneaded products and grilled as steaks or canned.

On the Japanese tuna long liners, bluefin are frozen round or gilled and gutted, while bigeye and yellowfin are generally gilled and gutted. Imported large tuna are dressed to save freight, although head-on fish are preferred.

Prices vary from year to year, season to season, fishing ground to fishing ground and fish to fish according to quality, freshness, fat content, flesh colour and other factors which are inspected (visually and sometimes by feel) for each fish individually. Prices for the blocks or cuts vary according to the part of the fish from which they are taken. Fresh prices vary anywhere

from 400 to 4 000 yen per kilogram depending on quality factors and supply-demand balance. Higher prices can be achieved for small-volume imports by selling directly into higher priced markets in consumption areas.

The Japanese tuna industry is experiencing increasing competition from yellowfin and bigeye caught by Taiwan and Korea. Future prospects will be affected by fisheries policies of the South Pacific countries.

Exports of bluefin from Canada (Atlantic coast) to Japan are not expected to increase appreciably in future because of the restricted resource. In 1979 these exports amounted to 186 tonnes valued at C$2 904 900. The catch of bluefin off Canada's Atlantic coast declined from 2 064 fish in 1976 to 575 fish in 1979. Catch limits are imposed by Canada through membership in the International Commission on Atlantic Tuna.

Japan also has a large albacore fishery (88 000 tonnes in 1978). Frozen albacore imports in 1979 were 2 645 tonnes, primarily from Taiwan, South Korea and Singapore. This species of tuna is not as good for sashimi because of whiter flesh and low fat content, so is used primarily for canning, and is exported to the United States and Canada. There is a local Japanese catch of albacore plus an incidental catch by longliners fishing southern bluefin. The price level at landing markets in December 1978 for albacore in the 12-15 kilogram range was 220-230 yen per kilogram. The average CIF price of frozen albacore imports in December, 1978 was 298 yen per kilogram.

Most of the canned tuna production in Japan is made up of skipjack tuna (katsuwonus pelamis). Landings of this species in 1978 were 385 000 tonnes - the fourth largest category in landed weight. It is a red fleshed fish with high fat content used for canning and also for cured and dried product. It is a relatively low priced species of tuna with landed prices in 1978 at 120 yen per kilogram and the Tokyo central market wholesale prices averaging 192 yen per kilogram.

c. Swordfish

In the swordfish, marlin and sailfish category, landings in Japan have ranged from 42 000 to 51 000 tonnes since 1973. The average landed price of

this category in 1978 was 576 yen per kilogram. Imports of frozen swordfish in the past two years have been at the 21 000 tonne level, with an average import price in 1979 of 407 yen per kilogram. Imports came from 17 countries in 1979, with the largest suppliers being Taiwan and South Korea. About 1 300 tonnes of fresh swordfish were also imported in 1979 from Taiwan.

Swordfish in Japan are used for grilled dishes or commercially pre-flavoured products. They can be cured or canned. Canned swordfish exports are recorded from Japan to the United States. Home consumption accounts for a large part of use.

There were no imports of swordfish to Japan from Canada in 1979, but in 1978, 2 671 kilograms were sold for an average import price of 238 yen per kilogram. The swordfish fishery was re-opened in Canada in 1979 after being closed for nine years because of mercury content in the fish. Before the ban on fishing, Canadians caught 4 500 tonnes per year. In 1979 the catch quota was 3 000 tonnes. For the future, Canada can be expected to increase swordfish exports to Japan to some extent if marketing problems in the United States persist. So far prices offered by Japanese importers to Canadian processors have not been an inducement to larger sales.

d. Mackerel

The Japanese mackerel catch is dominated by blue mackerel, (scomber japonicus), which is similar to the mackerel caught off Canada's East Coast (scomber scombus). Japanese landings of this species are not dependent on foreign zones and have been increasing from 1 355 000 tonnes in 1977 to 1 626 000 tonnes in 1978. This species nearly tied for first place with sardines as the largest volume species caught in Japan. The average landed price is only 26 yen per kilogram. Mackerel is used for canning (about 30 000 tonnes), drying and fish meal and oil. The better quality can be used for grilling or boiling. Fisheries market experts in Japan say that table consumption of this species will probably not increase in the future as when it is broiled it gets very smoky and is not attractive to young persons.

It is concluded that mackerel from Canada's Atlantic coast will not find a significant market in Japan in the near future.

E. SUMMARY AND CONCLUSION

1. Japan's population is growing slowly at 0.6% per year and will reach 122 million by 1985. Average earnings are high at nearly C$16 500 per year and are growing in real terms. Consumer spending is also rising, particularly for eating out. The economy is performing satisfactorily with a good rate of economic growth and inflation is under control. Under these conditions, it is reasonable to see reduced starch and increasing animal/fish protein consumption. At the same time the proportion of protein accounted for by fish is declining, but so far only at a moderate rate with the result that the total per capita consumption of fish, currently 66.7 kilogram live weight equivalent is projected to be 65 kilograms by 1985. Higher-priced fish obtained largely from imports, are expected to be in strong demand.

2. Total fish and marine landings in Japan have remained at over 10.5 million tonnes recently, showing no declining trend after extended fishing jurisdictions. Landings from some traditional foreign zones have declined, but this has been offset by an increase in catches elsewhere. Japan has been successful in gaining fishing access to waters of a number of countries through joint ventures and co-operative arrangements, and by trading-off market access for fishing allocations. As a result total landings in Japan are not expected to decline significantly in the near term, but over a longer term shortages will appear.

3. Fish production has shown an increase in total product weight since 1974, especially in frozen packaged foods and convenience foods. The processing of fish is generally very specialized in Japan, with tastes and preferences which have evolved over centuries in various parts of the country, and countless methods of fish preparation.

4. The distribution of fish in Japan is complex and involves a large number of intermediaries. Some of the main products have their own distribution channels which are by no means exclusive. Most fish goes through two wholesale

markets - at the landing level and at the consuming level. Recently many major fish dealers in Japan have been taking a commodity trading approach to marketing. All of these factors have caused fish prices to be very high. Small fish shops still account for the bulk of the fish sold - from 65 to 70%. Supermarket sales, restaurant and food service sales are expanding.

5. Imports of fishery products to Japan increased each year between 1970 and 1979, with the sharpest rise being from 1975 to 1977. Growth prior to 1976 was largely for shrimp and prawns but also for other products. After 1976 imports of herring, salmon, squid, crabs and other fish increased sharply because of the cutbacks in high seas fishing faced by Japan and due to speculation and general fear of supply shortages. During 1980, imports of seafood were down substantially from 1979, stemming from market problems that developed in Japan in the latter half of 1979. The United States is now supplying a larger share of fish imports. If predictions of fish consumption and landings hold true, Japan will be importing about 18% more fish in 1985 than in 1979.

6. The next five years should consolidate Canada's position in the Japanese market. Canadian exports to Japan of herring roe, salmon and squid have increased in recent years. For herring roe the resource off the Pacific coast will be the limiting factor, with an expected yield of 2 500 to 3 500 tonnes. For salmon the market still holds out considerable potential, particularly for frozen sockeye. The squid situation is unpredictable at present because of high domestic catches and alternate sources of supply. Herring spawn on kelp and food herring markets are strong and the potential is good for increasing exports. Some potential is also noted for a number of groundfish, shellfish and freshwater fish products.

APPENDIX I

IMPORT BARRIERS IN JAPAN

1. Quotas

Import barriers in Japan consist mainly of a system of import quotas (IQ) and tariffs. The IQ system for marine products is designed primarily to protect fishermen and processors in Japan from competition from foreign countries. Marine species subject to quotas are:

- Cod, yellowtail, mackerel, sardine, jack mackerel, saury
- Scallops, shellfish adductors
- Nibasi (small fish boiled and dried for seasoning use)
- Cod roe (including pollock roe)
- Squids and cuttlefish
- Alaska pollock
- Herring
- Kelp
- Dried laver
- Dried seaweed in bulk

The main Canadian species currently affected by these quotas are cod, mackerel, scallops, cod roe, pollock roe, Alaska pollock and herring.

There is a special provision in the IQ system for companies that have 40% or more of the equity share holding in an overseas fishing joint venture. These companies can apply for special quotas. Most quotas are world quotas, however South Korea is given special treatment (quotas) for fresh frozen squid, and cod roe, among other products. Most quotas are for six-month periods except for dried squid and seaweeds which are for 12-month periods. Actual quantities set for each product during each period have varied extensively.

There is also a group of products which are subject to special approval for import from the Minister of International Trade and Industry. Species affected include tunas (excluding albacore) and swordfish[1].

2. Tariffs

Import tariffs in Japan apply to:

1) Fresh, chilled or frozen fish (live or dead)
   - this category covers the main products including fillets which have not been treated in any way. It also covers fresh or frozen roes.
2) Partly processed fish by drying or salting in brine, smoked whether or not cooked before or during the smoking process
   - this category covers mainly hard roes and smoked fish
3) Fish prepared or preserved
   - this covers hard roes of fish, caviar and ikura, canned or bottled fish and other fish such as cured
4) Fish extracts
5) Crustaceans and molluscs
   - fresh, frozen, live, dead, in brine or broiled
6) Crustaceans and molluscs prepared or preserved
   - canned, bottled or smoked

Other rates are set for seaweeds, jellyfish, oils, meals, whales and pearls.

For products from Canada the most important items are as follows in 1979, 1980 and 1987 as revised under the GATT Multilateral Trade Negotiations (Tokyo Round):

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[1] For an excellent discussion on Japan's import regulations for fish and shellfish products see: Sunee C. Sonu, A Survey of Japan's Import Regulations on Fish and Shellfish Products, National Marine Fisheries Service, NOAA, NMFS, Washington, D.C. USA.

Japanese Tariffs on Fish Products

Tariff No.	Tariff item	Base rate 1979	Final rate 1987	Current rate 1980
0.301 2(2) A	Nishin (herring) fresh, chilled or frozen (excluding fillets)	10%	6%	9.5%
03.01 2(2) A	Tara (cod) fresh, chilled or frozen (excluding fillets)	10%	6%	9.5%
	Capelin, frozen	5%	4%	4.88%
03.01 2(2) A	Hard roes of herring and cod, frozen	10%	6%	9.5%
	Hard roes of nishin (herring), fresh or chilled	10%	8%	9.75%
03.01 2(2) B	Fish, fresh, chilled or frozen, nes (salmon, bluefin tuna, swordfish)	5%	5%	5%
03.02 1	Hard roes of tara, dried, salted, in brine or smoked	15%	7.5%	14.07%
	Hard roes of nishin (herring)	15%	12%	14.63%
	Hard roes of salmon, dried, salted, in brine	7.5%	5%	7.19%
03.02 1	Hard roes nes	7.5%	4%	7.07%
03.02 2 (1)	Fish, dried, salted in brine - herring	15%	12%	14.63%
03.02 2 (1)	Fish, dried, salted in brine, nes	15%	15%	15%
03.03 2(1)	Squid, fresh, frozen	10%	5%	9.38%
03.03 2(2)	Squid, other	15%	15%	15%
12.08 2(2)	Seaweed of porplya	40%	40%	40%
12.08 2 (3)	Other edible seaweed (kelp)	15%	15%	15%
16.05 1	Smoked squid 114.45	12%	12%	12%

Tariff No.	Tariff item	Base rate 1979	Final rate 1987	Current rate 1980
16.05 2(2)	Other squid preparations (excluding canned) 114.45	15%	15%	15%
16.04 2(2)	Hard roes of herring, prepared or or preserved	20%	16%	19.5%
16.05 2(1)	Shrimp, prawn, lobster, fresh, chilled, frozen, salted, in brine or dried	5%	3%	4.75%
16.05 2 (1)	Shrimp, prawn, lobster, prepared or preserved	15%	7.5%	14.07%
16.05 2(1)	Crab, fresh, chilled or frozen	10%	6%	9.5%
16.05 2(2)	Crab in airtight containers	15%	7.5%	14.07%
03.01 2(2) B	Shark (dogfish), fresh, chilled or frozen (excluding fillets)	5%	3.5%	4.82%
03.01 2(2) B	Sea bream, fresh, chilled, frozen (excluding fillets)	5%	3%	4.75%

APPENDIX II

Canada-Japan Trade Balance

Canada-Japan trade relations are based on the General Agreement on Tariffs and Trade (GATT) and the Canada-Japan Agreement on Commerce of 1954. As a member of GATT, Japan accords most-favoured-nation tariff treatment to Canada.

Total Canadian exports to Japan were valued at C$4 billion dollars in 1979. Since 1973, Japan has been second only to the US in terms of export value. Imports to Canada from Japan were C$2.2 billion. The major Canadian export items were wheat (C$287 million), rapeseed (C$369 million), copper (C$366 million), softwood lumber (C$486 million) and wood pulp (C$342 million). Japan's exports to Canada on the other hand, consist almost entirely of finished goods including fabrics, metal products, chemicals, photographic goods, office machinery and appliances. The most important category was cars, trucks and motorcycles at C$431 million.

In 1979 Canada exported C$254 million worth of fish products to Japan, a slight increase from the previous year. Canadian imports of fishery products from Japan in 1979 were valued at C$26 million - a 17% drop from 1978. The 1980 export from Canada to Japan will be substantially lower than in 1979.

Canada-Japan Fisheries Trade

Table 1 Canadian exports of selected products to Japan, 1978-1980.

Table 2 Japanese imports of fish products from Canada 1979 and 1980.

Table 3 Canadian imports of selected fishery products from Japan 1977-1979.

TABLE 1. Canadian exports of fishery products to Japan.

	1980		1979		1978	
	Q (tonnes)	V (C$000)	Q (tonnes)	V (C$000)	Q (tonnes)	V (C$000)
Fresh Pacific Halibut	8	31	0	0	0	0
Salmon Coho Fresh/Whole/Dressed	17	79	8	52	28	170
Salmon Spring (Fresh/Whole/ Dressed)	0	4	0	1	190	835
Sea fish Fresh/Whole/Dressed	186	1 476	178	1 723	299	2 067
Smelt Fresh/Whole/Dressed plus fish for W.G.	17	9	107	86	51	42
Cod, Atlantic Frozen/Whole/ Dressed	23	52	17	63	4	12
Halibut Atlantic Frozen/ Whole/Dressed	16	62	0	0	0	0
Halibut Pacific Frozen/ Whole/Dressed	212	969	14	89	178	1 051
Herring Frozen/Whole/Dressed	5 222	6 039	6 701	5 405	1 605	1 196
Mackerel Frozen/Whole/Dressed	1	0	1	7	14	69
Salmon Atlantic Frozen/Whole/ Dressed	0	0	1	7	14	69
Salmon Chum Frozen/Whole/Dressed	61	286	454	1 904	918	4 588
Salmon Coho Frozen/Whole/Dressed	874	4 833	185	1 152	1 935	11 117
Salmon Sockeye Frozen/Whole/ Dressed	847	4 972	3 191	20 672	na	na
Salmon Spring Frozen/Whole/ Dressed	136	958	134	661	561	3 464
Salmon Frozen/Whole/Dressed N.E.S.	265	1 095	530	2 394	5 963	38 820
Sea Smelt Frozen/Whole/ Dressed	453	330	445	359	1 741	1 427
Sea fish Frozen/Whole/Dressed	6 768	11 839	3 665	7 122	1 427	2 607
Freshwater Smelt Frozen/Whole/ Dressed	3 228	2 638	2 092	1 781	3 111	2 586
Other Freshwater Frozen/ Whole/Dressed	30	44	1	1	15	12
Cod Fillets Frozen	3	6	0	0	0	0
Herring Fillets Frozen	427	339	19	18	58	48
Sole/Flounder/Fillets Frozen	1	3	2	7	1	3
Sea Fish Fillets Frozen N.E.S.	12	90	33	218	9	149
Freshwater Fish Fillets Frozen N.E.S.	17	14	0	0	0	0
Cod Fillets Smoked	0	1	0	0	0	1
Herring Boneless Smoked	2	3	0	0	0	0
Salmon Smoked	31	515	89	894	102	861
Fish Salted & Dried N.E.S.	32	130	381	2 364	766	5 288
Salmon Sockeye Canned	21	147	35	233	96	260
Canned N.E.S.	16	94	0	0	19	14
Clams Fresh & Frozen	478	2 936	307	1 815	28	88
Crabs Fresh & Frozen	94	514	64	253	2	11
Lobster In Shell Fresh or Frozen	92	476	39	260	194	852
Lobster Meat Fresh, Chilled, Boiled	1	4	0	0	0	0

TABLE 1. Canadian exports of fishery products to Japan (cont'd).

	1980		1979		1978	
	Q (tonnes)	V (C$000)	Q (tonnes)	V (C$000)	Q (tonnes)	V (C$000)
Lobster Meat Frozen incl. boiled	14	59	0	0	23	231
Scallops Fresh or Chilled	0	1	0	0	0	0
Shrimp & Prawn Fresh or Frozen	615	2 534	390	1 945	326	1 210
Squid Whole/Fresh/Frozen	15 462	15 288	19 342	15 993	na	na
Squid Tubes, Fresh or Frozen	2 350	1 884	1 798	2 135	na	na
Shellfish Fresh or Frozen N.E.S.	81	571	128	881	27 661	28 552
Crabs Canned	3	161	4	59	25	143
Lobster & Products Canned	2	9	0	0	0	0
Shellfish and Products N.E.S.	77	472	48	286	86	57
Herring Roe Fresh/Frozen/Cured	2 889	36 268	6 580	167 667	9 243	115 723
Salmon Roe, Fresh/Frozen/Cured	853	8 564	901	12 814	na	na
Other Roe, Fresh/Frozen/Cured	316	3 005	169	1 082	1 687	21 877
Other Seafoods and Feeds N.E.S.	223	228	114	265	51	26
Precooked & Frozen Fish & Shellfish	5	8	2	1	0	0
Precooked & Frozen Dinners	19	15	0	0	1	1
Mosses & Sea Grasses	20	25	9	59	16	6
Fish Meal	239	132	167	67	1 033	533
Ocean Perch Fillets, Frozen	0	0	-	1	0	0
Cod Blocks & Slabs	0	0	37	106	36	60
Sea Fish Blocks & Slabs	0	0	90	74	74	186
Herring Bloaters	0	0	99	54	0	0
Fish, Smoked N.E.S.	57	118	0	0	0	0
Herring Whole/Dressed Pickled N.E.S.	0	0	0	2	0	0
Salmon, Pickled	0	0	71	432	23	175
Herring Kippers Snacks Canned	0	0	0	1	0	0
Canned Chum Salmon	0	0	41	149	0	0
Canned Pink Salmon	0	0	195	78	0	0
Canned Salmon N.E.S.	0	0	2	22	16	90
Seal Skins	0	0	63	1		
Haddock, Hake, Frozen/Whole/ Dressed	0	0	0	0	87	66
Flatfish Fillets, Pacific	0	0	0	0	27	188
TOTAL ALL PRODUCTS	42 814	108 326	48 942	254 506	59 730	246 762
TOTAL SALMON	3 105	21 453	5 837	41 465	9 846	60 449

Source: Statistics Canada, Domestic Exports by Commodities, Dec. 1978, 1979 & 1980.

TABLE 2. JAPANESE IMPORTS OF FISH PRODUCTS FROM CANADA 1979 AND 1980.

Commodity	1979 Quantity (kg)	1979 Value (US$)	1980 Quantity (kg)
Hard roes of cod, fresh or chilled	13 337	91 557	7 096
Herring, frozen	6 194 904	4 980 057	7 564
Cod, pollock, hake, frozen	1 496	4 011	--
Hard roes of herring, frozen	491 863	3 868 233	380 415
Hard roes of cod, frozen	122 045	559 174	20 059
Bluefin tuna, fresh or chilled	186 059	2 526 288	190 019
Salmon, fresh or chilled	6 869	36 434	565
Salmon, frozen	4 720 042	27 227 946	2 640 973
Shark, frozen	8 595	16 187	70 873
Shishamo (capelin), frozen	2 764 430	7 038 224	6 438 042
Globefish, frozen	17 000	16 363	--
Fish, frozen, nes	3 887 582	5 028 762	--
Fillets, frozen (03.01-271-279)	2 813	8 872	--
Salmon roes, salted, dried or smoked	982 796	13 450 277	1 153 887
Hard roes of cod, salted, dried or smoked	2 194	23 131	--
Herring roes on the tangles, salted, dried or smoked	214 240	4 136 746	239 908
Hard roes of herring, salted, dried or smoked	5 107 098	173 123 798	2 292 742
Fish roes, salted, dried or smoked, nes	312	711	--
Fish, salted in brine or dried	943 907	5 880 623	--
Fish, smoked	90 950	1 295 090	--
Shrimps, prawns and lobster, live	13 183	172 055	8 053
Lobster, fresh, chilled or frozen	56 760	293 767	100 706
Shrimps, prawns, fresh, chilled or frozen	456 841	2 291 953	1 125 877
Shrimps, prawns and lobsters, salted, dried	1 505	7 631	--
Crab, live, fresh, chilled or frozen	173 165	753 384	164 979
Cuttlefish and squid, fresh, chilled or frozen	15 443 134	15 690 735	18 478 298
Octopus, fresh, chilled or frozen	6 744	14 401	--
Abalone, live, fresh, chilled or frozen	147 440	879 778	106 412
Crustaceans and molluscs, fresh, chilled or frozen nes	356 348	1 930 537	536 602
Cuttlefish and squid, salted or dried	47 017	302 071	81 684
Sea urchin	19 725	261 567	26 582
Agar-agar, nes	4	1 064	--
Seaweeds, nes	9 278	10 937	--
Ikura	8 733	230 295	49 799
Salmon in airtight containers	232 055	919 402	
Mackerel in airtight containers	238	517	
Fish preparations in airtight containers, nes	2 041	4 022	Balance of
Fish preparation, n.e.s.	9 867	19 029	categories
Shrimp, prawn and lobster preparations, nes	476	8 544	not avail-
Cuttlefish and squid prepared or preserved, excluding those smoked or in airtight containers	67 399	181 529	able at time of
Crustaceans and molluscs, prepared or preserved, in airtight containers	5 996	92 896	printing.
Crustaceans and molluscs, prepared or preserved (excluding those in airtight containers), nes	2 834	26 271	
Fish meal and flour: for the quantity (quota), stipulated by a Cabinet order	17 000	12 320	
Fish meal and flour, other	44 000	40 248	
TOTAL	43 921 315	273 457 443	

Source: Canadian Dept. of Industry, Trade & Commerce, Canadian Embassy, Tokyo, Japan

TABLE 3. CANADIAN IMPORTS OF SELECTED FISHERY PRODUCTS FROM JAPAN.
Quantities (Q) in metric tons, Value (V) in C$000.

	1977		1978		1979	
	Q	V	Q	V	Q	V
Tuna, fresh or frozen	na	na	1 651	1 764	451	845
Seafish, nes. fresh or frozen	202	323	435	941	383	714
Trout, fresh or frozen	369	1 039	493	1 441	323	989
Tuna, flake pack, canned	1 875	6 845	1 853	7 068	1 806	7 072
Tuna, nes, canned	3 330	11 545	3 033	11 148	2 421	9 950
Fish & fish products, nes, canned	222	247	201	339	372	516
Shellfish, nes, fresh or frozen	25	40	2 402	1 024	35	516
Clams, canned	1 676	3 269	1 531	3 929	1 146	3 079
Oysters, canned	299	1 183	610	3 136	480	2 152
Shellfish & products nes, canned	na	na	14	163	28	258
TOTAL	8 130	25 099	12 336	31 246	7 587	26 077

Selected products are those for which Canadian imports were valued at C$200 000 or more in any of the three years.

Source: Annual Statistical Review of Canadian Fisheries, Department of Fisheries & Oceans, Ottawa.

APPENDIX III

Monthly Average Exchange Rates: - Japanese Yen Per Canadian Dollar - 1975-1980

	1975	1976	1977	1978	1979	1980
January	.003320	.003304	.003475	.004569	.006020	.004896
February	.003431	.003295	.003609	.004637	.005964	004736
March	.003478	.003281	.003751	.004865	.005545	.004722
April	.003461	.003287	.003820	.005151	.005146	.004743
May	.003530	.003229	.003780	.004952	.005257	.005147
June	.003498	.003255	008377	005242	.005357	.005286
July	.003479	003296	.004008	.005633	.005415	.005211
August	.003475	.003391	.004032	.006050	.005296	.005176
September	.003473	.003394	004023	.006138	.005242	.005431
October	.003391	.003342	.004317	.006442	.005104	.005589
November	.003351	.003340	.004535	.006101	004823	.005567
December	.003317	.003456	.004552	.006022	.004868	.005718
Annual Average	.003430	.003327	.003980	.005480	.005375	.005185
Yen per dollar	291	300	251	182	186	193

Source: Bank of Canada, Foreign Exchange Quotations Desk, Ottawa.

APPENDIX IV

US fishery allocations to Japan from the Bering Sea and Aleutians, and Gulf of Alaska by species (tonnes).

	1980			1981		
	Bering Sea & Aleutians	Gulf of Alaska	TOTAL	Bering Sea & Aleutians	Gulf of Alaska	TOTAL
Pollock	793 989	26 159	820 148	794 066	49 941	844 007
Yellowfin Sole	63 700	0	63 700	65 948	0	65 948
Turbot	49 700	0	49 700	64 360	0	64 360
Flounder Other Flatfish	33 400	13 200	46 600	40 510	18 802	59 312
Pacific Cod	22 000	26 870	48 870	22 222	25 031	47 253
Pacific Ocean Perch	4 953	9 940	14 893	5 491	11 349	16 840
Other Rockfish	3 883	2 355	6 238	3 883	2 500	6 383
Sablefish	1 880	2 390	4 270	2 019	3 375	5 394
Atka Mackerel	1 900	1 865	3 765	12 283	5 898	18 181
Squid	5 570	1 056	6 626	6 247	2 891	9 138
Herring	3 550	0	3 550	0	0	0
Other	50 700	15 543	66 243	53 856	8 961	62 817
TOTAL	1 035 225	99 378	1 134 603	1 070 885	128 748	1 199 633

APPENDIX V

ILLUSTRATION OF IMPORTANT FISHES IN JAPAN.

I Sea Water Fisheries

A Marine Mammals

Blue whale (English name)
Shironagasukujira (Japanese name)
Balaenoptera musculus (Scientific name)

Fin whale
Nagasukujira
Balaenoptera physalus

Sei whale
Iwashikujira
Balaenoptera borealis

Sperm whale
Makkokujira
Physeter catodon

Mink whale
Koiwashikujira
Balaenoptera acutoro strata

Pilot whale
Gondokujira
Globicephala melacna

Killer Whale
Shachikujira
Orcinus orca

(Dolphin)
Mairuka
Delphinus delphis delphis

Right whale
Semikujira
Balaena mysticetus

B Fishes

Herring
Nishin
Clupea pallasi

Scad
Muroaji
Decapterus Muroadsi

Sardine
Maiwashi
Sardinops melanosticta

Mackerel
Masaba
Scomber japonicus

Round herring
Urumeiwashi
Etrumeus micropus

Saury (Saury-pike)
Sanma
Cololabis saira

Anchovy
Katakuchiiwashi
Engraulis japonica

Yellowtail
Buri
Seriola quinqueradiata

Jack mackerel
Maaji
Trachurus japonicus

Skipjack
Katsuo
Katsuwonus pelamis

Frigate mackerel
Hirasoda
Auxis thazard

Striped marlin
Makajiki
Tetrapturus audax

Bluefin tuna
Maguro
Thunnus thynnus orientalis

Broadbill swordfish
Mekajiki
Xiphias gladius

Albacore
Binnaga
Thunnus alalunga

Blue marlin
Kurokajiki
Makaira nigricans

Bigeye tuna
Mebachi
Thunnus obesus

Sailfish
Bashokajiki
Istiophorus orientalis

Yellowfin tuna
Kiwada
Thunnus albacares

Chum salmon
Sake (Shirozake)
Oncorhynchus keta

Cherry salmon
Sakuramasu
Oncorhynchus masou var. masou

Bastard halibut
Hirame
Paralichthys olivaceus

Dab (Flat fish)
Magarei
Limanda herzensteini

Arrow toothed halibut
Aburagarei
Atheresthes evermanni

(Flat fish)
Sohachigarei
Cleisthenes pinetorum herzensteini

Frog flounder
Meitagarei
Pleuronichthys cornutus

Roundnose flounder
Mushigarei
Eopsetta grigorjewi

Flathead flounder
Akagarei
Hippoglossoides dubius

Slime flounder
Babagarei
Microstomus achne

Fluke
Hireguro
Glyptocephalus stelleri

Cod
Madara
Gadus macrocephalus

Alaska pollack
Suketodara
Theragra chalcogramma

Atka mackerel
Hokke
Pleurogrammus azonus

(Rock fish)
Sangomenuke
Sebastes flammeus

(Rock fish)
Kichiji
Sebastolobus macrochir

Sand fish
Hatahata
Arctoscopus japonicus

Deep sea smelt
Nigisu
Algentina semifasciata

Great blue shark
Yoshikirizame
Glyphis glaucus

Salmon shark
Nezumizame
Lamna ditropis

Dog fish
Aburatsunozame
Squalus acanthias

White croaker
Shiroguchi
Argyrosomus argentatus

Yellow croaker
Kiguchi
Pseudosciaena manchurica

Black croaker
Kuroguchi
Argyrosomus nibe

(Croaker)
Honnibe
Miichthys imbricatus

Lizard fish
Maeso
Saurida argyrophanes

Butter fish
Ibodai
Psenopsis anomala

Sharp toothed eel
Hamo
Muraenesox cinereus

Hairtail
Tachiuo
Trichiurus lepturus

(Gurnard)
Hobo
Chelidonichthys kumu

(Gurnard)
Kanagashira
Lepidotrigla microptera

Stingray
Akaei
Dasyatis akajei

Red sea bream
Madai
Chrysophrys major

Crimson sea bream
Chidai
Evynnis japonica

Yellow sea bream
Kidai
Taius tumifrons

Black sea bream
Kurodai
Mylio macrocephalus

Spanish mackerel
Sawara
Scomberomorus niphonius

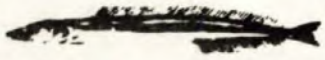
Dolphin fish
Shiira
Coryphaena hippurus

Flyingfish
Tobiuo
Prognichthys agoo

Mullet
Bora
Mugil cephalus

Common sea bass
Suzuki
Lateolabrax japonicus

Sand lance
Ikanago
Ammodytes personatus



Striped pigfish
Isaki
Parapristipoma trilineatum

(Globe fish)
Torafugu
Fugu rubripes

C Shellfishes

Abalone
Awabi
Haliotis gigantea

Top shell
Sazae
Turbo cornutus

Short necked clam
Asari
Venerupis Philippinarum

Hard clam
Hamaguri
Meretrix lusoria

Hen clam
Hokkigai
Mactra sachalinensis

(Pearl Oyster)
Akoyagai
Pinctada martensii

Common scallop
Hotategai
Pecton yessoensis

(Oyster)
Magaki
Crassostrea gigas

"Mogai" clam
Sarubo
Anadara subcrenata

D Other Marine Animals

Common squid
Surumeika
Ommastrephes sloani pacificus

Cuttlefish
Maika
Sepiella maindronide

Octopus (Devilfish)
Madako
Octopus vulgaris

Spiny lobster
Iseebi
Panulirus japonicus

(Prawn)
Kurumaebi
Penaeus japonicus

(Shrimp)
Akaebi
Metapenaeopsis barbatus

King crab
Tarabagani
Paralithodes camtschaticus

Queen crab, Tanner crab
Zuwaigani
Chionoecetes opilio

Blue crab
Gazami
Neptunus trituberculatus

(Sea urchin)
Murasakiuni
Heliocidaris crassispind

(Sea cucumber)
Manamako
Stichopus japonicus

(Jelly fish)
Bizenkurage
Rhopilema esculenta

E Seaweeds

(Kelp)
Makonbu
Laminaria japonica

(Seaweed)
Honfunori
Gloiopeltis tenax

(Seaweed)
Wakame
Undaria pinnatifida

(Seaweed)
Arame (Kajime)
Eisenia bicyclis

Agar-agar
Tengusa (Makusa)
Gelidium Amansii

Laver (Seaweed"Nori")
Asakusanori
Porphyra tenera

II Inland Water Fisheries

A Fishes

Rainbow trout
Nijimasu
Salmo gairdnerii irideus

Brook trout
Kawamasu
Salvelinus fontinalis fontinalis

Bull trout (mountain trout)
Iwana
Salvelinus pluvius

Pond-smelt
Wakasagi
Hypomesus olidus

Sweet fish
Ayu
Plecoglossus altivelis

White bait
Shirauo
Salangichthys microdon

Common carp
Koi
Cyprinus carpio

Crucian carp
Funa
Carassius auratus

(Minnow)
Ugui
Tribolodon hakonensis hakonensis

(Minnow)
Oikawa
Zacco platypus

Eel
Unagi
Anguilla japonica

Loach
Dojo
Misgurnus anguillicaudatus

Goby
Mahaze
Achanthogobius flavimanus

Sculpin
Kajika
Cottus pollux

(Shiner)
Tanago
Acheilognathus moriokae

(Minnow)
Honmoroko
Gnathopogon caerulescens

Cat fish
Namazu
Parasilurus asotus

Lamprey
Kawayatsume
Entosphenus japonicus

B Others

(Shrimp)
Nukaebi
Paratya compressa improvisa

Opossum shrimp
Isazaami
Neomysis intermedia

Bull-frog
Ushigaeru
Rana catesbiana

(Corbicula)
Yamatoshijimi
Corbicula japonica

Snapping turtle
Suppon
Amyda japonica

(Aquatic plant)
Kawanori
Prasiola japonica