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Effects of North Pacific 200-Mile Exclusive Economic Zone Marine Management Policy on Japanese Seafood Production, Trade and Food Security

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Abstract

This investigation reviews the past 20 years during which Japan regressed from a nation of seafood self-sufficiency to one increasingly dependent on imports. Japan's diminishing position from former world leader in production and exports of fishery goods to its present state of leading world importer, strongly correlates with the onset of the 200-mile Exclusive Economic Zone (EEZ) era. In the North Pacific, a primary fishing ground of Japan, this period began in 1976 when the United States of America (US/USA) and the former Soviet Union independently inaugurated their respective versions of EEZ marine management policy.

Presented are trends in international seafood production and trade of specific categories of fishery commodities with an emphasis on US-Japan trade relations. The result clearly documents the US overtaking Japan as the world's leading exporter of fishery products and Japan's growing dependence on American seafood imports.

Introduction

In recent decades, Japan has consistently lead the world in total fishery production while maintaining a populous whose per capita consumption of fish and fishery products is second only to Icelanders¹⁾. Japan remains a leading world market for marine products. However, as Table 1 reveals, Fujita has shown that between 1970 and 1988 it dropped from 104% self-sufficiency in fishery foods to 22% dependent on seafood imports^{2,3)}.

Table 1. Japan's Rate of Self-Sufficiency by Caloric Supply and Food Groupings: 1960-1988.
(Unit: %)

Food Grouping	1960	1965	1970	1975	1980	1985	1986	1987	1988
Caloric supply	79	73	60	54	53	52	51	49	49
Food grains	89	80	74	69	69	69	69	68	68
Grains	82	62	46	40	33	31	31	30	30
Farm products	91	86	81	77	75	74	73	71	70
Fishery products	113	112	104	92	90	79	84	78	78
Total Food	98	94	88	82	80	76	77	74	72

Source: MAFF, Food Balance Sheet; Fujita, 1991.

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International trade in fishery products specifically, and food in general, is one of the few areas in which Japan runs a trade deficit. The establishment in 1976 of marine 200-mile EEZ's by the United States of America and the former Soviet Union contributed significantly to Japan changing from a net-exporter to a net-importer of fishery products.

The onset of the 200-mile EEZ era radically restructured international importer-exporter relationships by limiting resource access on the basis of nationality. Japan is not alone as an "EEZ loser". However, given its large involvement in fisheries of the world, it is likely the most negatively effected.

Trends in World Fishery Production

1. Catch by Region of the World: The Role of the North Pacific

World fishery production has experienced impressive growth over the past twenty years both in terms of quantity and value. In 1989, total annual world inland and marine landings essentially reached the long-awaited goal of 100 million metric tons (Fig. 1). This was aided primarily by dramatic increases in Peruvian anchovy (*Engraulis ringens*) harvests, tremendous North Pacific landings sustained in the Alaska pollock (*Theragra chalcogramma*) fishery, large harvests of Japanese pilchard (*Sardinops melanostictus*), and growth in production from inland waters during the 1980's; principally from aquaculture.

The North Pacific Ocean has the world's most productive fishing grounds. Since 1972 it has consistently been the source of more than 30% of total marine production⁴. The six major North Pacific rim fishing nations (USSR, China, Japan, USA, South Korea, and Canada) are contributing to total world catch at an increas-

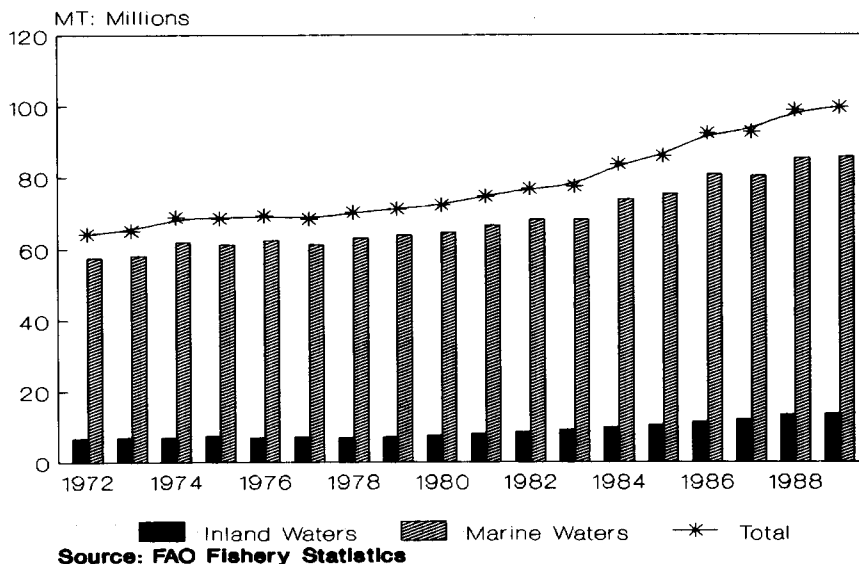


Fig. 1. World total fish production from inland and marine waters: 1972-89.

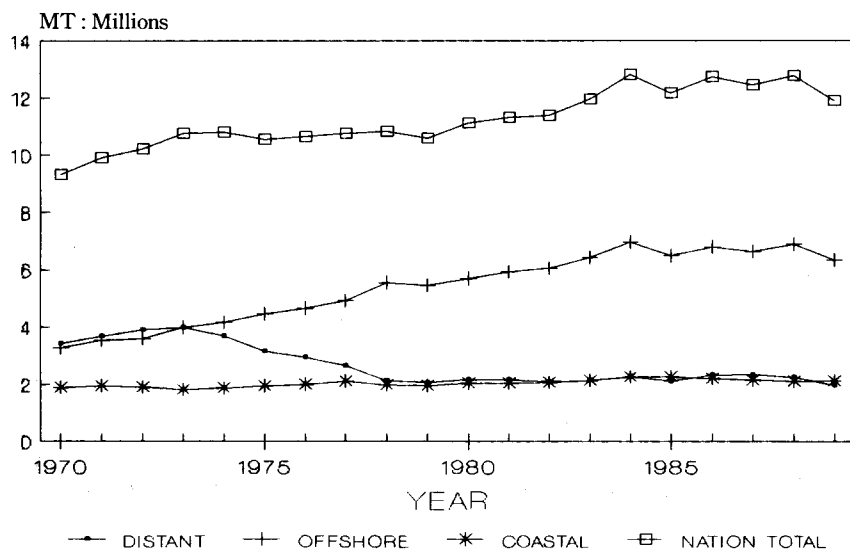
ingly significant degree, reaching 44% in 1989.

2. Recent Trends in Japanese Fishery Production

Japan is among those former fishing nations that were heavily dependent on access to the North Pacific fishery resources now within the US EEZ. With the onset of the international 200-mile EEZ era, production dramatically declined among Japan's distant water fisheries (Fig. 2).

Although significant increases have occurred in Japanese offshore fishery landings, the increase is dominantly due to rapid growth in the sardine fishery off northeastern Hokkaido. Japanese pilchard landings in Japan have grown from 17,000 mt to 5.1 million metric tons (mt) from 1970 to 1989, respectively⁵⁾. Food and Agriculture Organization of the United Nation (FAO) fishery statistics list it as the third dominant species harvested in the world; surpassed only by Alaska pollock and Peruvian anchovy⁶⁾. However, unlike Japan's previous harvests of pollock, the vast majority of sardine landings today are not utilized for human consumption domestically. Rather they are processed into fishmeal and oil for export.

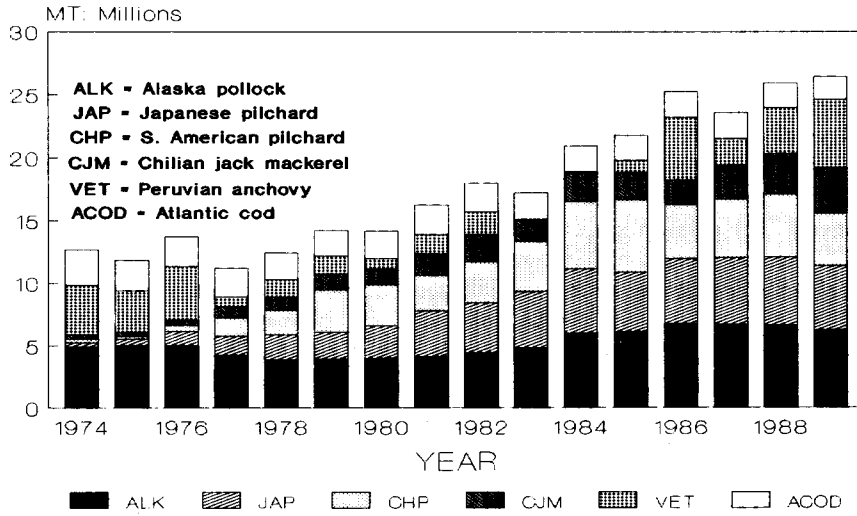
Japanese pilchard is a cyclical fishery and strong evidence suggests landings have peaked and significant declines have already begun. This marks the beginning of the end for Japan as the world's leading harvesting nation. To underscore this point, FAO fishery statistics indicate in 1989, for the first time in recent history, Japan had fallen out of first place (behind USSR and China) as the world's top fishing nation in terms of tonnage landed. This is a direct result of the 9% drop between 1988-89 in Japanese pilchard offshore fishery landings (see again Fig. 2).



Source: Japan Ministry of Agriculture, Forestry and Fishery Statistics

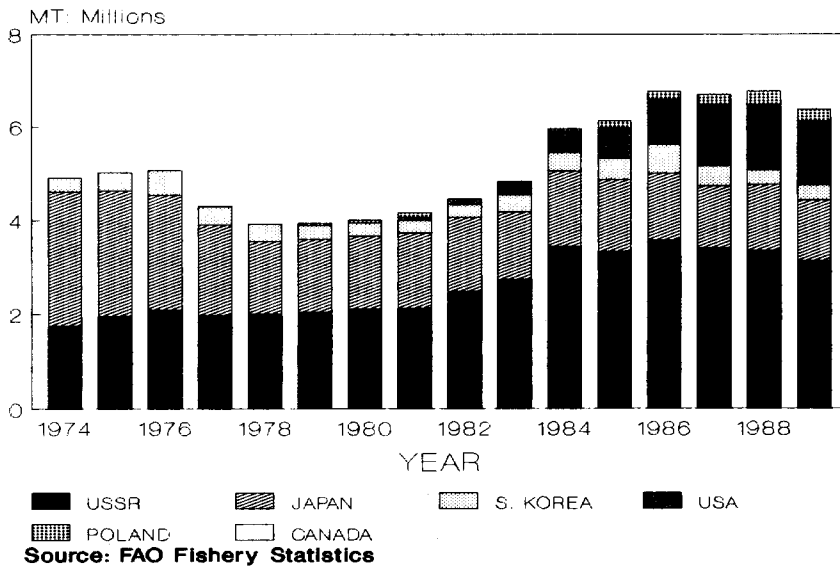
Fig. 2. Japan's total harvests within distant, offshore and coastal fisheries: 1970-89.

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Source: FAO Fishery Statistic

Fig. 3. Breakdown of six major fish species in world marine catch: 1974-89.



Source: FAO Fishery Statistics

Fig. 4. Alaska pollock world landings by country: 1974-89.

3. *Landings by Major Species : The Role of Alaska Pollock*

Given the leading role of North Pacific fisheries in world marine production, it is not surprising to observe that within this region large populations of groundfish and clupeoids reside. These two groups are listed by FAO as the world's leading categories of harvested fish. Most of the world's leading commercial fish are categorized within these groups. In 1989, over 30% of world marine catch was from only six species. The relative ranking of these top six species among themselves is shown in Fig. 3. In recent decades, in terms of volume landed, Alaska pollock of the North Pacific clearly dominates as the world's most important commercial species.

While large catches of Alaska pollock in the past two decades have remained relatively consistent, the ranking of those fishing nations harvesting them has not. Prior to 1977 Japan lead the world in Alaska pollock landings. It now ranks third behind the former Soviet Union and America (Fig. 4). Despite this displacement, Japan continues to lead world demand for pollock fishery products, most specifically minced-fish or "surimi". Surimi is the fundamental ingredient for an important category of traditional Japanese food products, as well as an increasingly popular group of convenience foods.

In summary, Japan is the leading industrialized nation of the world in consumption and production of seafood. In current decades, Japan has dominated global fisheries. Until recently, this has been true for the Alaska pollock fishery. It is the world's most abundantly harvested fish and predominately resides within foreign EEZ's of the North Pacific Ocean; the world's most productive fishing grounds. Alaska pollock is also the world's primary source-fish for surimi; an increasingly important commodity in international seafood trade. The following is a review of trends in international fisheries trade focusing on the United States and Japan.

International Seafood Trade

1. *Trends in World Fisheries Trade*

Perhaps equally significant as the growth in total world fishery production is the rising quantity and share exchanged on the international market (Fig. 5). For example, in 1989 39% of world landings were traded; the highest percentage in recent history. Economic value of these goods also reached an all time high in 1989 when total world fishery imports valued \$35.2 billion⁷⁾.

2. *Japan and USA International Fisheries Trade in Relation to World Total Imports and Exports of Fishery Products*

a. *Perspective on Imports*

International EEZ marine policy transformed Japan from the world's leading fishery harvesting and exporting nation to a net importer. In contrast, America has reduced its dependence on marine imports and has displaced Japan as the world leading fishery exporting nation in terms of both value and quantity (Fig. 6 & Fig. 7). FAO statistics for 1989 reveal Japan held 28% of the world's fishery product imported trade volume (2.2 million mt valued at \$10.1 billion) and is now far and away the number one importing nation of fishery products. The United States is

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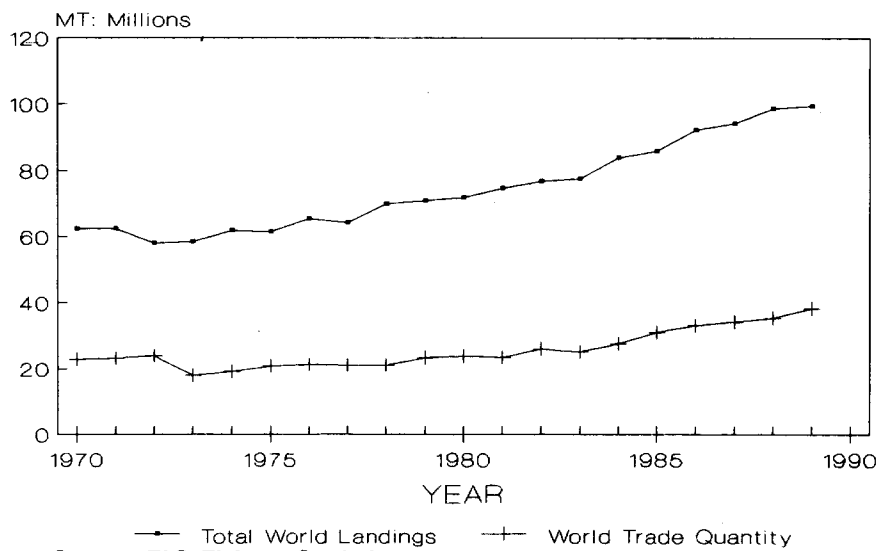


Fig. 5. Total world fishery landings and amount traded on international market: 1970-89.

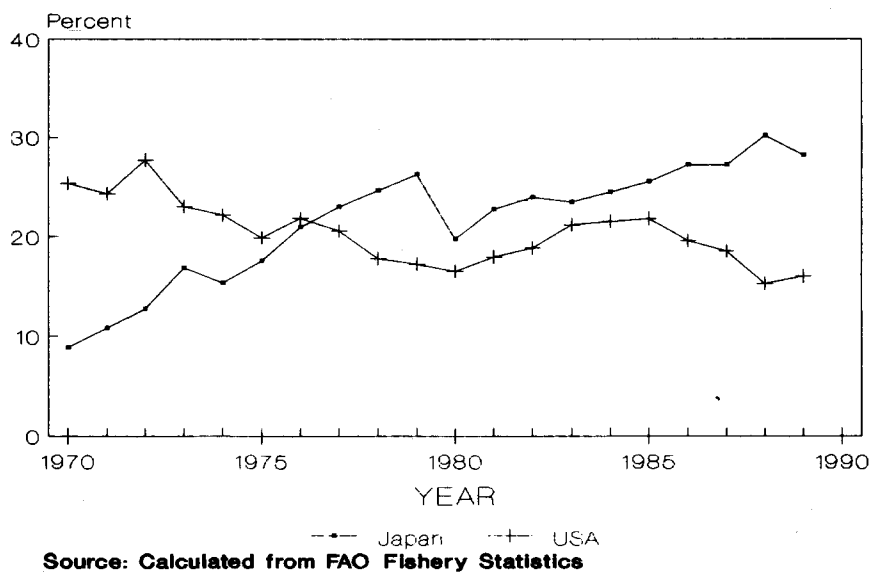
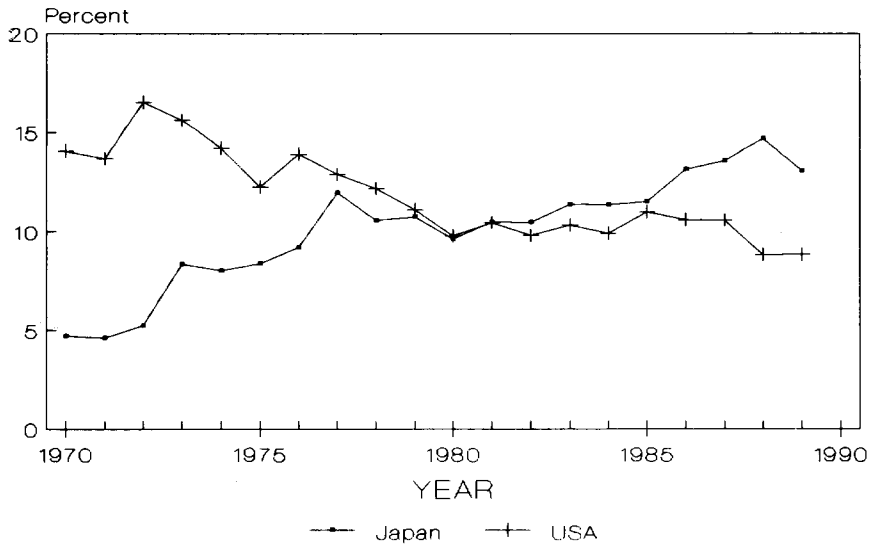


Fig. 6. Japan and USA percentage of world fishery trade import value: 1970-89.



Source: Calculated from FAO

Fig. 7. Japan and USA percentage of world fishery trade import quantity: 1970-89.

a distant second with fishery imports valued at \$5.8 billion equaling 16% of world import-traded volume.

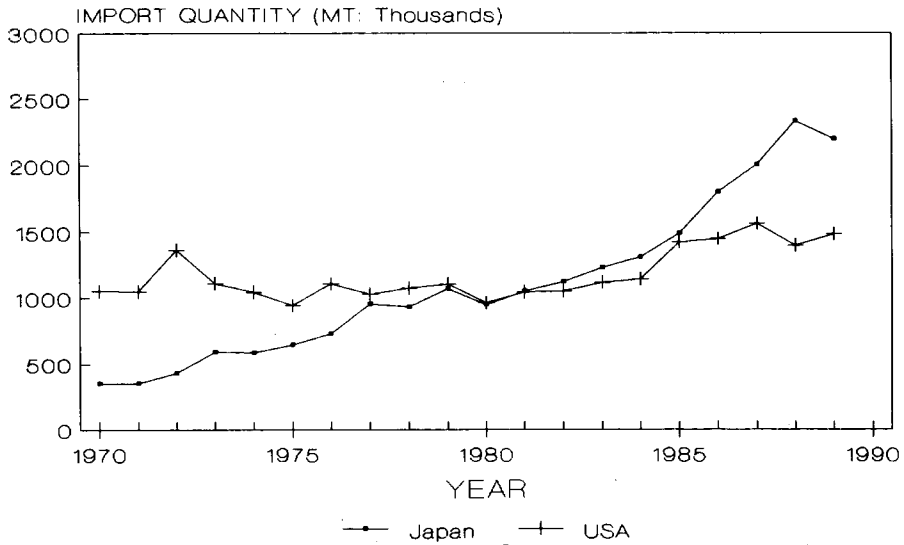
After 1976, when the US initiated its 200-mile EEZ policy, the gap rapidly diminished between American and Japanese fishery import quantities (Fig. 8a). In terms of total value, Japan fishery imports exceeded those of America in 1977 (Fig. 8b). Japan fishery imports have remained highest in the world ever since.

In the past 20 years, Japan and the United States have remained the leading markets for imported fishery products even though they have exchanged relative position as the number one and two importing nation. During this period, the average nominal price of fishery imports to both countries have steadily grown. However, what has not changed is that the Japanese market consistently commanded the highest average price for imported fishery goods (Fig. 9). This is a testimony to both strong consumer demand in Japan for high valued fishery products, and the growing economic strength of the Japanese national economy (and currency) enabling it to successfully bid for quality fishery commodities.

b. Perspective on Exports

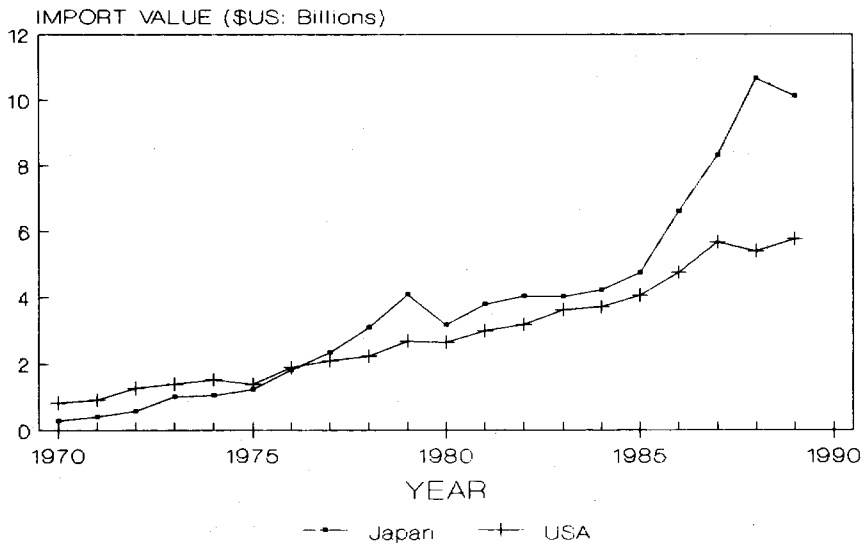
A review of Japan and US fishery export trends over the past couple of decades reveals the mirror image of what was observed for imports. In the early 1970's Japan lead world fishery exports averaging over 10% and 8% of the world share in terms of value and quantity, respectively (Table 2a). During the same period the USA averaged approximately 4% and 3% of world share in terms of traded value and quantity, respectively (Table 2b). However, in the late 1980's Japan's share of global fishery exports plummeted to less than 4% and 5% in terms of value and quantity, respectively. In contrast, America's share had grown to average 7% and 11.5% in terms of value and quantity of world fishery exports. As if to typify this

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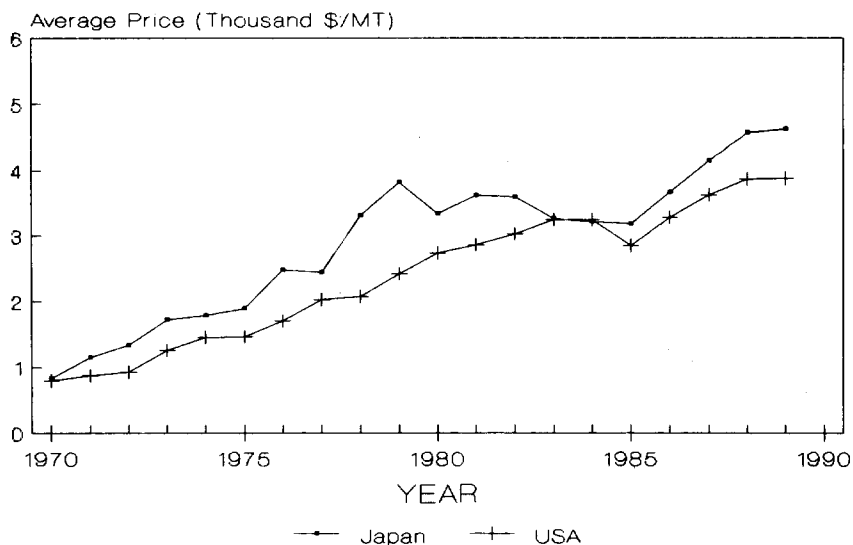
Source: Calculated from FAO Fishery Statistics

Fig. 8a. Total quantity of fishery products imported by Japan and USA : 1970-89.



Source: FAO Fishery Statistics

Fig. 8b. Total value of fishery products imported by Japan and USA : 1970-89.



Source: Calculated from FAO Fishery Statistics

Fig. 9. Average price of fishery products imported by Japan and USA : 1970-89.

dramatic position reversal of America and Japan in the world fishery export market, by 1989 America was the leading world fishery exporting nation in terms of traded value while Japan had dropped to 11th place⁶⁾.

From 1970 to 1989, it is interesting to observe that Japan fishery exports actually remained relatively constant between one million and half a million mt. The nominal value of fishery exports from Japan only grew at an annual average rate of 3% (Table 2a). Therefore, Japan's decline as a leading fishery exporter did not occur as a result of reduced export volume but rather from its inability to keep pace with growing international fishery product demand while faced with strong domestic demand. Contributing to this problem for Japan has been reduced access to foreign waters where it had harvested product for both domestic consumption and foreign export.

Immediately after America initiated its 200-mile EEZ policy in 1977 the value of US fishery exports grew more rapidly than export quantity. Obviously, US control over productive fishing grounds historically exploited by foreign fishing nations provided it a competitive advantage over those countries. The result initially manifested itself between 1976 and 1983 as a measurable rise in US export quantity and significantly higher average price for those goods. The combined effect enabled the total value of US fishery exports to exceed that of Japan for the first time in 1978 and continue ahead at an ever increasing degree ever since (Table 2b).

By the mid-1980's US-foreign joint-venture operations significantly increased in high volume fisheries but were eventually phased-out as "domestic" capacity increased. The US North Pacific groundfish fishery is a prime example where, by 1990, it was completely "Americanized". US-foreign joint-venture production

conducted in US waters is listed as an American export by FAO statistics and therefore helps account for the dramatic increase in the US export quantity observed in Table 2b. The majority of these exports were in low value, unprocessed, form and resulted in a dramatic drop in the average price of US fishery exports. As a result, the period between 1984 to 1987 was the only time in the past 20 years that American fishery exports were lower in average value than those of Japan. However, given the tremendous volume involved, the overall result was a dramatic increase in total export value.

3. Composition of Japanese Fishery Imports and American Export Trade by FAO Categories

a. Japan's Fishery Import Composition

The composition of Japanese fishery imports reveals increased demand is focused around fresh-frozen fish, crustacean and shellfish (Fig. 10). Generally, products in these groups are high quality luxury seafood items such as fish fillets, caviar, shrimp and lobster. The strengthened Japanese economy resulted in increased consumption of these higher quality fresh-frozen seafood and is apparent by their rising percentage of total national fishery imports. From 1970 to 1989 fresh-frozen fish increased steadily from 29% to 42% of total seafood imports to Japan (Table 3).

Because of its relatively low price, frozen-surimi is an exception within the fresh-frozen fish category. However, its import volume grew significantly in the 1980's and contributed to the 10 fold increases in frozen-fish imports from 100,000 mt to over 1 million mt between 1970 and 1989, respectively (Table 3).

Crustaceans and mollusca were the second most abundant seafood category

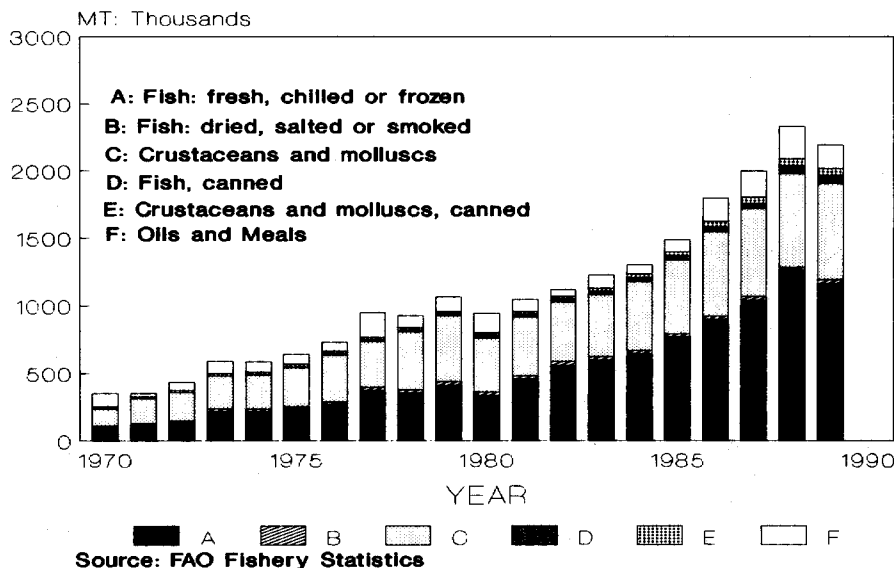


Fig. 10. Japanese import quantities of seven FAO fishery product categories: 1970-89.

Table 2a. Japan Fishery Product Export Data : 1970-89.

Year	Export value (1,000 US\$)	Export quantity (MT)	Percent of world total export value (%)	Percent of world total export quantity (%)	Exports ave. price (\$/MT)
1970	335495	534300	11.39	7.19	628
1971	367364	586200	10.83	7.69	627
1972	467015	650600	11.33	8.04	718
1973	553928	674200	10.00	9.78	822
1974	608112	706200	10.11	9.97	861
1975	489958	593400	7.77	7.79	826
1976	649377	642495	8.29	8.29	1011
1977	631357	582929	6.72	7.21	1083
1978	754835	745086	6.41	8.28	1013
1979	719781	714639	5.06	7.23	1007
1980	905186	716564	5.90	7.01	1263
1981	863252	683139	5.37	6.60	1264
1982	800557	702070	5.15	6.45	1140
1983	787633	667797	4.96	5.96	1179
1984	881965	887797	5.44	7.27	993
1985	819840	776750	4.73	5.65	1055
1986	897851	751281	3.89	5.03	1195
1987	889828	715726	3.17	4.63	1243
1988	1037341	971196	3.20	5.87	1068
1989	919180	812256	2.80	4.76	1132

Source : FAO Fishery Statistics.

Table 2b. USA Fishery Product Export Data : 1970-89.

Year	Export value (1,000 US\$)	Export quantity (MT)	Percent of world total export value (%)	Percent of world total export quantity (%)	Export average price (\$/MT)
1970	111879	141600	3.80	1.91	790
1971	135758	193500	4.00	2.54	702
1972	151695	174200	3.68	2.15	871
1973	285192	253200	5.15	3.67	1126
1974	252641	221800	4.20	3.13	1139
1975	298034	196300	4.73	2.58	1518
1976	371899	220080	4.75	2.84	1690
1977	508064	226034	5.41	2.80	2248
1978	895709	350348	7.61	3.89	2557
1979	1070846	355377	7.53	3.59	3013
1980	993352	466501	6.48	4.57	2129
1981	1142026	454333	7.11	4.39	2514
1982	1032248	403307	6.64	3.71	2559
1983	996651	526541	6.27	4.70	1893
1984	1002932	1124451	6.19	9.21	892
1985	1162372	1363610	6.71	9.92	852
1986	1480990	1765993	6.42	11.83	839
1987	1836451	2128691	6.54	13.77	863
1988	2441176	2114148	7.54	12.79	1155
1989	2532444	1548545	7.72	9.08	1635

Source : FAO Fishery Statistics.

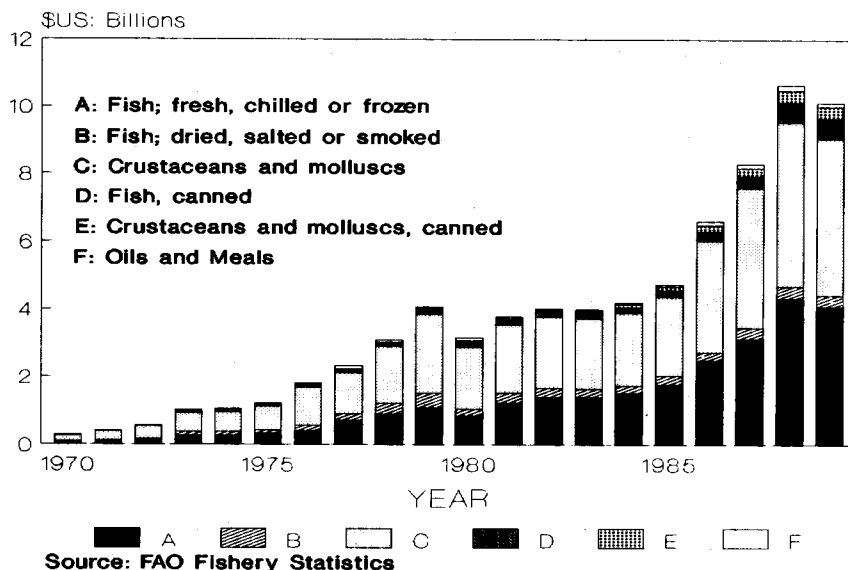


Fig. 11. Japanese import values of seven FAO fishery product categories: 1970-89.

imported by Japan in terms of quantity; increasing from just over 100,000 mt in 1970 to 700,000 mt in 1989. However, during the same two decades this category ranked number one in terms of import value (Fig. 11). Although its percentage of total Japanese seafood import value has lost ground to fresh-frozen fish, in 1989 crustaceans and mollusca equaled US\$ 4.6 billion and commanded 46% of Japanese seafood import value (Table 4). Frozen-fish imports to Japan were valued at just over US\$ 4 billion in 1989 composing 41% of the national total. This is up significantly from its 22% in 1970.

Table 5 and Table 6 list Japanese fishery import percentages of world total import quantities and values, respectively. Clearly, in each of the seven FAO human-food fishery product categories, Japan has increased its consumptive role in the world market. Most notable increases in Japanese dominance are again in fresh/frozen fish, crustaceans and mollusca. Between 1970 and 1989, Japanese fresh/frozen fish import quantity rose from 5% of the world market to 15%, respectively. In terms of value, it rose from 6% to 28%, during the same period. Over these past 20 years, the Japanese percentage of world crustacean and mollusc import quantities also increased (Table 5). Even more dramatic is the percentage of economic import value of these categories controlled by Japan. In 1989, Japan consumed over 40% of the world's imported fresh/frozen crustaceans and shellfish, 15% of its canned fish, and 20% of globally imported canned crustaceans and mollusca (Table 6).

The strengthening yen in recent years has promoted the buying power of the Japanese on the international seafood market with specific emphasis on fresh-chilled and frozen high-grade products. Yen appreciation has contributed to rises in the value of Japanese imports when calculated in US currency; a conventional FAO

Table 3. Japanese imports of 7 FAO fishery product categories by quantity and their relative percentages to total national fishery import quantity : 1970-89.

Unit : M.T.

Year	A	%	B	%	C	%	D	%	E	%	F	%	G	%	F & G	%	TOTAL
1970	103200	29	9300	3	122800	35	9600	3	8100	2	2100	1	97500	28	99600	28	352600
1971	122400	35	7900	2	184700	52	2400	1	11000	3	2600	1	21700	6	24300	7	352700
1972	134200	31	14300	3	209000	48	1900	0	14500	3	2100	0	56800	13	58900	14	432800
1973	222200	38	18100	3	239100	40	2900	0	20300	3	2300	0	87300	15	89600	15	592200
1974	217300	37	18900	3	253700	43	4700	1	17200	3	1200	0	74500	13	75700	13	587500
1975	241200	38	13300	2	287500	45	7000	1	21500	3	1700	0	70600	11	72300	11	642800
1976	271690	37	19309	3	345012	47	10600	1	22556	3	1544	0	59543	8	61087	8	730254
1977	376140	39	19918	2	339581	36	14831	2	19996	2	1611	0	181143	19	182754	19	953220
1978	355966	38	24737	3	427595	46	13534	1	20276	2	4709	1	84923	9	89632	10	931740
1979	411197	39	29047	3	486562	46	18774	2	15033	1	4784	0	101645	10	106429	10	1067042
1980	340772	36	22803	2	399599	42	23432	2	16970	2	2578	0	141008	15	143586	15	947162
1981	456651	44	25965	2	436552	42	24149	2	18750	2	2248	0	84068	8	86316	8	1048383
1982	562562	50	29272	3	438033	39	24397	2	18887	2	3840	0	44275	4	48115	4	1121266
1983	599749	49	26200	2	458940	37	26010	2	18566	2	5400	0	95071	8	100471	8	1229936
1984	648697	50	22582	2	511326	39	28628	2	28017	2	7028	1	61618	5	68646	5	1307896
1985	771485	52	25728	2	541493	36	31372	2	32021	2	7724	1	80256	5	87980	6	1490079
1986	905824	50	22927	1	622261	35	36433	2	41812	2	7629	0	161488	9	169117	9	1798374
1987	1044808	52	25071	1	650967	33	40369	2	46550	2	7161	0	187298	9	194459	10	2002224
1988	1266788	54	22581	1	692348	30	55921	2	54427	2	7383	0	231506	10	238889	10	2330954
1989	1170352	53	24538	1	712826	32	57212	3	53998	2	3383	0	171445	8	174828	8	2193754

Legend : A = Fish : fresh, chilled or frozen ; B = Fish : dried, salted or smoked ; C = Crustaceans and molluscs, fresh, frozen, dried, salted or smoked ;
D = Fish, canned ; E = Crustaceans, canned ; F = Oils & Fats ; G = Meals.

Source : FAO Fishery Statistics, various years

Note : percent (%) rounded to nearest whole number.

Table 4. Japanese imports of 7 FAO fishery product categories by value and their relative percentages to total national fishery import value: 1970-89.
Unit: \$US 1,000

Year	A	%	B	%	C	%	D	%	E	%	F	%	G	%	F & G	%	TOTAL
1970	62889	22	22492	8	170794	59	7518	3	8449	3	636	0	19141	7	19777	7	291919
1971	82354	20	27996	7	273279	67	3778	1	12538	3	1018	0	4044	1	5062	1	405007
1972	112015	19	61249	11	370672	64	4134	1	19809	3	1141	0	10614	2	11755	2	579634
1973	247501	24	127723	13	556508	55	10118	1	43867	4	1630	0	32069	3	33699	3	1019416
1974	253086	24	113731	11	589459	56	17136	2	47721	5	1952	0	27221	3	29173	3	1050306
1975	328123	27	92763	8	697930	57	26879	2	49586	4	3046	0	19735	2	22781	2	1218062
1976	412487	23	163606	9	1111522	61	45939	3	56090	3	2243	0	19320	1	21563	1	1811207
1977	700519	30	207306	9	1209695	52	65386	3	54345	2	1690	0	93850	4	95540	4	2332791
1978	907237	29	314534	10	1680593	54	78970	3	54218	2	6011	0	45360	1	51371	2	3086923
1979	1085587	27	433104	11	2331995	57	127800	3	47058	1	6278	0	45653	1	51931	1	4077475
1980	854812	27	200367	6	1836316	58	137990	4	45162	1	6744	0	77239	2	83983	3	3158630
1981	1248055	33	283687	7	2022766	53	128714	3	54649	1	6739	0	48758	1	55497	1	3793368
1982	1398158	35	275725	7	2115038	53	155539	4	58639	1	5121	0	20184	1	25305	1	4028404
1983	1397477	35	251496	6	2094224	52	155766	4	60344	2	7543	0	48272	1	55815	1	4015122
1984	1532915	36	214257	5	2159743	51	158173	4	98781	2	9607	0	33626	1	43233	1	4207102
1985	1783988	38	252615	5	2348333	49	196661	4	113341	2	14753	0	34586	1	49339	1	4744277
1986	2497432	38	235733	4	3306727	50	262207	4	188887	3	26928	0	75601	1	102529	2	6593515
1987	3148393	38	329285	4	4110684	49	342895	4	258379	3	12448	0	105993	1	118441	1	8308077
1988	4331365	41	365570	3	4845560	45	580373	5	379381	4	13395	0	142073	1	155468	1	10657717
1989	4108838	41	334682	3	4626961	46	576326	6	370848	4	8578	0	101238	1	109816	1	10127471

Legend : A = Fish : fresh, chilled or frozen ; B = Fish : dried, salted or smoked ; C = Crustaceans and molluscs, fresh, frozen, dried, salted or smoked ;
D = Fish, canned ; E = Crustaceans, canned ; F = Oils & Fats ; G = Meals.

Source : FAO Fishery Statistics, various years.

Note : percent (%) rounded to nearest whole number.

Table 5. Japanese import percentage of world total import quantity by 7 FAO fishery product categories : 1970-89.

Year	A (%)	B (%)	C (%)	D (%)	E (%)	F & G (%)
1970	5.1	1.9	24.9	1.6	8.0	2.7
1971	5.8	1.6	32.4	0.4	11.2	0.6
1972	5.6	2.9	30.9	0.3	13.0	1.5
1973	8.1	4.2	34.0	0.4	15.8	3.8
1974	7.8	4.9	33.7	0.6	13.7	3.0
1975	8.9	3.3	35.7	1.0	17.0	2.5
1976	9.5	5.2	37.3	1.2	15.5	2.2
1977	12.3	6.0	38.5	2.0	13.0	6.6
1978	9.6	6.8	41.3	1.6	12.7	3.3
1979	10.1	7.3	39.7	2.2	9.4	3.3
1980	8.2	5.4	35.7	2.4	9.9	4.8
1981	10.4	5.7	38.3	2.3	10.3	3.1
1982	12.3	7.3	35.4	2.7	9.5	1.4
1983	12.4	5.6	34.1	3.0	8.4	3.3
1984	13.0	5.0	34.4	3.2	11.9	2.0
1985	14.3	5.2	33.9	3.2	12.6	2.1
1986	14.9	4.8	35.5	3.5	15.4	4.2
1987	15.1	5.0	33.8	3.8	15.2	4.9
1988	16.6	4.5	32.9	5.1	16.6	5.7
1989	14.8	4.9	31.3	4.8	17.5	3.8

Legend : A = Fish : fresh, chilled or frozen ; B = Fish : dried, salted or smoked ; C = Crustaceans & molluscs ; D = Fish, canned ; E = Crustaceans, canned ; F = Oils & Fats ; G = Meals

Source : Derived from FAO Fishery Statistics, various years.

practice (Fig. 12). Private studies have show a direct relationship between raising seafood imports, shrimp for example, and the strengthening value of the Japanese Yen⁹⁾. Similarly, a government publication from the Japan Export, Trade and Research Organization (JETRO) Agricultural Department indicated the value of air-freighted food imports grew 350% from \$500 million to \$1.8 billion between 1985 and 1988 when the yen appreciated most significantly. The document indicated that...“High grade-fish/shellfish such as shrimp, tunas and hard roes of fish and fruit/vegetables including asparagus and cherries account for most of the air-freighted imports. These foods are imported fresh, refrigerated or in low temperature rather than frozen, using transportation devices designed to prevent deterioration.”¹⁰⁾

b. American Fishery Export Composition

In the early 1970's prior to America's implementation of its 200-mile EEZ policy, US fishery exports were relatively dismal. They averaged approximately 200,000 mt valued roughly at US\$ 2 million annual (Fig. 13 and Fig. 14). In 1970,

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Table 6. Japanese import percentage of world total import value by 7 FAO fishery product categories: 1970-89.

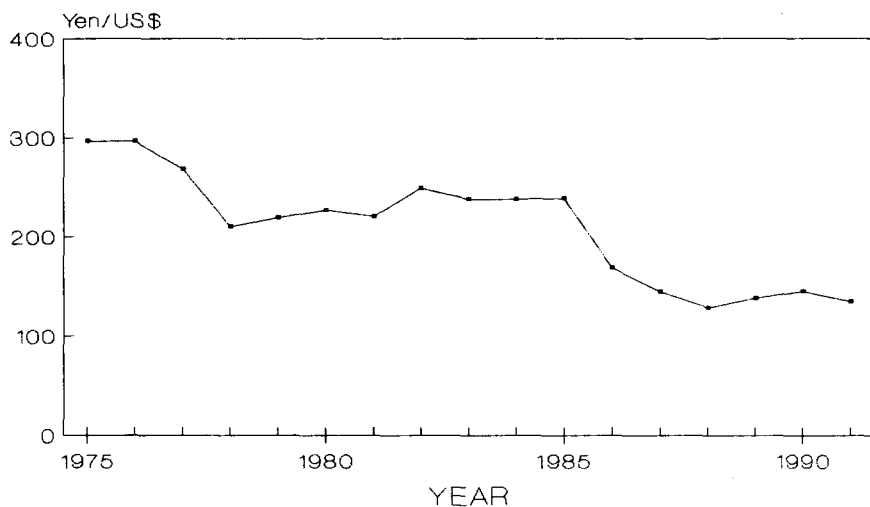
Year	A (%)	B (%)	C (%)	D (%)	E (%)	F & G (%)
1970	6.3	7.8	25.6	1.6	5.2	0.5
1971	7.2	8.3	32.7	0.7	7.0	0.1
1972	7.5	14.7	33.3	0.7	9.6	0.3
1973	11.9	23.6	39.6	1.2	14.6	1.4
1974	11.4	19.0	36.5	1.8	13.3	1.2
1975	14.3	15.5	38.8	2.7	13.5	0.8
1976	14.4	23.2	44.2	4.0	12.8	0.8
1977	19.3	27.8	44.9	5.2	10.0	3.5
1978	19.4	31.2	49.5	5.1	8.8	1.9
1979	19.2	34.5	49.3	7.3	6.5	1.6
1980	14.7	16.3	41.3	6.4	5.6	2.8
1981	20.0	21.2	44.1	5.7	6.7	2.0
1982	22.0	23.3	41.9	8.0	6.8	0.7
1983	22.6	21.6	37.8	8.1	6.4	1.8
1984	24.5	20.7	38.5	8.4	10.6	1.2
1985	25.3	21.5	39.8	9.7	11.4	1.2
1986	26.5	16.6	41.2	10.4	13.7	2.5
1987	25.6	17.2	40.9	11.7	14.8	3.0
1988	30.2	18.2	42.8	16.8	19.1	3.7
1989	27.9	17.1	40.2	15.7	20.2	2.4

Legend : A = Fish: fresh, chilled or frozen; B = Fish: dried, salted or smoked; C = Crustaceans & molluscs; D = Fish, canned; E = Crustaceans, canned; F = Oils & Fats; G = Meals

Source : Derived from FAO Fishery Statistics, various years.

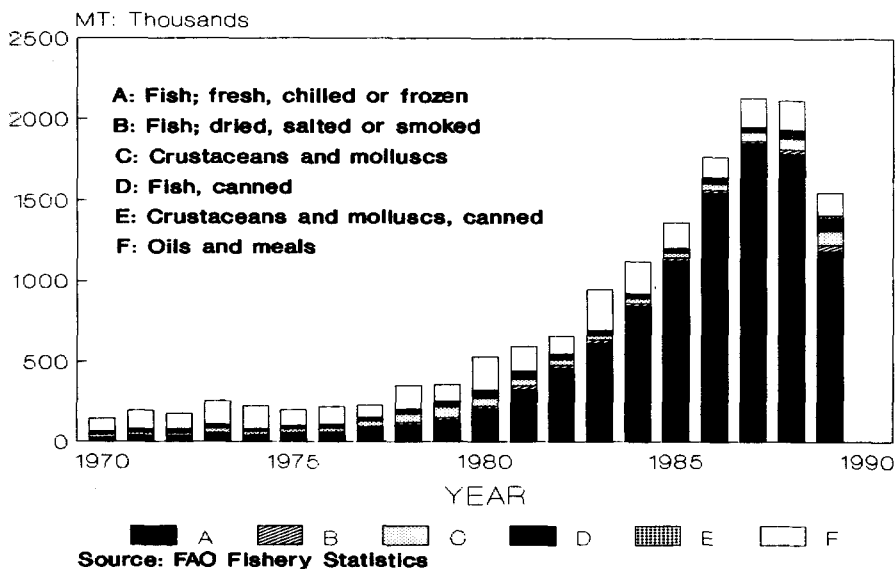
what relatively few exports did exist were primarily in the form of fish oil which comprised over 50% of US total export quantity and 15% in value (Table 7 and Table 8). By 1980 America had begun realizing its domestic fishery production potential by successfully phasing-out foreign fishing in its 200-mile EEZ. America was then in a position to exploit this advantage in the world fisheries trade arena. The result was dramatic growth in US fishery exports during the past decade in both quantity and value.

Far and away fresh-frozen fish constituted the bulk of US export quantity during this period of rapid expansion. It grew in share from 15% to 77% of US total annual seafood export quantity between 1970 and 1989. In contrast low-valued fish meals and oils dwindled in their significance from 56% to 9% during the same period. In terms of export value, in 1989 fresh-frozen fish, crustaceans/mollusca, and canned fish generated the highest gross revenues for US seafood exports equalling US\$ 1.6 billion, US\$ 529 million, and US\$ 219 million, respectively.



Source: Japan's Weekly Economist Magazine

Fig. 12. Historical appreciation of official value of Japanese Yen on international stock market: 1975-91.



Source: FAO Fishery Statistics

Fig. 13. American export quantities of seven FAO fishery product categories: 1970-89.

Table 7. American exports of 7 FAO fishery product categories by quantity and their respective percentages of total national fishery export quantity : 1970-89.

Unit : M.T.

Year	A	%	B	%	C	%	D	%	E	%	F	%	G	%	F & G	%	TOTAL
1970	21100	15	4200	3	18800	13	10900	8	8000	6	74300	52	4300	3	78600	56	141600
1971	34200	18	3600	2	19700	10	10800	6	9100	5	107000	55	9100	5	116100	60	193500
1972	31100	18	3400	2	19500	11	14100	8	8900	5	87800	50	9400	5	97200	56	174200
1973	49400	20	4300	2	29400	12	14800	6	9400	4	112600	44	33300	13	145900	58	253200
1974	36200	16	3700	2	22500	10	9500	4	7800	4	91700	41	50400	23	142100	64	221800
1975	49100	25	4500	2	22900	12	14400	7	7100	4	87600	45	10700	5	98300	50	196300
1976	54913	25	5923	3	24448	11	14951	7	8481	4	81299	37	30365	14	111664	51	220380
1977	81950	36	10469	5	33920	15	15742	7	7594	3	43607	19	32752	14	76359	34	226034
1978	102511	29	16529	5	54978	16	20866	6	8467	2	100703	29	45994	13	146697	42	350048
1979	134201	38	16080	5	66467	19	26923	8	7426	2	90036	25	14244	4	104280	29	355377
1980	205701	39	18439	3	50963	10	40060	8	7609	1	128824	24	77365	15	206189	39	528961
1981	329146	55	20759	3	42272	7	43110	7	7915	1	108094	18	42662	7	150756	25	593958
1982	460125	70	21205	3	34907	5	27068	4	6590	1	91781	14	16275	2	108056	16	657951
1983	615858	65	19868	2	27074	3	31937	3	2555	0	183790	19	70231	7	253521	27	950813
1984	848333	75	17502	2	29700	3	27682	2	1754	0	181175	16	18305	2	199480	18	1124451
1985	1127583	83	20065	1	30133	2	26105	2	1763	0	126588	9	31373	2	157961	12	1363610
1986	1548530	88	17596	1	39810	2	32703	2	5232	0	87186	5	34936	2	122122	7	1765993
1987	1851215	87	15159	1	57030	3	24465	1	4152	0	112998	5	63672	3	176670	8	2128691
1988	1787570	85	25656	1	70847	3	45565	2	5076	0	67712	3	111722	5	179434	8	2114148
1989	1186623	77	41487	3	87052	6	77154	5	15963	1	91572	6	48694	3	140266	9	1548545

Legend : A = Fish : fresh, chilled or frozen ; B = Fish : dried, salted or smoked ; C = Crustaceans and molluscs, fresh, frozen, dried, salted or smoked ; D = Fish, canned ; E = Crustaceans, canned ; F = Oils & Fats ; G = Meals.

Source : FAO Fishery Statistics, various years.

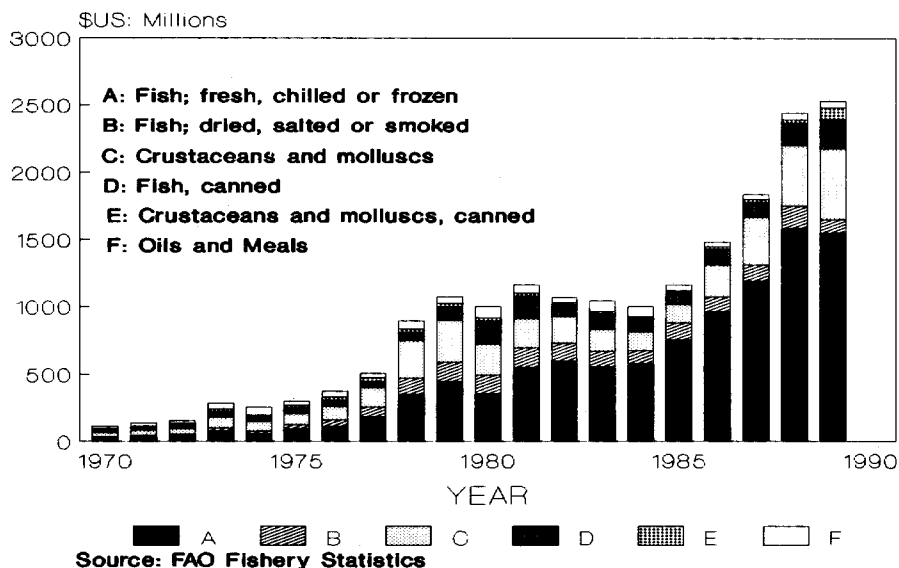


Fig. 14. American export values of seven FAO fishery product categories : 1970-89.

The 200-mile EEZ policy help transform America from a minor seafood exporter, principally involved in fish oil, to the world's leader specializing in high valued fresh-frozen fishery products. American dominance increased in three major seafood categories : fresh-frozen fish and, to a lesser extent, dried-salted-smoked fish, and canned fish. US leadership in world seafood exports focused around these commodities. In 1988, US exports of these goods composed 21%, 5% and 4% of world export quantities in those categories, respectively (Table 9). In terms of value, during the same year, they comprise 13%, 9%, and 4%, respectively (Table 10).

An explanation why US exports heavily lean toward fresh-frozen fish would include technological and market demand factors. As illuded to previously, advancements in freeze and chill technologies and development of international travel networks capable of timely transportation of fresh food-stuffs has made international trade of these commodities a viable option under complimentary economic conditions. These technological improvements provide a quality product for international consumption. The combination of high quality and increasingly diverse buyer competition generates sufficiently high prices to sustain economic viability of the practice.

The Japanese strong demand for high-quality seafood in conjunction with the increased buying power of an appreciated Yen contributed significantly to creating complimentary economic conditions supporting trade in fresh-frozen seafood. This situation bid-up world prices for quality fresh-frozen goods specifically, and the majority of other seafood commodities in general. The degree that Japan has become increasingly dependent on imported food stuffs, particularly from the United

Table 8. American exports of 7 FAO fishery product categories by value and their relative percentages of national total fishery export value : 1970-89.
Unit : \$US 1,000

Year	A	%	B	%	C	%	D	%	E	%	F	%	G	%	F & G	%	TOTAL
1970	24149	22	8075	7	31991	29	19646	18	10929	10	16407	15	682	1	17089	15	111879
1971	33087	24	10901	8	36930	27	21086	16	12253	9	20032	15	1469	1	21501	16	135758
1972	38261	25	11745	8	41734	28	29952	20	13092	9	15382	10	1529	1	16911	11	151695
1973	76976	27	22372	8	80554	28	41504	15	20791	7	34028	12	8967	3	42995	15	285192
1974	56894	23	18252	7	73052	29	30033	12	17361	7	40240	16	16809	7	57049	23	252641
1975	93503	31	30153	10	81783	27	44311	15	18030	6	28137	9	2117	1	30254	10	298034
1976	113790	31	44819	12	101930	27	47627	13	23364	6	29946	8	10423	3	40369	11	371899
1977	182664	36	73892	15	142780	28	49716	10	26649	5	19779	4	12584	2	32363	6	508064
1978	351458	39	118810	13	277444	31	63678	7	24510	3	42340	5	17469	2	59809	7	895709
1979	444507	42	145584	14	307980	29	102551	10	25127	2	39571	4	5526	1	45097	4	1070846
1980	356469	36	138616	14	229172	23	168452	17	27484	3	52395	5	29137	3	81532	8	1001725
1981	552320	47	144918	12	215850	19	163985	14	24330	2	42572	4	19056	2	61628	5	1163031
1982	602243	56	129297	12	197746	19	84255	8	15834	1	35679	3	3595	0	39274	4	1068649
1983	559897	54	110294	11	166498	16	112290	11	13851	1	59836	6	21749	2	81585	8	1044415
1984	582767	58	96223	10	136613	14	100421	10	10665	1	70980	7	5263	1	76243	8	1002932
1985	754254	65	128545	11	135560	12	93404	8	6893	1	36757	3	6959	1	43716	4	1162372
1986	962409	65	110524	7	238608	16	117161	8	20889	1	20828	1	10571	1	31399	2	1480990
1987	1194035	65	119207	6	355470	19	106791	6	24391	1	23312	1	13245	1	36557	2	1836451
1988	1584846	65	165109	7	458227	19	157355	6	30247	1	21945	1	23447	1	45392	2	2441176
1989	1550204	61	100300	4	528994	21	218726	9	87469	3	21495	1	25256	1	46751	2	2532444

Legend : A = Fish : fresh, chilled or frozen ; B = Fish : dried, salted or smoked ; C = Crustaceans and molluscs, fresh, frozen, dried, salted or smoked ;

D = Fish, canned ; E = Crustaceans, canned ; F = Oils & Fats ; G = Meals.

Source : FAO Fishery Statistics, various years.

Table 9. American export percentage of world total export quantity by 7 FAO fishery product categories : 1970-89.

Year	A (%)	B (%)	C (%)	D (%)	E (%)	F & G (%)
1970	1.0	0.8	4.3	1.8	10.7	2.2
1971	1.6	0.7	3.8	1.7	12.9	3.1
1972	1.3	0.7	3.0	2.0	10.1	2.6
1973	1.8	0.9	4.4	1.9	10.4	6.7
1974	1.4	0.9	3.3	1.2	9.6	5.7
1975	1.7	1.1	3.1	1.9	8.9	3.5
1976	1.9	1.4	2.8	1.9	8.1	4.2
1977	2.5	2.6	4.0	2.0	7.0	2.9
1978	2.7	4.0	5.4	2.5	7.5	5.3
1979	3.1	3.5	5.8	3.2	6.6	3.4
1980	4.6	3.8	4.7	4.1	5.5	6.7
1981	7.1	4.2	3.7	4.2	5.0	5.2
1982	9.6	4.9	2.8	3.0	4.1	3.2
1983	11.8	4.5	1.9	3.7	1.4	8.3
1984	15.6	4.0	1.9	2.9	0.9	5.5
1985	18.1	4.4	1.8	2.6	0.8	3.7
1986	21.2	3.7	2.2	3.1	2.3	3.0
1987	24.1	3.1	2.8	2.3	1.7	4.4
1988	21.2	5.0	3.3	4.0	1.9	4.4
1989	14.8	7.6	3.8	6.2	5.5	3.0

Legend : A = Fish : fresh, chilled or frozen ; B = Fish : dried, salted or smoked ; C = Crustaceans & molluscs ; D = Fish, canned ; E = Crustaceans, canned ; F = Oils & Fats ; G = Meals

Source : Derived from FAO Fishery Statistics, various years.

States, is presented below.

4. Japan's Growing Dependence on American Food Imports

In 1990, the total value of goods imported into Japan was ¥33.9 trillion (\$233.8 billion*). In the same year, American products accounted for over 22% of this import market: the largest share for any country or region (Table 11). Products originating from the European Community collectively were a distant second capturing 15% of the market¹¹⁾.

By 1990, food comprised 13.5% in total value of all Japanese imports (Table 11). Again, US goods overwhelmingly dominated food imports by commanding one third of the Japanese food import market-share. Figure 15 presents the 1988 shares of the primary individual countries and territories exporting food to Japan. This typically represents food import allocations in recent years.

* @¥144.8/1\$: see Fig. 12.

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Table 10. American export percentage of world total export value by 7 FAO fishery product categories: 1970-89.

Year	A (%)	B (%)	C (%)	D (%)	E (%)	F & G (%)
1970	2.6	3.0	5.9	4.1	8.8	3.5
1971	3.1	3.5	5.3	3.9	9.2	4.3
1972	2.8	3.1	4.5	4.4	7.8	3.4
1973	4.1	4.4	6.6	4.7	9.1	6.6
1974	3.1	3.1	5.5	3.0	6.9	7.7
1975	4.3	5.1	5.2	4.6	6.9	5.7
1976	4.5	6.7	4.6	4.0	7.5	6.0
1977	5.3	10.2	5.9	3.8	7.1	3.7
1978	8.0	13.2	8.4	4.1	5.7	6.8
1979	8.3	13.1	7.2	5.8	4.9	4.8
1980	6.4	10.8	5.4	7.7	4.2	7.4
1981	9.1	10.2	5.0	7.2	3.7	6.1
1982	10.4	10.8	4.2	4.4	2.3	4.0
1983	9.8	10.7	3.2	5.8	1.7	8.2
1984	10.0	10.5	2.6	5.0	1.3	7.4
1985	11.5	12.7	2.4	4.4	0.8	4.6
1986	10.9	8.4	3.1	4.3	1.8	2.8
1987	11.1	7.0	3.7	3.4	1.7	2.9
1988	12.6	8.6	4.3	4.4	1.8	2.8
1989	11.8	5.5	5.0	6.2	4.9	2.9

Legend : A = Fish: fresh, chilled or frozen; B = Fish: dried, salted or smoked; C = Crustaceans & molluscs; D = Fish, canned; E = Crustaceans, canned; F = Oils & Fats; G = Meals

Source : Derived from FAO Fishery Statistics, various years.

Previously in Table 1 it was shown by Fujita that between 1960 and 1988 Japan's food calorie supply self-sufficiency ratio had dwindled from 79% to less than 50%; the lowest level among the major developed countries¹². Wheat, fish, and meat were among those goods displaying dramatic declines in self-sufficiency ratios. All of these are principle commodity groups produced by the United States and exported to Japan.

Japan is heavily reliant on American grain (excluding rice which enjoys a total import restriction). In addition, during recent decades the country also experienced growing dependence on foreign meat and seafood imports. For example, between 1977 and 1990 meat rose from representing 9% of Japan's food import value to 16%, respectively. Over the same period seafood rose from comprising 22% to 33% of the country's food import value (Table 12). It is not surprising that seafood imports rose during this period in Japan because it had previously maintained the world's largest distant-water fishing fleet. It was at this time that international 200-mile EEZ policy began systematically excluding those fishing fleets from many of their

Table 11. Contribution of US food imports, in terms of value and percentages, to Japanese total imports since the onset of the international 200-Mile EEZ era : 1977, '80, '85, & '90

(Yen : millions)

CATEGORY	1977	1980	1985	1990
Value of all imports into Japan	19131780	31995325	31084935	33855208
Value of all imports into Japan from US	3357384	5558112	6213380	7585904
Total value of food imports into Japan	2728659	3326440	3718803	4572354
Value of all food imports into Japan from the US	742507	1170632	1222175	1531457
% of value of total imports into Japan from US	17.5	17.4	20.0	22.4
% of Japan's total import value associated with food	14.3	10.4	12.0	13.5
% of value of all US goods imported into Japan associated with food	22.1	21.1	19.7	20.2
% of value of all food imported into Japan from US	27.2	35.2	32.9	33.5

Source : Calculated from Japan Statistical Yearbook. Japan Statistics Bureau, Management and Coordination Agency.

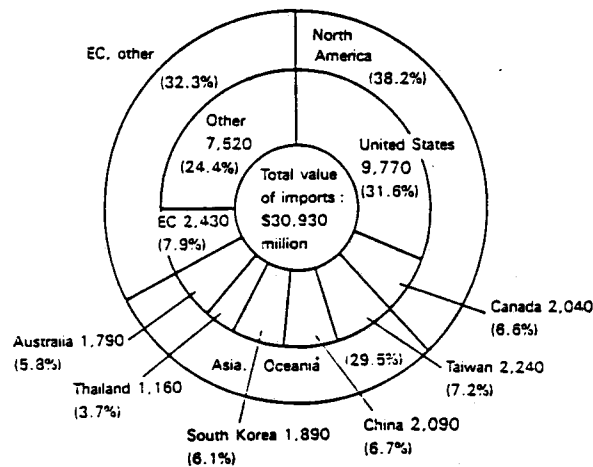


Fig. 15. Shares of individual countries and territories in food imports to Japan: 1988. Reproduced by permission from "Current Trend of Japan Imports" JETRO AG-36, 1989, 5 p.

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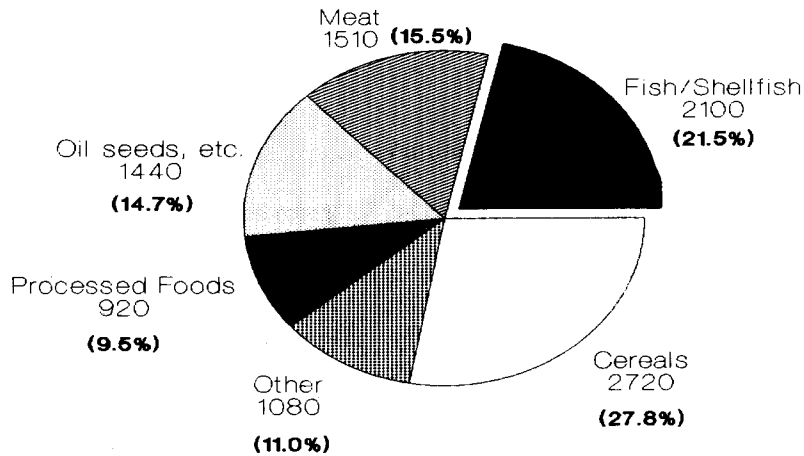
Table 12. Annual values and percentages of specific food groups imported into Japan since the onset of the international 200-mile EEZ era.

(Yen : millions)

CATEGORY	1977	1980	1985	1990
Total value of food imports in Japan	2728659	3326440	3718803	4572354
Value of all meat imports into Japan	257808	345762	458687	726172
Value of all seafood imports into Japan	588470	684334	1096424	1518357
Value of all wheat imports into Japan	200092	279164	234533	146806
Value of all other food imports into Japan	1682289	2017180	1929159	2181019
% of Japan's food import value associated with meat	9.4	10.4	12.3	15.9
% of Japan's food import value associated with seafood	21.6	20.6	29.5	33.2
% of Japan's food import value associated with wheat	7.3	8.4	6.3	3.2
% of Japan's food import value associated with other foods	61.7	60.6	51.9	47.7

Source : Calculated from Japan Statistical Yearbook. Japan Statistics Bureau, Management and Coordination Agency.

U.S. Food Import Value = \$9,770 million



Source: JETRO, 1989. Values in \$ millions.

Fig. 16. Japan food imports from United States by category and value: 1988. JETRO AG-36, 1989 (same as Fig. 15). 6 p.

Table 13. Annual values of US food groups imported to Japan and percentages of commodity imported value.

(Yen : millions)

CATEGORY	1977	1980	1985	1990
Value of all meat imported into Japan from US	53778	98094	133418	281198
Value of all seafood imported into Japan from US	59583	94425	208012	303133
Value of all wheat imported into Japan from US	115877	159011	132761	78356
Value of all other foods imported into Japan from US	513269	819102	747984	868770
% of value of all US goods imported into Japan associated with meat	7.2	8.4	10.9	18.4
% of value of all meat imported into Japan from US	20.9	28.4	29.1	38.7
% of value of all US goods imported into Japan associated with seafood	8.0	8.1	17.0	19.8
% of value of all seafood imported into Japan from US	10.1	13.8	19.0	20.0
% of value of all US goods imported into Japan associated with wheat	15.6	13.6	10.9	5.1
% of value of all wheat imported into Japan from US	57.9	57.0	56.6	53.4
% of value of all US good imported into Japan associated with other foods	69.1	70.0	61.2	56.7
% of value of other foods imported into Japan from US	30.5	40.6	38.8	39.8

Source : Calculated from Japan Statistical Yearbook. Japan Statistics Bureau, Management and Coordination Agency.

historical fishing grounds ; areas which now are within fisheries management jurisdiction of foreign nations.

Over the past decade food accounted for more than 20% of value of all US exports to Japan (Table 12). Among those American commodities exported to Japan, meat and seafood have grown in significance in terms of value while wheat has diminished. Between 1980 and 1990 meat rose from contributing 8% to 18% of all US exports bound for Japan (Table 13). Decreasing import restrictions on beef, negotiated in the late 1980's, and growing Japanese consumer demand for beef in their diets are the major contributing factors to this trend. In 1990, US meat obtained 39% of the value of all the meat imported by Japan.

Of any developed nation on earth, Japan has become the most heavily dependent on seafood imports. In 1990, seafood alone accounted for over 33% of the value of all foodstuffs imported by Japan (Table 12). This alarming fact is often pointed out within Japan Government publications.

"Fish/shellfish accounted for the largest part of Japan's food imports in 1988 (30.7%), followed by meat (13.5%), processed foodstuffs (13.1%), cereals (12.4%) oil seeds (9.5%), fruit/vegetables (8.9%), and others (11.9%). The fact that the ratio

of fish/shellfish is so high as to be unparalleled in the world and that the four major food sectors of meat, processed foodstuffs, cereals and fish/shellfish combined account for 70% of food imports indicate an important composition peculiar to Japan."¹³⁾

American seafood doubled its share of Japan's burgeoning seafood import market, growing from 10% to 20% between 1977 and 1990, respectively. As a result, it significantly increased its importance among US exported goods bound for Japan. In 1977 seafood only comprised 8% of the value of all US export to Japan. However, by 1990 seafood accounted for 20% of the value of all US goods Japan imported (Table 13). Figure 16 shows 1988 data as an example of how American food imports to Japan breakdown categorically in recent years.

Discussion

The point of this exercise has been to emphasize the dramatic shift underway within Japan's food industry, especially the seafood sector, as a result of trends in the international marketplace. Japan's food industry is changing from being production-export oriented to consumption-import oriented. While being beneficial to the average Japanese consumer, the social and economic effects of this transition will be enormous for many individuals involved in various domestic sectors of Japan's food production-distribution industry. The following is a 1988 quote from The Japan Economic, Trade and Research Organization, a division of Japan's Ministry of Agriculture.

"... In the area of foodstuffs, where differences in raw material prices between domestic and overseas markets are widening, the Japanese food industry has no choice but to address the problem and consider the development and import of products or advances abroad. Under the food production system so far, it has been comparatively easy for Japanese food businesses to map out plans for the production, distribution and management of their products on the basis of estimated domestic supply and demand. But, when food imports have surpassed the \$30 billion mark, there will emerge such a situation whereby the higher the ratio of imports to the domestic food supply rises, the more liable the supply/demand balance is to collapse."¹⁴⁾

In 1990, the total value of food imports to Japan exceeded \$31 billion (¥4.5 trillion¹⁵⁾). As anticipated, recent years have seen various food production industries in Japan experience dramatic restructuring. Japan's seafood industry has especially been affected in this way with the onset of the 200-mile EEZ era.

The future of Japan's fisheries industry holds increasing diversification into trading subsidiaries, more and more of which will be located abroad. Branch purchasing offices located in the hub of foreign fishery trading markets will continue to grow. The majority of production facilities and capacity for major fisheries like Alaska pollock that were previously dominated by domestic Japanese industry will shift abroad. An example of this trend of growing Japanese investment in international seafood sectors is the surimi industry.

Successful "Americanization" of the US groundfish fishery resulted in rapid growth in the number of surimi factories in America. The US now ranks second only to Japan in the number of facilities. These include both land-based and

sea-based surimi factories. However, factory ownership alone does not assure production if resource availability remains a constraint. Japanese fisheries corporations recognize this new dimension to their industry and have responded by heavily investing abroad. Such international posturing has allowed Japanese firms diverse involvement in production, distribution, and marketing of marine commodities in order to maintain a leading role in global fisheries trade even though they are losing position as world leaders in production/harvesting.

One could speculate that these business-motivated adjustments might also meet Japanese national food security objectives through diverse investment in important world food production sectors. Fujita's observation that Japan suffers the lowest rate of self-sufficiency in foods of any developed country could encourage such conjecture.

According to a private publication in Japan on fisheries entitled "Suisansha", in May 1989, 192 foreign-based fisheries companies were listed in which Japanese companies either own or had significant investments. These companies are scattered across the globe including Asia (79), the South Pacific (32), Africa (9), Central and South America (26), North America (39), and the USSR (7)¹⁶⁾.

Numerous examples exist demonstrating how large Japanese corporations, predominantly fishery oriented, have responded to the 200-mile era by deemphasizing their direct harvesting interests in favor of a greater role in international trade, distribution, and production of value-added fishery products. A 1991 report by the US State Department of Commerce Office of International Affairs reports:

"Nippon Suisan, one of the largest Japanese companies fishing for pollock, reduced its vessel crew size from 3,200 in 1977 to only 1,500 in 1988, and plans further reductions to about 800 in the next 3 years. Taiyo Gyogyo has reduced its vessel crews from 4,000 in 1977 to 1,500 in 1988, to be cut to 500 in the next 3 years. It has also reduced its number of fishing vessels by about half."¹⁷⁾

Nippon Suisan and Taiyo Gyogyo are the two largest fishing corporations in Japan. Their shift away from direct harvesting involvement represents the trend nation-wide in Japan's fishing industry. The Japanese response to the 200-mile era is clear. While Japanese fishery companies reduce their domestically-based harvesting sectors of world fisheries, they are expanding counter investments abroad. The 200-mile era did not eradicate foreign involvement within the fisheries of coastal states. It simply altered their participation from direct harvesters to share holders in these burgeoning fishery industries.

References

- 1) F.A.O. (1991). Food and Agriculture Organization of the United Nations. *Fish and Fishery Products: World Apparent Consumption Statistics Based on Food Balance Sheets: 1961-1989*. Rome. 423 p.
- 2) M.A.F.F. Statistics and Information Department, *Japan Ministry of Forestry and Fisheries; Food Balance Sheet*. Tokyo. Various issues.
- 3) Fujita, N. (1991). Agriculture and Agricultural Policy in Japan. *Food Consumption and Japanese Agriculture* (ed.). The Committee for the Japanese Agriculture Session, XXI International Association of Agricultural Economists Conference. Tokyo. 39-46.
- 4) F.A.O. Food and Agriculture Organization of the United Nations. *Yearbook of Fishery Statistics: Catches and Landings*. Various issues.

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- 5) Japan Ministry of Agriculture, Forestry and Fisheries. *Fisheries, Aquaculture Production Annual Statistic*. Various issues (in Japanese).
- 6) see endnote 4.
- 7) FAO (1991). Food and Agricultural Organization of the United Nations. *Yearbook of Fishery Statistics : Fishery Commodities*. Vol. #69. 397 p.
- 8) FAO (1991). see endnote 7.
- 9) Taya, K. (1991). Supply and Demand of Fisheries Products in Japan with an Emphasis on Shrimp and Salmon. *International Association of Agricultural Economist Symposium on Aquaculture Economics*. Tokyo, Japan.
- 10) JETRO, (1989). *Current Trend of Japan's Food Imports*. Japan Export, Trade and Research Organization, Agricultural Department. Tokyo, Japan. AG-36. 3 p.
- 11) S.B.M.C.A. (1991). *Japan Statistical Yearbook*. Statistics Bureau, Management and Coordination Agency. Tokyo. 352 p. (in Japanese).
- 12) see endnote 2 and 3.
- 13) see JETRO AG-36, 1989. 5 p.
- 14) see JETRO, AG-36, 1989. 13 p.
- 15) see endnote 11.
- 16) Suisansha, 1989. "*Suisannenkan*", Vol. 35, Tokyo, Japan. 141 p. (in Japanese).
- 17) NOAA, 1991. "The Alaska Pollock Resource : An Overview". Office of International Affairs Foreign Fisheries Analysis Branch, United States Department of Commerce. 8 p.