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THE JAPANESE MARKET FOR SQUID AND CUTTLEFISH

Sunee C. Sonu

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U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Southwest Region

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EXECUTIVE SUMMARY

Japan was the world's largest producer of squid and cuttlefish until 2001, but its share of world landings has decreased sharply from 87 percent in 1950 to 16 percent in 2002. Japanese landings in 2003 of 382,000 metric tons (mt) were 49 percent of the record landings, and were the lowest in 39 years.

Japan is a major market for squid and cuttlefish, utilizing an average of 672,000 mt per year during 1982-2003. Supply for this market comes from both domestic catches and imports. The share of the Japanese market for squid supplied by imports increased from 13 percent in 1982 to 19 percent in 2003. In 2003, imports were worth $526 million. Frozen products dominated, representing 68 percent both in volume and value in 2003. Japanese imports of frozen squid from the United States in 2003 were 6,246 mt valued at $9.2 million, an increase of 58 percent in quantity and 39 percent in value over 1999 imports.

Prices of squid are primarily determined by supply and demand, but quality, origin, and species are also important. During 1997-2003, the highest annual average wholesale prices at Tokyo Central Wholesale Market for fresh *Todarodes pacificus* occurred in 1998, for frozen *T. pacificus* in 1997, for fresh *Ommastrephes bartrami* in 1997, and for *Illex argentinus* in 2003, which corresponded to periods of low supply of these products.

Squid and cuttlefish products imported into Japan are subject to import quotas (IQ) and tariffs. To meet strong demand for squid, the Japanese government increased the IQ for fresh and frozen squid from 7,000 mt for 1971 to 53,000 mt for 1986, and then to 59,950 mt for 2004. Processed squid which have been flavored, such as smoked, prepared, or preserved products, are exempted from IQ. Common cuttlefish (*Sepia officinalis*), which is not caught in Japanese waters, has been exempted from IQ since 1978.

As the United States and Japan are signatories to the World Trade Organization (WTO), WTO tariffs apply to imports of squid products from the U.S.: 3.5 percent for fresh or frozen cuttlefish, 5 percent for fresh or frozen squid, 6.7 percent for smoked products, 15 percent for dried products. Tariff rates are calculated as a percentage of total cost, including insurance and freight.

INTRODUCTION

World squid and cuttlefish catches have increased considerably recently, nearly doubling since 20 years ago (Table 1). Japan has historically been the most important player in squid fisheries and consumption. In 2002, however, China finally took the lead in world catch of squid and cuttlefish, although Japan is still the largest consumer. To fill the domestic demand, Japan has greatly increased imports of squid and cuttlefish.

Although squid and cuttlefish are taxonomically different groups of cephalopods, they are normally lumped together in Japanese fishery statistics because of their general similarity in appearance as well as in how they are used as food. Squid and cuttlefish are used in various ways, depending on species and state of preservation, and prices for them vary accordingly.

Japanese squid catches are dominated by species in family Ommestrephidae, which can be characterized as oceanic species, but those in family Loligindae are also important in local fisheries. Likewise cuttlefish species comprise only a small percentage of the total catch of both groups.

U.S. fisheries for squid target *Loligo peali* on the east coast and *L. opalescens* off California. The latter has found a niche in the Japanese market which can be developed.

This report provides a detailed examination of the Japanese fishery, as well as import, export, supply, demand, consumption, and wholesale prices of squid and cuttlefish.

FISHERY

The Japanese commercial fishery for squid and cuttlefish can be traced back as far as 1458, and throughout history Japan has been the leading nation in terms of total catch as well as consumption. In the last half century, however, Japan's dominance has decreased steadily, its share of world landings falling from 87 percent in 1950 to 16 percent in 2002, when China finally took over the top position (Table 1). Since 1950, Japanese squid and cuttlefish landings have ranged between 329,000 and 773,000 mt, averaging 539,000 mt.

Japanese, and indeed world catches of squid are dominated by species in family Ommastrephidae, which are generally found in offshore oceanic waters. Loliginid species, on the other hand, are generally caught in nearshore waters, and their catches are relatively minor. Thus detailed statistics are lacking on Japanese fisheries for the latter species, as well as cuttlefish.

Five species of Ommastrephidae comprise the major targets of the Japanese squid fishery. These are *Todarodes pacificus*, *Ommastrephes bartrami*, *Nototodarus sloani*, *Illex argentinus*, and *Dosidicus gigas*. In 2003, landings of these five species accounted for 77 percent of Japan's total squid and cuttlefish landings (Table 2).

Todarodes pacificus is the species most familiar to Japanese consumers and, as such, sets standards for appearance and taste for the entire market. The availability of this species essentially dictates the extent of use of other squid species. When the landings of this species are low, *T. pacificus* goes to the high-value direct consumption market. Conversely, when the landings are high, more of it is used in processed form, at the expense of other species (Suisan Keizai Shinbun Sha 1992).

Japanese landings of *T. pacificus* steadily declined from 1968 to 1986 (Table 3). In 1968, landings of this species totaled 668,000 mt, an historical high, representing 86 percent of Japan's total squid and cuttlefish landings and 63 percent of the world's landings for that year. Landings of *T. pacificus* was 80 percent of total Japanese squid landings in 1970, but this dropped to 67 percent in 1975 and 13 percent in 1986. By 1986, Japanese catch of *T. pacificus* represented only about 4 percent of the world squid landings.

Following the sharp decline in its catch of *T. pacificus*, Japan developed fisheries for *O. bartrami* in the North Pacific, using jigging in 1974 and later adding drift gillnet in 1978 (Kohrin Sha 1989). Landings of this species grew rapidly from 17,000 mt in 1974 to a peak of 163,000 mt in 1982 (Table 4). Between 1977 and 1990, landings of this species fluctuated between 100,000 and 163,000 mt. However, landings have decreased sharply since 1990. Lower landings have continued due mainly to a ban, starting in 1993, in the use of driftnets to catch *O. bartrami* on the high seas in the North Pacific. This action complied with United Nations General Assembly Resolution 46-215 which mandated a global moratorium on all large-scale driftnet fisheries by December 31, 1992.

Since the implementation of the United Nations' moratorium on squid driftnet fishing in the North Pacific, greater effort has been made to find additional sources of squid in other areas. At auctions held by the Peruvian government in April and June of 1993, Japan gained an allocation of 80,000 mt of *D. gigas* and 36 licenses to fish in the Peruvian Exclusive Economic Zone (EEZ) for a ten month period starting May 3, 1993 (Suisan Tsushin Sha 1993). In April 1993, the Fisheries Agency of Japan announced its approval of the operation of about 20 vessels in an experimental jig fishery in the area where driftnet operations

had been prohibited after January 1, 1993 (Nikkan Shokuryo Shinbun Sha 1993). Japanese catches of giant squid *D. gigas* in waters off Peru, Mexico, Equador, and Costa Rica increased from 23,500 mt in 1991 to 56,000 mt in 1994 (Table 5). Landings of *D. gigas* have since fluctuated, with poor years associated with low catches in the Peruvian EEZ. (Hokkai Keizai Shinbun Sha 2004). In March 2004, Japan received an allocation of 70,000 mt of *D. gigas* to fish in the Peruvian EEZ for a three month period starting in April 2004 (Suisan Tsushin Sha 2004).

Japanese fishermen began to increase harvest of *N. sloani* off New Zealand in 1970 and *I. argentinus* off Argentina in 1978 (Korin Sha 1989). June through November constitutes the squid fishing season for most jig boat in Japanese waters (Zen Gyoren 2004). To extend the season, Japanese vessels fish squid from December through May off New Zealand and from February through May off Argentina.

Annual landings of *N. sloani* and *I. argentinus* fluctuated considerably between 1980 and 2003 and reached records of 78,000 mt in 1989 for *N. sloani* and 240,000 mt in 1987 for *I. argentinus* (Table 6). Since 1990, however, landings of these species have declined sharply, due mainly to reduced numbers of vessels operating in waters off New Zealand and Argentina.

Table 1. World landings of squid and cuttlefish by major countries, 1950-2002 (1,000 metric tons).

Year	World total	Japan	China	Korea Rep. of	Argentina	Taiwan	Thailand	U.S.A.	Share (%) Japan/world
1950	542	469	14	20	0*	2	..**	4	87
1951	604	517	20	24	0	3	..	8	86
1952	754	656	25	24	0	3	..	3	87
1953	568	468	25	18	0	3	..	7	82
1954	540	443	31	9	0	2	..	5	82
1955	550	434	34	18	0	4	..	8	79
1956	473	346	39	22	0	5	..	10	73
1957	557	419	38	40	0	5	..	8	75
1958	555	412	38	34	0	5	..	5	74
1959	707	538	40	47	0	8	..	11	76
1960	707	542	40	42	1	7	..	3	77
1961	669	457	40	83	0	8	..	6	68
1962	809	613	42	57	1	14	..	6	76
1963	926	667	42	117	0	16	..	7	72
1964	574	329	42	87	1	14	..	8	57
1965	761	500	44	71	1	14	..	10	66
1966	736	485	44	76	2	19	..	10	66
1967	831	597	44	42	3	14	..	11	72
1968	1056	773	46	89	3	14	..	13	73
1969	849	590	46	65	1	15	..	11	69
1970	832	517	57	77	2	16	34	12	62
1971	819	482	73	46	2	14	37	16	59
1972	987	608	48	61	2	21	69	10	62
1973	868	482	-***	63	4	36	60	7	56
1974	858	474	-	58	5	21	63	16	55
1975	935	534	-	70	4	30	63	13	57
1976	969	497	36	89	8	36	60	13	51
1977	1,024	490	40	53	2	32	87	11	48
1978	1,137	519	62	73	59	33	87	19	46
1979	1,346	529	90	104	87	46	73	22	39
1980	1,344	687	80	109	9	45	67	16	51
1981	1,143	517	28	121	11	58	75	25	45
1982	1,395	551	50	128	39	86	110	27	39
1983	1,402	539	53	149	29	77	124	28	38
1984	1,421	526	54	164	29	103	123	22	37
1985	1,541	528	53	183	22	166	107	26	34
1986	1,481	463	50	197	13	160	123	38	31
1987	2,004	755	62	266	51	220	121	41	38
1988	1,913	661	76	270	21	227	112	58	35
1989	2,253	734	59	356	23	233	127	58	33
1990	2,019	567	69	322	28	215	117	43	28
1991	2,157	545	70	401	46	280	134	63	25
1992	2,363	724	71	464	78	207	130	51	31
1993	2,284	588	122	424	195	219	133	74	26
1994	2,343	596	194	373	198	190	129	98	25
1995	2,424	548	222	399	200	187	140	104	23
1996	2,658	678	173	428	293	171	150	109	26
1997	2,957	643	243	459	414	250	151	102	22
1998	2,325	386	375	283	292	236	156	45	17
1999	3,035	501	410	568	343	297	149	117	17
2000	3,064	621	478	407	279	259	153	144	20
2001	2,796	521	499	393	231	165	151	105	19
2002	2,698	434	520	371	177	128	151	93	16

0* more than zero but less than 500 mt
..** data not available
-*** magnitude known to be zero

Source: FAO 2003, 2004
Hokkai Keizai Shinbun Sha 2004

Table 2. Japan's landings of Ommastrephid squid, 2001-2003 (1,000 metric tons).

Species	2001	2002	2003
Todarodes pacificus	254	240	233
Dosidicus gigas	52	56	26
Illex argentinus	54	20	18
Ommastrephes bartrami	15	9	13
Nototodarus sloani	1	2	3
Sub-total	376	327	293
Japan's total squid and cuttlefish landings	521	434	382
Ommastrephid squid as percent of total	72	75	77

Sources: Suisan Tsushin Sha 2003
Suisan Keizai Shinbun Sha 2004
Hokkai Keizai Shinbun Sha 2004
Zen Gyoren 2004

Table 3. Landings of *Todarodes pacificus* and total squid and cuttlefish landings, by world and by Japan, 1950-2002 (1,000 metric tons).

Year	*Todarodes pacificus*		Total Squid and Cuttlefish		Share (%)	
	World(A)	Japan(B)	World(C)	Japan(D)	B/D	B/C
1950	429	409	542	469	87	75
1951	480	456	604	517	88	75
1952	601	577	754	656	88	76
1953	422	403	568	468	86	71
1954	392	383	540	443	86	71
1955	386	368	550	434	85	67
1956	305	279	473	346	81	59
1957	390	350	557	419	84	63
1958	381	346	555	412	84	62
1959	507	457	707	538	85	65
1960	505	460	707	542	85	65
1961	472	385	669	457	84	57
1962	584	518	809	613	85	64
1963	701	574	926	667	86	62
1964	334	238	574	329	72	41
1965	477	397	761	500	79	52
1966	470	383	736	485	79	52
1967	526	477	831	597	80	57
1968	759	668	1,056	773	86	63
1969	545	478	849	590	81	56
1970	492	412	832	517	80	50
1971	407	364	819	482	76	44
1972	528	465	987	608	77	47
1973	401	334	868	482	69	39
1974	355	310	858	474	66	36
1975	418	358	935	534	67	38
1976	349	281	969	497	56	29
1977	243	208	1,024	490	42	20
1978	250	216	1,137	519	42	19
1979	269	213	1,346	529	40	16
1980	405	330	1,344	687	48	25
1981	290	197	1,143	517	38	17
1982	274	145	1,395	551	26	10
1983	246	143	1,402	539	27	10
1984	287	131	1,421	526	25	9
1985	214	108	1,541	528	20	7
1986	141	61	1,481	463	13	4
1987	262	139	2,004	755	18	7
1988	228	119	1,913	661	18	6
1989	320	164	2,253	734	22	7
1990	321	166	2,019	567	29	8
1991	403	196	2,157	545	36	9
1992	545	326	2,363	724	45	14
1993	548	235	2,284	588	40	10
1994	504	234	2,343	596	39	10
1995	513	256	2,424	548	47	11
1996	716	388	2,658	678	57	15
1997	603	310	2,957	643	48	10
1998	379	144	2,325	386	37	6
1999	498	203	3,035	501	41	7
2000	570	291	3,058	621	47	10
2001	529	254	2,776	521	49	9
2002	504	240	2,698	434	55	9

Sources: FAO 2004
Zen Gyoren 1990-2004 Suisan Tsushin Sha 2003, 2004

Table 4. Japan's landings of *Ommastrephes bartrami*, 1974-2003 (metric tons).

Year	Driftnet	Jig	Others	Total
1974	0	-	-	17,000
1975	0	-	-	41,164
1976	0	-	-	84,184
1977	0	-	-	121,768
1978	-	-	-	151,307
1979	-	-	-	124,692
1980	-	-	-	144,000
1981	-	-	-	120,000
1982	108,000	38,000	17,000	163,000
1983	112,000	25,000	11,000	148,000
1984	73,000	15,400	11,600	100,000
1985	99,000	10,000	26,000	135,000
1986	85,000	8,000	15,000	108,000
1987	111,000	0	21,000	132,000
1988	86,000	2,000	13,000	101,000
1989	98,500	6,900	14,600	120,000
1990	103,000	16,000	17,000	136,000
1991	70,200	5,500	6,000	81,700
1992	67,600	2,100	300	70,000
1993	1,830	7,300	200	9,330
1994	0	35,300	3,600	38,900
1995	0	34,900	16,430	51,330
1996	0	38,630	2,140	40,770
1997	0	40,000	1,700	41,700
1998	0	53,960	4,290	58,250
1999	0	34,430	160	34,590
2000	0	16,250	1,250	17,500
2001	0	15,300	110	15,410
2002	0	8,940	0	8,940
2003	0	12,670	530	13,200

-...breakdown is not available

Sources: Zen Gyoren 1988, 1993, 2004
Kohrin Sha 1989
Suisan Tsushin Sha 2004

Table 5. Japan's landings of *Dosidicus gigas*, 1991-2003 (metric tons).

Year	Waters off		Total
	Peru	Others*	
1991	18,500	5,000	23,500
1992	27,000	4,700	31,700
1993	46,100	0	46,100
1994	56,000	0	56,000
1995	25,000	0	25,000
1996	5,440	3,470	8,910
1997	2,500	22,000	24,500
1998	220	5,300	5,520
1999	0	410	410
2000	52,900	19,400	72,300
2001	51,600	160	51,760
2002	55,500	0	55,500
2003	25,970	0	25,970

Others* include Mexico, Equador, and Costa Rica

Sources: Zen Gyoren 1988, 1993, 2004
Suisan Tsushin Sha 2004

Table 6. Japan's landings of *Nototodarus sloani*, and *Illex argentinus*, 1980-2003.

Year	*Nototodarus sloani*		*Illex argentinus*	
	Landings (metric tons)	Number of vessels	Landings (metric tons)	Number of vessels
1980	63,000	-	38,000	-
1981	40,000	-	18,000	-
1982	50,000	-	35,000	-
1983	49,000	112	25,000	-
1984	65,000	125	60,000	-
1985	50,000	116	77,000	-
1986	40,000	101	95,000	107
1987	52,000	129	240,000	134
1988	53,000	83	203,000	119
1989	78,000	151	174,000	108
1990	8,680	54	83,900	99
1991	8,950	30	91,200	82
1992	10,500	10	71,600	64
1993	8,000	14	96,800	-
1994	9,710	9	79,270	-
1995	20,400	22	65,950	51
1996	10,530	25	58,730	49
1997	5,210	25	87,650	50
1998	3,710	15	69,580	44
1999	1,840	15	122,860	48
2000	1,850	8	97,930	48
2001	1,390	4	53,880	42
2002	1,700	3	20,450	34
2003	3,090	4	17,500	25

-...not available

Sources: Zen Gyoren 1990-2004
Suisan Tsushin Sha 2003, 2004

IMPORTS

Japan has traditionally included both squid and cuttlefish under the common name squid ("ika"). This tradition continues in its trade regulation, as both squid and cuttlefish are combined in a single import quota (IQ).

Squid and cuttlefish imports were previously not allowed because domestic demand was satisfied by Japanese catches. When landings of Japanese flying squid (*T. pacificus*) dropped sharply in 1969, however, Japan had to begin importing squid and cuttlefish in 1971 under a carefully administered quota system. From 1971 to 1979, imports of squid and cuttlefish to Japan increased steadily from 24,000 mt to 160,000 mt, more than six times in volume (Table 7). From 1982 to 2003, imports have fluctuated between 101,000 and 142,000 mt.

Japan liberalized the import of fresh and frozen common cuttlefish (*Sepia officinalis*) on April 1, 1978, making it free from import quota restrictions. This is the only species exempt from IQ.

Japan's imports of squid and cuttlefish in 2003 totaled approximately 123,000 mt valued at 526 million dollars (Table 7 and Japan Fish Traders Association 2004). Frozen products dominated, representing as much as 68 percent both in volume and value in 2003. Prepared or preserved products accounted for 28 percent in volume and 26 percent in value, followed by dried or salted products with 3 percent in volume and 6 percent in value. Imports of fresh products were minor, with less than 1 percent both in volume and value in 2003.

Imports of frozen squid and cuttlefish (Rossia macrosoma and Sepiola spp) fluctuated between 33,000 and 63,000 mt from 1988 to 2003 (Table 7). The products came mostly from China, with lesser quantities imported from Thailand, the United States, Viet Nam, and Argentina (Table 8).

Japan's imports of frozen cuttlefish (excluding Rossia macrosoma and Sepiola spp.) have declined since 1995 (Table 7). Thailand remained the largest supplier of frozen cuttlefish with an annual average of 20,000 mt from 1999 to 2003, followed by Viet Nam, Morocco, Malaysia, and China (Table 9).

Imports of squid into Japan from the United States have been almost exclusively confined to *Loligo opalescens* (U.S. Department of Commerce 2004). In 2003, Japan's imports of squid from the United States were worth more than $9.2 million at 6,246 mt, an increase of 39 percent in value and 58 percent in quantity over 1999 imports (Table 9 and Japan Fish Traders Association 2004).

Japan imported 14 mt of fresh cuttlefish (excluding Rossia macrosoma and Sepiola spp.) in 2003, 5 mt each from Italy and Thailand and 4 mt from Hong Kong (Table 10). In 2001, Japan imported 17 mt from Hong Kong and 11 mt from Thailand.

Imports of fresh squid and cuttlefish (Rossia macrosoma and Sepiola spp.) were only 4 mt in 2003 (Table 11). Italy was the single suppler of fresh products in 2003. The Republic of Korea supplied 14 mt of fresh products to Japan in 1999.

Imports of dried or salted squid and cuttlefish increase from 2,484 mt in 1997 to 5,192 mt in 2001, but have since shown a downward trend (Table 7). China has been the major supplier of dried squid and cuttlefish to Japan since 1999, providing Japan with 75 percent in volume of dried or salted products in 2003 (Table 12).

Imports of prepared or preserved squid and cuttlefish (excluding dried or salted squid) increased from 9,525 mt in 1998 to 34,898 mt in 2003 (Table 7). China has consistently been the leading supplier of prepared or preserved products to Japan, providing over 69 percent of the total in 2003 (Table 13).

Trade barriers

Japan regulates imports of squid and cuttlefish with import quotas (IQ) and tariffs. Import quotas are set once a year, with new quotas announced each year. To meet strong demand, the Japanese government has gradually increased the IQ for fresh and frozen squid and cuttlefish from 53,000 mt for 1993 to 59,950 for 2004 (Table 14). The IQ for dried squid and cuttlefish was set at 4,500 mt for 2003.

Product forms which are exempted from import quota regulations include processed squid and cuttlefish which have been flavored, such as prepared or preserved products (i.e. canned, boiled, seasoned, or fermented products). Common cuttlefish (*Sepia officinalis*) has been exempted from import quota since 1978, when the quota was removed from this highly prized species which is not caught in Japanese waters.

While the Ministry of International Trade and Industry is the lead agency in administering the quota system, it coordinates its actions closely with the Fisheries Agency (FAJ) of the Ministry of Agriculture, Forestry, and Fisheries. In addition to setting quotas for imports, the government also controls allocations among the following recipient groups:

A. Traders: Trading companies with past import history;

B. Users: Processors' associations which usually hire traders to perform import functions on their behalf;

C. Fishermen: Fishermen or fishery organizations fishing in overseas waters and designated by FAJ Director General, or those who received import orders from such fishermen or fishery organizations;

D. Joint venture: Japanese joint venture participants in which the Japanese equity exceeds 40 percent;

E. First-Come-First-Served: Companies which have import contracts for squid and cuttlefish signed after the date of the IQ announcement.

There is a great deal of variation in the amount of quota held by recipient groups (Table 15) and individual importers. Trading companies have held the largest share of quota allocations, and since 2000 this has been about 40 percent. The share of the processors' associations has been about 35 percent since 2001. The fishermen's quota increased to 20 percent in 2003.

Imports of squid and cuttlefish are subject to tariffs. As the United States and Japan are signatories to the World Trade Organization (WTO), WTO tariffs apply to U.S. exports of squid products: 3.5 percent for fresh or frozen cuttlefish (excluding Rossia macrosoma and Sepiola spp.), 5 percent for fresh or frozen squid and cuttlefish (Rossia macrosoma and Sepiola spp.), 6.7 percent for smoked products, 10.5 percent for prepared or preserved products (including products in airtight containers), and 15 percent for dried or salted products (Japan Fish Traders Association 2004). Tariff rates are calculated as a percentage of total cost, including insurance and freight.

Table 7. Japan's annual imports of squid and cuttlefish products by volume, 1971-2003 (metric tons).

Year	Fresh/frozen					Dried/ salted	Prepared/ preserved***	Total
	Cuttlefish*		Squid/ cuttlefish**		Sub-total			
	Fresh	Frozen	Fresh	Frozen				
1971	-****	-	-	-	21,330	-	2,832	24,162
1972	-	-	-	-	27,844	-	4,529	32,373
1973	-	-	-	-	28,980	783	7,105	36,868
1974	-	-	-	-	44,762	-	6,155	50,917
1975	-	-	-	-	58,580	856	7,023	66,459
1976	-	-	-	-	68,533	714	5,835	75,082
1977	-	-	-	-	74,732	1,347	2,997	79,076
1978	-	-	-	-	118,142	1,594	2,454	122,190
1979	-	-	-	-	155,868	1,602	2,079	159,549
1980	-	-	-	-	94,375	1,869	1,908	98,152
1981	-	-	-	-	68,776	2,311	1,612	72,699
1982	-	-	-	-	96,399	1,935	2,643	100,977
1983	-	-	-	-	101,661	2,311	2,369	106,341
1984	-	-	-	-	102,581	2,657	5,374	110,612
1985	-	-	-	-	112,883	4,006	7,870	124,759
1986	-	81,759*****	-	43,455*****	125,214	4,804	11,911	141,929
1987	-	62,751*****	-	39,170*****	101,921	4,057	11,730	117,708
1988	239	53,703	4	47,891	101,837	3,773	15,932	121,542
1989	80	67,312	9	48,176	115,577	3,688	10,767	130,032
1990	80	61,166	0	53,030	114,276	3,173	11,151	128,600
1991	98	51,683	0	46,236	98,019	2,923	11,374	112,316
1992	66	48,300	40	52,890	101,296	4,598	9,858	115,752
1993	55	54,001	19	43,998	98,073	3,298	8,034	109,405
1994	86	60,769	81	54,882	115,818	3,288	8,300	127,406
1995	43	53,144	0	33,057	86,244	3,101	11,238	100,583
1996	46	49,345	0	58,124	107,515	3,550	12,143	123,208
1997	32	46,982	3	48,661	95,678	2,484	11,445	109,607
1998	9	44,761	5	48,602	93,377	2,691	9,525	105,593
1999	5	43,373	18	62,513	105,909	3,670	12,947	122,526
2000	13	41,426	1	56,077	97,517	4,912	23,721	126,150
2001	28	38,955	0	43,136	82,119	5,192	26,173	113,484
2002	2	36,092	2	60,362	96,458	4,395	35,351	136,204
2003	14	32,607	4	51,272	83,897	3,799	34,898	122,594

*.....excluding Rossia macrosoma and Sepiola spp.
**.....Rossia macrosoma and Sepiola spp.
***....excluding dried/salted products
-****..not available
*****..fresh and frozen
0......no imports

Source: Japan Fish Traders Association 1972-2004

Table 8. Japan's imports of frozen squid and cuttlefish* by country of origin and volume, 1999-2003 (metric tons).

Country of origin	1999	2000	2001	2002	2003
China	21,119	24,975	16,952	17,299	19,901
Thailand	8,258	7,144	8,229	9,556	9,266
U.S.A.	3,959	6,812	5,568	8,962	6,246
Viet Nam	2,970	4,287	3,722	4,573	4,483
Argentina	3,343	190	60	9,838	2,914
Peru	279	1,492	694	418	1,668
India	2,434	1,873	2,965	1,926	1,354
Taiwan	7,013	914	196	117	1,035
South Africa	444	443	303	498	947
Korea, Rep. of	7,204	1,981	405	672	780
Philippines	370	402	355	477	704
Morocco	1,737	2,904	1,638	1,593	544
New Zealand	613	800	768	2,785	449
Malaysia	619	488	418	833	429
Spain	520	481	752	673	275
Indonesia	124	115	-	50	118
Myanmar	31	37	41	37	59
Sri Lanka	-**	-	-	19	41
Panama	1	-	-	-	30
Mexico	413	35	-	-	20
Australia	1	2	-	17	5
Hong Kong	4	-	-	-	3
Pakistan	50	-	-	-	-
Iran	12	-	-	-	-
Canada	18	10	-	-	-
Uruguay	-	4	48	-	-
Mauritania	555	527	1	-	-
Senegal	1	11	23	-	-
Ghana	2	-	-	-	-
Canary Is.	423	147	-	-	-
Mauritius	-	2	-	-	-
Chile	-	-	-	20	-
Total	62,513	56,077	43,136	60,363	51,272

*.....Rossia macrosoma and Sepiola spp.
-**...no imports

Source: Japan Fish Traders Association 2000-2004

Table 9. Japan's imports of frozen cuttlefish* by country of origin and volume, 1999-2003 (metric tons).

Country of origin	1999	2000	2001	2002	2003
Thailand	20,003	20,826	20,716	20,104	17,294
Viet Nam	5,011	4,885	4,912	4,732	4,101
Morocco	6,289	6,400	4,725	5,062	4,053
Malaysia	2,081	2,599	2,628	2,364	1,999
China	522	736	1,375	1,455	1,379
Yemen	513	572	261	91	752
Senegal	372	270	326	280	497
India	2,079	1,616	1,528	364	392
Ghana	637	549	191	163	358
Philippines	276	502	594	427	339
Korea, Rep. of	669	201	224	427	335
Angola	-**	-	-	80	284
Mauritania	2,052	958	782	302	253
Oman	384	420	364	119	198
Iran	798	572	174	63	148
Pakistan	20	12	84	7	103
Indonesia	146	128	56	42	83
Singapore	8	-	-	-	12
Netherlands	2	-	-	-	11
South Africa	-	-	-	-	6
Spain	58	41	-	-	3
Italy	-	-	4	-	2
Myanmar	-	-	-	-	2
Canary Is.	538	38	-	10	-
U.S.A.	1	-	10	-	-
United Arab Emirates	-	-	1	-	-
Hong Kong	33	14	3	-	-
Panama	258	52	1	-	-
Gambia	541	32	-	-	-
Bangladesh	3	-	-	-	-
Turkey	14	-	-	-	-
Kenya	65	-	-	-	-
Total	43,373	41,426	38,955	36,092	32,607

*....excluding Rossia macrosoma and Sepiola spp.
-**...no imports

Source: Japan Fish Traders Association 2000-2004

Table 10. Japan's imports of fresh cuttlefish* by country of origin and volume, 1999-2003 (metric tons).

Country of origin	1999	2000	2001	2002	2003
Italy	5	5	-	-	5
Hong Kong	4	12	17	2	4
Thailand	1	6	11	-	5
Malaysia	-**	-	-	-	-
China	-	1	-	-	-
Total	5	13	28	2	14

*.....excluding Rossia macrosoma and Sepiola spp.
-**...no imports

Source: Japan Fish Traders Association 2000-2004

Table 11. Japan's imports of fresh squid and cuttlefish* by country of origin and volume, 1999-2003 (metric tons).

Country of origin	1999	2000	2001	2002	2003
Italy	-**	-	-	-	4
Thailand	4	-	-	-	-
Korea, Rep. of	14	-	-	1	-
China	-	1	-		-
Australia	-	-	-	1	-
Total	18	1	-	2	4

*.....Rossia macrosoma and Sepiola spp.
-**...no imports

Source: Japan Fish Traders Association 2000-2004

Table 12. Japan's imports of dried or salted squid and cuttlefish by country of origin and volume, 1999-2003 (metric tons).

Country of origin	1999	2000	2001	2002	2003
China	1,862	3,309	3,914	3,141	2,831
Viet Nam	1,333	1,217	1,158	1,135	825
Thailand	225	114	89	115	76
Korea, Rep. of	105	131	9	4	46
Argentina	146	140	-	-	15
Taiwan	-*	-	18	-	6
Philippines	-	2	4	-	-
Total	3,671	4,912	5,192	4,395	3,799

-*...no imports

Source: Japan Fish Traders Association 2000-2004

Table 13. Japan's imports of prepared or preserved* squid and cuttlefish by country of origin and volume, 1999-2003 (metric tons).

Country of origin	1999	2000	2001	2002	2003
China	7,465	15,504	17,404	22,302	23,921
Mexico	213	859	1,850	4,949	4,041
Thailand	1,953	3,029	3,677	4,440	3,658
Viet Nam	1,190	1,645	1,460	1,415	1,381
Korea, Rep. of	1,452	2,113	1,232	1,320	927
Indonesia	46	125	294	331	367
Peru	287	-	-	218	317
India	269	268	167	231	212
Chile	-**	-	-	87	21
Philippines	17	54	4	1	17
Malaysia	1	35	21	18	13
Spain	5	2	2	1	10
U.S.A.	2	-	19	-	6
Taiwan	7	18	13	7	3
Myanmar	-	7	-	6	2
Singapore	11	8	14	2	2
Italy	-	1	-	1	1
Argentina	-	-	-	-	1
Australia	28	35	15	22	-
Mauritania	2	-	-	-	-
Hong Kong	-	1	-	-	-
New Zealand	-	17	-	-	-
Total	12,947	23,721	26,173	35,351	34,898

*....excluding dried or salted products
-**..no imports

Source: Japan Fish Traders Association 2000-2004

Table 14. Japan's import quotas for fresh or frozen squid and cuttlefish*, 1971-2004 (metric tons).

Year	Import quota	Year	Import quota
1971	7,000	1988	53,000
1972	10,000	1989	53,000
1973	12,000	1990	53,000
1974	14,900	1991	53,000
1975	15,900	1992	53,000
1976	18,200	1993	53,000
1977	40,000	1994	55,100
1978	60,000	1995	55,100
1979	76,500	1996	55,100
1980	18,000	1997	55,100
1981	25,000	1998	55,600
1982	41,000	1999	55,600
1983	38,000	2000	56,450
1984	41,000	2001	58,450
1985	46,000	2002	64,750
1986	53,000	2003	59,450
1987	53,000	2004	59,950

*....excludes *Sepia officinalis*

Sources: Zen Gyoren 1993, 2004
Minato Shinbun Sha 2004

Table 15. Allocation of Japan's import quotas for fresh or frozen squid and cuttlefish* by recipient groups for 1984-1992 and 2000-2003 (metric tons).

Year	Total	Traders	Users	Joint venture	Fishermen	First-come First-served
1984	41,000	20,244	15,956	4,800	0	0
1985	46,000	21,799	18,601	5,600	0	0
1986	53,000	23,598	21,496	4,906	3,000	0
1987	53,000	23,598	21,496	4,906	3,000	0
1988	53,000	23,598	21,496	4,906	3,000	0
1989	53,000	23,598	21,496	4,906	3,000	0
1990	53,000	23,598	21,496	4,906	3,000	0
1991	53,000	23,598	21,496	4,906	3,000	0
1992	53,000	23,598	21,496	4,906	3,000	0
2000	56,450	23,629	20,766	1,620	9,100	1,335
2001	58,450	23,789	20,766	1,620	10,010	2,265
2002	58,950	23,829	20,766	1,620	10,238	2,497
2003	59,450	23,869	20,994	0	11,858	2,729

*...excludes *Sepia officinalis*

Sources: Zen Gyoren 1985-2004

COLD STORAGE HOLDING

Japan's cold storage holdings of squid and cuttlefish fluctuate from year to year. Table 16 shows year-end inventories of frozen squid and cuttlefish between 1981 and 2003. Large increase in inventory are seen starting in 1987, attributed to increased inventories of Ommastrephid squid, (*T. pacificus*, *N. sloani*, and *I. argentinus*). For some unknown reason *O. bartrami*, another Ommastrephid squid, is separated from the other three.

The sharp increases in inventory of the three Ommastrephid squid in 1987, 1988, and 1989 were due to increased landings of *I. argentinus* in the Southwest Atlantic, and of *T. pacificus* in the Northwest Pacific. Inventories of total squid and cuttlefish for 2001, 2002, and 2003 were low due to poor catches.

Table 16. Japan's year-end cold storage holdings of frozen squid and cuttlefish, 1981-2003 (metric tons).

Year end	Ommastrephid squid*	Cuttlefish**	Other squid	Total
1981	52,303	11,771	32,684	96,758
1982	52,331	13,755	53,294	119,380
1983	48,982	14,137	55,302	118,421
1984	54,158	14,592	43,681	112,431
1985	59,117	20,203	65,477	144,797
1986	43,371	29,873	67,582	140,826
1987	115,868	27,455	75,021	218,344
1988	127,246	18,421	71,530	217,197
1989	181,537	23,590	80,770	285,897
1990	137,744	23,862	77,604	239,210
1991	100,148	20,099	81,979	202,226
1992	124,493	14,238	75,889	214,620
1993	86,112	14,099	56,614	156,825
1994	81,636	17,869	66,231	165,736
1995	75,712	18,509	60,952	155,173
1996	113,199	16,784	51,411	181,394
1997	115,665	13,915	55,447	185,027
1998	64,015	12,599	42,335	118,949
1999	78,489	11,961	38,634	129,084
2000	106,528	12,145	58,745	177,418
2001	84,940	10,541	49,313	144,794
2002	72,755	9,420	44,516	126,691
2003	64,447	9,394	39,459	113,300

*.....excludes *O. bartrami*, which is included in "other squid and cuttlefish"
**....excludes *Sepia officinalis*, which is included in "other squid and cuttlefish"

Sources: Ministry of Agriculture, Forestry, and Fisheries, 1983-2004
Hokkai Keizai Shinbun Sha 2004

SUPPLY

The annual supply of squid and cuttlefish for the Japanese market and for export is comprised of the cold storage inventory of January 1, plus that year's domestic catches and imports. The annual supply reached a record high in 1989 due mainly to sharply increased domestic catches (Table 17).

Between 1982 and 2003, annual supply of squid ranged between 580,000 and 1,081,000 mt, averaging 839,000 mt. During this period catches averaged 554,000 mt (about 66 percent of the total supply). The January inventory averaged 166,000 mt (20 percent), and imports 119,000 mt (14 percent) but the latter was higher (19 percent) in 2002 and 2003, when the catch was lower.

Table 17. Japan's annual supply of squid and cuttlefish, 1988-2003 (1,000 metric tons).

Year	Inventory (January 1)	Catch	Imports	Supply	Percent of Supply		
					Inventory	Catch	Import
1982	97	551	101	749	13	74	13
1983	119	539	106	764	16	71	14
1984	118	526	111	755	16	70	15
1985	112	528	125	765	15	69	16
1986	145	463	142	750	19	62	19
1987	141	755	118	1,014	14	74	12
1988	218	661	122	1,001	22	66	12
1989	217	734	130	1,081	20	68	12
1990	286	567	129	982	29	58	13
1991	239	545	112	896	27	61	13
1992	202	724	116	1,042	19	69	11
1993	215	588	109	912	24	64	12
1994	157	296	127	580	27	51	22
1995	166	548	101	815	20	67	12
1996	155	678	123	956	16	71	13
1997	181	643	110	934	19	69	12
1998	185	386	106	677	27	57	16
1999	119	501	123	743	16	67	17
2000	129	621	126	876	15	71	14
2001	177	521	113	811	22	64	14
2002	145	434	136	715	20	61	19
2003	127	382	123	632	20	60	19
average (1982-2003)	166	554	119	839	20	66	14

Sources: Ministry of Agriculture, Forestry, and Fisheries, 1983-2004
Hokkai Keizai Shinbun Sha 2004
Japan Fish Traders Association 1983-2004
FAO 2004

EXPORTS

Japanese exports of squid and cuttlefish products from 2001 through 2003 are summarized in Table 18. In 2003, Japan exported 16,323 mt, amounting to $20.14 million worth of squid and cuttlefish products, a decrease of 33 percent in volume and 20 percent in value from the 2002 level.

Frozen squid and cuttlefish were the most important export products, worth $19.28 million, followed by fresh ($829,000), and dried or salted product ($31,000).

Japanese exports of frozen squid and cuttlefish in 2003 decreased 33 percent in volume and 19 percent in value from the 2002 level (Table 19). China has been the major market, taking 53 percent in volume of Japanese exports of frozen squid and cuttlefish in 2003. Other important buyers in 2003 were New Zealand (16 percent), the Republic of Korea (6 percent) and Thailand (5 percent). Exports to the United States were low but values were high.

Exports of fresh squid and cuttlefish in 2003 also showed a decrease from 2002 (Table 20). Much of the decrease was due to lower exports to the Republic of Korea which is by far the largest market for this product. Thailand purchased 154 mt of fresh squid and cuttlefish in 2003, a notable increase from the 2002 purchase of 10 mt.

Japanese exports of dried, salted, or in brine squid and cuttlefish are minor (Table 21). The main markets for this product in 2003 were are the United States (843 kilo grams), Australia (640 kilo grams) and Hong Kong (348 kilo grams).

Table 18. Japan's exports of squid and cuttlefish by volume and value, 2001-2003.

Product form	Volume (metric tons)			Value (U.S. $1,000)		
	2001	2002	2003	2001	2002	2003
Fresh	632	780	420	1,128	1,299	829
Frozen	42,707	23,692	15,901	35,347	23,859	19,284
Dried/ salted	4	5	2	56	107	31
Total	43,343	24,477	16,323	36,531	25,265	20,143

Source: Japan Fish Traders Association 2002-2004

Table 19. Japan's exports of frozen squid and cuttlefish by country, 2001-2003.

	Volume (metric tons)			Value (U.S. $1,000)		
	2001	2002	2003	2001	2002	2003
China	31,681	14,843	8,418	21,506	11,193	7,805
New Zealand	1,251	1,831	2,562	1,224	1,433	2,805
Korea, Rep. of	1,259	718	928	1,101	945	494
Thailand	1,019	1,716	854	1,277	1,992	973
Russia	247	264	611	270	313	686
Singapore	18	159	360	35	155	603
USA	1,181	681	335	2,995	2,833	2,796
Peru	389	1,082	334	431	1,018	269
Hong Kong	362	335	280	482	601	587
South Africa	234	458	269	359	545	465
Argentina	-*	132	240	-	254	314
Philippines	-	-	134	-	-	88
Canary Islands	1,538	922	129	2,118	1,476	217
Iceland	44	104	100	73	177	176
Panama	9	26	100	13	36	164
Spain	1,960	42	80	1,590	67	130
Canada	365	31	51	705	147	243
Malta	382	-	24	225	-	11
Australia	1	3	17	11	27	29
Malaysia	16	16	16	82	90	88
Bahama	-	23	14	-	37	30
Indonesia	555	230	14	415	190	16
Viet Nam	20	10	13	32	9	50
Taiwan	5	12	13	56	131	154
Guam	6	8	4	81	105	41
North Korea	-	32	1	-	46	17
Switzerland	0**	1	1	5	6	12
Mariana	1	1	1	17	12	11
Venezuela	-	-	0	-	-	5
Chile	-	-	0	-	-	2
Brazil	0	-	0	3	-	2
Ecuador	27	-	-	38	-	-
Fiji	15	-	-	11	-	-
Colombia	11	11	-	15	19	-
Palau	4	-	-	8	-	-
United Kingdom	1	0	-	14	3	-
Congo	56	-	-	81	-	-
West Sahara	37	-	-	46	-	-
Senegal	12	-	-	30	-	-
Total	42,707	23,692	15,901	35,347	23,859	19,284

-*....no exports
0**...more than zero but less than 0.5 metric ton
Total may not add due to rounding
Source: Japan Fish Traders Association 2002-2004

Table 20. Japan's exports of fresh squid and cuttlefish by country, 2001-2003.

	Volume (metric tons)			Value (U.S.$1,000)		
	2001	2002	2003	2001	2002	2003
Korea, Rep. of	574	651	261	1,042	1,054	585
Thailand	-*	10	154	-	16	210
U.S.A.	7	17	4	38	109	20
Hong Kong	1	1	1	5	7	5
Canada	1	0**	0	14	2	2
China	48	98	-	25	96	-
Malaysia	-	2	-	-	10	-
Russia	-	0	0	-	5	7
Singapore	1	-	-	4	-	-
Total	632	780	420	1,128	1,299	829

-*... no exports
0**...more than zero but less than 0.5 metric ton
Total may not add due to rounding

Source: Japan Fish Traders Association 2002-2004

Table 21. Japan's exports of dried, salted, or in brine squid and cuttlefish by country, 2001-2003.

	Volume (kilo grams)			Value (U.S. $1,000)		
	2001	2002	2003	2001	2002	2003
U.S.A.	2,197	2,986	843	41	68	25
Australia	-	-	640	-	-	2
Hong Kong	2,100	-	348	13	-	2
Taiwan	-	-	80	-	-	2
Singapore	42	1,199	-	2	7	-
China	-	1,300	-	-	32	-
Total	4,339	5,485	1,911	56	107	31

-*...no exports

Source: Japan Fish Traders Association 2002-2004

DEMAND

Annual demand for squid and cuttlefish for both the Japanese market and for export (annual supply minus the cold storage inventory on December 31) was 519,000 mt in 2003, a decrease of 12 percent compared with 2002 (Table 22). Between 1982 and 2003, annual demand for squid and cuttlefish ranged between 414,000 and 827,000 mt, averaging 672,000 mt per year.

Table 22. Japan's demand for squid and cuttlefish and apparent consumption, 1982-2003 (1,000 metric tons).

Year	Supply	Cold storage holdings	Demand	Exports	Apparent consumption
1982	749	119	630	6	624
1983	764	118	646	10	636
1984	755	112	643	6	637
1985	765	145	620	4	616
1986	750	141	609	4	605
1987	1,014	218	796	5	791
1988	1,001	217	784	1	783
1989	1,081	286	795	4	791
1990	982	239	743	2	741
1991	896	202	694	7	687
1992	1,042	215	827	9	818
1993	912	157	755	11	744
1994	580	166	414	10	404
1995	815	155	660	14	646
1996	956	181	775	50	725
1997	934	185	749	27	722
1998	677	119	558	12	546
1999	743	129	614	3	611
2000	876	177	699	9	690
2001	811	145	666	43	623
2002	715	127	588	24	564
2003	632	113	519	16	503

Sources: Ministry of Agriculture, Forestry, and Fisheries, 1983-2004
Hokkai Keizai Shinbun Sha 2004
Japan Fish Traders Association 1983-2004
Ministry of Finance 1983-2004
FAO 2004

CONSUMPTION

Squid and cuttlefish combined have remained the leading seafood consumed in Japan (Table 23). While demand is sensitive to price, squid is still the most popular of all fresh and frozen seafood products in Japan. In 2003, Japanese families purchased an average of 3.55 kilo grams (7.82 pounds) of fresh and frozen squid and cuttlefish per household. The number of persons represented in a household has declined, from 3.34 in 1997 to 3.21 in 2003 (Table 23).

The annual Japanese apparent consumption of squid and cuttlefish (demand minus exports) was 503,000 mt, a decrease of 11 percent compared with 2002 (Table 22). Between 1982 and 2003, annual apparent consumption averaged 659,000 mt per year.

Squid is prepared in various ways for the table by the Japanese. The most popular dish is "sashimi" (which typically consists of thin slices of raw seafood) served with soy sauce and condiments. Squid steaks are used in boiled, baked, broiled, or fried form, alone or as an ingredient in other dishes. Squid is also used in dried, salted, smoked, or fermented form. Historically, squid was simply dried, but a variety of processed squid products are available today. Cuttlefish is used mainly for sashimi and sushi. Sashimi is eaten both at home and in restaurants.

Table 23. Average per household consumption in Japan on fresh and frozen fish and shellfish by major species or groups, by quantity, 1997-2003 (grams).

	1997	1998	1999	2000	2001	2002	2003
Squid and cuttlefish	4,665	3,993	4,013	3,994	3,896	3,638	3,545
Tuna	3,170	3,538	3,402	3,400	3,443	3,565	3,373
Salmon	3,051	3,005	2,974	3,140	3,394	3,411	3,103
Saury	2,139	2,122	1,632	1,752	2,147	2,227	2,416
Shrimp	2,738	2,478	2,474	2,383	2,335	2,273	2,087
Yellowtail	1,828	1,953	1,802	1,961	2,026	2,011	1,930
Jack Mackerel	2,467	2,420	2,355	2,222	1,965	1,852	1,897
Pacific Mackerel	1,413	1,811	1,726	1,645	1,519	1,541	1,473
Flounder	1,792	1,728	1,615	1,566	1,485	1,483	1,316
Crab	1,446	1,407	1,258	1,229	1,258	1,267	1,073
Sardine	1,616	1,462	1,656	1,417	1,189	1,031	1,010
Average number of person per household	3.34	3.31	3.30	3.24	3.22	3.19	3.21

Sources: Ministry of Agriculture, Forestry, and Fisheries, 1998-2004; Suisan Tsushin Sha 2003-2004

WHOLESALE PRICES

Squid and cuttlefish are usually sold through auction at consumer wholesale markets located in consumption areas, and at production wholesale markets located at Japanese ports of landing. Squid and cuttlefish are also sold directly to processors and representatives of supermarket chains. The largest consumer wholesale fish market is the Tokyo Central Wholesale Market. In 2003, this market handled about 692,000 mt of seafood products valued at about $4.8 billion (Tokyo Metropolitan Government 2004). It therefore plays an important role in providing indicators about supply and demand of fishery products in Japan. Wholesale prices at the Tokyo Central Wholesale Market generally serve as price indices for fishery products throughout the world.

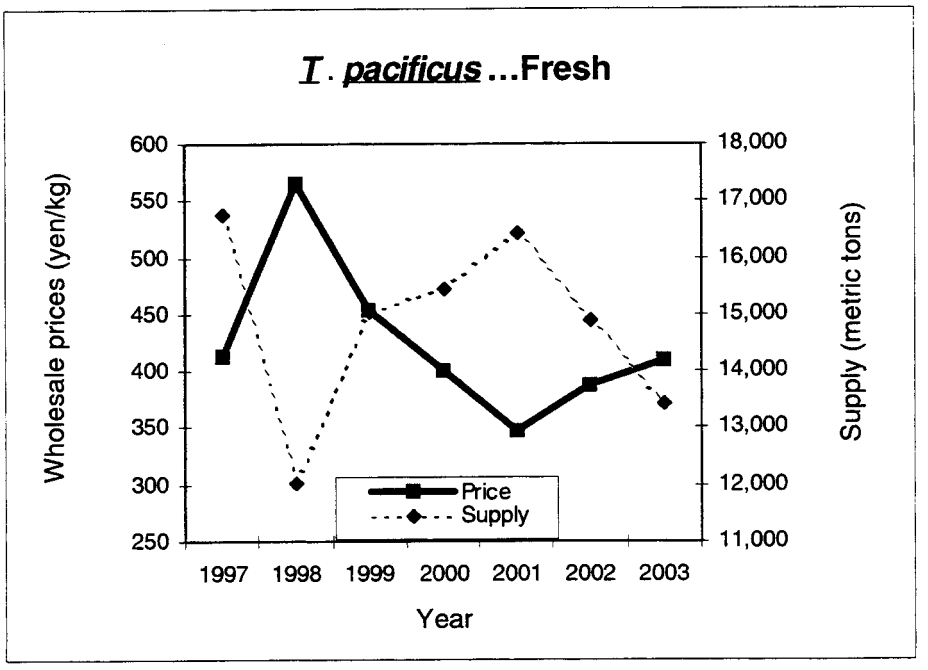
Wholesale prices for squid and cuttlefish vary widely, depending on species, quality, origin, and supply and demand, as well as other factors.

Tables 24 shows annual average wholesale prices of major species of squid and cuttlefish at the Tokyo Central Wholesale Market between 1997 and 2003. All species showed fluctuations in wholesale prices, which were influenced mainly by volume of supply (Figure 1-3); usually, the greater the supply, the lower the price, and vice versa. Fresh *O. bartrami* and *S. officinalis* clearly brought higher prices.

Table 24. Annual average wholesale prices of squid and cuttlefish at Tokyo Central Wholesale Market, 1997-2003 (yen/kg).

Year	*T. pacificus* Fresh	*T. pacificus* Frozen	*O. bartrami* Fresh	*I. argentinus* Frozen	*S. officinalis* Fresh	*S. officinalis* Frozen
1997	413	316	1,402	233	968	563
1998	566	263	854	279	828	580
1999	453	297	1,037	287	859	493
2000	400	230	980	285	830	415
2001	347	261	825	232	709	455
2002	387	264	847	261	736	446
2003	410	278	919	358	826	479

Source: Tokyo Metropolitan Government 1998-2004



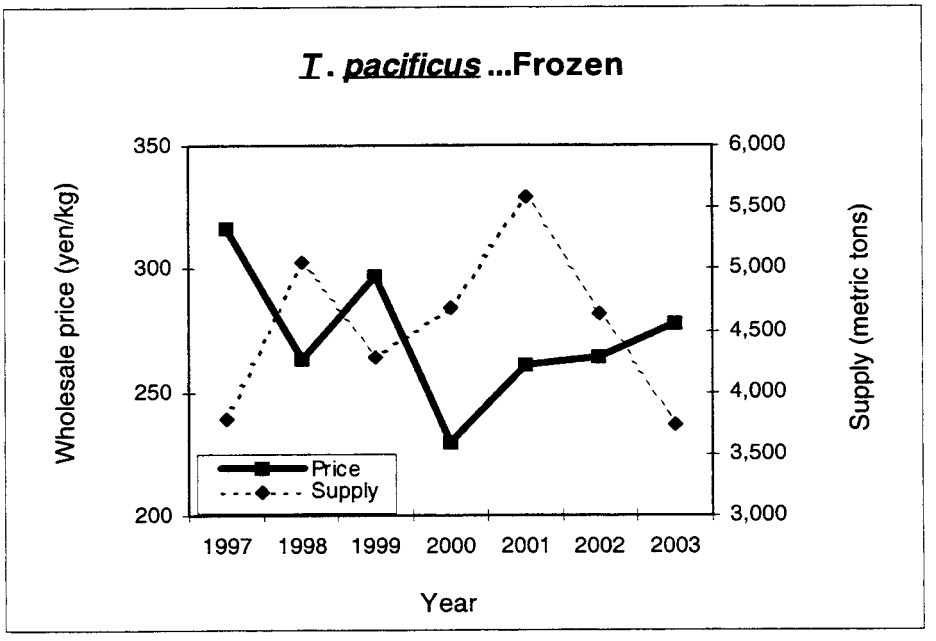
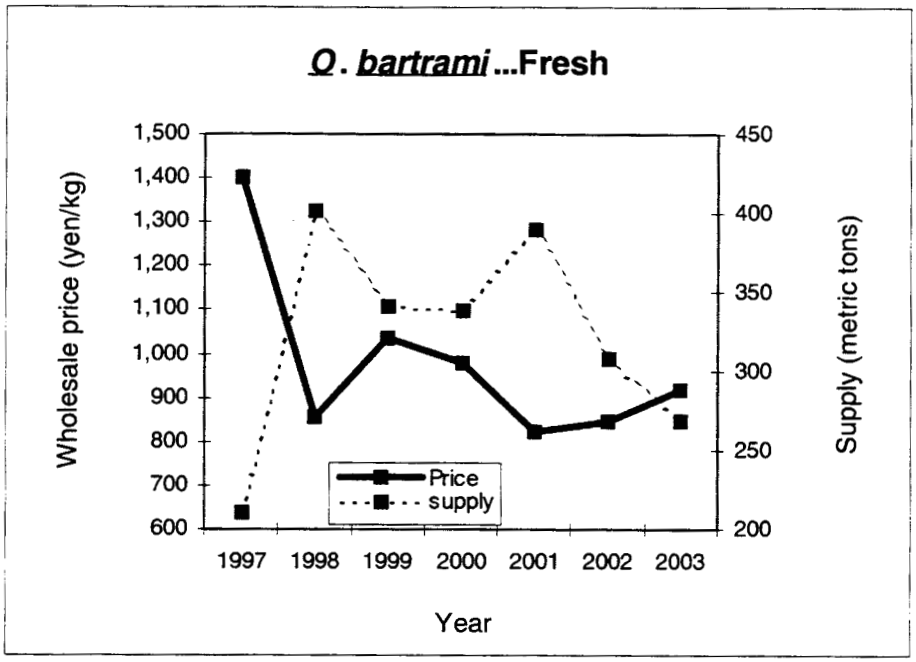


Figure 1. Annual average wholesale prices and supply of *T. pacificus* at Tokyo Central Wholesale Market, 1997-2003.

Source: Tokyo Metropolitan Government 1998-2004



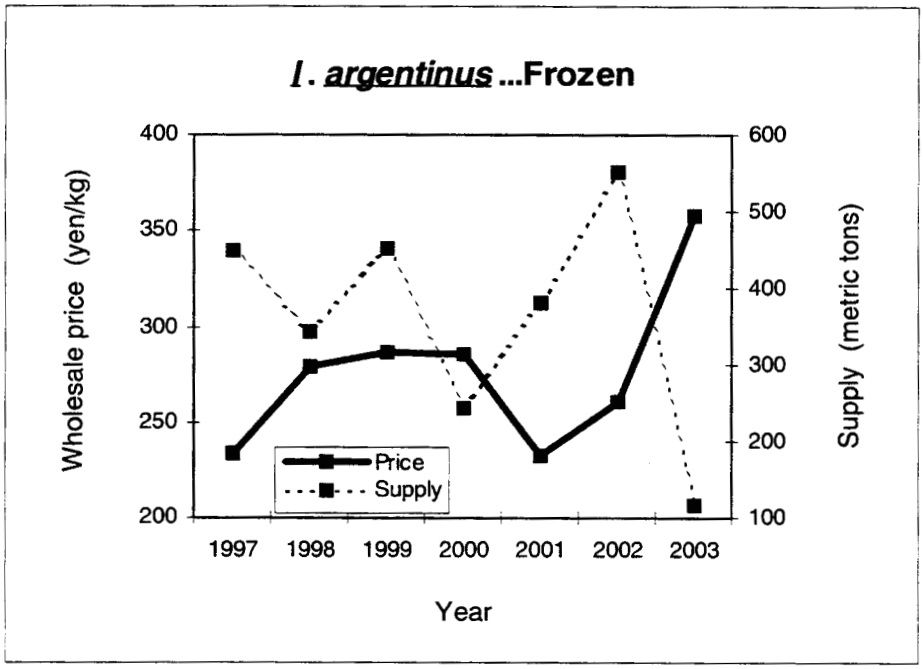
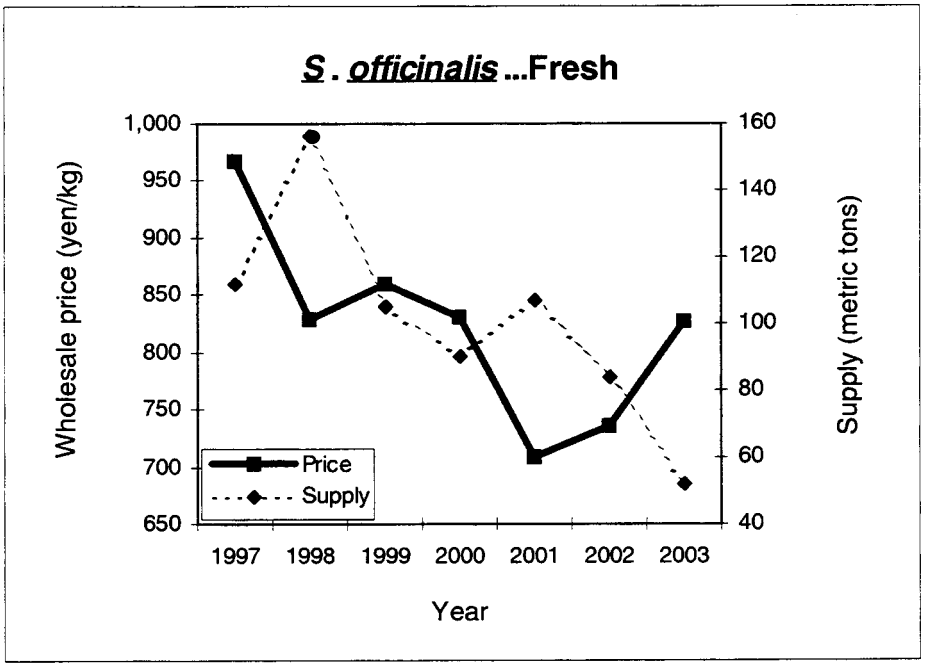


Figure 2. Annual average wholesale prices and supply of *Q. bartrami* and *I. argentinus* at Tokyo Central Wholesale Market, 1997-2003.

Source: Tokyo Metropolitan Government 1998-2004



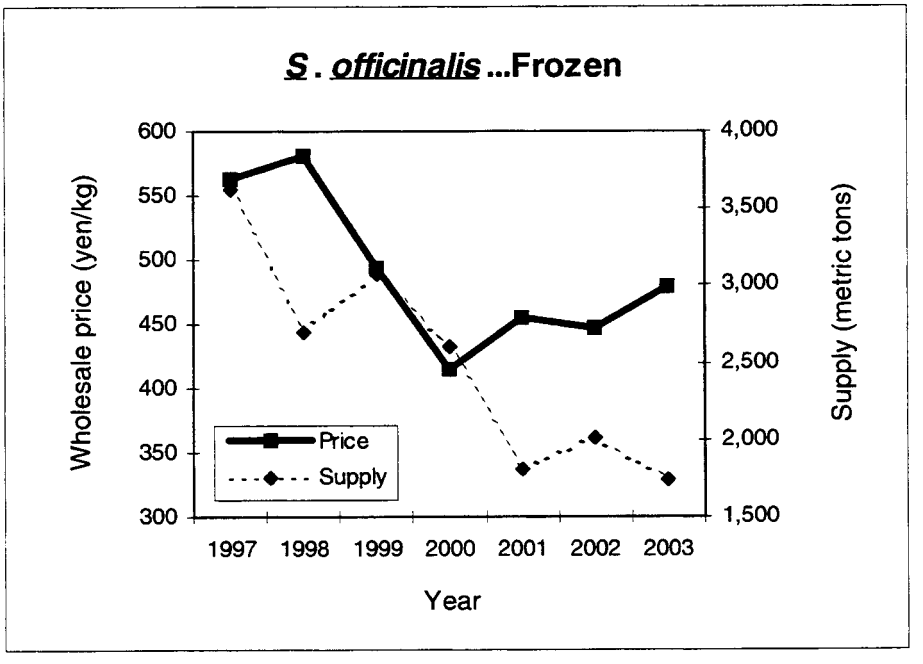


Figure 3. Annual Average wholesale prices and supply of *S. officinalis* at Tokyo Central Wholesale Market, 1997-2003.

Source: Tokyo Metropolitan Government 1998-2004

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