

WORLD RAW AND CANNED TUNA SITUATION

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There is a dearth of comprehensive and reliable data on the world tuna economy^{1/--} particularly about the disposition of tuna landings in such processed forms as frozen and canned tuna, and the consumption of various types of tuna. Despite these deficiencies, however, Tables 1 to 5 (world raw tuna landings and disposition) and Tables 6 to 10 (canned tuna production and disposition) provide a useful partial picture. These figures ought to be looked at with care. A reconciliation of data in some tables has been found impracticable.

Raw Tuna and Tunalike Fish

From 1956 to 1965, world landings^{2/} of raw tuna, bonito, and skipjack increased continuously from 1956 to 1963, with the exception of 1960. They rose from 805,000 metric tons to 1.3 million metric tons (Tables 1 and 2)--an increase of 6.6 percent per annum but, in the last two years of the decade, fell by about 4 percent from 1963. Nevertheless, world landings in 1956 to 1965 rose 4.6 percent per annum.

The slight decline in 1960 reflected a 7 percent reduction in Japanese landings and a 15 percent reduction by "other countries" from 1959. But in 1960 these two areas exceeded their 1958 and 1959 landings. The decline in 1964 is accounted for by a decline of 18 percent in Peruvian and 8 percent in "other countries" landings from 1963. In 1965, Peruvian landings declined by 24 percent from 1964, and Japanese landings also fell slightly. On the basis of a least squares regression^{3/}, the upward trend in supplies in 1956 to 1965 was maintained at an annual rate of 4.9 percent. However, between 1958 and 1965 the growth rate slowed, and it rose only 3 percent per year.

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Note: The tuna and tunalike fish in this article include: Albacore, Bigeye Tuna, Bluefin Tuna, Bonitos, Frigate Mackerels, Little Tunas, Skipjack, Yellowfin Tuna, and various tunalike scombriforms.

^{1/}From the beginning of 1956, FAO changed its fishery classification system. Hence the data prior to 1956 are not comparable. "World" excludes the Sino-Soviet Bloc.

^{2/}Over 70 percent of total world landings are accounted for by Japan, U.S.A., and Peru.

^{3/}"Least squares regression" is a mathematical technique to produce the closest approximation of a line that will go through a set of data from the real world. It is used often to extend (project) a line on a chart to arrive at a likely future situation. It is used too to show a past situation.--Ed.

^{4/}There appears to be some discrepancy in either the total landings figures or in the canned tuna production. The latter figures are perhaps slightly more reliable because one would expect processing plants to supply more definite data. However, reconciliation is not possible.

Of total landings of tuna and tunalike fish in 1956 and 1957, about 75 percent and 81 percent respectively^{4/} were used for canned production. Since then, the percentages have varied between 52 and 57. A detailed discussion of the canned tuna situation is given on pages 27-30.

For 1956-65, apparent direct world consumption of raw tuna and tunalike fish has been arrived at in Table 5 by deducting from total landings the net exports of fresh and frozen tuna, and fresh and frozen tuna used for canned-tuna production. The result follows:

Year	Apparent Raw Consumption (Table 5)
	Landed Weight 1,000 Metric Tons
1956.	276.6
1957.	262.5
1958.	410.2
1959.	474.5
1960.	432.4
1961.	592.3
1962.	554.9
1963.	592.2
1964.	488.5
1965.	441.7

It is obvious that there is some serious discrepancy in the figures for 1956, 1957, and 1958.

Japan A Leading Consumer

Based on Table 5 data, most of the apparent world direct consumption of fresh tuna takes place in less-developed countries. In 1956 and 1957, Japan, Turkey, and Peru accounted for over 80 percent of apparent world direct consumption of raw tuna; Japan's share was 57 percent and 66 percent, respectively. In the following years, the share of these three countries in total consumption of raw tuna varied between 65 and 71 percent. Japan still remained the largest single consumer, but its share fluctuated between 44 and 55 percent.

Table 1 - World Total Landings of Raw Tunas, Bonitos and Skipjacks, 1956-65^{1/}

Year	Total Landings	Landed Weight Equivalent Used for Canned Tuna Production ^{2/}
. . . (Landed Weight, 1,000 Metric Tons) . . .		
1956	804.7	604.0
1957	811.9	656.0
1958	995.0	516.0
1959	1,066.5	560.0
1960	1,057.1	598.0
1961	1,234.0	648.0
1962	1,243.1	644.0
1963	1,257.6	664.0
1964	1,212.0	670.0
1965	1,205.0	696.0

^{1/}Excluding Eastern Europe and China (Mainland).

^{2/}World canned tuna production has been converted to landed weight raw tuna basis by increasing the former (canned production) by 100 percent.

Source: FAO Yearbooks of Fishery Statistics.

Table 4 - Destination of Exports of Frozen Tuna and Tunalike Fish, 1956-65^{1/}

Year	Canada	U.S.A.	E.E.C.	Others	Total
. (1,000 Metric Tons)					
1956	2.2	67.3 (69.0)	13.0	3.8	86.3
1957	1.0	78.5 (86.0)	11.8	11.6	102.9
1958	2/	99.5 (119.4)	14.2	13.8	127.5
1959	1.1	109.3 (141.6)	21.1	33.7	165.2
1960	1.7	102.3 (133.8)	17.9	44.3	166.3
1961	1.1	95.4 (121.8)	24.4	53.6	174.5
1962	1.7	108.1 (161.5)	31.4	53.7	194.9
1963	1.5	94.9 (142.7)	37.3	52.7	185.9
1964	1.8	128.3 (169.2)	27.9	46.2	204.2
1965	2.5	116.4 (169.5)	31.9	45.0	195.8

^{1/}Includes Czechoslovakia, East Germany and Yugoslavia but excludes USSR, Rest of Eastern Europe and China (Mainland).

^{2/}Negligible or insignificant.

Note: U. S. figures in brackets are from U. S. Department of Interior, BCF.

Source: FAO Yearbooks of Fishery Statistics.

Table 2 - World Landings of Tunas, Bonitos, and Skipjacks, 1956-1965^{1/}

	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
. (Landed Weight, 1,000 Metric Tons)										
Africa:										
Angola	10.0	10.6	10.8	14.4	8.6	8.5	9.7	8.5	7.8	8.4
Morocco	6.0	7.0	16.2	7.1	8.9	8.1	8.5	9.8	8.8	9.6
Tunisia	1.5	1.7	1.3	-	-	-	-	-	-	-
North America:										
Canada	0.2	0.1	2/	0.2	0.2	0.1	0.3	0.5	1.1	0.6
Cuba	-	-	-	-	3.2	3.0	1.2	2.4	1.6	2.2
Mexico	0.8	0.6	2.7	4.1	3.9	3.4	4.4	4.5	4.6	4.3
U.S.A.	161.2	146.8	159.0	141.2	145.4	165.8	155.7	164.6	161.9	172.9
S. America:										
Argentina	2/	2/	2/	1.1	2.1	1.7	1.3	2.7	2.0	1.8
Brazil	-	-	-	6.4	5.5	5.5	4.7	4.3	2.6	-
Chile	5.4	2.6	4.0	2.6	2.4	3.7	2.4	2.7	6.2	11.3
Ecuador	6.8	9.9	11.8	14.8	19.1	11.7	11.4	13.5	9.8	14.8
Peru	97.0	71.2	85.1	116.2	124.1	134.2	113.9	118.8	97.2	74.0
Asia:										
China (Taiwan) . .	16.7	17.4	19.9	21.3	17.2	23.4	32.2	28.2	32.2	26.8
Israel	0.2	0.3	0.5	0.5	0.5	0.7	1.0	0.9	1.1	1.5
Japan	356.6	397.6	455.0	518.3	483.9	593.7	641.2	614.3	607.0	592.0
Korea, South . . .	2/	2/	2/	2/	2/	2/	2/	2.8	5.4	-
Turkey	55.5	40.7	27.6	11.1	32.5	42.1	4.0	19.2	11.2	-
Europe:										
France	17.4	25.1	28.7	22.7	31.8	30.0	34.2	38.3	40.8	35.2
Greece	3.3	5.3	1.3	0.9	-	-	-	3.4	3.5	3.8
Italy	-	-	3.4	3.3	2.6	4.2	3.1	4.0	3.7	3.4
Portugal	6.9	10.1	7.0	9.4	9.0	9.0	11.2	13.3	9.4	11.8
Spain	40.2	42.2	56.2	43.9	46.6	35.3	53.8	51.4	51.9	57.2
Oceania:										
Australia	0.5	1.0	1.4	2.5	3.2	4.4	4.8	5.0	8.1	7.2
Others	18.4	21.7	98.1	124.5	106.4	145.5	144.1	144.5	134.0	169.0
Total	804.7	811.9	995.0	1,066.5	1,057.1	1,234.0	1,243.1	1,257.6	1,212.0	1,205.0

^{1/}Excluding Eastern Europe and China (Mainland).

^{2/}Negligible or insignificant.

Source: FAO Yearbooks of Fishery Statistics and U. S. Department of Interior, BCF, for U. S. figures.

Table 3 - Exports of Frozen Tuna and Tunalike Fish, 1956-1965

Country	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
. (1,000 Metric Tons)										
Canada	4.4	4.8	3.5	3.9	2.8	0.3	0.4	1.2	0.7	0.9
Japan	58.7	74.1	102.1	128.6	140.4	148.0	170.5	157.2	187.4	177.8
Norway	6.6	6.2	5.1	7.0	5.3	6.5	4.1	4.8	2.9	6.5
Denmark	2.6	3.7	-	-	-	-	-	-	-	-
Sweden	1.4	1.9	-	-	-	-	-	-	-	-
Peru	12.6	12.2	16.8	25.7	117.8	19.7	19.9	22.7	13.2	10.6
Total	86.3	102.9	127.5	165.2	166.3	174.5	194.9	185.9	204.2	195.8

Source: FAO Yearbooks of Fishery Statistics.

Table 5 - Apparent World Consumption of Raw Tuna and Tunalike Fish, 1956-65^{1/}

Country	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
	(Landed Weight, 1,000 Metric Tons ^{2/})									
Portugal	-	-	1.2	-	-	-	0.6	1.5	-	-
Spain	-	-	-	11.9	12.2	7.5	17.8	13.4	21.5	15.0
Japan	157.9	172.3	217.3	220.1	190.6	271.9	303.3	289.5	243.8	257.6
Turkey	53.7	39.1	25.8	10.7	31.7	41.9	3.8	19.2	11.2	-
Morocco	2.4	-	11.2	1.7	3.1	0.9	-	9.0	2.2	1.6
Peru	33.0	9.0	33.9	82.8	59.0	108.6	58.2	89.3	80.0	35.0
Rest of World ^{3/}	29.6	42.1	120.8	147.3	135.8	161.5	171.2	170.3	129.8	132.5
Total	276.6	262.5	410.2	474.5	432.4	592.3	554.9	592.2	488.5	441.7

^{1/}Excluding Eastern Europe and China (Mainland).

^{2/}Apparent world consumption has been arrived at by deducting from total landings the net exports of fresh and frozen tuna, etc. (frozen tuna was converted to landed weight by increasing its weight by 30%) and of tuna, etc., used for canned production (canned tuna was converted to landed weight by increasing it by 100%).

^{3/}Some of the main countries included in this group are: Angola, Mexico, Argentina, Brazil, Chile, Ecuador, and China (Taiwan).

Source: FAO Yearbooks of Fishery Statistics.

Table 6 - World Production and Exports of All Fish in Airtight Containers, 1956-1965^{1/}

Year	Production			Exports		
	Total	Of Which Tuna, Etc.	Tuna, Etc. as % of Total	Total	Of Which Tuna, Etc.	Tuna, Etc. as % of Total
	(1,000 Metric Tons)					
1956	1,263.0	302.0	24	368.5	56.6	15.4
1957	1,287.0	328.0	25	359.2	72.6	20.2
1958	1,321.0	258.0	20	421.3	49.9	11.8
1959	1,359.0	280.0	21	457.2	61.1	13.4
1960	1,466.0	299.0	20	444.9	58.6	13.1
1961	1,547.0	324.0	21	455.6	66.1	14.5
1962	1,562.0	322.0	21	465.8	65.6	14.0
1963	1,517.0	332.0	22	423.3	64.7	15.3
1964	1,637.0	335.0	21	542.0	67.0	12.4
1965	1,702	348.0	20	483.0	62.0	12.8

^{1/}Excludes Eastern Europe and China (Mainland).

Source: FAO Yearbooks of Fishery Statistics.

Japan consumed 43 to 47 percent of its total landings, except in 1960 and 1964, when the figure dropped to about 40 percent simultaneously with a drop in landings. Fluctuations in consumption appear to depend on fluctuations in domestic catch. Peru's raw tuna consumption fluctuated between 13 and 82 percent of her total landings. There does not appear to be any stable growth pattern in consumption since 1959. Turkey's landings declined from 54,000 metric tons in 1956 to 11,200 tons in 1965--and with them consumption. It appears that the pattern of raw tuna consumption in major areas largely reflects the availability of domestic supplies, and perhaps traditional eating habits as well. Nevertheless, consumption of raw tuna has increased in Japan from 1956 to 1965 by 5.6 percent per year. These figures should be looked at cautiously, especially in projecting future demand.

Consumption by Rest of World

Apparent direct consumption of raw tuna in the "rest of the world" shows an almost continuous increase from 29,600 tons in 1956 to

170,000 tons in 1963--even after allowing that the data for the early years are probably not homogeneous. But in the following two years, when total landings declined, consumption fell to around 130,000 to 133,000 tons. Assuming greater homogeneity in the available statistics since 1958, the rate of growth through 1963 appears to be 7.1 percent per annum. However, in 1958 to 1965, rate of growth dropped to 1.1 percent per annum. Almost all countries in this group catch their own tuna for domestic direct consumption.

In 1956-1965, least squares regression indicate that direct consumption of raw tuna rose at the rate of about 6.2 percent per year based on Table 5 but, from 1958 to 1965, increased only by about 2 percent per annum.

During 1956-65, most of the world's landings of raw tuna and tunalike fish were consumed within their landing areas. A very small proportion of total landings enters international trade. In recent years, about 10 to 17 percent of total landings was exported in the form of frozen tuna.

^{5/}Some countries included in this group are: Angola, Mexico, Argentina, Brazil, Chile, Ecuador, and China (Taiwan).

World Exports Rose

World exports of frozen tuna and tunalike fish rose from 86,300 metric tons in 1956 to 204,200 metric tons in 1964 (Table 3)--an 11.3 percent rate per annum. In 1963, however, they declined 4.6 percent from 1962, but this was accounted for by a drop in Japan's total landings. In 1965, they fell 4 percent from 1964, in line with declines in Peruvian and Japanese landings. Based on a least squares regression, the growth rate between 1956-65 was 8.7 percent per annum; in 1958 to 1965, it rose only 5.3 percent per year. This means that the world exports of frozen tuna and tunalike fish in 1956 to 1965, or in 1958 to 1965, rose faster than landings and consumption of raw tuna (Table 5).^{6/}

Among individual exporters of frozen tuna and tunalike fish, Japanese exports accounted for nearly 70 to 92 percent of total world exports. Japan was followed by Peru with 5 to 16 percent. Japanese exports of frozen tuna and tunalike fish increased continuously from 58,700 tons in 1956 to 187,400 tons in 1964--up about 17 percent per annum.^{7/} But in 1963, exports fell about 7 percent below 1962 and, in 1965, 5 percent below 1964. This was due perhaps to low landings in those years. On the other hand, Peruvian exports of frozen tuna and tunalike fish fluctuated from year to year with no detectable trend. For example, Peru recorded in 1961 its highest landings, but exports of frozen tuna and tunalike fish fell to 19,700 tons. Yet, in 1959, total landings were 116,200 tons, lower than in 1961, and Peru exported 25,700 tons (Tables 2 and 3). On the whole, then, it seems that Japan has maintained a powerful hold over exports of frozen tuna to world markets.

U. S. and EEC Imports

In recent years, the U. S. and the European Economic Community (EEC), the Common Market, imported nearly 72 to 79 percent of total frozen tuna exports; the U. S. accounted for over 50 percent. However, U. S. imports fluctuated between 67,300 tons and 128,300 tons in 1956-65. Based on a least squares regression, despite wide fluctuations during this period, imports rose at 4.1 percent rate per

annum, which is in line with growth in U. S. consumption of canned tuna.^{8/} But, in 1958 to 1965, U. S. imports rose only at 2.3 percent rate per year (least squares regression). However, it should be borne in mind that U. S. landings (Table 2) have remained fairly stable in recent years. But consumption of canned tuna has been increasing^{8/}, and this could only be met by imports of frozen tuna. It seems that there is some discrepancy in the figures giving a declining import trend. Alternatively, if BCF figures of U. S. imports (figures in brackets, Table 4) are considered then, based on a least squares regression, the growth in 1956-65 and 1958-65 was 8.3 percent and 4.7 percent per annum. This explains that increased consumption of canned tuna has been met by imports of frozen tuna.

Imports into EEC also fluctuated between 13,000 tons to 37,300 tons per year. On the average, they rose from 13,000 tons per year in 1956-58 to 32,400 tons per year in 1963-65. That is, imports more than doubled.^{9/} The apparent growth is credible considering that the absolute quantities are modest and at least one EEC country, Italy, expanded canned tuna production at a similar rate in this period. Consumption of canned tuna in EEC as a whole, however, is increasing at only a 4.3 percent rate per annum. Imports into the "rest of the world" have also increased tremendously--from about 9,700 tons in 1956-58 to nearly 48,000 tons in 1963-65. Yet in most recent years, there has hardly been growth in the "rest of the world". Nevertheless, it accounts for about 28 to 30 percent of total world imports (Table 4).

1956-65 Landings and Consumption

Principal findings of the raw tuna situation thus far are that landings in 1956-65 rose at 5 percent rate per annum, but growth rate in 1958 to 1965 slowed to 3 percent per year. World consumption of raw tuna in 1956-65 grew at 6.2 percent rate per year based on Table 5. Most of this growth took place in the developing countries. World exports of frozen tuna during 1958-65 rose 5.3 percent per year; growth during 1956-65 was at 8.7 percent rate per year, but the figures for 1956 and 1957 are not entirely satisfactory.

^{6/}Exports of canned tuna barely kept pace with production and consumption of canned tuna and tunalike fish.

^{7/}It appears that Japan expanded its frozen tuna exports at a faster rate than exports of canned tuna (see Table 8).

^{8/}All imports of frozen tuna in the U. S. are used for canning. In the same period canned tuna consumption rose by 3.3 percent per year.

^{9/}In EEC, frozen tuna imports are believed used largely for canning.

Canned Tuna and Tunalike Fish

In 1956-65, world^{10/} production of all fish in airtight containers increased continuously from 1.26 million metric tons to 1.70 million metric tons (Table 6)--up about 35 percent, or a compound annual increase rate of 3.4 percent. Production fell by 3 percent in 1963 (Table 6), but it seems more likely that this is due to natural or cyclical reasons (possibly a short catch in Japan or a drawing down of canned tuna inventories) than to a reversal of the implied long-term demand trend.

World production of canned tuna, bonito, etc., accounted for nearly 25 percent of canned fish production in 1956 and 1957, but it has varied since between 20 and 22 percent (Table 6).

During 1956-65, world production of tuna and similar fish in airtight containers fluctuated between 258,000 and about 348,000 tons per year. There was almost no growth between 1957 and 1963. There was, however, a detectable upward trend during the period as a whole. Based on a least squares regression, it seems fair to say that production did grow by about 1.9 percent per annum, or just over half the rate at which total canned fish production has been growing. The sharp decline in 1958 was due to a decline in production in France, Japan, Peru, and Portugal; in the following years, production growth in those countries was very slow.

U. S. Ate About Half World's Canned Tuna

In 1956-65, over 75 percent of the apparent world canned-tuna consumption was concentrated in EEC, Portugal, Spain, the U.K., the U. S., Japan, and Mexico. The U. S. consumed most--nearly 50 percent of apparent total world consumption (Table 10). Demand trends varied radically among these countries, however. Consumption in Japan has been declining at the rate of about 14 percent per annum; in Spain, at 2 percent per year from 1956 to 1964^{11/}; and in the U.K., by about 7 percent (Table 10). On the other hand, consumption in EEC has been increasing at 4.3 percent rate, 1956 to 1964^{11/}; in the U. S., by about 3.3 percent per annum. These conflicting trends indicate the need for extreme caution in assessing future demand for tuna. The comparative growth rates for the U. S. and EEC are roughly consistent with comparative levels and growth

rates of per-capita income in these areas. However, the same can hardly be said for the U.K., Japan, and Spain. Possibly changes in eating habits in specific countries are as important, if not more so, in determining the demand trend for canned tuna as are the level and trend of per-capita income.

Consumption in the rest of the world appears to have fluctuated with movements in supplies.^{12/} In 1957 and 1965, when world production of canned tuna was at its highest, consumption in the "rest of the world"^{13/} reached very high levels. In the intervening years, however, the apparent consumption declined when the supply situation became tighter.

Most of the world's production of all canned fish, and of canned tuna in particular, appears to be consumed within the producing countries. However, a substantial proportion does enter international trade channels. In recent years, $\frac{1}{4}$ and $\frac{1}{3}$ of world production of canned fish has been exported. Similarly, around $\frac{1}{5}$ of world canned-tuna production has gone into export channels. Tuna has accounted for only 12 to 15 percent of world exports of all canned fish, except in 1957, when the proportion reached a high of 20 percent.

Exports Fluctuate

While world production of all canned fish and canned tuna has tended to increase more or less steadily since 1956, exports have tended to fluctuate rather frequently and quite widely, especially of tuna. Consequently, it is extremely difficult to determine what the trade trend has been. For canned fish as a whole, there undoubtedly was a strong upward trend in export trade between 1956 and 1964, despite downward fluctuations in 1957, 1960, 1963, and 1965. Such exports increased from 368,500 tons to 542,000 tons (Table 6)--up about 47 percent, an average compound rate of 5 percent per year. Exports in 1963 and 1964, however, declined by about 9 percent from 1962 and 1964, respectively. For canned tuna and tunalike fish, the secular trend of world export trade is even more obscure because of extremely wide gyrations early in the period, when an increase of 28 percent in 1957 was followed by a fall of 30 percent in 1958, and another rise of 20 percent in 1959 (all changes measured with respect to level of preceding year). The analysis of exports by destination in Table 9 indicates that these fluctuations may have reflected partly demand factors (see EEC

^{10/}"World" excludes the Sino-Soviet bloc.

^{11/}The increase in apparent consumption in Spain and a drop in EEC consumption in 1965 over 1964 (Table 10) appears due to fortuitous circumstances rather than any change in long-term trend.

^{12/}Consumption is believed to be price elastic, but lack of data on prices prevents any price analysis.

^{13/}Among the principal countries in this category are Argentina, Canada, China (Taiwan) and Australia.

Table 7 - Production by Countries of Tunas, Bonitos, and Skipjacks, in Airtight Containers, 1956-1965^{1/}

	1956 ^{2/}	1957 ^{2/}	1958	1959	1960	1961	1962	1963	1964	1965
..... (1,000 Metric Tons)										
Africa:										
Angola	1.2	1.5	-	-	-	-	-	-	-	-
Morocco	1.8	5.5	2.5	2.7	2.9	3.6	4.9	2.6	3.3	4.0
Tunisia	0.9	0.6	0.4	-	-	-	-	-	-	-
North America:										
Canada	1.0	0.2	0.1	1.1	0.9	0.5	1.4	1.0	2.6	-
Cuba	-	0.4	0.3	0.6	-	1.7	0.9	0.7	0.3	0.5
Mexico	0.3	-	0.4	0.6	0.7	2.5	1.5	1.9	7.0	6.8
United States	112.9	113.8	122.9	124.6	132.7	141.9	152.5	148.8	158.9	162.7
South America:										
Argentina	4.1	9.1	-	1.2	2.2	1.1	0.7	2.4	0.9	1.2
Brazil	-	-	0.1	0.1	0.2	0.2	0.1	-	0.2	0.2
Chile	1.7	1.3	0.9	0.8	0.3	1.4	1.0	0.8	1.8	1.6
Ecuador	-	0.4	0.9	1.2	1.6	3.7	2.3	2.8	3.4	3.3
Peru	23.8	23.8	14.7	-	21.0	-	14.9	19.0	-	12.7
Asia:										
China (Taiwan)	0.3	0.9	0.7	0.4	0.7	1.2	1.5	2.8	3.6	2.1
Israel	-	-	0.1	0.2	0.2	0.2	0.2	0.2	0.4	0.5
Japan	61.2	64.5	52.5	65.5	55.4	64.7	58.1	60.2	59.8	52.1
Korea, South	4.2	5.4	3/	3/	4.3	5.2	0.3	0.1	-	0.1
Turkey	0.9	0.8	0.9	0.2	0.4	0.1	0.1	-	-	-
Europe:										
France	4/29.4	4/44.6	19.3	22.4	21.4	21.0	22.0	23.0	23.3	-
Greece	0.7	1.2	1.2	1.0	-	1.0	1.0	0.8	0.8	0.8
Italy	13.0	12.0	15.0	15.0	28.0	32.0	33.2	39.2	35.5	42.0
Portugal	9.7	10.6	2.9	4.5	5.2	4.3	5.3	5.9	5.7	7.3
Spain	21.6	21.4	21.1	16.0	17.2	13.9	18.0	15.9	15.2	21.1
Oceania:										
Australia	0.8	1.5	0.5	0.7	0.9	1.4	1.7	1.9	2.1	2.5
Others	12.5	8.5	0.6	21.2	2.8	22.4	0.4	2.0	10.2	26.5
Total	302.0	328.0	258.0	280.0	299.0	324.0	322.0	332.0	335.0	348.0

^{1/}Excludes Eastern Europe and China (Mainland).^{2/}Tunas, Bonitos, Mackerels, Etc., in airtight containers.^{3/}Negligible or insignificant.^{4/}Includes Algeria.

Source: FAO Yearbooks of Fishery Statistics.

Table 8 - Breakdown of World Exports of Canned Tuna and Tunalike Fish, 1956-65^{1/}

Year	Morocco	United States	Peru	Japan	France	Portugal	Spain	Norway	Total
..... (1,000 Metric Tons)									
1956	1.5	1.2	16.1	25.8	-	7.6	3.1	1.3	56.6
1957	2.3	7.9	15.5	33.7	-	9.3	3.4	0.5	72.6
1958	2.5	0.1	13.3	29.1	-	2.3	2.6	-	49.9
1959	2.7	0.1	17.3	33.1	-	3.9	4.0	-	61.1
1960	2.9	0.2	15.1	32.4	-	3.4	4.6	-	58.6
1961	3.6	0.1	18.9	35.5	1.3	3.2	3.5	-	66.1
1962	4.9	0.2	13.3	38.6	1.1	3.7	3.8	-	65.6
1963	2.6	0.1	12.9	40.2	0.9	4.0	4.0	-	64.7
1964	3.3	-	15.1	43.9	0.5	2.3	2.3	-	67.4
1965	1.6	-	10.6	42.9	0.5	3.6	2.3	-	61.5

^{1/}Excludes Eastern Europe and Mainland China; 1956 and 1957 include mackerel instead of skipjack.

Source: FAO Yearbooks of Fishery Statistics.

Table 9 - Destination of World Exports of Canned Tuna and Tunalike Fish, 1956-65^{1/}

Year	E.E.C.	U.S.A.	U.K.	Rest of World	Total
..... (1,000 Metric Tons)					
1956	12.7	26.2	6.0	12.0	56.9
1957	14.6	30.6	4.0	22.0	71.2
1958	8.3	26.0	2.8	12.7	49.8
1959	12.6	27.4	2.4	18.7	61.1
1960	15.6	25.1	2.1	15.8	58.6
1961	14.0	27.3	3.4	21.4	66.1
1962	17.3	26.2	2.7	19.4	65.6
1963	15.1	25.0	3.4	21.2	64.7
1964	18.6	23.6	3.9	21.3	67.4
1965	18.2	21.9	3.1	18.2	61.5

^{1/}Excludes Eastern Europe and Mainland China.

Source: FAO Yearbooks of Fishery Statistics.

and USA) and partly supply factors (see imports into "rest of world"). If due allowance is made for the distorting effects of the violent fluctuations of the late 1950's, it is apparent that growth has been taking place in world exports of tuna. It is difficult to measure the precise trend but it could be 0.9 percent per year (taking account either of terminal years 1956 and 1965, and 1.1 percent per annum measuring from 1956-58 to 1963-65), or 1.0 percent per year (based on least squares regression). This would mean that world trade in canned tuna has just about kept pace with growth in world production and consumption.

Table 10 - Apparent World Consumption of Canned Tuna and Tunalike Fish, 1956-65^{1/}

Year	E.E.C.	Portugal	Spain	U.K.	U.S.A.	Japan	Morocco	Rest of World	Total
(1,000 Metric Tons)									
1956	55.1	2.1	18.5	6.0	137.9	35.4	0.3	47.0	302.3
1957	71.2	1.3	18.0	4.0	136.5	30.8	3.2	61.6	326.6
1958	42.6	0.6	18.5	2.8	148.8	23.4	0	21.2	257.9
1959	50.0	0.6	12.0	2.4	151.9	32.4	0	30.7	280.0
1960	65.0	1.8	12.6	2.1	157.6	23.0	0	36.9	299.0
1961	65.7	1.1	10.4	3.4	169.1	29.2	0	45.1	324.0
1962	71.4	1.6	14.2	2.7	178.5	19.5	0	34.1	322.0
1963	76.4	1.9	11.9	3.4	175.7	20.0	0	44.7	332.0
1964	76.9	3.4	12.9	3.9	182.5	15.9	0	39.5	335.0
1965	59.7	3.7	18.8	3.1	184.6	9.2	2.4	69.5	348.0

^{1/}Excludes Eastern Europe and China (Mainland).

Source: FAO Yearbook of Fishery Statistics.

Table 11 - Annual Weighted Average Price of All Types of Raw Tuna Ex-Vessel (California), 1956-65

Year	Dollars Per Ton	
		Deflated Price ^{1/}
1956	262	274
1957	257	261
1958	268	268
1959	255	255
1960	248	248
1961	264	264
1962	289	289
1963	251	252
1964	255	255
1965	264	259

^{1/}Deflated by the U. S. Wholesale Price Index, 1964=100.

Source: U. S. Department of Interior, BCF.

Table 12 - U. S. Wholesale Price of Canned Tuna, 1956-65

Year	Domestic Canned Tuna Price		Imported Canned Tuna Price ^{2/}	
		Deflated Price ^{1/}		Deflated Price ^{1/}
(Dollars Per Ton)				
1956	1,103	1,152	n.a.	-
1957	1,127	1,144	n.a.	-
1958	1,163	1,164	n.a.	-
1959	1,087	1,086	n.a.	-
1960	1,102	1,100	883	881
1961	1,129	1,131	937	939
1962	1,202	1,201	1,009	1,008
1963	1,127	1,129	1,014	1,016
1964	1,381	1,381	1,238	1,238
1965	1,385	1,358	1,201	1,071

^{1/}Deflated by the U. S. Wholesale Price Index, 1964=100.

^{2/}Mostly Japanese tuna in brine.

Source: U. S. Department of Interior, BCF.

U. S. Exports Virtually Nothing

Among individual exporters, U. S. exports declined from a high during the period of 7,900 tons in 1957 to virtually nothing in recent years, while some other major exporters, such as Peru, Portugal, and Spain, have shown stagnating or declining trends (Table 8). Japan is the only exporter to improve its position. Exports rose from 27-32 thousand tons early in the period to 40-42 thousand tons in recent years. In effect, Japan has not only preempted virtually all growth in the world export market since 1959, but she has also cut into its competitors' markets.

EEC, the U. S., and the U.K. imported just over 75 percent of total world imports (Table 9). Imports into U.K. have declined by about 45 percent from 1956, undoubtedly reflecting decline in demand. In the U. S., imports barely remained level despite growth in consumption. The growth in U. S. demand has been fed primarily through increased domestic production of canned tuna from imports of frozen tuna. Only in the "rest of the world" and in EEC have imports benefited from growing demand. In EEC, imports increased by 5,300 tons per year--from an average 12,000 tons per year in 1956-58 to 17,300 tons per year in 1963-65 (a 4.7 percent growth rate per year while consumption grew by almost 15,000 tons per year (from 56,300 tons to 71,000 tons). Most growth in imports has been in the "rest of the world", which absorbs only about 25 to 30 percent of total exports (Tables 9 and 10).

Price data for tuna are extremely scarce and the reliability of some series is questionable. During 1956-65, annual weighted average price of all types of raw tuna, exvessel California, in real terms (deflated by U. S. Wholesale Price Index 1964 = 100), fluctuated between a minimum and maximum of \$248 to \$289. The decade average was \$263. The real price of canned tuna in the U. S. similarly has shown no decided trend; it has averaged \$1,183 per ton.

CONCLUSION

On the whole, it appears that world landings of raw tuna and tunalike fish are likely to grow, but most of the growth is likely to take place in areas other than the U. S. In fact, U. S. landings in 1956-65 have risen by less than 1.2 percent per annum based on a least squares regression; in most recent years, they have stagnated.

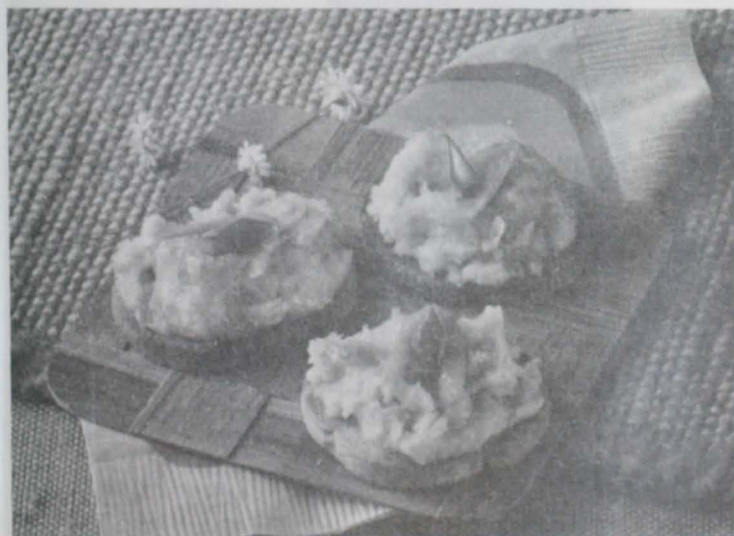
Domestic consumption of raw tuna apparently is concentrated in less developed areas, except in Japan, and depends on domestic catch; that is, it is not supplied by international trade.

Some countries, EEC, Canada, and the U.S., for example, depend on frozen tuna for all or part of their canned production. This has resulted in increasing international trade in frozen tuna. However, it is not clear whether trend of this trade has been 8.7 percent per year (1956-65) or 5.3 percent per year (1958-65). The latter should not be ignored since it represents more recent years. Japan has the lion's share of the export trade; she is not expected to lose her lead. Since demand for

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canned tuna in frozen-tuna-importing countries is increasing at 4.3 percent rate per annum in EEC, and 3.3 percent in the U. S., long-term rate of growth in demand for frozen tuna is likely to go no higher.

Consumption of canned tuna is rising only in the U. S. and EEC. However, there has been a tendency in these areas to meet domestic consumption needs from processing of frozen tuna, rather than by increased imports of canned tuna. This is reflected in very slow growth of canned tuna exports--0.9 percent per annum in 1956 to 1965, and 1.1 percent from 1956-58 to 1963-65, or 1.0 percent per year based on least squares regression.



TUNA CHEESIES

- 1 can (6-1/2 or 7 ounces) tuna
- 1 cup shredded cheese
- 1/4 cup butter or margarine, softened
- 2 tablespoons lemon juice
- 1-1/3 tablespoons grated onion
- 1 teaspoon Worcestershire sauce
- 1/2 teaspoon paprika
- 3 drops liquid hot pepper
- 30 melba toast rounds

Drain and flake tuna. Cream the cheese and butter. Add seasonings and tuna. Mix thoroughly. Spread each toast round with approximately 2 teaspoonfuls of tuna

mixture. Place on a baking pan, 15 by 10 by 1 inch. Broil about 4 inches from source of heat for 3 to 5 minutes or until lightly browned. Makes approximately 30 canapes.

This idea for entertaining is from a 22-page, full-color booklet, "Nautical Notions for Nibbling," by the United States Department of the Interior's Bureau of Commercial Fisheries. It is available for 45 cents from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. 20402. Ask for Market Development Series No. 10 (catalog no. I-49.49/2:10).